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Data Sources and Methods for the Drinking Water Advisories in Canada Indicator

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Canada

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1 Introduction

The Drinking Water Advisories in Canada indicator is part of the Canadian Environmental Sustainability Indicators (CESI) program, which provides data and information to track Canada's performance on key environmental sustainability issues.

2 Description and rationale of the Drinking Water Advisories in Canada indicator

2.1 Description

The Drinking Water Advisories in Canada indicator reports on the main reasons why drinking water advisories were issued in Canada between 2010 and 2012. It also reports on how community size influences the percentage of boil water advisories issued in one year.

This indicator provides a long-term view of the main reasons why drinking water advisories are issued, namely:

i) the detection of *E. coli*, which is evidence of disease-causing organisms in drinking water;
ii) a precautionary basis due to elevated levels of other, non-health-related water quality indicators; and
iii) a precautionary basis due to equipment- and process-related issues.

2.2 Rationale

Although Canada's drinking water is among the safest in the world, improved understanding of key trends related to drinking water advisories helps identify priorities for drinking water infrastructure and operations in Canada. This information helps foster consistency and coordination of efforts to support enhanced drinking water safety and the sustainability of drinking water infrastructure across the country.

The Canadian Network for Public Health Intelligence (CNPHI) provides a suite of secure surveillance and alerting applications for use by federal-provincial-territorial health protection agencies. In this regard, the CNPHI Drinking Water Advisories application (DWA) has been created to meet the needs of the agencies responsible for overseeing the safety of drinking water. The DWA helps them to manage and share information in order to coordinate response efforts during a drinking water incident, and helps to capture, analyze and report on the context of drinking water advisories so that lessons can be learned and priorities can be identified.

In Canada, the lead responsibility for overseeing the safety of drinking water lies with provincial and territorial governments. Drinking water advisory data are generated by lead agencies as the advisories are issued. When a drinking water advisory is issued, the DWA helps the lead agency quickly communicate the advisory to personnel while capturing key information describing the incident. The system can help agencies communicate information to the public quickly, and allows for analysis of accumulated drinking water advisory data to reveal key trends (such as water quality or operational reasons for the advisories) and the characteristics of the drinking water systems or communities affected.

3 Data

3.1 Data source

Data for this indicator originate from the agencies using the Canadian Network for Public Health Intelligence (CNPHI) Drinking Water Advisories application (DWA) and were drawn from the system.

3.2 Spatial coverage

Data used in this indicator originate from a variety of agencies and jurisdictions across Canada. Given that this is a relatively new surveillance tool, the data do not yet represent 50% of the Canadian population. However, the results are representative of key drinking water needs and issues in Canada.

3.3 Temporal coverage

Data for this indicator span the period from January 1, 2010 to December 31, 2012.

3.4 Data completeness

Data included in this indicator represent all boil water advisories issued by participating jurisdictions from 2010 to 2012.

3.5 Data timeliness

The Drinking Water Advisories in Canada indicator was calculated using the most recent data available.

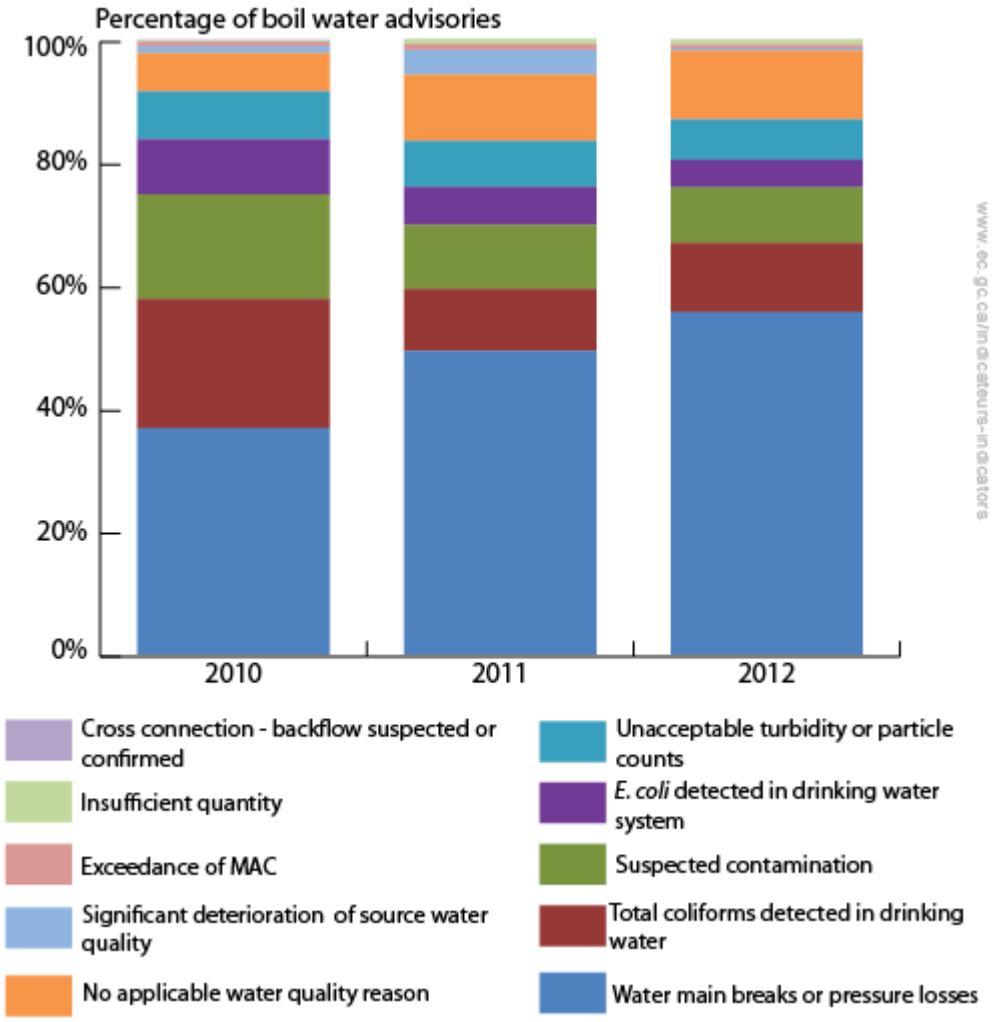
4 Methods

Since boil water advisories are the most common type of drinking water advisory, and represent the vast majority of the data, the Drinking Water Advisories in Canada indicator focuses on trends related to boil water advisories. The reasons that boil water advisories were issued fall into three categories: *E. coli*; Other water quality indicators; and Equipment and process. These categories represent a consolidation of the broad array of more detailed water quality reasons captured by the Drinking Water Advisories application (DWA) (Table 1). Figure 1 captures how these categories contributed to drinking water advisories.

Table 1. How DWA categories were grouped for the indicator

Category	Definition	Indicator Category
Water main breaks or pressure losses	Includes instances when distribution-system pipes break, resulting in a breach of integrity, leakage and loss of system pressure. This category also includes system pressure losses due to maintenance work, power failures or depleted reservoir storage.	Equipment and process
Total coliforms detected in drinking water system	Common environmental bacteria used to assess general conditions within the drinking water system.	Other water quality indicators
Suspected contamination	Used when contamination is suspected due to observed conditions, not test results.	Other water quality indicators
E. coli detected in drinking water system	The chief bacterial indicator of drinking water safety. Its presence suggests the possible presence of disease-causing micro-organisms in drinking water.	*E. coli*
Unacceptable turbidity or particle counts	A measure of the cloudiness of water caused by suspended particles.	Other water quality indicators
No applicable water quality reason	Used in cases when an advisory is issued solely for operational reasons with no observed impacts on water quality.	Equipment and process
Insufficient quantity	Used in cases when the capacity of water storage is depleted, resulting in a potential loss of pressure in the drinking water system.	Equipment and process
Significant deterioration of source water quality	Used in instances when a decline in source water quality has impacted drinking water quality.	Equipment and process
Exceedance of MAC	Used in instances when the Maximum Acceptable Concentration (MAC) of a contaminant has been exceeded.	Equipment and process
Cross-connection: backflow suspected or confirmed	Applies to inappropriate connections to a drinking water system, resulting in potential contamination of drinking water.	Equipment and process

Figure 1. The percentage of drinking-water advisories by Drinking Water Application water quality category, Canada, 2010 to 2012



5 Caveats and limitations

The Canadian Network for Public Health Intelligence (CNPHI) Drinking Water Advisories application (DWA) is a national asset that has been developed and enhanced over time through partnerships and collaborative work involving federal, provincial and territorial partners. The front line users of the system are the lead agencies who oversee drinking water safety. The data on the system belong to them, because they have created it in the course of their oversight activities.

The DWA became a live surveillance and alerting application in 2008. The pace at which data will approach the national scale will be dependent on how the growing number of partner agencies adopt and implement the system. The number of agencies using the system is growing each year, and the end goal for the Drinking Water Advisories in Canada indicator is to represent the full national picture. Although this is not yet the case, the data are

representative of prevailing trends in a variety of regions across Canada, and provide useful insight into issues that challenge the delivery of safe drinking water.

The Drinking Water Advisories in Canada indicator presents an overall view of the trends emerging in the system and does not focus on the specific data for any particular province, territory or agency. It is important to note that percentages reported in this report may change when additional historic data are added to the system as adoption of the DWA expands to new agencies.

Each boil water advisory record also includes information on operational reasons, such as power outages and planned maintenance, that resulted in a boil water advisory being issued. This context has been integrated into the Drinking Water Advisories in Canada indicator.

6 References and further reading

6.1 References

Health Canada (2009) Guidance on issuing and rescinding boil water advisories. Retrieved on 10 April, 2013. Available from: http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/boil_water-eau_ebullition/index-eng.php.

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Annex 1

The percentage of drinking-water advisories by Drinking Water Application water quality category, Canada, 2010 to 2012

	% boil water advisories		
Cause of boil water advisory	**2010**	**2011**	**2012**
Water-main breaks or pressure losses	36.8	49.4	55.7
Total coliforms detected in drinking water	21.0	10.1	11.3
Suspected contamination	17.1	10.4	9.0
E. coli detected in drinking water system	8.9	6.2	4.5
Unacceptable turbidity or particle counts	7.8	7.5	6.6
No applicable water quality reason	6.2	10.7	11.1
Significant deterioration of source water quality	1.2	4.0	0.4
Exceedance of MAC	0.6	1.0	0.6
Insufficient quantity	0.2	0.8	0.8
Cross connection – backflow suspected or confirmed	0.2	0.0	0.0

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