Drinking Water Medical Surveillance

Presented by: LT Nina Paddock, MSC
Environmental Health Officer, NMCPHC
Announcements

- Register for the Monthly Disease Surveillance Trainings to receive CMEs/CNEs:
  1. Log-on or Request log-on ID/password: https://tiny.army.mil/r/zB8A/CME
- Communicate with your Service surveillance hub to ensure you get information on future trainings: POC info in chat box
- Confirm attendance for today’s training:
  - Enter your name/service into chat box or email your Service hub
  - You will receive a confirmation email within the next 48 hours
  - If you do not receive this email, please contact us
  - Please put your phones on mute when not speaking
  - We will be taking attendance on the phone lines as well for future planning
Objectives

- Describe drinking water medical surveillance

- Discuss the importance of drinking water medical surveillance

- Identify factors that trigger drinking water testing

- Understand the key factors involved in conducting the testing and evaluation of drinking water
Drinking water

Potential challenges

- Pathogen resistance
- Contaminants
- Inadequate infrastructure
- Emergency related events
Safe Drinking Water Act (SDWA)
42 U.S.C. §300f et seq

- Protect public health by regulating the nation’s public drinking water supply

- Authorizes the U.S. Environmental Protection Agency to set national health-based standards for drinking water
  - National Primary Drinking Water Regulations

- Applies to every public water system in the U.S.
Continental U.S. Navy, Air Force, and Army drinking water policies

- OPNAVINST 5090.1C, Environmental Readiness Program Manual
  - BUMEDINST 6240.10 series, Standards for Potable Water
  - NAVMED P-5010, Chapter 5, Potable Water Ashore
  - CNIC 5090.1, CNIC 5090.2, CNIC 5090.3

- AFI32-7001, Environmental Management
  - AFI32-1067, Water Systems
  - AFI48-144, Drinking Water Surveillance Program

- AR 420-1, Army Facilities Management
  - AR 40-5, Preventive Medicine
  - TB MED 576
# Navy and Marine Corps Drinking Water Policy and Guidance

## CONUS
- OPNAVINST 5090.1 series
- MCO P5090.2A
- BUMEDINST 6240.10A
- NAVMED P-5010-5

## OCONUS
- DoD 4715.05-G, OEBGD
- Final Governing Standards (country specific)
- CNIC 5090.1
- CNIC 5090.2
- CNIC 5090.3
- Memorandum for Navy Overseas IWQB and RWQB
- Drinking Water Treatment Chemical Standards for U.S. Navy Installations Overseas
- BUMEDINST 6240.10A
- NAVMED P-5010-5

## AFLOAT
- BUMEDINST 6240.10A
- NAVMED P-5010-6
- COMNAVAIRFORINST 6000.1, (Aircraft carriers of the Naval Air Force)
- COMNAVSURFORINST 6000.1, (Naval Surface Forces)
- COMSUBFORINST 6000.2, Submarine Medical)

## DEPLOYMENT
- NAVMED P-5010-10
## Compliance Monitoring vs. Surveillance*

<table>
<thead>
<tr>
<th></th>
<th>Compliance Monitoring</th>
<th>Surveillance</th>
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<tbody>
<tr>
<td><strong>Who</strong></td>
<td>Water system owners (public works, engineering)</td>
<td>Military “public health” personnel</td>
</tr>
<tr>
<td><strong>What</strong></td>
<td>Microorganisms, disinfectants, disinfection byproducts, inorganic chemicals, organic chemicals, radionuclides</td>
<td>- Review or inspection of records</td>
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<tr>
<td></td>
<td></td>
<td>- Bacteriological testing</td>
</tr>
<tr>
<td><strong>When</strong></td>
<td>Based on type of contaminant, the type of source water used, and population service</td>
<td>Ongoing and during outbreak investigations</td>
</tr>
<tr>
<td><strong>Where</strong></td>
<td>Installation distribution system</td>
<td>Installation distribution system</td>
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<tr>
<td><strong>Why</strong></td>
<td>Assure compliance with drinking water laws and regulations in order to protect human health and the environment</td>
<td>Contributes to the protection of public health through detection of risks and identifying a source of an outbreak of a waterborne disease</td>
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<tr>
<td><strong>How</strong></td>
<td>EPA or State certified drinking water laboratory</td>
<td>EPA-approved kits and record reviews</td>
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*Medical surveillance for drinking water is executed differently across the services
Preventive Medicine’s role in drinking water

- Review records
- Test drinking water, as appropriate
- Ensure surveys or assessments are completed
- Work with the water system owners and base environmental staff
- Respond to waterborne disease outbreaks
Establishing a medical drinking water surveillance program

Violations of drinking water standards

- Requires public notification\(^2\) by the water system operators
  - Includes waterborne disease outbreak or other waterborne emergency

- Three tiers of PN:
  - Tier 1: Serious adverse effects on human health as a result of short-term exposure (24 hours)
  - Tier 2: Serious, but not immediate, adverse effects on human health (within 30 days)
  - Tier 3: Violations and situations not included in Tier 1 and Tier 2 (up to a year)

- EPA Revised Public Notification Handbook\(^3\)

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Waterborne disease outbreak

- Preventive medicine’s role with testing drinking water
  - Assess the possibility a waterborne outbreak is occurring
  - Assess the possibility the water supply is contaminated

- Coordinate with water system owners and local public health department

- Investigate the outbreak

- Report via Disease Reporting System internet per BUMEDINST 6220.12 series
**Waterborne disease outbreak**

40 CFR 141.2

Waterborne disease outbreak means the significant occurrence of acute infectious illness, epidemiologically associated with the ingestion of water from a public water system which is deficient in treatment, as determined by the appropriate local or State agency.

Waterborne Disease and Outbreak Surveillance System through the electronic National Outbreak Reporting System

1) Two or more persons must be linked epidemiologically by time, location of water exposure, and illness characteristics; and

2) The epidemiological evidence must implicate water as the probably source of illness

**Military Reporting Guidelines**

1) BUMEDINST 6220.12 series, Medical Surveillance and Medical Event Reporting
2) NMCPHC TM 6220.12, Medical Surveillance and Reporting
3) AFI 48-105, Surveillance, Prevention, and Control of Diseases and Conditions of Public Health or Military Significance
4) Armed Forces Reportable Medical Events Guidelines and Case Definitions
Characteristics of drinking water outbreaks (N=33) and outbreak-related cases (N=1,040)

- **Etiology**
  - *Legionella* caused the majority of drinking water outbreaks and outbreak-associated illnesses (57.6%)
  - Non-*Legionella* bacteria caused the majority of illnesses (81.8%)

- **Water system**: Community water systems

- **Water source**: Ground water

- **Predominant illness**
  - Outbreaks: Acute respiratory illness (57.6%)
  - Cases: Acute gastrointestinal illness (92.6%)
Detecting an waterborne disease outbreak

BLUF: It’s not easy!

- Epidemiologic evidence is generally more reliable than confirmation by microbiologic testing\(^5\).

- Different exposure risks (i.e., tap water consumption, water source, population at risk)

- Multi-disciplinary team (clinicians, infection control practitioners, public works engineers and facilities, nurses, preventive medicine, local public health)

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Waterborne disease outbreaks: EXAMPLES

- 1993 Cryptosporidium outbreak in Milwaukee\(^6\)
  - More than 400,000 people affected
  - Inadequate water-quality standards
  - Viral gastroenteritis or “intestinal flu” without further investigation
  - Outbreak associated illness estimated at $96.2 million\(^7\)

- Legionnaires’ disease outbreak at the VA Pittsburgh Healthcare System\(^8\)
  - Improper remediation action (flushing of all hot water distal outlets)
  - Failure to follow specific clinical SOPs
  - Poor communication and coordination: infection prevention team and facility management service staff

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Investigating a waterborne disease outbreak: Purpose

1) Prevent further transmission

2) Identify the source of exposure

3) Prevent further exposures and limit outbreaks

4) Identify hazards or gaps in the water safety system
Investigating a waterborne disease outbreak: Responsibilities

- Health care providers: immediately notify preventive medicine

- Public health: report potential outbreaks in DRSi and contact local public health department
  - Notify medical chain of command of a potential outbreak
  - Prepare risk communication plan

- Contact Service surveillance hubs or your cognizant NEPMU to assist with investigating and coordinate with the local health department.
Investigating a waterborne disease outbreak: Investigation

- Characterize the outbreak
- Confirm the existence of an outbreak
- Collect specimens and arrange for appropriate clinical laboratory testing
- Case definition
- Conduct an environmental investigation
- Implement control measures
Summary: The Drinking Water Program

- Understand the difference between medical surveillance and compliance monitoring
- Drinking water medical surveillance includes administrative actions as well as being able to detect and respond to a waterborne disease outbreak
- Water testing is complex
- Request assistance to conduct an adequate waterborne disease investigation and prepare a risk communication plan
Questions/Service POCs

- **Army:** USAPHC – Disease Epidemiology Program  
  Aberdeen Proving Ground – MD  
  Comm: (410) 436-7605  
  DSN: 584-7605  
  usaphc.disease.epidemiology@us.army.mil

- **Navy:** Contact your cognizant NEPMU  
  **NEPMU2:** COMM: (757) 950-6600; DSN: (312) 377-6600  
  Email: NEPMU2NorfolkThreatAssessment@med.navy.mil  
  **NEPMU5:** COMM: (619) 556-7070; DSN (312) 526-7070  
  Email: ThreatAssessment@med.navy.mil  
  **NEPMU6:** COMM: (808) 471-0237; DSN: (315) 471-0237  
  Email: NEPMU6ThreatAssessment@med.navy.mil

- **Air Force:** Contact your MAJCOM PH or USAFSAM/PHR  
  USAFSAM / PHR / Epidemiology Consult Service  
  Wright-Patterson AFB, Ohio  
  Comm: (937) 938-3207  
  DSN: 798-3207  
  episervices@wpafb.af.mil