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## Adoption Process for the Model Aquatic Health Code: An Example

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### Abstract

In 2014 the U.S. Centers for Disease Control and Prevention (CDC) published the first edition of the Model Aquatic Health Code (MAHC). This document represented the inaugural introduction of a federal policy guideline with a direct focus in the area of aquatic venue operation and maintenance with the sole purpose of improving the nature of public health in the field. The Indiana State Department of Health (ISDH) began the review and adoption process soon after the policy's release. The ISDH process is proposed as one method for others to consider. The background and history of the MAHC are presented in this manuscript along with an overview of the adoption process to date that has been employed by the State of Indiana. In addition, information is provided on the Diffusion of Innovations Theory (DIT) as a possible method for assessing the long-term adoption of the MAHC on a national level.

*Keywords:* Model Aquatic Health Code (MAHC), aquatic facility management, public health, diffusion of innovations theory

### Introduction

#### **Model Aquatic Health Code**

In September of 2014, the U.S. Centers for Disease Control and Prevention (CDCP) unveiled the Model Aquatic Health Code (MAHC) as the first set of federal guidelines designed to direct the operation and maintenance of aquatic venues. The CDCP developed the 300-plus page document over a span of seven years relying on the expertise of over 100 individuals familiar with the field of aquatics. The MAHC was based on a foundation of existing science and best practices in aquatic facility management. The process of development involved input and consensus from those working directly with the code's creation along with two rounds of publicly-solicited feedback before a final version was released to be considered for adoption across the country. The Code covers a wide range of topics broken down into three sections which include: (a) facility design and construction, (b) facility operation and maintenance, and (c) policies and management. The creation and introduction of the MAHC has the potential to make the single greatest public health contribution to human-made aquatic venues in the history of the United States.

The MAHC will be monitored, refined, and updated through oversight of the Council for the Model Aquatic Health Code (CMAHC) which comprises a diverse set of aquatic professionals, industry leaders, and stakeholders. The Council is supported and sponsored financially by grants from the National Swimming Pool Foundation (NSPF). The CMAHC provides membership opportunities and allows for additional review, comment, and annual voting on recommended updates. This unique process was designed to keep the Code current and relevant throughout its lifespan.

The next vote on updates to the Code is scheduled to take place in October of 2017. Although somewhat controversial, only members of the CMAHC are eligible to vote on this update. Membership on the Council currently requires a

membership fee of \$40 for a two-year period. Some have criticized this membership financial requirement since requiring a mandatory financial investment, albeit relatively small, for membership may be an inappropriate requirement in order to vote on future changes. As a federally-sponsored product, such membership requirement could lead to bias from unspecified special interest groups.

It is important to note that the MAHC does not represent a federal law but instead comprises a set of voluntary guidelines offered to provide the safest aquatic environments for users. Having such a national set of guidelines is important because a recent report from the CDCP published in the *Morbidity and Mortality Weekly Report* (Hlavsa, M.C., Gerth, T.R., Collier, S.A., *et al.*, 2016) indicated that nearly 80% of aquatic venues in a 2013 study experienced at least one health code violation including concerns due to improper water pH levels, problems with safety equipment, or unacceptable levels of disinfectants (e.g., chlorine). In addition, as a federal guideline, the MAHC document becomes the standard by which our judicial system eventually will evaluate the legal merit of cases brought that involve aquatic topics and incidents covered in the code.

The initial version of the MAHC has been available to state health departments for over two years. Two future research questions raised include: (a) how are states working to adopt all or parts of the MAHC? and (b) to what degree has the code been implemented by states across the U.S.? This paper was written to indicate one case study to illustrate how one state has addressed the first question.

### **The Adoption Process: An Example**

As the reader proceeds through this section of the manuscript, it's important to note that due to the confidential nature of the adoption process still working its way through governmental channels, we are unable to provide certain specific examples of adoptions and changes at this time. Our focus is to share hypothetical illustrations of the process of policy adoption and the presentation of general emerging themes.

The Indiana State Department of Health (ISDH) began the process of adoption early in the game with the formation of a review committee that began meeting in June of 2014. The committee consisted of 16 individual members representing aquatic professionals from both public and private settings to provide a balance of viewpoints. From this group, 11 members attended over 80% of the meetings with the other five participating on a somewhat less regular basis. The advisory group met monthly over the course of a year and a half with the charge from the ISDH to review the MAHC and make decisions on parts of the code that would be recommended for adoption or adaptation within the Indiana Public and Semi-Public Swimming Pools Rule (410 IAC 6-2.1). In addition to the Indiana Pool Code, the Indiana Construction Code (Article 20 – Swimming Pool Rule) which involved pool construction, but since it was administered through the Indiana Department of Homeland Security, it was *not* included as part of the adoption process for the ISDH advisory group.

The review process involved the following steps:

1. Formation of the Indiana Pool Code Advisory Committee (IPCAC) by the ISDH Director of Environmental Public Health
2. Designation of IPCAC co-chairs to provide oversight
3. Review and coding by IPCAC members to compare the MAHC with current Indiana Pool Code
4. Detailed per code item discussions resulting in decisions on adoption or adaptation
5. Final review of edits by IPCAC
6. Recommendations on adoption moved forward in the governmental review process

Once final recommendations were completed by the Indiana Pool Code Advisory Committee, the Director of Environmental Public Health began collaboration with the ISDH's Office of Legal Affairs on the promulgation process, which involved preparing economic impact reports, public hearings, and adoption by ISDH's Executive Board.

The overall governmental process included:

1. Preliminary approval by the State Board of Health
2. Approval by the Indiana State Office of Management and Budget on the fiscal impact reports
3. Public hearing and comment period
4. Comments summarized, rule finalized
5. Final adoption by the State Board of Health
6. Rule filed with the Attorney General – 45 days for review
7. Rule submitted to the Governor for signature
8. Rule published in the Indiana Register – effective 30 days later

The ISDH Director of Environmental Public Health established the review committee with the goal of assembling a group that would represent a wide range of stakeholders in the aquatics community across the State of Indiana including an equal number from the public (n=8) and private sectors (n=8). Several examples of areas represented included (a) pool consulting and maintenance companies, (b) large waterpark operators, (c) university aquatic facility operators, (d) academic/research specialists, (e) health department professionals, and (f) parks and recreation administrators. Those nominated to a position on IPCAC were asked to commit to the full duration of the project.

Leadership of the committee was shared between two individuals, one who represented the public sector and the other who represented the private sector. The Director of Environmental Public Health represented the public sector while an aquatic professional with more than 12 years of full time experience that ranged from maintenance, operations, and service to consulting, design, renovation; and construction within the commercial pool industry represented the private sector. In their role as committee co-chairs, these individuals were tasked with (a) organizing, directing, and communicating monthly meetings; (b) acting as facilitators/arbitrators among committee member viewpoints; (c) guiding discussions of the

process of comparing the MAHC to the current Indiana rule; (d) recording comments and decisions made in the process; and (e) summarizing and finalizing the Indiana code with proposed consensus changes resulting from IPCAC discussions and work.

As a preparatory step in the process, a doctoral student in Environmental Health at The Indiana University School of Public Health – Bloomington provided an initial comparison between the MAHC and the existing Indiana Public and Semi-Public Swimming Pools Rule (IPSPR). Within this process items were identified and colored coded as follows:

1. Green = MAHC and IPSPR were identical
2. Yellow = MAHC and IPSPR were close in nature but not exactly identical
3. Red = Items in which concepts in the MAHC code were not currently represented at all in the IPSPR

The result of this project was an item-by-item breakdown for IPCAC to use as a guide for further discussion. Within the initial review a total of 229 items were broken down as follows: (a) 47 were identical between the codes (coded green), (b) 45 were close in nature but not exactly identical (coded yellow), and (c) 137 were included in the MAHC but not in the Indiana code in any form (coded red).

During the second phase in the adoption process, all items were discussed in depth over the course of fifteen monthly meetings lasting over an 18 month period. The pace of the meetings and how much could be covered during each meeting was governed by the amount of discussion/debate necessary on individual items. Some items were tabled from time-to-time when it was decided that more information was needed to make an informed decision. The item was revisited when the additional information was obtained. An example of this was a discussion around the nature of stagnant water in filtration pipes and the time needed for the filtration system to operate before the pool was safe again for the pool to be opened to the public. To resolve the issue in question, two members with expertise in the areas of biology and water systems were asked to conduct inquiries into the topic with others. At a subsequent meeting it was determined that there was no direct empirical evidence to help support a decision on the topic. As a result, the code was left with a general comment regarding recirculating time to be sufficient prior to opening. Another example included moving the review of code sections related to lifeguards and bather supervision to a meeting when an IPCAC member expert on these topics could be present.

Although 47 items were identified as “identical” between the MAHC and IPSPR, each was still reviewed and discussed to assure consensus and make certain each was as clear as possible. During the review process, particular attention was given to those existing items determined to be similar but not exactly matching the intended meaning in the MAHC. Most of the conversation centered on items that potentially would be new additions to the state code. In some cases, existing items in the Indiana code were altered using information provided in the MAHC as a baseline, but customized to fit Indiana’s specific needs or situations.

As a result of the IPCAC work, several common themes arose during discussions that became important factors in determining the adoption process. Many of these themes resulted in trying to achieve balanced compromises. One such theme revolved around the financial impact that adopting a code change could create. In each case members of IPCAC sincerely weighed the best interest of the public. Nevertheless, the majority of these instances tended to err on the side of fiscal conservatism, considering possible financial hardships that would be created for those operating and maintaining aquatic facilities. At least one major exception to this conservative trend superseded concerns over possible financial burdens due to its level of importance and the gravity of the positive impact it would have on public health. When considering the MAHC provision to provide a qualified operator (MAHC: Section 6.1), the committee decided to put forward the recommendation even though it would certainly create a new fiscal challenge for facilities.

Another theme, viewed through the lens of health department inspectors, considered compliance of rules as well as the capability of inspectors to identify and document infractions to these rules. These conversations brought to light the interpretation that some of the wording in the MAHC ought to be considered as “aspiring to achieve best practices” in the desire to directly impact public health and safety rather than merely complying with and enforcing codes and rules. A final theme related to considering the feedback and judgment of the Director of Environmental Public Health regarding the political environment and how much additional regulations and requirements would be tolerated.

As consensus decisions were formed on an item, they were recorded by IPCAC co-chairs along with the adoption rationale to become part of the final committee recommendations. Once all sections of the code were addressed, an opportunity was given for all IPCAC members to review edits for final comment and clarification. Subsequently, a final draft representing the IPCAC deliberations was forwarded through the chain of command via the Director of Environmental Public Health as previously described in the process.

Several additional points should be mentioned about the process thus far that may be helpful to others attempting to work with adoption. An important take-away is that the Director of Environmental Public Health decided to go with the outside committee process to review the MAHC as means to have well-rounded input and obtain early buy-in among stakeholders. He previously had used this process and found that including stakeholder voices early on decreased the amount of possible controversy down the line when the draft opened for public comment. Another point to consider is whether or not some of the items in the MAHC should be seen more along the lines of best practices than enforceable code at a state level. By providing a list of best practices, we were able to still mention items that we did not feel could realistically be at the level of code but still were important to mention.

Issues that have come into play when going through the adoption process include the fact that the MAHC is a growing and changing document due to the work

of the CMAHC and its members. With governmental processes often lengthy in nature and more recent updates presumed to be coming to the Code, this could potentially mean that the version sent through the system is already outdated. For Indiana, the version completed by the IPCAC would continue to be vetted up the chain of command with any new revisions addressed with the Director and not the Committee as a whole. The entire document is not expected to be reviewed in its entirety again at this level of scrutiny for many years. Therefore, it will most likely not be able to keep pace if the MAHC continues to change on a regular basis.

### **A Note on the Role of Diffusion of Innovations Theory**

In the future, we intend to conduct an empirical research study, grounded in the Diffusion of Innovations Theory (DIT), to determine the rate and timeline by which the MAHC can be estimated to reach the final stages with those regarded as laggards (i.e., very late adopters) coming on board. Such a study could help determine the pace to which the MAHC is becoming actual public policy. The following section provides an overview of the theory with background information on how it has previously been used to assess public health policies such as the MAHC.

### **Diffusion of Innovations Theory**

DIT is one conceptual approach to study and monitor the adoption progress of the MAHC. Often used in business, the theory examines how innovations diffuse throughout social systems (Rogers, 2003). Diffusion refers to “the process in which an innovation is communicated through certain channels over time among the members of a social system” and an innovation is defined as “an idea, practice, or project that is perceived as new by an individual or other unit of adoption.” For the purpose of this article, the creation and introduction of the MAHC is the innovation with the adoption by state health departments acting as the diffusion audience.

Diffusion of Innovations Theory features four main elements: (1) the innovation, (2) communication channels, (3) time, and (4) the social system. Innovations possess five perceived characteristics that affect their rate of adoption: (1) relative advantage, the degree to which a new innovation is perceived as better than the one before it; (2) compatibility, the degree to which the innovation is perceived to be in-line with current values, previous experiences, and needs; (3) complexity, how difficult the innovation is to use or understand; (4) trialability, the latitude that exists for the innovation to be experimented with on a limited basis; and (5) observability, how visible the results of the innovation are to others. Some innovations can be re-invented during the adoption process. For example, as a federal guideline, an adopter of the MAHC might choose to adopt either all or just certain pieces of the code. Adopting only portions of the MAHC would be considered re-invention of the innovation.

The theory also postulated five degrees of adoption with each category representing a percentage of the estimated sample or population involved in an adoption process. Work by Rogers (2003) allows us to see traits and commonalities among adopters that follow a generalized distribution pattern which includes:

- (a) innovators - 2.5%,
- (b) early adopters - 13.5%,
- (c) early majority - 34%,
- (d) late majority - 34%, and
- (e) laggards - 16%.

DIT could be a possible means by which future research could assess the adoption process from a macro-level. Application of the theory in public health policy adoption has previously been used by projects involving the CDCP. Research performed involving a Federal Drug Prevention Policy determined that DIT was effective in examining factors related to adoption with the construct of compatibility rating the highest. Additionally, the theory was used to assess the adoptive nature of the CDCP policy on School Guidelines to Prevent Tobacco Use and Addiction (McCormick & Tompkins, 1998). Outcomes from this study were able to show relatively high receptivity, multiple perceived benefits with few barriers, and high commitment towards adoption.

According to the DIT, an adopter category is based on its innovativeness, which is “the degree to which an individual or other unit of adoption is relatively earlier in adopting new ideas than other members of a social system” (Rogers, 2003, p. 246). Thus, should Indiana emerge as one of the first states within the social system to formally adopt the MAHC, they will fall within the category of either “innovators” or “early adopters,” which comprise either the top 2.5% or top 16% of a normal probability curve. An innovations rate of adoption is usually s-shaped and the steepness of the s-curve depends on how rapidly diffusion occurs. “The area of the diffusion curve after about 10 percent adoption and up to 20 or 25 percent adoption is the heart of the diffusion process” (p. 245). Should adoption of the MAHC reach this “take off” point, it would be unlikely that further diffusion throughout the social system would be halted. The MAHC would have become a true driving force in aquatic facility management in the U.S. once about 20-25% of facilities and organizations have adopted. In the future, as the MAHC has been adopted by state health departments, facilities, and other agencies in the United States, DIT could be one method for capturing and explaining the process and rate of diffusion.

In the meantime, education and awareness has been taking place throughout the U.S. on the MAHC. The code eventually ought to have a policy impact on anyone working with and in aquatic venues. Ideally the MAHC ultimately will create safer, healthier, and more enjoyable aquatic facilities for the public.



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