



Public Health Update

Saturday, February 05, 2005

Dynamic Times

As with all of NPS, and indeed the whole of the federal government, the Public Health Program is faced with very limited resources and no lack of demand for our time and attention. For at least the last seven or eight years, the PHP has had a generally static base budget and increasing fixed costs. The program has held the line largely by allowing positions to go unfilled or reducing full time and seasonal personnel. There is no lack of support for our subject area, even at the highest levels of the agency, but things are simply tight all over.

Times like these test everyone, but they can also be an opportunity for self-examination, mission evaluation, innovation, and renewal. As scary as this sort of challenge is, perhaps there is some lemonade here somewhere.

During this last year, the PHP has begun a process of attempting to gather more data, and examine how we can be of the highest value to those we serve, both visitor and NPS. We entered this process a little behind the curve and so to date, for the sake of expediency, a lot of our effort has been limited to ideas and evaluations generated and conducted by our main office. However, now that we're a little caught up (wishful thinking?), we deeply desire to involve our field staff, formally survey parks and various NPS units, and ultimately renew our efforts by incorporating the latest science, needs and field ideas. My hope is to build on our past efforts, keeping what has worked best, in a process of continuous improvement. Those who came before us put in too much work for us to simply discard or dismiss their methods and priorities.

In connection with this initial self-examination, we have discovered that the nature of our park units and the work they inherently generate for our program is not even across regional boundaries. As a result, and in an effort to gain efficiency, we are taking steps toward combining our NE and NCR Public Health Consultant positions into one. This will be accomplished over the next calendar year. With input from both regions, we will develop a plan of coverage designed to

make sure that no critical public health issue or need is allowed to go unmet.

We do not plan any other consolidations or reduction in positions.

Other directions and areas of exploration include:

- A renewed effort to insure that the advice we offer NPS is soundly grounded in science;
- Exploring ways that we might set risk-based priorities;
- Making sure that our consultations pro-actively assess any and all potential for the convergence of park activities and infrastructure with the cycles of disease transmission;
- Actively assisting park units in finding solutions that both protect the public and contribute to all other aspects of the NPS mission; and
- Conducting our work in ways that efficiently and effectively stretch every public dollar.

A concerted effort has also been undertaken to reach out to those inside of and external to NPS that we may partner or collaborate with in order to leverage both our time and budget. Discussions with NPS units, parks, other federal agencies and academic institutions have already resulted in many examples of outcomes beyond what we might accomplish on our own.

Your continued feedback about needs and what types of services/assistance are of the most value to you, is greatly and sincerely appreciated!

By: CAPT Chuck Higgins, USPHS
Director, Office of Public Health
(202) 513- 7217

Executive Summary Waterborne Disease Outbreaks Associated with Drinking Water 2001- 2002

This summary is intended to provide NPS public health staff and utilities managers a simple description of available national

data on drinking water outbreaks and how this information may relate to National Park Service water systems. This summary answers the following questions: What is the scale and scope of waterborne illness associated with drinking water? What types of systems are associated with outbreaks? What factors are contributing to waterborne disease outbreaks in these systems? What are the etiologic agents causing the waterborne disease outbreaks? How does the national data relate to the water systems in the National Park Service?



What is the scale and scope of waterborne illness associated with drinking water?

During the years 2001-2002, a total of 31 disease outbreaks were associated with drinking water systems throughout the United States. In actuality, this number of outbreaks could be larger due to the fact that some outbreaks may not have been reported from military bases, national parks or tribal lands. The reported outbreaks caused illness in an estimated 1,020 persons, resulting in 51 hospitalizations and seven deaths.

What types of systems are associated with outbreaks?

Illness outbreaks were reported in public and non-public water systems throughout the country. Ground water systems comprise 90.9% of the public and non-public water systems while the rest are served by surface water systems. However, the majority of the people are served by surface water systems (66.2%).

Of the reported illness outbreaks, 92% occurred with groundwater systems while 8.0% occurred with surface water systems.

What factors are contributing to waterborne disease outbreaks in these systems?

The underlying factors or variables that led to the outbreaks vary by the type of system. Vulnerabilities associated with distribution played a heavier role in community systems than non-community systems. Contaminated ground water was involved in outbreaks for both types of systems, but was the most frequent cause of transmission in non-community systems. Breakdowns in treatment or the absence of treatment was a factor for outbreaks associated with both non-community and community systems.

From this data and previous years' data, it is obvious that a common precursor to drinking water outbreaks is the "misclassification" of ground water, leading operators to believe that their ground water sources are protected and without much potential for contamination. In fact, many of these sources are subject to surface water influence. Variables that may contribute to this vulnerability include:

1. Geology and hydrology;
2. Well construction; and
3. Weather / climate.

Unfortunately, an outbreak may end up serving as the proof that a previously unknown connection or potential connection exists between a ground water source and surface water.



What are the etiologic agents causing the waterborne disease outbreaks?

The infectious disease causing agents involved in the waterborne disease outbreaks, their percentage of the total outbreaks and their predominant illness include the following:

1. Legionella bacteria (19.4%)- Legionnaires disease and Pontiac fever.
2. Viruses (16.1%) attributed to Norovirus- Gastroenteritis

3. Parasites (16.1%) attributed to Giardia intestinalis- Gastroenteritis, Cryptosporidium- Gastroenteritis and Naegleria fowleri- Meningocephalitis



4. Bacteria other than Legionella species(9.7%)- Gastroenteritis
5. Chemical contamination (16.1%)- Chemical poisoning leading to Gastroenteritis
6. Unknown etiology (22.6%)- Gastroenteritis

How does the national data relate to the water systems in the National Park Service?

While the NPS has all types of drinking water systems, as a whole, ours more closely mirror the small community and non-community systems found in rural areas across the country.

An important lesson found within the national disease transmission statistics is that these smaller, often ground water-dependent systems are more likely to be involved in outbreaks. One of the central issues, therefore, for NPS is to actively examine our groundwater sources for any potential of surface water influence that might result in contamination.

The statistics also point to the importance of other factors including careful control over treatment, distribution and storage. Taking the time to deeply understand all of our systems, any possible vulnerabilities, and how much control we have over these issues, is well worth the effort.

Recent Examples / Case Studies

1. Walkerton (Ontario, Canada)
 - 1,304 cases reported (actual cases are estimated to be around 2,321)

- 165 hospitalized and 16 deaths
- agent was a bacteria, E. coli 0157:H7
- factors involved
- one well subject to surface contamination
- heavy rain and runoff from a nearby farm where animals tested positive for the outbreak agent
- inadequate treatment
- communication problems
- *Editorial Note: this report concluded that, "Prevention of such outbreaks cannot rely on monitoring, testing and reporting since failures in the system can only be identified after the contaminating event." This outbreak and conclusion points to the importance of deeply understanding our drinking water sources and protecting them. A central public health principle, "correct the cause, not the symptom" is an important theme within the NPS Public Health Program.*

2. Bighorn Lodge, Wyoming
 - a. 112 cases
 - b. agent was a virus, norovirus
 - c. factors involved
 - i. proximity of sewage disposal system
 - ii. geology
 - iii. narrow focus on compliance
 - d. *Editorial Note: This incident is a good illustration of missing a disease transmission route because all parties were only focused on compliance. The wells were at or over 100 feet from the septic system leach field, but both were in fractured granite which provided some filtration for larger organisms but not for something as small as norovirus.*



3. A Large Western Park (no identified cases or outbreak but great potential)
 - a. pathogenic parasites identified in raw water
 - b. shallow well in loose, rocky soil
 - c. filters in place
 - d. maintenance personnel installed incorrect filter bag allowing water to

- flow around part of the filter
- *e. next routine replacement of filter found situation*
- *f. Editorial Note: While no cases or outbreak have been identified, the public was placed at risk and transmission may have been enabled due to human error. No matter the safeguards, the people or operator factor is ever present, reminding us of the importance of training, oversight, and the need for purposeful, active management for a safe outcome.*

Sources Include:

CDC, Drinking Water Disease Surveillance Summary, 2001- 2002.

Bruce-Grey- Owen Health Unit, The Investigative Report of the Walkerton Outbreak of Waterborne Gastroenteritis.

Journal of Infectious Diseases, A Waterborne Outbreak of Norwalk-like Virus Among Snowmobilers – Wyoming, 2001.

By: CAPT Robert Reiss, PE
Regional Public Health Consultant
Public Health Program, MWR

Editorial Comments By:
CAPT Charles L. Higgins, REHS, MSEH
Director
Office of Public Health

Third Party Drinking Water Sanitary Surveys



The PHS consultants routinely provide an onsite public health survey of facilities within the National Parks and one of the areas we review is the drinking water system. These systems are typically operated by trained and certified National Park Service maintenance personnel. There are several classes of public drinking water systems and the terminology depends upon the population served and/or the number of buildings connected to the drinking water system. The large drinking water systems are commonly called community systems and the smaller

drinking water systems are typically referred to as noncommunity systems.

Public drinking water systems are required by law (Safe Drinking Water Act) to have a routine “sanitary survey” performed. The water system owner, in this case the National Park Service, pays a fee to have the Primacy agency perform a sanitary survey. The primacy agency for regulating drinking water systems in most instances belongs to the State, however EPA may also provide this role. The states of Washington and Alaska have primacy over the drinking water systems in each of their respective states. Most states prefer to perform the Sanitary Surveys themselves because they are the Primacy agencies; however some States contract-out survey work for the smaller systems to *qualified surveyors*.



This is the cases in the states of Washington and Alaska, Oregon and Idaho do not offer a similar program. I am currently a qualified surveyor for the States of Washington and Alaska. The advantages of having a qualified surveyor certificate are: 1) Cost savings to the park 2) This office is familiar with the system 3) Reduces the number of inspectors on site and 4) This position is not limited to just reviewing the drinking water systems, our program assists with other public health issues. To date I have completed a total of 32 state drinking water surveys for Parks within Washington State, that amounts to a cost savings of approximately \$10,000. I was recently awarded qualified surveyor status for the State of Alaska.

To learn more about the qualified sanitary survey program in Washington and Alaska please refer to the following web sites:

Washington State –
www.doh.wa.gov/ehp/dw/default.htm
Alaska -
<http://info.dec.state.ak.us/eh/dwww>

By: CDR John Leffel, REHS, MPH
Regional Public Health Consultant
Public Health Program, PWR

Regional Public Health Consultants
Northeast

CAPT Barry Hartfield (978) 970- 5033

National Capital

CAPT Richard Durrett (202)619- 7070

Southeast

CDR Brian Cagle (404) 562- 3124 ext 549

Midwest

CDR Robert Reiss (402) 221- 3786

Intermountain

CAPT John Collins (303) 969- 2922

CAPT Joe Winkelmaier (505) 988- 6040

LT George Larsen (307) 344- 2273

LTJG Adam Kramer (929) 226- 0168

Pacific West

CDR Paul Robinson (510) 817- 1375

CDR John Leffel (206) 220- 4270

Alaska

CDR John Leffel (206) 220- 4270

WASO Staff

Director, Office of Public Health

CAPT Chuck Higgins (202) 513- 7217

Deputy Director, Office of Public Health

LCDR Jason Thomas (202) 513- 7226

Program Analyst

Sonya Coakley (202) 513- 7215

Individual Park Public Health Staff

GATE LT Craig Ungerecht (718) 354- 4693

SEKI Paul Schwarz (559) 565- 3144

LAME J. Shannon Swann (702) 293- 8985

YOSE Bernice Dommer (209) 379- 1033



In Partnership for nearly 100 years, the National Park Service and the United States Public Health Service have worked together to protect the health of visitors in Americas Parks!