Adding to Our Healthy and Safe Swimming Arsenal: MAHC Tools For Inspectors and Operators

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Centers for Disease Control and Prevention

National Environmental Health Association Conference
MAHC Pre-conference Workshop
7/7/14
Regulatory Program Administration

- Regulatory guidance forms the framework around which an effective Model Aquatic Health Code (MAHC) is built
- The guidance reflected in the MAHC promotes all parties working together from the initial building permits to the code enforcement process
- Key: Can’t regulate the regulator
  - Much of the regulatory provisions were moved to a new document separate from the MAHC called Operational Guidelines for Regulatory Programs
The MAHC still contains requirements for but not limited to:

- **Design and Construction Standards:**
  - Plans and permits
  - Content of design report
  - Plan approval
  - Compliance certificate
  - Construction permits

- **Operation and Maintenance**
  - Operating permits
  - Preoperational inspections
  - Exemptions & variances
Regulatory Program Administration

- MAHC still contains requirements for but not limited to:
  - Policies and Management
    - Facility staffing: onsite vs. offsite operator
    - Recordkeeping
      - Daily operation records
      - Injury & Illness reports
      - Swimmer empowerment: operating permit and inspection report posted/published
  - Inspections
    - Establishment of imminent health hazards
    - Enforcement
OPERATIONAL GUIDELINES FOR REGULATORY PROGRAMS
Purpose

- Operational Guidelines document is intended to assist state and local public health pool programs in developing an effective pool inspection program which is data-driven, knowledge-based, and a risk reduction effort to prevent disease and injuries, and promote healthy recreational water experiences.

- The Operational Guidelines document is intended to support the MAHC by increasing the level of public health expertise in the regulation of aquatics facilities at state and local programs.
Background

- CDC has adapted the Food and Drug Administration (FDA) Model Food Code Annexes 2009 materials as a template for the chapters in the Operational Guidelines document.
- MAHC Operational Guidelines intended to be a “living” document that will be updated periodically as CDC learns from the collective experience of model practices from the local and state levels.
Public Input

- CDC invites suggestions for updates to be submitted to the Environmental Health Services Branch (EHSB) through their EHSB website link at http://www.cdc.gov/nceh/ehs/Home/contact.htm or the CDC Healthy Water link at http://www.cdc.gov/healthywater/swimming/

- Document will likely go out for a final 60 day round of public comment during Summer 2014
Draft Chapter Titles

- Purpose and scope
- The public health reasons for a strong pool inspection program
- Risk-based inspections
- What is needed to conduct a risk based inspection?
- Risk based inspection methodology
- Achieving onsite and long-term compliance
- Inspection form and scoring
- Closing conference
Draft Chapter Titles (Cont.)

- Database construction, management, and data entry
- Inspection program resources including fee categories
- Regulatory staff training
- Plan review and collaboration with building officials
- Outbreak, injury, and drowning investigations
- Variances
- Aquatic health advisory committee
- Conference for the Model Aquatic Health Code (CMAHC)
- Future research and areas of improvement
Implications for Regulatory Programs and Operators

- The MAHC seeks to increase ACTIVE OPERATOR CONTROL of aquatic facilities through training and reporting requirements, recognizing that inspectional staff may only be able to visit the facility on a periodic basis, whereas the facility manager should have a hands-on approach to her/his facility.

- The concept of RISK BASED INSPECTIONS can be utilized by managers and inspectors to further prioritize inspection program activities based on potential and inherent recreational water injury and illness risks.
Active Operator Control

- ACTIVE OPERATOR CONTROL means the purposeful incorporation of specific actions or procedures by industry management into the operation of their businesses to attain control over recreational water injury and illness risk factors.

- Regulatory inspections and follow-up activities must be proactive by using an inspection process designed to evaluate the implementation of MAHC interventions and the degree of ACTIVE OPERATOR CONTROL.
Risk Based Inspections

- Studies have shown that the types of aquatic venues, location of aquatic venues, and patron number and populations served all have a bearing on the occurrence of recreational water injury and illness risk factors in aquatic facilities.

- Regulatory jurisdictions should develop and use a process that groups aquatic facilities or venues into categories based on potential and inherent recreational water injury and illness risks.
In addition, regulatory jurisdictions should assign inspection frequency based on the risk categories to focus program resources on aquatic facilities with the greatest recreational injury and illness risk.

With limited resources, creating a variable inspection frequency for each category will allow inspection staff to effectively spend more time in increased risk venues that pose the greatest potential risk of recreational water injury and illness.
### Example Risk Categorization of Pool Establishments

<table>
<thead>
<tr>
<th>RISK CATEGORY</th>
<th>DESCRIPTION</th>
<th>FREQUENCY #/YR</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Examples may include:</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>• Pool serving highly susceptible populations such as diaper-aged children (children&lt;5 years old)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Pools serving large numbers of people</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• History of waterborne illness, injuries and/or complaints</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• History of non-compliance with critical items</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Year round operation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• AQUATIC VENUES which have been shown in national studies to have more pool violations</td>
<td></td>
</tr>
</tbody>
</table>
Long-term Compliance (Operator)

- Control of recreational water injury and illness risk factors may be achieved through several means, such as training programs, operator oversight, or standard operating procedures.
- If an operator is effectively monitoring all critical activities in the aquatic facility and taking corrective actions when needed, a safe recreational water experience will result.
Long-term compliance (Inspector)

- It’s important for regulatory jurisdictions to establish a compliance and enforcement protocol that results in credible follow-up for each violation noted during an inspection. Especially violations related to recreational water injury and illness risk factors and MAHCinterventions.
- Lack of follow-up on the part of the regulatory agency signals to the operator that the priority item and priority foundation item violations noted were not important.
Successful intervention strategies for out-of-control recreational water injury and illness risk factors can be tailored to each operation's resources and needs

- Will require inspectors to work with the operator to identify weaknesses in the existing recreational water safety management system and consulting with the operator to strengthen any weak areas noted.

Long-term compliance may best be achieved through voluntary actions by the operator

- If an operator supports the concept that a recreational water safety management system is needed, there is a better chance that long-term compliance will be achieved.
Speaker Transition
Surveillance Tools: Measuring the Model Aquatic Health Code’s Impact

Michele Hlavsa, RN, MPH
Epidemiologist, Healthy Swimming

Pre-Conference Workshop:
National Environmental Health Aquatic Symposium
Las Vegas, NV
July 7, 2014
Outline

- Why is it important to assess the impact of the Model Aquatic Health Code (MAHC)?
- What are surveillance data?
- How can we measure the MAHC’s impact on public aquatic venues?
- How can we measure the MAHC’s impact on public health?
- How can we measure the MAHC’s impact on operation and maintenance of public aquatic venues?
MAHC, by the Numbers

- 1 Steering and 14 Technical Committees
  - ~140 volunteers from public health, aquatics sector, and academia
  - 7 years: 2007–2014
- 14 modules → 1 “knitted” version
  - ~300 references
  - ~300 pages of model standards
  - >350 pages of annex (i.e., reasoning)
Surveillance Data

- Surveillance (CDC definition)$^1$
  - “Ongoing systematic collection, analysis, and interpretation of outcome-specific data for use in the planning, implementation, and evaluation of public health practice.”

- Uses$^2$
  - Estimate magnitude of public health problem
  - Document distribution of public health event
  - Evaluate prevention and control measures
  - Direct public health–decision making

ASSESSING THE MAHC’S IMPACT ON PUBLIC AQUATIC VENUES: ASSESSING MAHC DISSEMINATION
Assessing MAHC Dissemination

- Challenge: Write, enact, and implement pool codes in individual state and local jurisdictions
  - Dissemination will vary across U.S.
- Strategy: Document dissemination of specific MAHC standards and language into proposed and enacted legislation
  - Replicate MAHC language directly in its text
  - Include key concepts, recommendations, or principles directly derived from MAHC
  - Mention MAHC directly in its text or comments
Legal Database Searches: Framework

- Develop protocol to decrease variability across individual searches
  - Conduct searches every 3–10 months, depending on database (e.g., Westlaw, Municode, and CQ State Track)
- Draft list of standards and concepts of interest
  - Secondary disinfection: UV and ozone
  - Hygiene: diaper-changing station
  - Design & Construction: fencing
<table>
<thead>
<tr>
<th>Surveillance Data Uses</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimate magnitude of public health problem</td>
<td>How many jurisdictions adopted a given MAHC standard?</td>
</tr>
<tr>
<td>Document distribution of public health event</td>
<td>Where are the jurisdictions that adopted a given MAHC standard?</td>
</tr>
</tbody>
</table>
ASSESSING THE MAHC’S IMPACT ON PUBLIC HEALTH
Outbreaks associated with Recreational Water (n=789), by Year — United States, 1978 and Beyond

Estimated Number of Emergency Department (ED) Visits for Injuries associated with Pool Chemicals United States, 2003 and Beyond

ASSESSING THE MAHC’S IMPACT ON OPERATION & MAINTENANCE: ROUTINE INSPECTIONS OF PUBLIC AQUATIC VENUES
Routine Inspections of Public Aquatic Venues

- **Challenge:** Write, enact, and implement pool codes in individual state and local jurisdictions
  - Inspections vary across U.S.
    - Inspect different items
    - Inspect same items differently
- **Strategy**
  - Maximize coverage of public aquatic venues across U.S.: top 5 counties in top 5 pool states
  - Focus on inspection with greatest public health impact (i.e., closure items)
Preventing Recreational Water–associated Illness

- Proper disinfectant level
- pH 7.2–7.8
- Automated chemical feeder operable
- Recirculation pump and filter: approved, in good repair, and operating
- Qualified operator or responsible supervisor on site
Preventing Drowning and Pool Chemical–associated Health Events

- **Drowning**
  - Enclosure: fencing, walls, gates, and doors in good repair AND self-closing/self-latching gates or doors
  - Water clear, main drain visible
  - Appropriate safety equipment present and in good repair
  - Qualified lifeguards and/or adequately staffed

- **Pool chemical–associated health events**
  - Pool chemicals labeled, stored safely, and secured
## Tracking MAHC Impact: Inspection Data

<table>
<thead>
<tr>
<th>Surveillance Data Uses</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evaluate prevention and control measures</td>
<td>Does frequency of violations decrease when qualified operator or responsible supervisor is on site?</td>
</tr>
<tr>
<td>Direct public health—decision making</td>
<td>Where should finite resources be targeted?</td>
</tr>
</tbody>
</table>
Standardizing Inspections?

- Develop model MAHC inspection form
- THANK YOU to CA, FL, GA, and NY state and local partners
Lessons Learned from Study of 2008 Pool Inspection Data

- Provide unique identifier for each inspection of each venue within each aquatic facility
- Specify pool setting, pool type, type of inspection, water location, disinfectant type
- Identify inspector
- Limit data field to one inspection item
- Record pool chemistry readings
- Document inspection outcome
- Log time required for inspection
Schedule Inspections Based on Risk

- History of recreational water–associated illness outbreaks, injuries, or complaints
- History of non-compliance
- High-risk venues
  - Venue type shown to have more violations
  - Typical patrons (e.g., children aged <5 years)
  - Number of patrons
Scoring and Grading Highlights

- **Scoring**
  - Out of a possible 100 points

- **Grading**
  - A=95–100
  - B=85–94
  - C=75–84
  - F<75 or closure item

- Scoring/grading to encourage code compliance
  - Extra demerits for repeat violations
Speaker Transition
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MAHC eBook and Inspection Application

- MAHC is currently being converted into a free e-book version that will be viewable and searchable on tablet readers
- MAHC inspection form is currently being incorporated into a free electronic inspection application for tablet computers
  - Digitizing the MAHC Inspection Form is a way to further disseminate the MAHC and facilitate standardized approach to pool inspections and data collection/analysis across jurisdictions
  - MAHC inspection app will serve as a template for existing data vendors serving state and local programs to update their electronic inspection programs
Forms

- **Astoria Park Pool** (Started on 07/21/2013 at 10:30 AM)
- **Northampton High School Gymnasium** (Started on 06/15/2013 at 12:30 PM)
- **Sunshine Estates Park Club & Pool** (Started on 05/21/2013 at 11:45 AM)
- **Astoria Community YMCA** (Started on 03/21/2013 at 1:30 PM)

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**Water Quality**

Use table below to record feature measurements.

<table>
<thead>
<tr>
<th>pH</th>
<th>Cl or Br</th>
<th>Total</th>
<th>Free</th>
<th>Stab...</th>
<th>TA</th>
<th>°F</th>
<th>Flow Rate</th>
<th>Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Cl</td>
<td>ppm</td>
<td>ppm</td>
<td>ppm</td>
<td>ppm</td>
<td>gpm</td>
<td>psi</td>
<td>psi</td>
</tr>
</tbody>
</table>

Expand each section below to record Water Quality compliance details.

- **pH Levels:** 3
  - ![Out of Compliance](image)
  - View Related Code(s)
  - Repeat
  - COS
  - By Date
  - Enter comment

- **pH Feeders**
  - ![Select Compliance](image)
  - Enter comment
FUTURE RESEARCH AND AREAS OF IMPROVEMENT
Operational Guidelines Looking Forward

- It is envisioned that this document will expand over time to meet the needs of all MAHC stakeholders through a robust public engagement process.

- Items currently being considered for future updates include but not limited to:
  - Additional MAHC specific forms for plan review, drowning investigations, daily operation checklists, variances etc.,
  - Resources for increasing collaboration with building officials,
  - Detailed scale and dimensional drawings and technical specifications for equipment in the aquatic system flow diagram,
  - Head loss calculations,
  - Pump curves.
Contact Information

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Centers for Disease Control and Prevention
National Model Aquatic Health Code Program
The findings and conclusions in this presentation have not been formally disseminated by CDC and should not be construed to represent any agency determination or policy.

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National Model Aquatic Health Code Program

More Information: Search on “CMAHC” or visit the CMAHC Website: www.cmahc.org
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