Welcome to the

Model Aquatic Health Code Network Webinar

New Resources from CDC for Healthy and Safe Swimming Week

Featured Presenters: Michele Hlavsa, RN, MPH and CDR Joe Laco, MSEH, RS/REHS

Tuesday, May 22, 2018

Please use your computer speakers to listen to today's presentation

Questions may be submitted via the chat box

We will begin at 1:00 PM Eastern

Thank you for your interest and attendance!

NACCHO
National Association of County & City Health Officials

Updates from NACCHO

It's Healthy and Safe Swimming Week!

- Feature Blog on the Essential Elements of Local Public Health
- Visit www.essentialelements.naccho.org

Next Webinar: July 2018

- Featured Presenter: Michael Beach, Associate Director for Healthy Water, CDC
- Topic: New edition of the Model Aquatic Health Code

Join the MAHC Network!

- MAHC Implementation Resources
- Webinar Updates
- Archived Webinars

REGISTER TODAY

MAHC Network May 2018 Webinar

"New CDC Resources for Healthy & Safe Swimming Week"

WATCH NOW

Watch the MAHC's January Webinar

Webinar Title, "Cyanuric Acid: It's Not Just About Crypto"

BECOME A MEMBER

Join the MAHC Network today!

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Archived Model Aquatic Health Code Network Webinars +

Model Aquatic Health Code Resources +

Colorado Swimming Pool & Mineral Bath Regulations Revision Work Group +

Stay tuned for more ways to network…

NACCHO
National Association of County & City Health Officials

Outbreaks associated with treated recreational water — United States, 2000–2014

Michele Hlavsa, RN, MPH

Epidemiologist, Healthy Swimming & CryptoNet

Waterborne Disease Prevention Branch

Review of Data on 2000–2014 Recreational Water–associated Outbreaks

- Outbreak Definition
  - Similar illness in ≥2 persons, epidemiologically linked by location and time of exposure to
    - recreational water or
    - pathogens or chemical agents aerosolized or volatilized from recreational water into the surrounding air
- Reporting System
  - 50 states, DC, U.S. territories, and Freely Associated States voluntarily report
- Reporting Period
  - 2000–2012; data previously summarized
  - 2013–2014; data reported by December 31, 2015

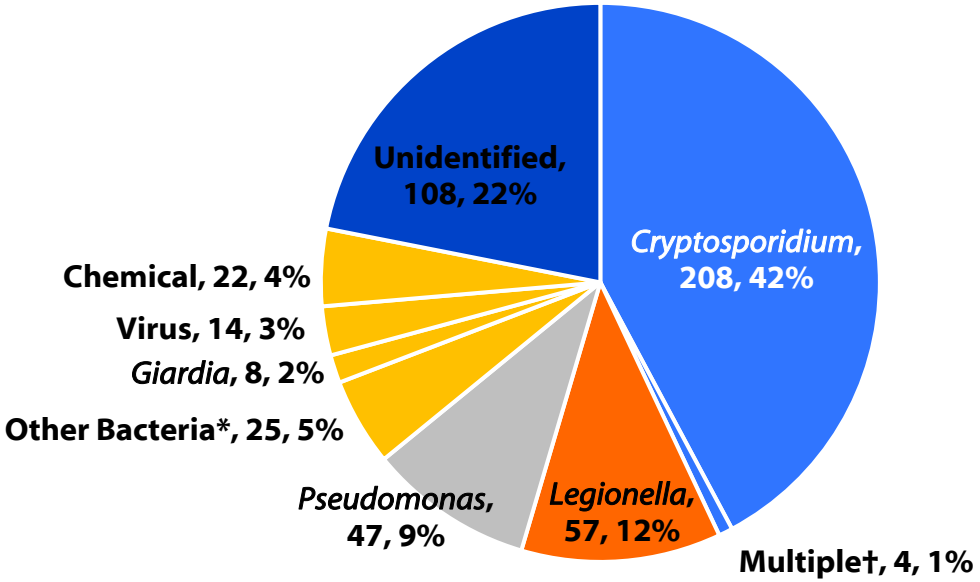
46 states and Puerto Rico

493 outbreaks

>27,000 cases

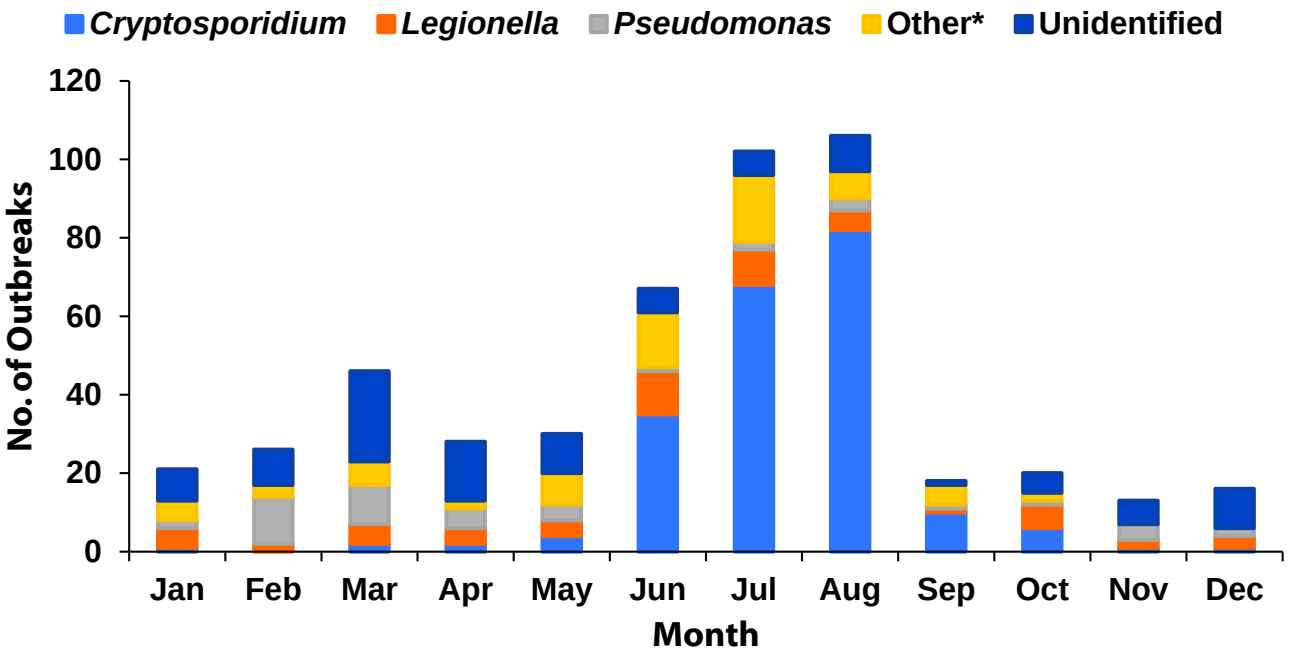
8 deaths

Number of treated recreational–associated outbreaks (n = 493), by etiology United States, 2000–2014



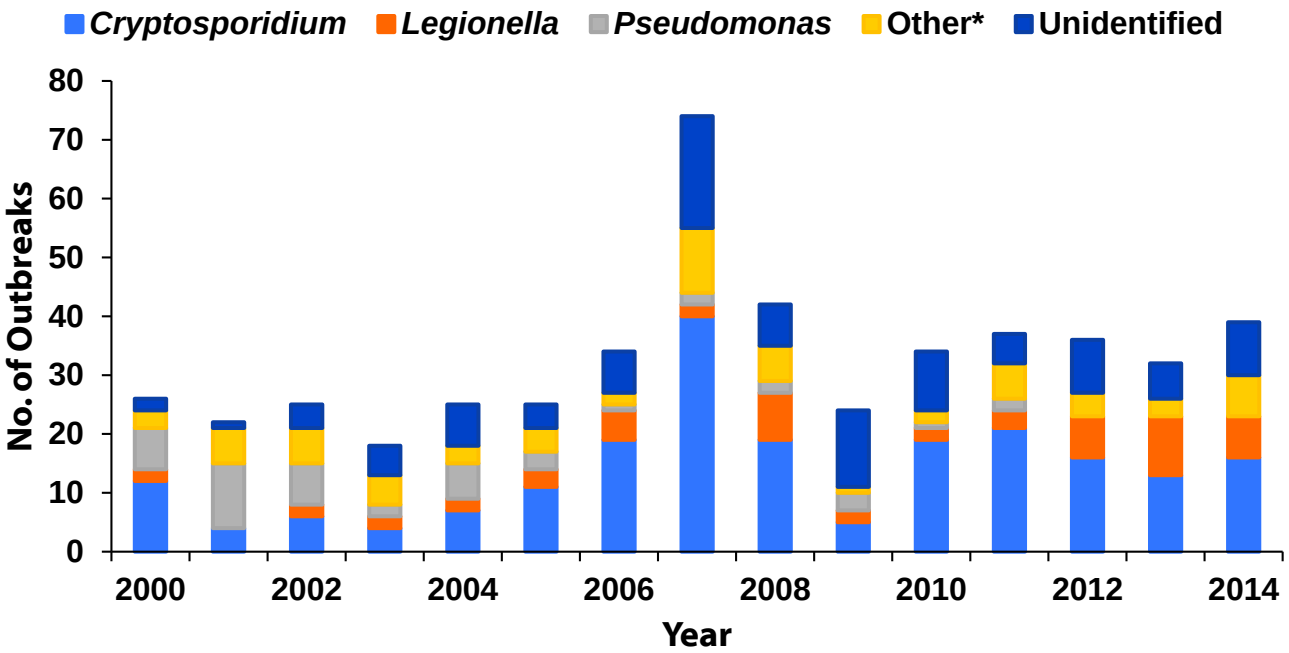
* Includes *Bacillus*, *Campylobacter*, *Escherichia coli*, MRSA, nontuberculous mycobacteria, *Salmonella*, *Shigella*, and *Staphylococcus*.
† All four outbreaks caused by both *Cryptosporidium* and *Giardia*.

Number of treated recreational–associated outbreaks (n = 493), by etiology and month United States, 2000–2014



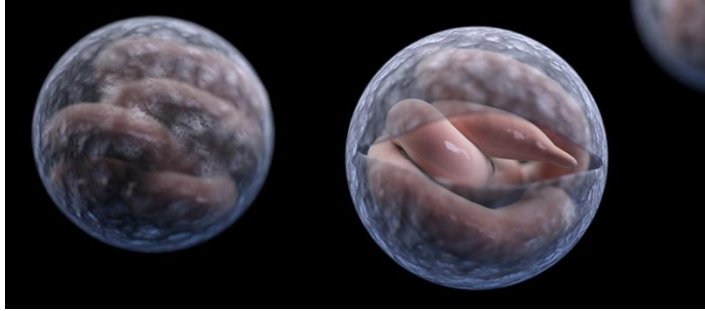
* Includes outbreaks with the following etiologies: *Bacillus*, *Campylobacter*, *Escherichia coli*, methicillin-resistant *Staphylococcus aureus*, nontuberculous mycobacteria, *Salmonella*, *Shigella*, *Staphylococcus*, *Giardia*, echovirus, norovirus, and chlorine/disinfection by-product/altered pool chemistry.

Number of treated recreational–associated outbreaks (n = 493), by etiology and year United States, 2000–2014



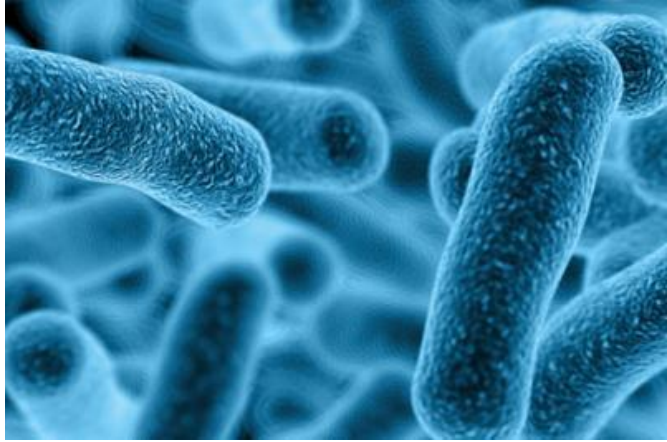
* Includes outbreaks with the following etiologies: *Bacillus*, *Campylobacter*, *Escherichia coli*, methicillin-resistant *Staphylococcus aureus*, nontuberculous mycobacteria, *Salmonella*, *Shigella*, *Staphylococcus*, *Giardia*, echovirus, norovirus, and chlorine/disinfection by-product/altered pool chemistry.

Cryptosporidium



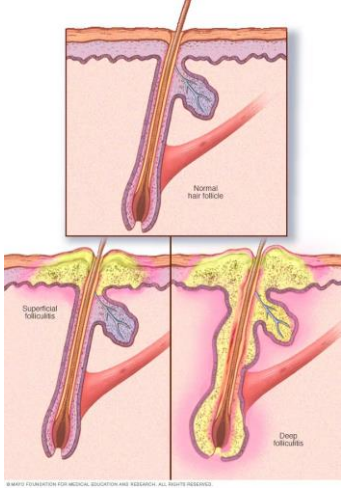
- Extremely chlorine tolerant parasite
- Transmitted when diarrheal incident containing parasite occurs in water and contaminated water ingested
- Prevention messages
  - For aquatics operators and public health
    - Check out the Model Aquatic Health Code: www.cdc.gov/mahc
    - Collaborate to educate swimmers and parents of young swimmers
  - For swimmers
    - Don’t swim or let your kids swim if sick with diarrhea
    - Don’t swallow the water you swim in

Legionella



- Bacterium associated with biofilm
- Transmitted when aerosolized water droplets containing bacterium inhaled
- Prevention messages
  - For aquatics operators and public health
    - Check out the Model Aquatic Health Code: www.cdc.gov/mahc
    - Collaborate to educate swimmers
  - For swimmers
    - Check out latest inspection score
    - Do own mini-inspection
    - Know if at increased risk for Legionnaire's disease

Pseudomonas



- Bacterium associated with biofilm
- Transmitted when skin comes in contact with contaminated water
- Prevention messages
  - For aquatics operators and public health
    - Check out the Model Aquatic Health Code: www.cdc.gov/mahc
    - Collaborate to educate swimmers
  - For swimmers
    - Check out latest inspection score
    - Do own mini-inspection

Healthy and Safe Swimming Week

- 2017 Metrics
  - More than 225 broadcast stories reaching a total of **8.9 million** people
  - Social media coverage included 3,556 tweets with an estimated reach of over **88 million** people.
  - Twitter Chat reached **5 million** Twitter users and had 531 participants; 1,293 total mentions used the hashtag #HealthySwimChat

- Objective
  - Increase awareness of recreational water–associated outbreaks and steps to prevent them
- Target audiences
  - Swimmers and parents of young swimmers

Communications Toolkit

- Community outreach suggestions
- List of resources/URLs
- Sample press release
- Sample feature
- Sample proclamation
- Social media message bank

www.cdc.gov/healthywater/observances/hss-week/response-tools-public-health.html

Promotional Activities and Outreach

- Web
  - CDC.gov homepage feature
  - Fact sheet updates
  - Content syndication https://tools.cdc.gov/syndication/

- Social Media
  - Facebook Live Event (May 21)
  - New graphics and GIFs
  - Instagram story
  - #HSSW18

Promotional Activities and Outreach

- Partner Outreach
  - Blog post
  - GovDelivery announcement

- Media
  - CDC Press Release
  - Radio Media Tour (May 22)

Printed Materials

- Brochure

  (English & Spanish)
- 2 Pool Chemical Safety Posters
  - Use
  - Storage

  (English & Spanish)
- Infographics, Buttons & other promotional materials

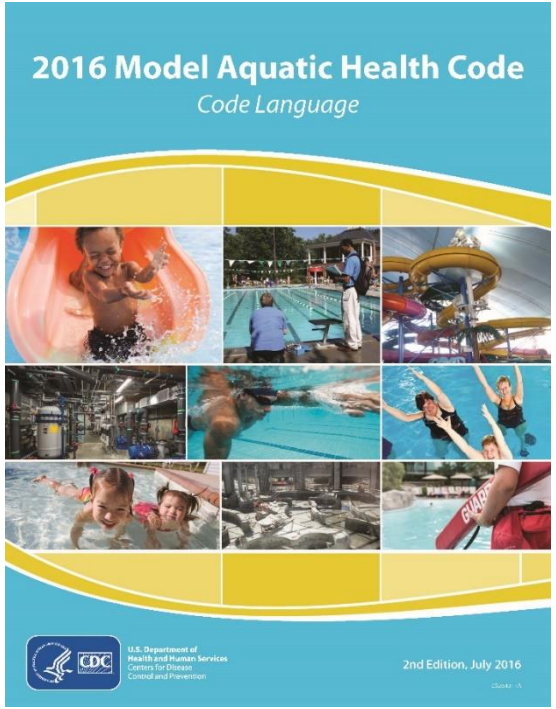
www.cdc.gov/healthywater/swimming/materials/index.html

An Introduction to Mini-MAHCs

Topic-specific packages of MAHC code and resources

Presented by:
CDR Joe Laco, MSEH, RS/REHS

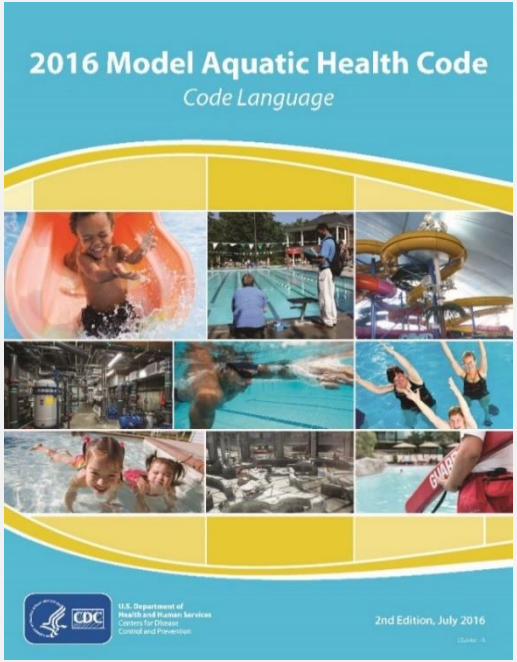
MAHC Network Webinar May 22, 2018



INTRODUCTION

What is the MAHC?

- **Model Aquatic Health Code (MAHC)**
- Based on science and best practices
  - Code / Annex
- Resource for creating or updating pool codes
- Goals
  - Reduce risk for outbreaks, drowning, and pool-chemical injuries
  - Outline uniform safety and operation standards
- Review and update cycle
  - Council for the Model Aquatic Health Code (CMAHC)



MAHC Layout and Contents

- Code Language
  - 1.0 Preface
  - 2.0 User Guide

1.0 Chapter

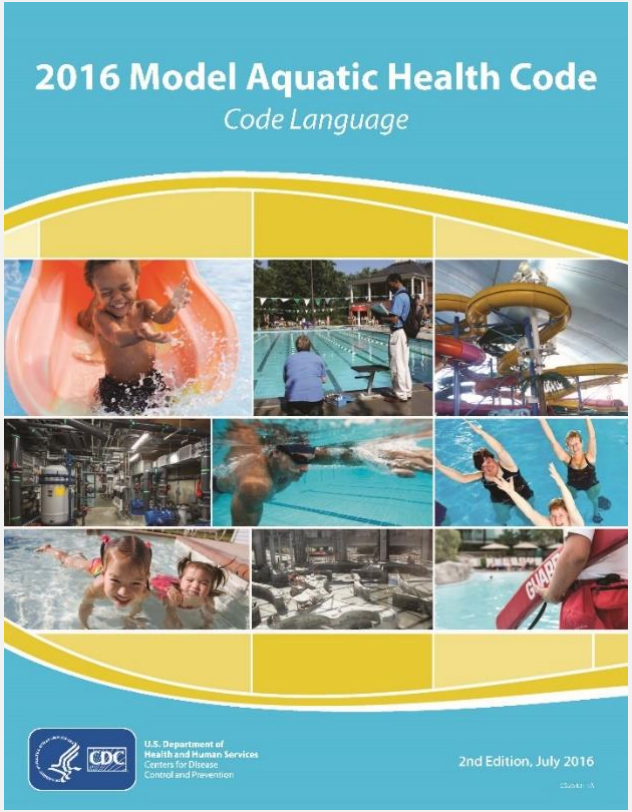
1.1 Part

1.1.1 Subpart

1.1.1.1 Section

1.1.1.1.1 Paragraph

1.1.1.1.1.1 Sub-Paragraph



MAHC Layout and Contents

4.9 Filter/Equipment Room

4.9.1 Equipment Room

4.9.1.1[A] General Requirements

4.9.1.1.1 Nonabsorbent Material

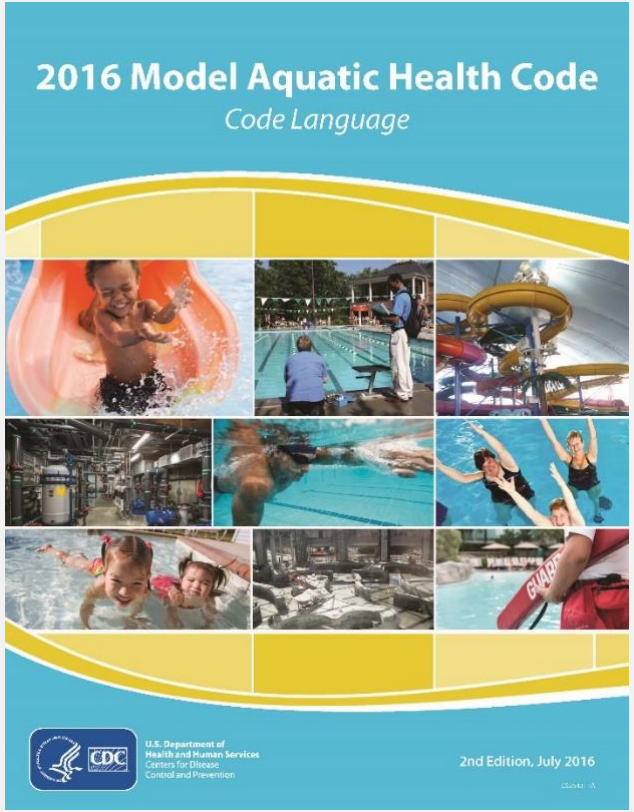
The equipment area or room floor shall be of concrete or other suitable material having a smooth slip resistant finish.

4.9.1.1.1.1 Positive Drainage

The equipment area or room floor shall have positive drainage, including a sump drain pump if necessary.

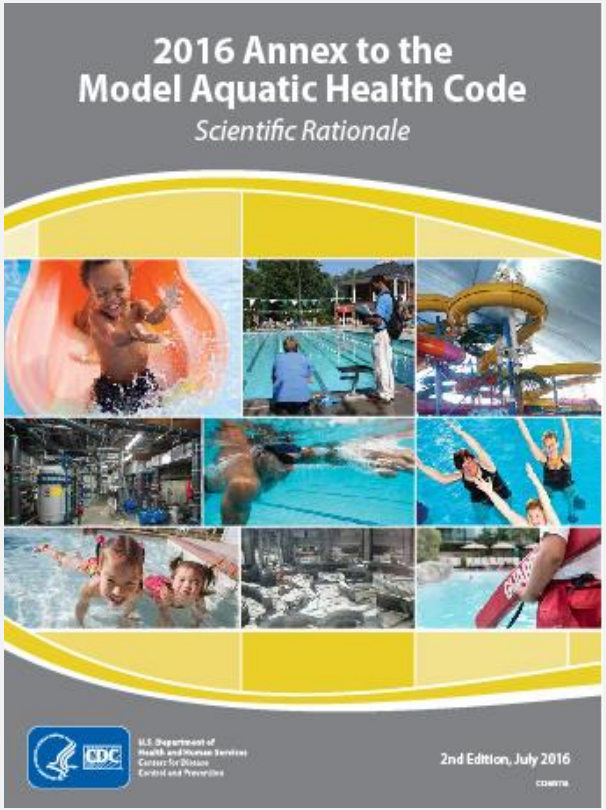
MAHC Layout and Contents

- Code Language
  - **3.0** Glossary of Acronyms, Initialisms, and Terms
  - **4.0** Aquatic Facility Design Standards and Construction
  - **5.0** Facility Operation and Maintenance
  - **6.0** Policies and Management



MAHC Layout and Contents

- Annex[A]
  - Scientific rationale for Code Language
  - Suggested best practices
  - Regularly updated
  - Superscript “A” – Annex available



MAHC Adoption Challenges

- The MAHC Is Big
  - 2016 Annex - 371 pages
  - 2016 Code Language - 289 pages
  - Can be overwhelming…
- Entire Adoption – Myth
  - Partial adoption
  - Accept specific sections
- Time Consuming

MINI MAHC

What Is a Mini MAHC?

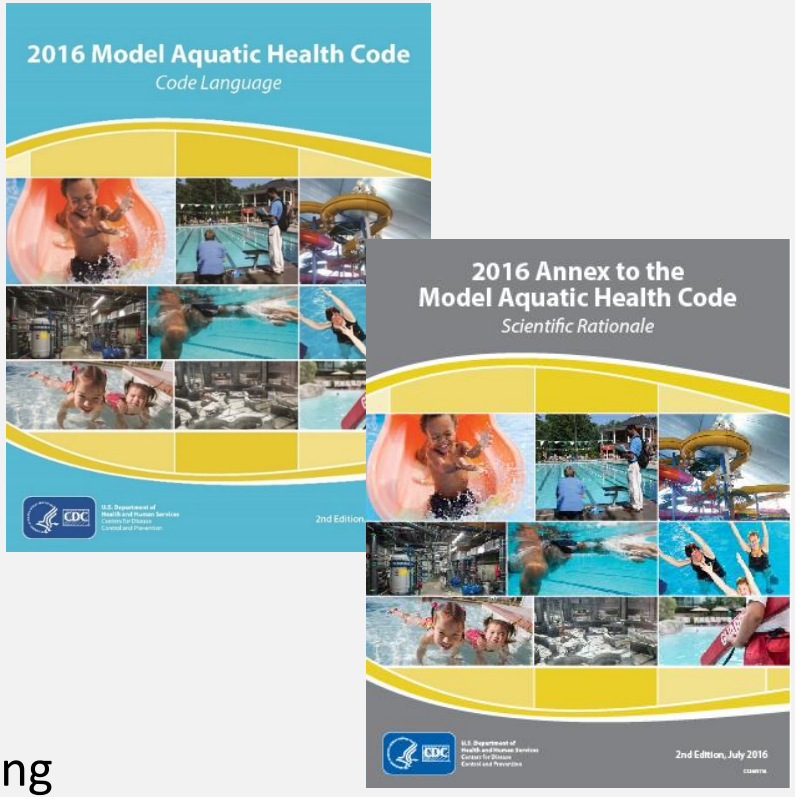
- Partial Adoption
  - Addresses one particular issue
  - Supports á la carte adoption
- Specific Topic Areas
  - Focuses on how to fix or prevent
- Precision
  - Zeroes in on the matter at hand
- Code Language and Annex
  - Reduces time spent examining the entire Code and Annex

Mini MAHC Intended Uses

- Reactive
  - Respond to an existing problem
  - Solutions to outbreak/injury/drowning investigations
  - Adjust current code
- Proactive
  - Prevent potential problems
  - Avoid future illness and/or injury
  - Address needs/gaps in current code

Mini MAHC Layout and Contents

- Code Language
  - Design & Construction 4.0
  - Operation & Maintenance 5.0
  - Policies & Management 6.0
- Annex
  - Scientific rationale
  - Separate document
- Familiar Look
  - Headings/format/numbering/spacing similar to the MAHC



Example: *Cryptosporidium*

- Lives in water, food, soil, on surfaces, or dirty hands spread through infected feces (humans/animals)
- Found throughout the United States
- 2001–2010 - Leading cause of waterborne disease outbreaks, linked to recreational water in the United States
- Very tolerant to chlorine - oocysts can stay alive for days

Crypto Prevention & Response Mini MAHC

- Code Language condensed to 7 pages

4.0[A] Aquatic Facility Design Standards and Construction

4.7 Recirculation and Water Treatment

4.7.3[A] Disinfection and pH Control

4.7.3.3 Secondary Disinfection Systems

4.7.3.3.2[A] Log Inactivation and Oocyst Reduction

4.7.3.3.2.1[A] Log Inactivation

SECONDARY DISINFECTION SYSTEMS shall be designed to achieve a minimum 3-log *(99.9%)* reduction in the number of infective *Cryptosporidium parvum* OOCYSTS per pass through the SECONDARY DISINFECTION SYSTEM for INTERACTIVE WATER PLAY AQUATIC VENUES and a minimum 2-log (99%) reduction per pass for all other AQUATIC VENUES requiring SECONDARY DISINFECTION.

Crypto Prevention & Response Mini MAHC (cont'd)

6.0[A] Policy and Management

6.5[A] Fecal/Vomit/Blood Contamination Response

6.5.3 Aquatic Venue Water Contamination Disinfection

6.5.3.2[A] Diarrheal-Stool Contamination

Diarrheal-stool contaminated water shall:

1) Check the FREE CHLORINE RESIDUAL and then raise the FREE CHLORINE RESIDUAL to 20.0 mg/L and maintain for at least 12.75 hours (or an equivalent time and concentration to reach the CT INACTIVATION VALUE) before reopening the AQUATIC VENUE, or

2) Circulate the water through a SECONDARY DISINFECTION SYSTEM to theoretically reduce the number of Cryptosporidium OOCYSTS in the AQUATIC VENUE below one OOCYST/100 mL as outlined in MAHC 4.7.3.3.2.4.

Crypto Prevention & Response Mini MAHC (cont'd)

- Annex condensed to 34 pages

6.0 Policies and Management

6.5 Fecal/Vomit/Blood Contamination Response

6.5.3 Aquatic Venue Water Contamination Disinfection

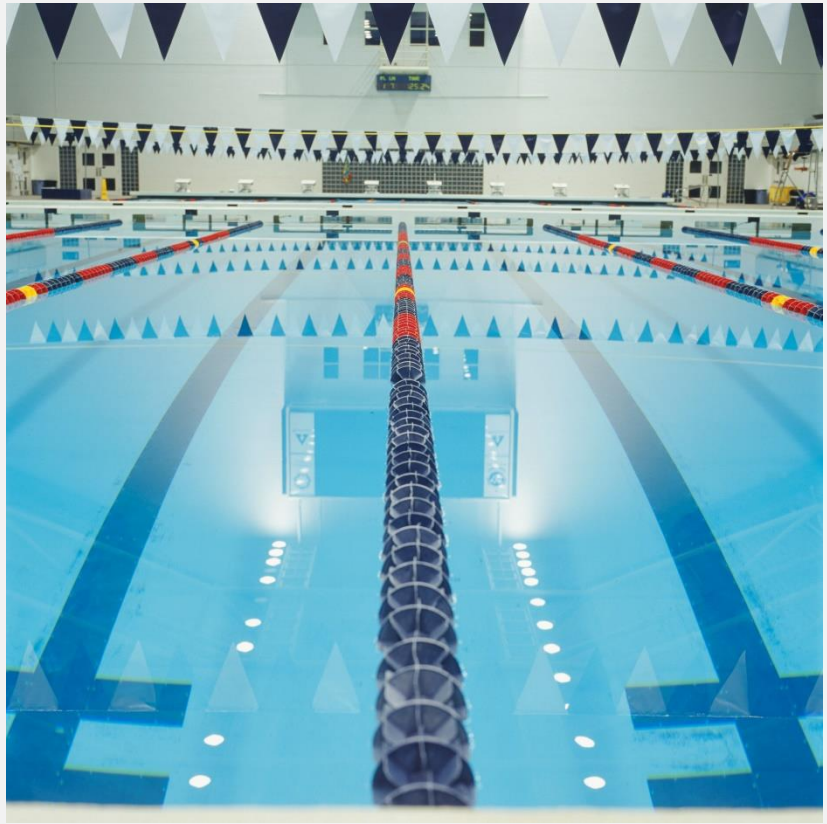
6.5.3.2 Diarrheal-Stool Contamination

For diarrheal-stool contamination, inactivation times are based on *Cryptosporidium* inactivation times. The CT INACTIVATION VALUE for *Cryptosporidium* is 15,300. If a different CHLORINE concentration or inactivation time is used, an operator must ensure that the CT INACTIVATION VALUES remain the same.

For example, to determine the length of time needed to disinfect a POOL at 20 mg/L after a diarrheal accident, use the following formula: C x T = 15,300. Solve for time: T= 15,300 ÷ 20 mg/L = 12.75 hours.

Next Steps

- 2018 MAHC Release (3rd Edition)
  - June/July 2018
  - First Mini MAHC
- Prioritized Topics
  - Crypto Prevention
  - Needs/Gaps



Potential Mini MAHC Topic Areas

- *Cryptosporidium* Outbreak Prevention
- Hygiene & Diaper Changing
- Chemical Gassing
- Lifeguarding/Lifeguard Supervision and Drowning Prevention
- Policies/Checklists/Reporting/Maintenance Documentation
- Operator Training
- Others?

What Mini MAHC topic areas would you like to see addressed next?

ADDITIONAL MAHC TOOLS

Inspection Form

Aquatic Facility Permit #: _____ Aquatic Venue Identifier: _____ Date: ____ /____ /_____

Model Aquatic Health Code Aquatic Facility Inspection Report

Time: In _____ / Out _____

Name of Aquatic Facility Address City State Zip Code

Venue Type: ❑ Pool ❑ Hot tub/Spa ❑ Wading Pool ❑ Interactive water play venue ❑ Other_____

Risk Type*: ❑ 1 ❑ 2 ❑ 3

Item		Descriptions (Bold= critical violations)	Points	In	Out	N/A	N/O
1	Pool/ Spa Area	**Enclosure: fencing, walls, gates and doors in good repair**	10				
2		**Self-closing/Self-latching gates or doors operational**	10				
3		**Protected overhead electrical wires/GFCI electrical receptacles**	10				
4		Grab rails, ladders secured; shell, deck in good repair	5				
5		Float/safety line clearly present	5				
6		"Depth" & "no diving" markers; stair stripes; in good repair and visible	5				
7		Skimmers: Weirs and baskets installed; clean and operating; covers in good repair	5				
8		Recirculation inlets functional	5				
9		**Main drain grate secured in place & in good repair**	10				
10		**Water is clear, main drain visible**	10				
11		Starting blocks removed, covered, or access blocked	5				
12		Pool deck free from obstructions; emergency exit marked	5				
13		Emergency phone or other communication device available and well-marked	5				
14		First Aid Kit available	5				
15		**Appropriate safety equipment present & in good repair**	10				
16		**Adequate supervision of the aquatic facility**	10				
17		Signs: Bathing load/rules/chemicals/spa legible and in good repair	5				
18		Spa temperature ≤ 104°F (40°C)	10				
19	Water Chemicals	Approved NSF/ANSI Standard 50 DPD test kit	5				
20		**Proper disinfectant level**	10				
21		**pH between 7.2 and 7.8**	10				
22		Combined chlorine < 0.4 ppm	5				
23		Cyanuric acid ≤ 100 ppm	5				
24	Equipment/ Chemical Room	Automated feeder operable	10				
25		Automated controller operable	5				
26		Piping and valves identified and marked	5				
27		Flow meter present and operating	5				
28		**Recirculation pump: approved, good repair, operating**	10				
29		**Filter: approved, good repair, operating**	10				
30		Pump strainer: baskets in good condition, not clogged	5				

SCORE:

_____ %

Letter Grade:

_____

Previous Score:

_____ %

Purpose of Visit (Check one)

____Routine
____Complaint
____Follow-Up
____Other

Water Quality Readings

Free clorine	ppm
Free bromine	ppm
pH	

Cheat Sheet

Item

1 **Enclosure (Fencing/Walls/Doors): Failure to provide and maintain an enclosure or barrier to inhibit unauthorized access to the aquatic facility or aquatic venue when required**

2 **Gates/Doors: Failure of gates and doors that are self-closing and self-latching. Failure of exit doors or gates that swing away from the pool enclosure (except where emergency egress codes require them to swing into the pool enclosure)**

3 **Protected overhead electrical wires/GFCI electrical receptacles: Unprotected overhead electrical wires within 20 feet horizontally of the aquatic venue; non GFCI protected electrical receptacles within 20 feet of the inside wall of the aquatic venue. NEC grounding compliance: Failure to maintain or repair electrical circuits or devices to preserve grounding compliance with the NEC**

4 Grab rails/ladders & shell/deck: Failure to have grab rails and ladders anchored securely; shell and deck are in good repair

5 Float/safety line: Failure to have float line clearly present

6 Failure to have Depth markers, No Diving markers, and Stair Stripes that are in good repair and visible

7 Skimmers: Failure to have weirs and skimmer baskets installed; clean and operating; skimmer covers in good repair

8 Recirculation inlets: Ineffective distribution of treated water by either a continuous perimeter overflows system with integral inlets or by means of directionally adjustable inlets adequate in design, number, location, and working order.

9 **Virginia Graham Baker (VGB): Broken, unsecured, or missing main drain gate or any unprotected submerged suction outlet in the aquatic venue.**

10 **Water is clear, main drain visible: Aquatic venue bottom not clearly visible.**

11 Starting blocks: Failure to have starting blocks removed, covered, or access blocked when not being supervised by qualified official.

12 Deck free from obstruction: Failure to have a minimum of 4 feet of clearance from aquatic venue edge to fencing or other obstruction to allow for qualified lifeguard transit, roaming, or change of positioning to maximize viewing of the zone of patron surveillance as well as execution of bather extrication

13 Emergency communication equipment: As necessary, a functional telephone or other communication system or device that is hard wired and capable of directly dialing 911 or function as the emergency notification system. The telephone or communication system or device not

Cross-Reference Guide

- Complements the Inspection Form and Cheat

[A] = denotes where information is further supplemented in the Annex to the MAHC (Scientific Rationale).

Inspection Report Item Description (Bold = critical violations)

- Code Language, Annex Section, and Element Reference

Pool/Spa Area

Inspection Report Item #1: Enclosure: fencing, walls, gates and doors in good repair

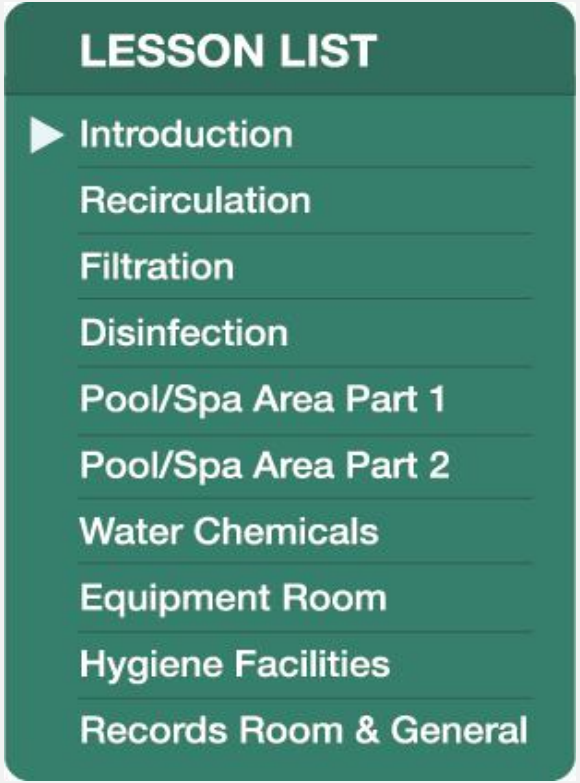
- **4.0[A] Aquatic Facility Design Standards and Construction**
  - 4.8.6 Barriers and Enclosures
    - 4.8.6.1.1 Enclosed
      - 4.8.6.1.1.1 Barriers
- **5.0[A] Facility Operations and Maintenance**
  - 5.6.10 Aquatic Facility Maintenance

Aquatic Inspector

- App for iPad
  - March 2018 release
- March MAHC Network Webinar
- Based on the MAHC Model Inspection Form and Cross-Reference Guide

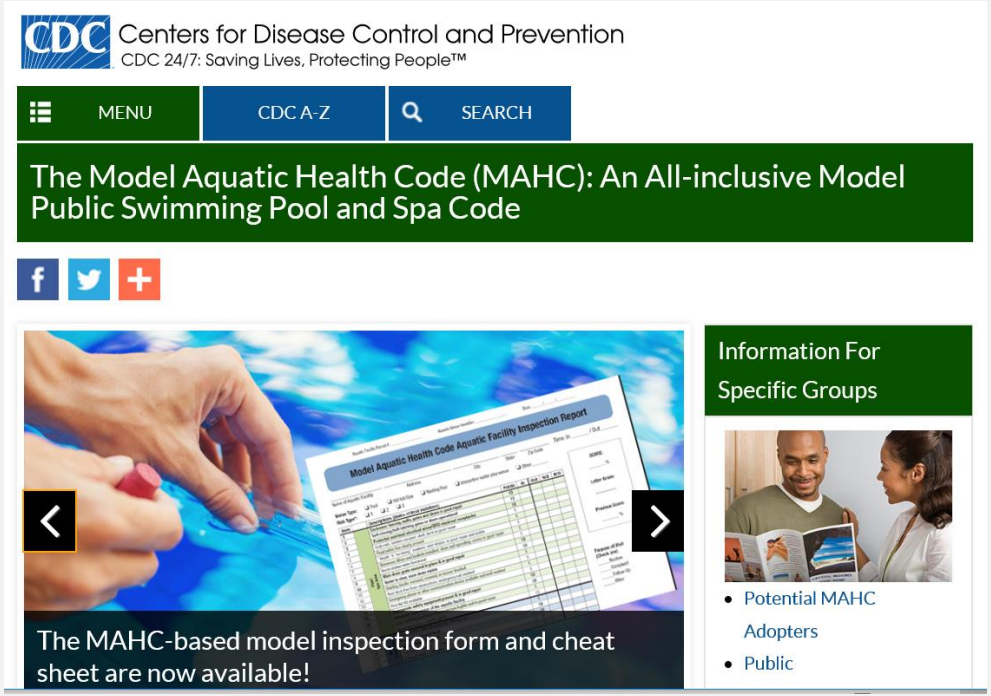
Online MAHC Inspector Training

- Online, 2018
  - Coming Soon!
- Partnering with NEHA
- Provides instruction how to use the MAHC Aquatic Facility Inspection Report



RESOURCES

Resources

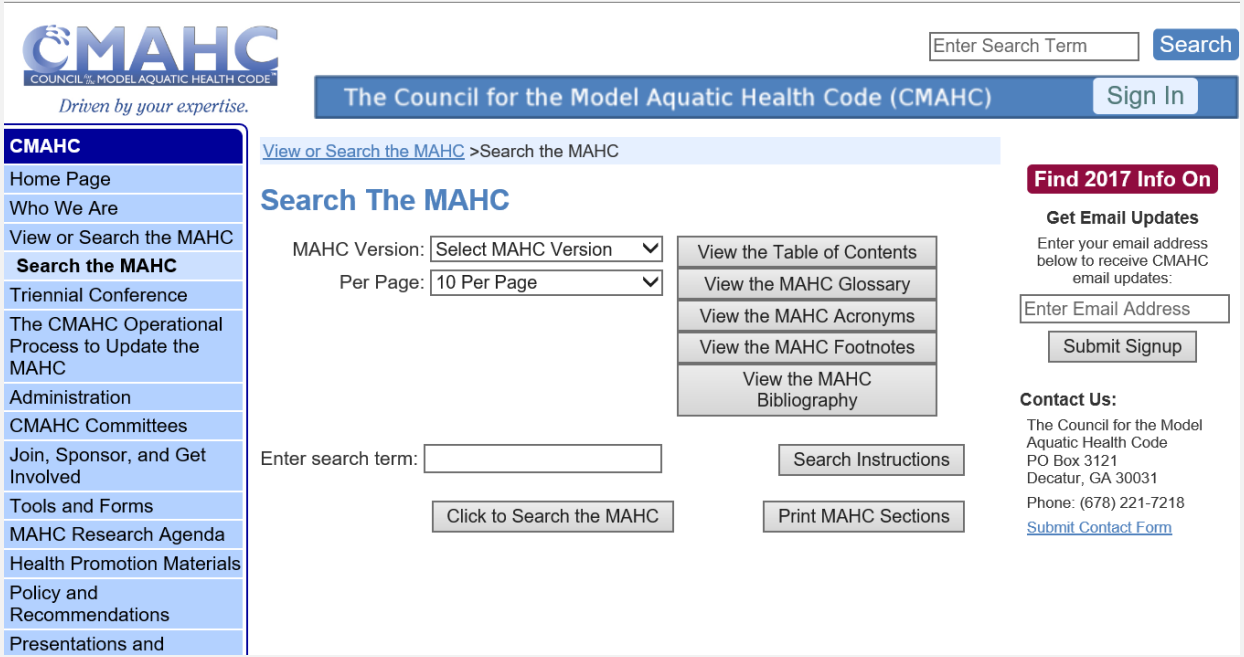


Model Aquatic Health Code

www.cdc.gov/mahc

www.cdc.gov/mahc/networks-tools-forms.html

Resources



Search the MAHC

www.cmahc.org/search-the-mahc.php

Are You a Member of the MAHC Network?

Be first to know about upcoming webinars, available webinar replays, and other MAHC news

Acknowledgments

- Michael Beach: CDC
- Doug Sackett: CMAHC
- CDR Jasen Kunz: CDC
- Maggie Byrne: CDC
- Elaine Curtiss: CDC
- Michele Hlavsa: CDC
- National Environmental Health Association

Contact Us

Questions about the Model Aquatic Health Code, Mini MAHCs, or MAHC Resources?

- Email MAHC@cdc.gov
- Email JLaco@cdc.gov

QUESTIONS AND FEEDBACK

For more information, contact NCEH
1-800-CDC-INFO (232-4636)
TTY: 1-888-232-6348 www.cdc.gov
Follow us on Twitter @CDCEnvironment