

17-CC-01

Committee: Cross Cutting**Title:** Support for Use of the CDC's Model Aquatic Health Code (MAHC) as a Resource and Guidance Document by State, Territorial, and Local Jurisdictions Regulating Public Aquatic Facilities**I. Statement of the Problem:**

In the United States, we have an estimated 309,000 public aquatic venues (e.g., pools) and spend >1 billion days in recreational water annually.¹ The health benefits and associated illness and injury risk of water-based physical activity are well-documented. Incidence of U.S. outbreaks associated with aquatic facilities (which include ≥ 1 aquatic venues and support infrastructure) has increased significantly. From 2003–2012, 343 aquatic facility–associated outbreaks, affecting 22,432 persons were reported to CDC.² About 4,000 persons drown each year in the United States.³ Pool chemical–associated health events lead to 3,000–5,000 annual visits to U.S. emergency departments.⁴ One study found 12.3% (8,118/66,098) of routine inspections of public aquatic venues resulted in immediate closure because of identified imminent public health hazard(s).¹ Proper design, construction, operation, and maintenance can help prevent public aquatic facility–associated illness and injury.⁵ To reduce incidence of public aquatic facility–associated outbreaks, CSTE passed a 2004 position statement requesting that CDC convene a public health–aquatic sector workshop to develop prevention recommendations.⁶ Experts found that individual state/local jurisdictions develop, enact, implement, and enforce their own unique public aquatic facility codes. This results in country-wide variability in design, construction, operation, and maintenance standards. This is further compounded by a lack of staff resources to regularly update codes, difficulty with setting standards in the absence of scientific data, and variable code update schedules. These issues impede the ability to revise codes in response to emerging illness and injury threats. The workshop recommended CDC lead a national consortium of public health and aquatics sector experts to create an all-hazards prevention model code for voluntary state/local adoption. After 7 years of multi-stakeholder collaboration, CDC released the 2014 Model Aquatic Health Code (MAHC) (1st Edition). The MAHC update process successfully resulted in release of the 2016 MAHC (2nd Edition) only 2 years later.⁷

II. Statement of the desired action(s) to be taken:

1. CSTE endorses state, territorial, and/or local jurisdictions using CDC's Model Aquatic Health Code (MAHC) as a resource and guide when creating, revising, or updating state and local aquatic program regulations, guidance, and policy. The MAHC development process involved stakeholders from all sectors relevant to aquatics and was modeled on the successful development process of the FDA Model Food Code.⁸ The Council for the Model Aquatic Health Code (CMAHC)'s partnership with CDC to develop MAHC update recommendations is modeled after the Conference for Food Protection's successful partnership with FDA to recommend updates to its Model Food Code.⁹
2. CSTE supports voluntary sharing of public health and first responder/hazardous material incident data (e.g., epidemiologic; laboratory; environmental health; pool and hot tub/spa inspection; and illness and injury [including drowning, aquatic venue (e.g., pools, interactive water play venues/water playgrounds, and hot tubs/spas) chemical–associated health event, and spinal cord injury] investigation data) with CMAHC and/or CDC to support data-driven updates to the MAHC and, ultimately, optimize prevention and control of public aquatic facility–associated illness and injury.
3. CSTE supports CDC regularly updating the MAHC based on the most recent evidence and best practices.
4. CSTE supports use and analysis of public health data to develop recommended updates to the MAHC that could be submitted to the CMAHC, which collects and assesses advice from public health and aquatic sector experts and develops national MAHC update recommendations for consideration by CDC every 2 years.
5. CDC will work with the CMAHC and other interested partners to provide technical consultations to facilitate interpretation or use of the MAHC.

6. CDC will continue to monitor voluntary use of the MAHC as a resource and guide when creating, revising, or updating state and local aquatic program regulations, guidance, and policy by state, territorial, and local jurisdictions.
7. CDC will continue to conduct voluntary national surveillance of aquatic facility–associated outbreaks and aquatic venue chemical–associated health events in collaboration with state, territorial, and local public health partners.
8. CDC will continue to analyze inspection data collected through the voluntary Network for Aquatic Facility Inspection Surveillance (NAFIS) in collaboration with state, territorial, and local public health collaborators.¹⁰

* Aquatic venue means an artificially constructed structure or modified natural structure where the general public is exposed to water intended for recreational or therapeutic purpose. Such structures do not necessarily contain standing water, so water exposure may occur via contact, ingestion, or aerosolization. Examples include swimming pools, wave pools, lazy rivers, surf pools, spas (including spa pools and hot tubs), therapy pools, waterslide landing pools, spray pads, and other interactive water venues.

III. Public Health Impact:

Nationwide use of the MAHC as a guidance and resource document by state, territorial, and/or local jurisdictions will:

- 1) Draw attention to risks from use of public aquatic facilities.
- 2) Increase state, territorial, and/or local aquatic codes based on recent evidence and best practices.
- 3) Decrease expenditure of state, territorial, and local public health time and staff used for developing and updating pool codes.
- 4) Decrease the incidence of public aquatic venue–associated outbreaks, drowning, aquatic venue chemical–associated health events, and disinfection byproduct-associated health events (e.g. asthma exacerbation and eye or skin irritation).

Fiscal impact:

Nationwide use of the MAHC as a guidance and resource document may:

- 1) Decrease expenditure of state, territorial, and local public health time and staff used to develop and update public aquatic facility codes since MAHC update recommendations would be developed by public health and aquatic sector partners as a national consortium, and not by individual jurisdictions.
- 2) Increase costs for at least new or substantially renovated public aquatic venues due to requirements for data-driven interventions.

IV. Revision History

V. References

1. Hlavsa MC, Gerth TR, Collier SA, et al. Immediate Closures and Violations Identified During Routine Inspections of Public Aquatic Facilities - Network for Aquatic Facility Inspection Surveillance, Five States, 2013. MMWR Surveill Summ. 2016 May 20;65(5):1-26. Available from: <http://www.cdc.gov/mmwr/>
2. Hlavsa MC, Roberts VA, Kahler AM, et al. Outbreaks of Illness Associated with Recreational Water--United States, 2011-2012. MMWR Morb Mortal Wkly Rep. 2015 Jun 26;64(24):668-72. Available from: <http://www.cdc.gov/mmwr/>
3. Xu J. Unintentional drowning deaths in the United States, 1999–2010. NCHS Data Brief 2014;149:1–8.
4. Hlavsa MC, Robinson TJ, Collier SA, Beach MJ. Pool chemical–associated health events in public and residential settings—United States, 2003–2012, and Minnesota, 2013. MMWR Morb Mortal Wkly Rep 2014;63:427–30.
5. Kohlhammer Y, Heinrich J. Chlorine, Chlorination By-Products and their Allergic and Respiratory Health Effects. Current Respiratory Medicine Reviews 2007; 3: 39-47.
6. Council of State and Territorial Epidemiologists (CSTE). Prevention and Control of Recreational Water Illnesses. CSTE position statement 04-ID-03. Atlanta: CSTE; June 2004. Available from: <http://www.cste.org>.
7. CDC. The Model Aquatic Health Code. www.cdc.gov/MAHC
8. Council of State and Territorial Epidemiologists (CSTE). Adoption of the FDA Model Food Code by State and Local Food Regulatory Agencies. CSTE/NASPHV position statement 98-ID-15. Atlanta: CSTE; June 1998. Available from: <http://www.cste.org>.
9. CMAHC. The Council for the Model Aquatic Health Code. www.cmahc.org
10. Network for Aquatic Facility Inspection Surveillance (NAFIS). www.cdc.gov/mahc/nafis.html

VI. Coordination**Agencies for Response:**

Brenda Fitzgerald, MD
Director
Centers for Disease Control and Prevention
1600 Clifton Road, NE
Atlanta, GA 30333
Telephone: 404-639-7000
Email: director@cdc.gov

Agencies for Information:

Rima Khabbaz, MD
Acting Director, National Center for Emerging and Zoonotic Infectious Diseases
1600 Clifton Road, NE; Mailstop F61
Atlanta, GA 30333
Telephone: 404-639-2100
Email: rfk1@cdc.gov

Patrick Breysse, PhD
Director, National Center for Environmental Health
1600 Clifton Road, NE; Mailstop D10
Atlanta, GA 30333
Telephone: 770-488-0604
Email: pjb7@cdc.gov

Douglas Sackett
Executive Director, Council for the Model Aquatic Health Code
PO Box 3121
Decatur, GA 30031
Telephone: 678-221-7218 Email: dsackett37@gmail.com

VII. Submitting Author:

Kenneth Komatsu
State Epidemiologist/Chief, Office of Infectious Disease Services
Arizona Department of Health Services
150 N. 18th Avenue, Suite 100
Phoenix, AZ 85007
Telephone: (602) 364-3676
Email: ken.komatsu@azdhs.gov

Co-Author:

Active Member Associate Member

Michael Landen, MD, MPH
State Epidemiologist
New Mexico Department of Health
1190 S. St. Francis Drive
Santa Fe, NM 87505
Telephone: 505-827-2613
Email: Michael.Landen@state.nm.us

Active Member Associate Member

June E Bancroft, MPH
ELC and Waterborne Epidemiologist
Oregon Health Authority
800 NE Oregon Street, Suite 772
Portland, OR 97232
Telephone: 971-673-1045
Email: June.E.Bancroft@state.or.us

Additional Co-Authors:

(1) Associate Member
Michael J. Beach, PhD
Deputy Director, Division of Foodborne, Waterborne, and Environmental Diseases
Centers for Disease Control and Prevention
Mailstop C-09
1600 Clifton Rd NE
Atlanta, GA 30329-4018
Telephone: 404-639-1591
Email: mbeach@cdc.gov

(2) Associate Member
Jefferson Jones, MD MPH
Preventive Medicine Resident, Division of Foodborne, Waterborne, and Environmental Diseases
Centers for Disease Control and Prevention
Mailstop C-09
1600 Clifton Rd NE
Atlanta, GA 30329-4018
Telephone: 404-718-5517
Email: jjones10@cdc.gov

(3) Associate Member
Michele Hlavsa, RN, MPH
Epidemiologist, Healthy Swimming and Cryptosporidiosis
Centers for Disease Control & Prevention
1600 Clifton Rd, MS C-09
Atlanta, GA 30329-4018
Telephone: 404.718.4695
Email: acz3@cdc.gov