

National Collaborating Centres for Public Health

Update on the NCCPH Small Drinking Water System Project

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Outline

- NCCCPH Overview
- Small Drinking Water Systems Beginnings
- Project Update



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National Collaborating Centres for Public Health (NCCCPH)

Who are we?

- Six Centres created by the Federal government to strengthen public health in Canada
- Each Centre focuses on a specific area of public health

Mission

- Develop, translate, promote and support the use of existing and new evidence in public health to inform best practices nationally – and beyond



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National Collaborating Centres for Public Health (NCCCPH)



NATIONAL COLLABORATING CENTRE
FOR ABORIGINAL HEALTH

CENTRE DE COLLABORATION NATIONALE
DE LA SANTÉ AUTOCHTONE



Centre de collaboration nationale
sur les politiques publiques et la santé

National Collaborating Centre
for Healthy Public Policy



National Collaborating Centre
for Determinants of Health

Centre de collaboration nationale
des déterminants de la santé



National Collaborating Centre
for Infectious Diseases

Centre de collaboration nationale
des maladies infectieuses



National Collaborating Centre
for Environmental Health

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National Collaborating Centre
for Methods and Tools

Centre de collaboration nationale
des méthodes et outils



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NCC Leads & Host Institutions



NCCA – Margo Greenwood, PhD
University of Northern British Columbia, Prince George, BC



NCCDH – Hope Beanlands, RN, PhD(c)
St. Francis Xavier University, Antigonish, NS



NCCCEH – Tom Kosatsky, MD, MPH
British Columbia Centre for Disease Control, Vancouver, BC



NCCCHPP – François Benoit, MSc
Institut national de santé publique du Québec, Montreal, QC



NCCID – Margaret Fast, MD
International Centre for Infectious Disease Inc., Winnipeg, MB



NCCMTH – Donna Ciliska, RN, PhD
McMaster University, Hamilton, ON



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National Collaborating Centres for Public Health (NCCCPH)

Goals of all NCCs

- Synthesize, translate, and exchange evidence-based knowledge to support front-line public health practitioners and policy-makers in Canada
- Identify gaps in the use of evidence in public health practice and policy making
- Strengthen national profile with significant contacts and networking across Canada
- Consult with front-line public health practitioners to identify promising practices, policy options and research gaps



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Small Drinking Water Systems Project

Why this project?

- NCCEH commissioned Retrospective Surveillance of Waterborne Disease Outbreaks
- Most outbreaks happened in small systems (<5000 connections)

Purpose: Improve small systems by identifying gaps and providing the necessary evidence to inform policy and practice



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Consultations

- Consulted policymakers & practitioners, Aboriginal organizations and communities, and other experts
 - CIPHI conference (May 2009)
 - CPHA conference (June 2009)
 - Toronto forum (June 2009)
 - Montreal forum (September 2009)
 - Online Survey (ended October 2009)



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Results of Consultations

- Identified gaps were prioritized within each of these six areas:
 - Testing
 - Treatment
 - Surveillance
 - Interventions
 - Policy
 - Education



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Small Drinking Water Projects

1. Description of roles and responsibilities
2. Production of a user guide to home water testing
3. Review of applicability of treatment technologies
4. Creation of a database of notifiable waterborne diseases
5. Review of effective strategies for risk communication
6. Review of drinking water and its impact on pregnancy and children's health
7. Inventory and summary of Canadian and international projects in SDWS
8. First Nations SDWS



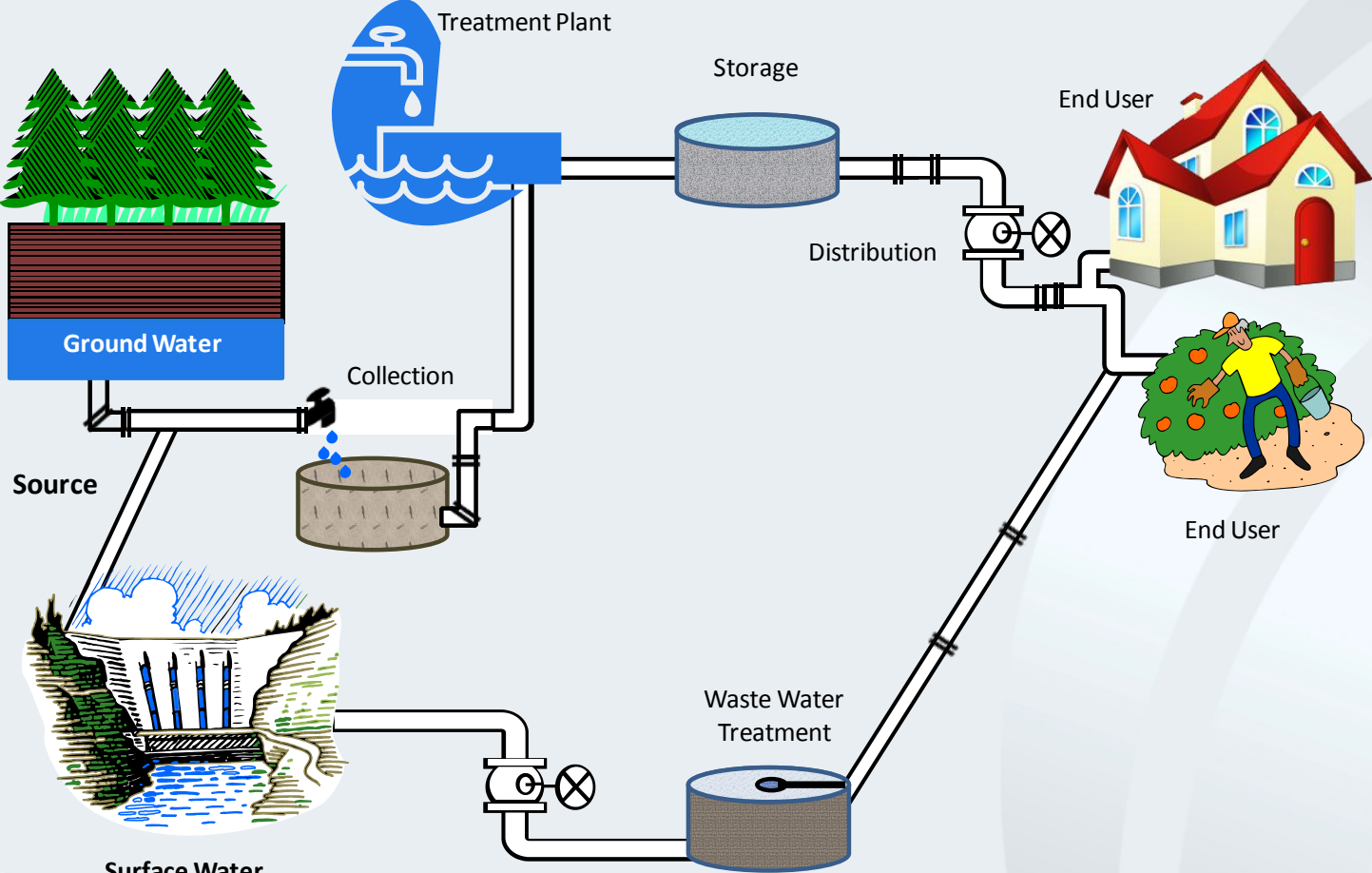
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Source to Tap to Source



Surface Water
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1. Roles and Responsibilities

- Components:
 - Source water protection
 - Water treatment and distribution
 - Drinking water quality and monitoring
 - Waste management
 - Surveillance
 - Role of community in provision of safe drinking water



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1. Gaps

British Columbia

Source Water Protection:

- Source vulnerability assessment & ranking (in progress)

Water Treatment & Distribution:

- Lead funding organization - water system planning/infrastructure
- Fee for water distribution

Drinking Water Quality & Monitoring:

- Chemical testing

Surveillance:

- No overall policy; guided regionally

Manitoba

Water treatment & distribution:

- Fee for water distribution

Surveillance:

- No overall policy; guided regionally



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1. Roles and Responsibilities (partial sample only)

Location	Organization/Personnel	Source	Treatment	Quality	Waste	Surveillance	Community
BC	Lieutenant Governor in Council	√		√			
	Ministry of Healthy Living & Sport	√		√			
	Minister - Healthy Living & Sport	√		√			
	Provincial Health Officer/Authority	√	√	√		√	√
	Regional Health Authorities	√		√		√	√
	Medical Health Officer	√	√	√		√	√
	Provincial Drinking Water Officer	√	√	√		√	√
	Regional Drinking Water Officers	√	√	√		√	√
	Water System Owner	√	√	√			
	Water Supplier	√	√	√		√	√
	PH Engineer	√	√	√			



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2. Home Water Testing Guide

- Extensive search for test kits
- Contact with producers

Results:

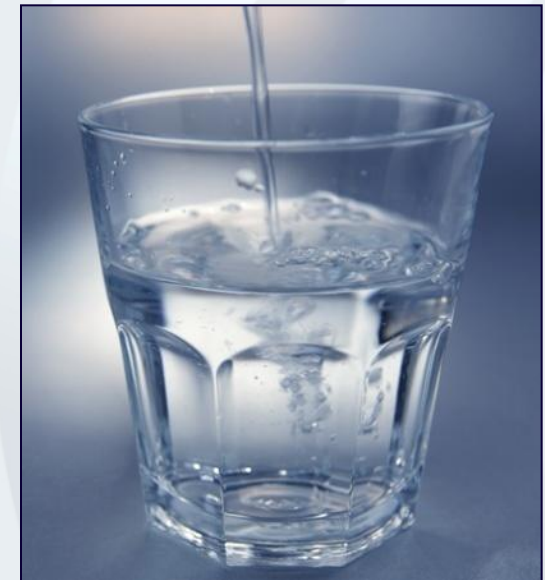
10 kits found

2 had any information about precision or accuracy

-false positives up to 14%

-false negative up to 38%

Fact Sheet available!



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3. Treatment Technologies

General comments:

- Look for high water quality first (groundwater vs surface water) to avoid need for coagulation and disinfection (if possible)

Treatment Requirements:

- Low construction & operating costs
- Simple operation
- Low maintenance & low labour requirements
- No serious residual disposal
- Specific to the water characteristics!
- Pilot plant testing is essential, even for packaged plants!



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Partial Sample Only

Treatment	Level of operational skills	Level of maintenance	Comments
Coagulation-filtration package plants	<ul style="list-style-type: none"> • Coagulation chemistry must be managed properly 	<ul style="list-style-type: none"> • Cleaning or backwash required 	<ul style="list-style-type: none"> • Ready to operate • Little flexibility • Alternative to large scale coagulation-filtration which is complicated
Slow sand filtration	<ul style="list-style-type: none"> • Basic 	<ul style="list-style-type: none"> • 2 to 5 hours per month 	<ul style="list-style-type: none"> • No access to electrical power needed • Low turbidity water • Does not remove all microorganisms
Diatomaceous earth filtration	<ul style="list-style-type: none"> • Intermediate 	<ul style="list-style-type: none"> • Cleaning filter every 1-4 days 	<ul style="list-style-type: none"> • Removes <i>Giardia</i> and <i>Cryptosporidium</i> (oo)cysts • Fine grade can remove bacteria, however use of coagulant chemical required for virus removal • If no chemical used, residue can be discarded to landfill • Does not remove all microorganisms
Precipitative softening	<ul style="list-style-type: none"> • Can require advanced operator skills • Knowledge in water chemistry needed 	<ul style="list-style-type: none"> • Require regular attention 	<ul style="list-style-type: none"> • Due to complexity of fluctuation of water characteristics, used only for well water • Removes a wide range of contaminants including nitrate and arsenic • Lime sludge can usually be suitable for application to farmland





4. Waterborne Disease Outbreaks

- Review of surveillance systems for waterborne disease outbreaks in Canada and internationally
 - No formal surveillance conducted nationally
 - Scattered informal surveillance conducted at provincial, local, and university levels
 - Reporting only done through journal articles, case studies, etc.

- GAP: National surveillance system for waterborne disease outbreaks



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4. Notifiable Disease Database

- Reporting of notifiable diseases is conducted at the provincial level
 - Different requirements in each jurisdiction
 - Includes various diseases/conditions (both waterborne and other)
- Reporting at the federal level is voluntary

STEP 1: Compile and compare *notifiable disease reporting requirements* in all Canadian jurisdictions



<http://www.flickr.com/photos/bjarkih/2538316297/>



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4. Notifiable Disease Database

- Compile and publish federal, provincial, and territorial reporting requirements for notifiable diseases
 - What is reported: pathogen, disease, case definition
 - Who reports: physician, laboratory, veterinarian
 - Classifications: *waterborne*, foodborne, STBBI, zoonotic, respiratory
- Stored online and accessible to PH practitioners
- Includes search and comparison capabilities

STEP 2: Use results from database to inform NCC SDWS projects and further work, make recommendation on reporting of waterborne disease outbreaks



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5. Risk Communication – Systematic Review

Lessons learned

- from a trusted source
- tailored to the audience
- based on the strongest scientific evidence available
- incorporate text with visuals (pictures, diagrams) with qualitative and quantitative data for print materials



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5. Risk Communication

- disseminate through multiple sources and channels
- deliver warning system notices on a regular and on-going basis.
- develop communication strategies with the awareness that people make choices based on personal past experience
- ensure the public have an opportunity to address questions and concerns





6. Drinking Water and Impact on Pregnancy and Children's Health

- **Summary of evidence - findings include:**
 - Literature is not well organized or easily retrieved
 - Clean quality drinking water is an issue in rural areas
 - Evidence of Canada's commitment to children's environmental health, and safe drinking water
 - Evidence of need to protect children i.e.
 - use of chloramines
 - chronic arsenic exposure
 - lead leaching from pipes
 - homes, schools & communities



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6. Drinking Water and Impact on Pregnancy and Children's Health

- **Evidence indicates a need to:**
 - **Incorporate child protection measures in water quality policy making, regulatory decisions & accountability**
 - **Support research, monitoring and publications of health impact of contaminants on fetuses and children**
 - **Provide parents and caregivers with accessible information to make informed choices around protecting children from drinking water contaminants**
 - **Publish performance measures of children's environmental health including water quality indicators**



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7. Inventory of Other Small Drinking Water Projects

- **Summarized and linked to information on projects across Canada and internationally**
 - Walkerton Centre
 - Canadian Network for Public Health Intelligence (CNPHI) drinking water modules
 - Environmental Operators' Certification Programs
 - RES'EAU Water Network
 - Circuit Rider programs



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7. Circuit Rider Training Programs (CRTP)

- National training program began in Canada mid-1990s
- Customized training program for water and wastewater operators in remote locations
- CRTP takes into consideration:
 - Educational background of trainees
 - Remote location of the communities
 - Unique culture of First Nations peoples
- Circuit riders (trainers) are experts in the field with years of experience; personally oversee training of operators in several communities (the circuit)



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7. CRTP

- **One-on-one hands-on training on-site:**
 - water and sewage treatment
 - health and safety guidelines
 - community awareness promotion
 - water testing
- **Every province and territory (except Nunavut) with plans for more expansion over the next 5 years**



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8. First Nations SDWS

- Collaborative project with Assembly of First Nations (AFN)
- Evidence Reviews(2)
 - State of Knowledge on SDWS in First Nations communities across Canada
 - Regulatory Issues On-Reserve



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Potential Projects

- Case study of a municipal/regional example of policy change: tracking key factors in producing them
- Deliberative process
 - Multisectoral discussion
 - Add to the stock of pertinent evidence
 - To make the most informed decision possible



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Next Steps

- Today's consultative session on SDWS
- Complete these projects and others
- Develop an e-magazine describing current and promising practices
- Put together a repository of SDWS information
- Continuing consulting with users of this information and experts



Next Steps

- Develop a training catalogue to increase capacity of PH practitioners with specific responsibilities in SDWS
- Evaluate hazard analysis tools for SDWS
- Use webinars and discussion boards as a way to engage remote PH professionals



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**Thank you!
Questions?
Contact us**

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Website: www.nccph.ca



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