

Welcome to the  
CDC's Model Aquatic Health Code Network Webinar

# Implementation of the Model Aquatic Health Code in Pueblo County, CO

**7/26/23**  
2:00 PM ET

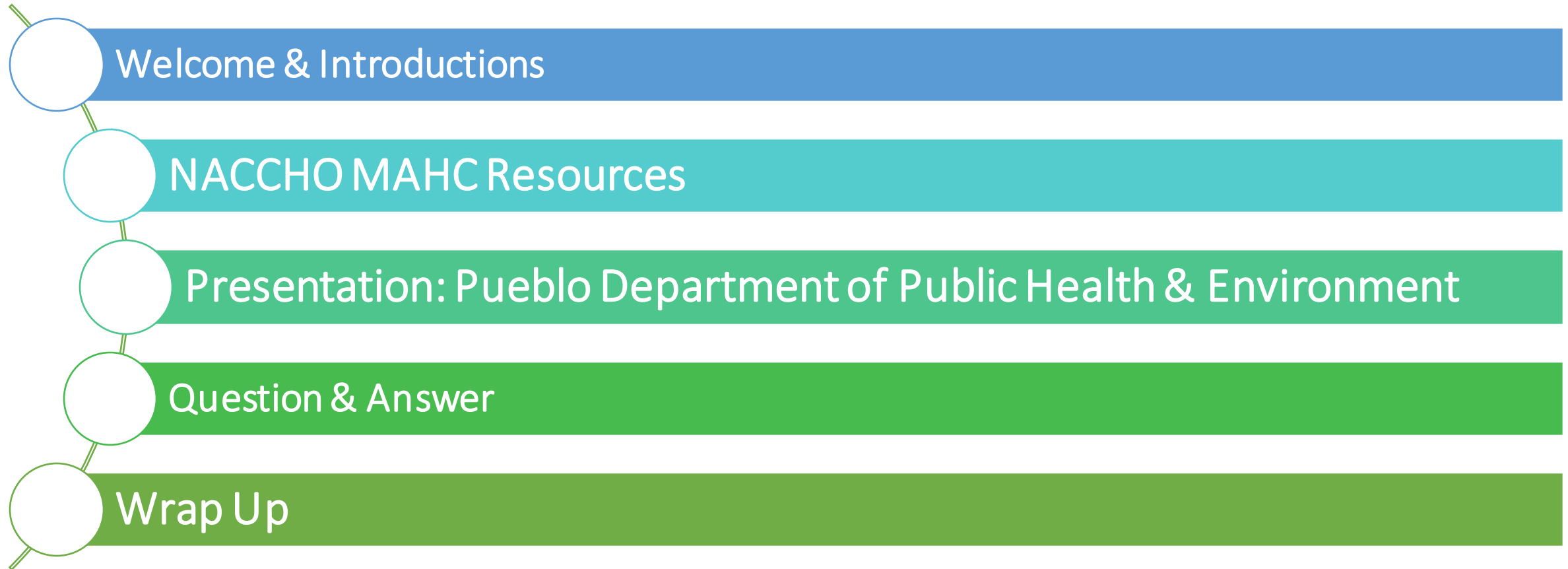
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Call: 301-715-8592 / Webinar ID: 874 2438 7323

**Questions may be submitted/upvoted via the Q&A box.**

**This webinar is being recorded.**

# Webinar Agenda



# Introductions



**Deise Galan, DrPH, MPH**

Lead Program Analyst  
National Association of County and City Health  
Officials (NACCHO)



**Rebecca Rainey**

Program Analyst  
National Association of County and City Health  
Officials (NACCHO)



Contact us by e-mailing [MAHCnet@naccho.org](mailto:MAHCnet@naccho.org)

- Visit NACCHO's [MAHC Network](#) webpage for MAHC resources:
  - Recordings & slides from past MAHC Network webinars
  - Resources for local health departments
  - Subscribe to the MAHC Network newsletter to up to date on new webinars, resources, and more!

# Today's Presenters



## **Autumn Whittaker, BS**

Environmental Health Specialist

Pueblo Department of Public Health and Environment

## **Scott Cowan**

Environmental Health Program Manager

Pueblo Department of Public Health and Environment

# Making Waves In Pueblo County: A Journey Through A MAHC Adoption

Recreational Water Team | July 26, 2023



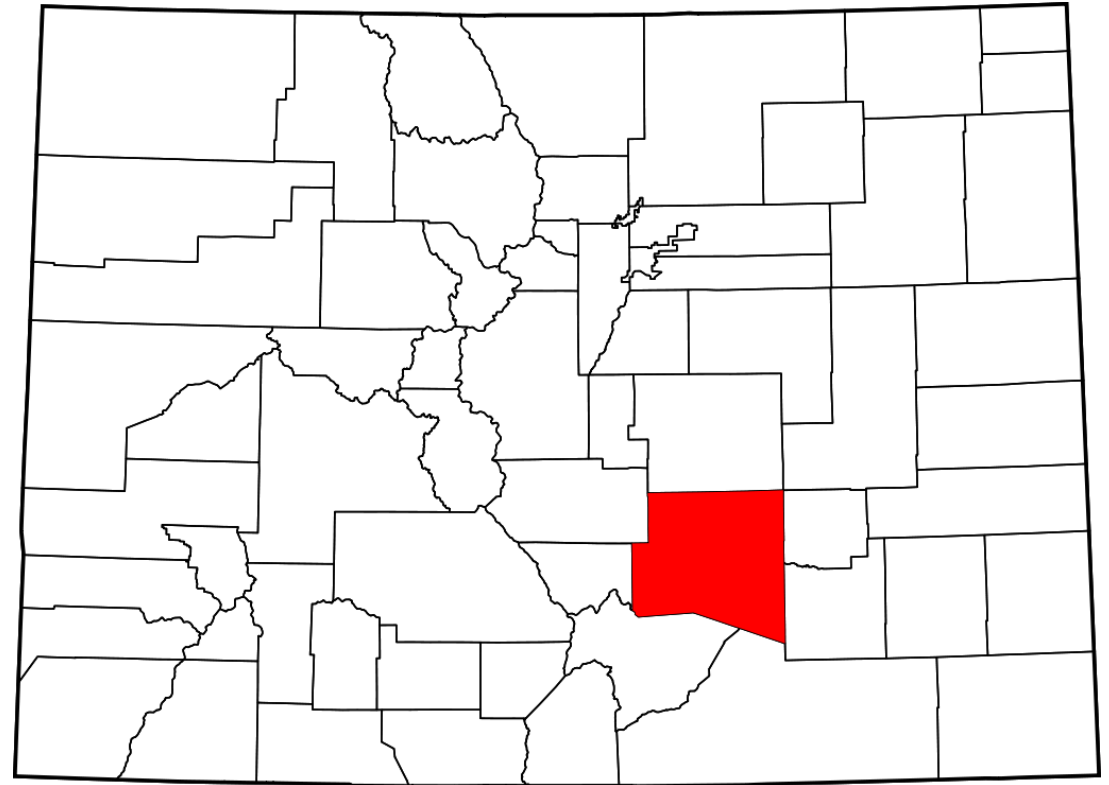
Autumn Whittaker, Scott Cowan

# Objectives

- Background and historical challenges
- MAHC overview and adoption process
- Major facility changes and compliance assistance
- Cost-benefit analysis results
- Data pre- and post-adoption
- Successes and challenges
- Next steps and takeaways

# Pueblo County Information

- "Home of Heroes"
- Location: Southeast Colorado
- Population size (2020):
  - City of Pueblo- 111,876
  - Total Pueblo County- 168,162
  - 2,398 square miles
- Ninth largest city in Colorado





# PDPHE Recreational Water Program



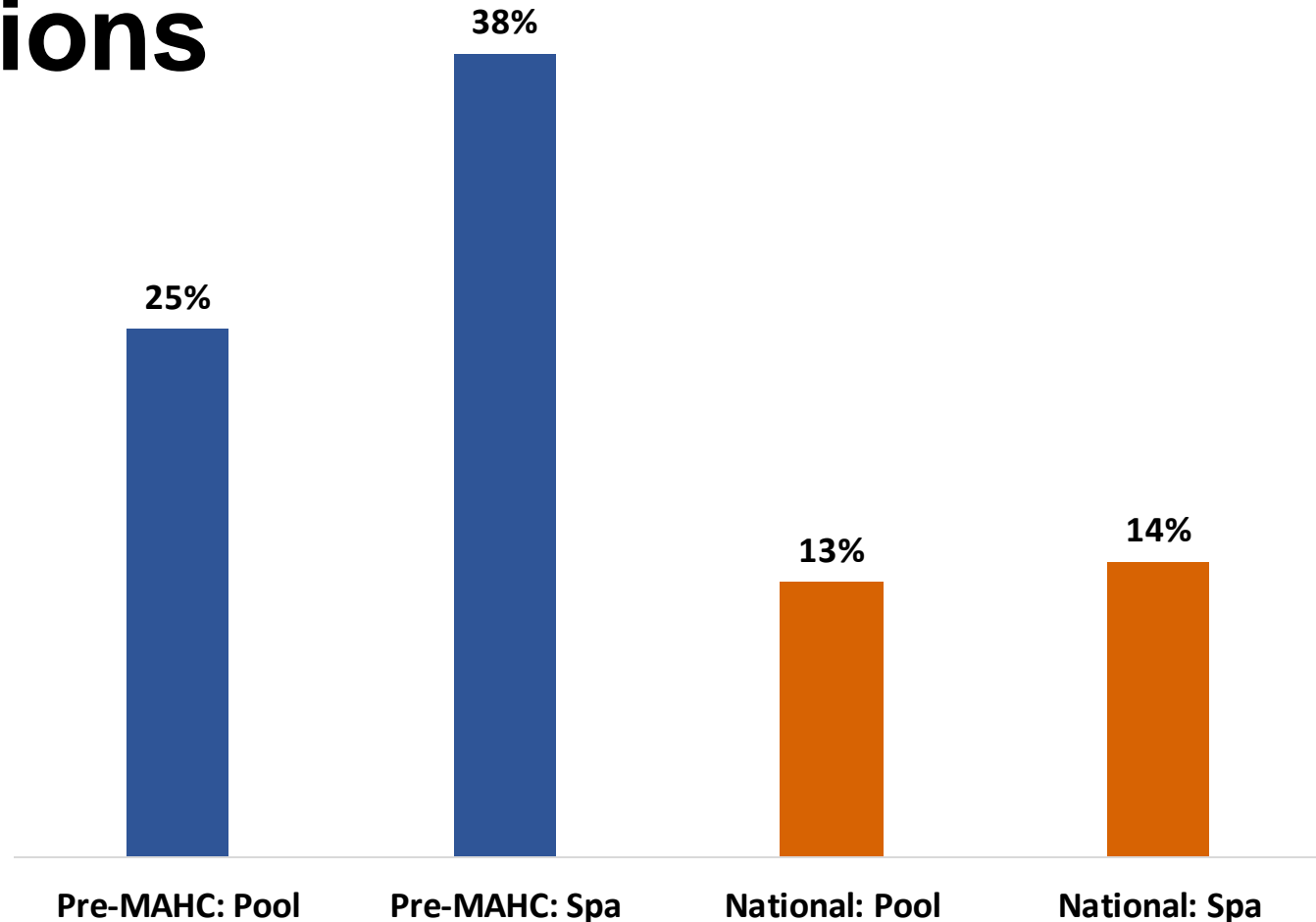
<https://www.koaa.com/news/covering-colorado/pueblo-city-pools-open>

- Total Facilities: 48
- Total Water Body Count: 75
  - Pools – 56
    - 30 year-round, 26 seasonal
  - Spas - 14
    - 13 year-round, 1 seasonal
  - Fountains – 5 seasonal
- Total Routine Inspections/Year - 118

# Swimming Pool and Mineral Bath Regulations

- Last updated in 1994
- Closure rates
  - National: 1 in 8 pools, 1 in 7 spas
  - Local: 1 in 4 pools, 1 in 3 spas
- Did not align with Virginia Graeme Baker Pool and Spa Safety Act

Percent of inspections resulting in closure  
Pre-MAHC: 2016-2021, National: 2018



# Historical Challenges

- High closure rates
- Repeat violations
- Enforcement challenges
- Cryptosporidiosis outbreak - 2011
- Legionella/Pontiac Fever – 2013
- Multiple drowning accident- 2016

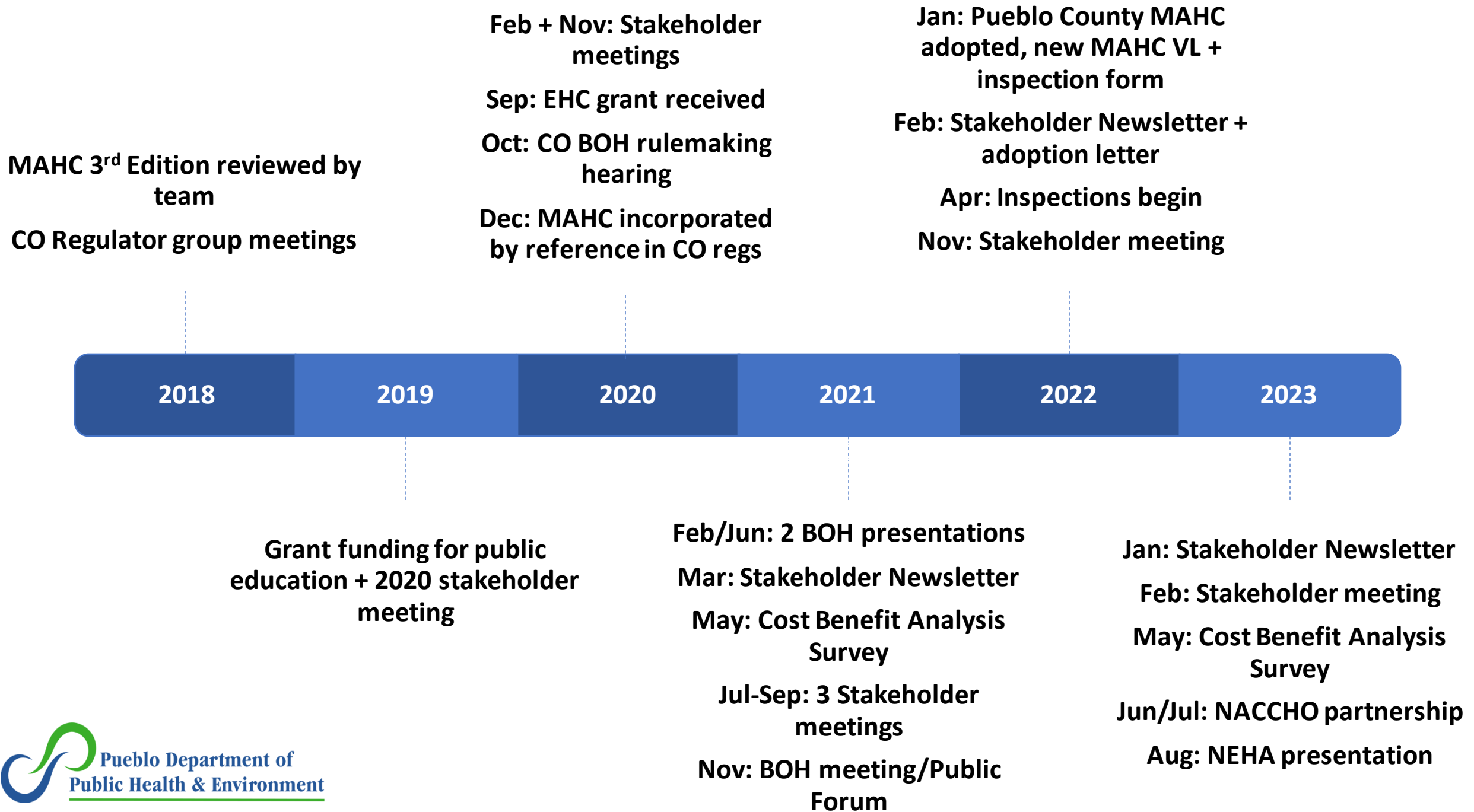


# Enter the Model Aquatic Health Code

- Voluntary guidance published by CDC
- Revised in 3-year cycles
- Based on latest science and supported by 270-page scientific rationale (MAHC Annex)
- Aimed at reducing recreational water related injuries and disease outbreaks using current data

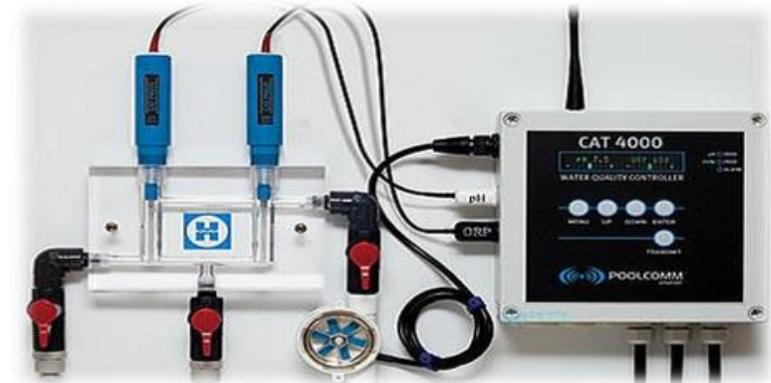
# Advantages of the MAHC

- Brings program in line with national standards and VGB Act
- Improves data-based decision making for addressing risks
- Facilitated pool program improvements
- Renewed by regulatory, industry, and community experts



# Major Facility Changes: Upon Adoption

- Chemical and pH adjustment feeders in all aquatic facilities
- New therapy, wading pools, or interactive water play venues need secondary disinfectant system
- Diaper changing station required with portable hand wash station
- Existing automated controllers shall be interlocked
- Lifeguards and Safety Equipment
- Certificate of Operation



# Major Facility Changes: Within One Year

- All facilities must have automated controllers with interlocks for no/low flow deactivation
- Diaper changing station adjacent hand sink installed and operational
- Compliance agreements available



# For those unable to cover MAHC upgrades...

## Compliance Agreement

Additional time for upgrades

Must meet criteria until upgrades completed



## Variance

Undue financial hardship

Must meet intent of regulation



# What was not adopted and what was added

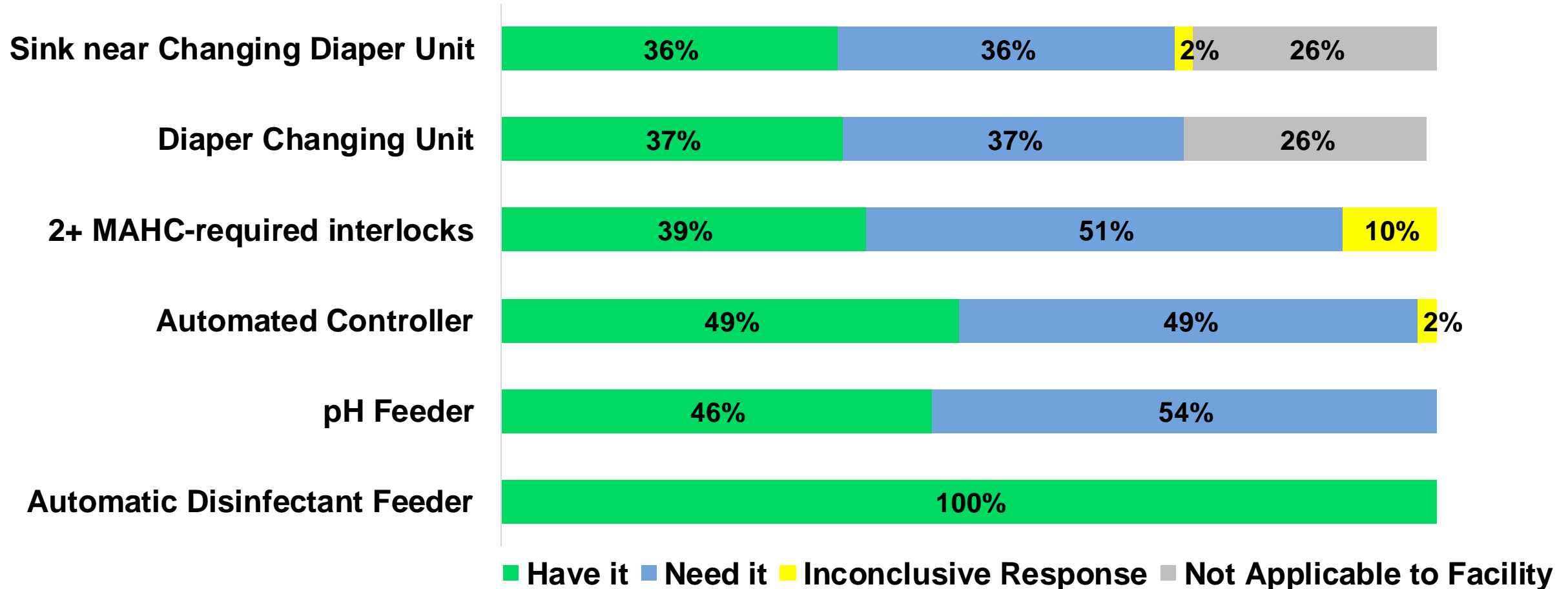
- Flootation Tanks (4.12.10 and 5.12.10)
- Discharged water (5.6.7.4.2)
- Combined plan criteria (6.3.3.2 EAP merged into 6.3.4.5)
- Enforcement and civil penalties (6.4-6.5)

IHHs added from old regulations:

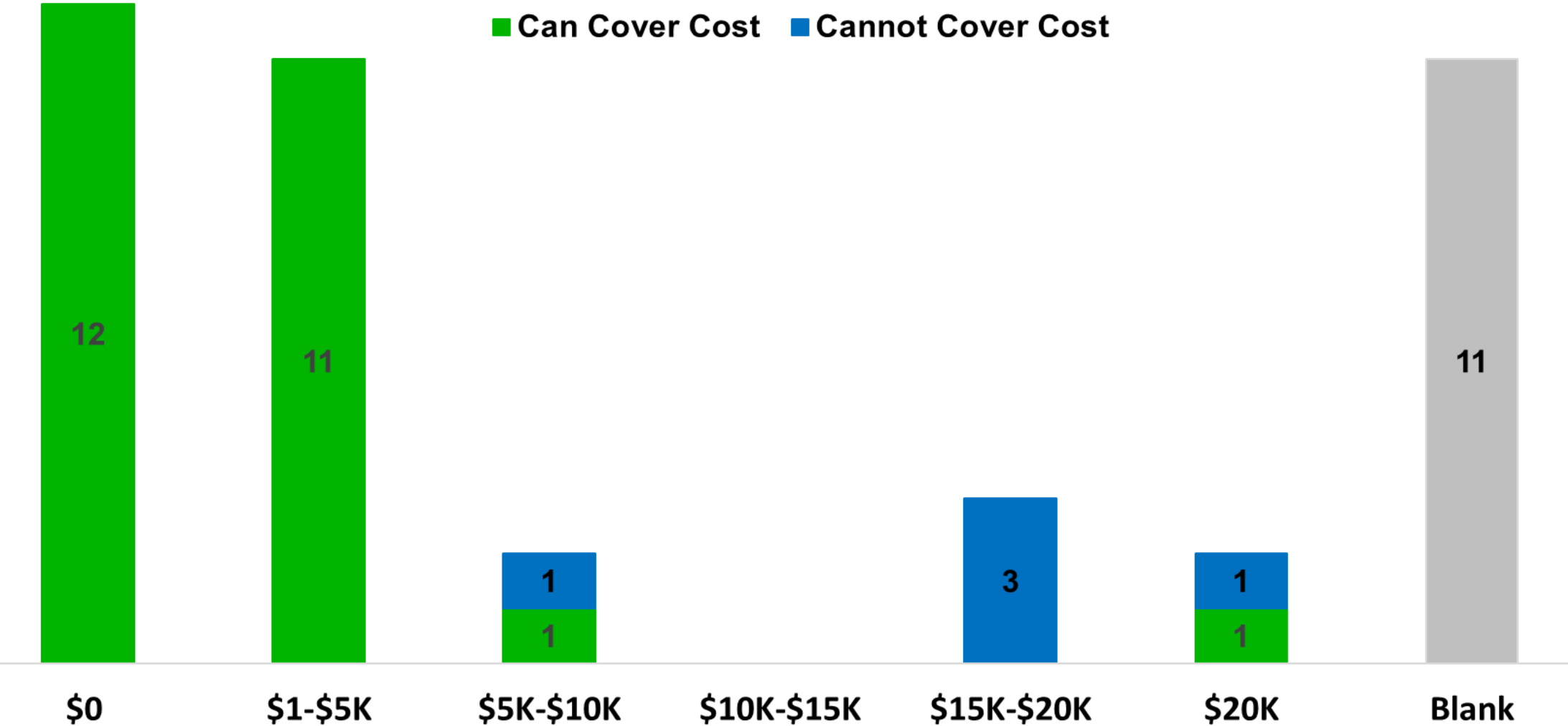
- Positive total coliform water samples (routine for interactive play features)
- Max water temp (104°F)



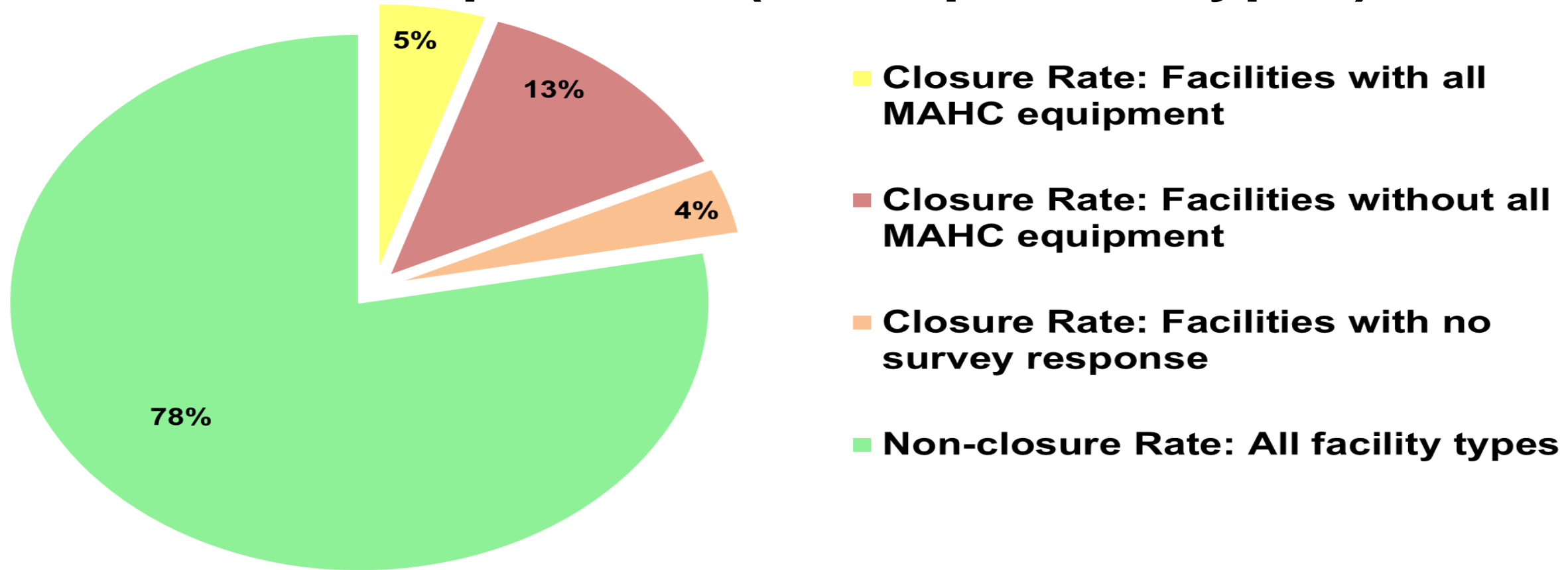
# Cost-Benefit Analysis: MAHC-equipment required by 1/1/23



# Stakeholder Ability to Cover Cost Estimate for Upgrades



# Percentage of non-closure inspections vs. closure inspections (all inspection types)



# MAHC Adoption Successes

- Board of Health support
- Grant funding and accountability
- Stakeholder support and feedback
- 30% drop in pH violations since 2021
- Inspector morale after inspections

# New regulations means new...everything!



- Violation library
- Inspection report form
  - Record 68 data points per inspection
- Plan review packet
- Operator resources
  - Logs, daily checklists, variance forms, compliance agreements, newsletters

## Pool/Spa Area

### **⚠ Inspection Form Item #1: Enclosure: fencing, walls, gates and doors in good repair**

#### **4.0<sup>A</sup> Aquatic Facility Design Standards and Construction**

- 4.8.6 Barriers and Enclosures
  - 4.8.6.1.1 Enclosure
    - 4.8.6.1.1.1 Enclosures

#### **5.0<sup>A</sup> Aquatic Facility Operation and Maintenance**

- 5.6.10 Aquatic Facility Maintenance
  - 5.6.10.5<sup>A</sup> Fencing, Enclosures, and Barriers
    - 5.6.10.5.1 Maintenance
- 5.8.6 Barriers and Enclosures
  - 5.8.6.1 General Requirements

#### **6.0<sup>A</sup> Policies and Management**

- 6.1.2.1.4.12 Enclosures
- 6.4.1.3.1 Daily Inspection Items
  - #17 Fencing/Enclosures, Gates
- 6.6.3.1<sup>A</sup> Violations Requiring Immediate Correction or Closure
  - #15 Maintain Enclosure

# Aquatic Facility Inspection Form

Based on CDC's 2023 Model Aquatic Health Code



101 West 9<sup>th</sup> Street  
Pueblo, CO 81003  
Phone (719) 583-4307 Fax (719) 583-9902  
www.pueblohealth.org

Name of Aquatic Facility \_\_\_\_\_ Address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_

Venue Type: Pool Hot tub/Spa Wading Pool Interactive water play venue Floatation Tank Other \_\_\_\_\_

Area	Item	Descriptions (▲ = critical violations)	Points	In	Out	N/A
Pool/Spa Area	1	▲ 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	10			
	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			
	Water Chemicals	18	Water temperature ≤ 104°F (40°C)	5		
19		Approved NSF/ANSI Standard 50 DPD test kit	5			
20		▲ Proper disinfectant level	10			
21		▲ pH properly maintained	10			
22		Combined chlorine < 0.4 ppm	5			
Equipment/Chemical Room	23	▲ Cyanuric Acid to Chlorine ratio ≤ 45:1	10			
	24	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			
	31	Filter gauges operable: filter inlet and outlet, strainer; sight glass	5			
	32	Proper functioning UV system; ozone system	5			
Hygiene Facilities	33	Chemicals: labeled, stored safely, secured	5			
	34	Appropriate Personal Protective Equipment (PPE) available	5			
	35	Diaper-changing station present; sink, adjacent trash can, sanitizer	5			
	36	Used equipment separated from cleaned equipment	5			
	37	Toilets: clean, good repair, bathroom appropriately stocked	5			
	38	Rinse showers: good repair, accessible	5			
	39	Cleansing showers: Warm, non-scalding water available; good repair; soap	5			
Records Room	40	Operator training certification available onsite	5			
	41	Lifeguard training certification available onsite	5			
	42	Inspection report conspicuously posted at each entrance	5			
	43	Operator inspection daily items: checklist used daily	5			
	44	Operator inspection items: evidence of appropriate steps promptly taken	5			
	45	Chemical records: filled out daily	5			
	46	Chemical records: evidence of appropriate steps promptly taken	5			
General	47	Emergency Action Plan available on site	5			
	48	▲ Floatation Tank: Ozone or UV system in proper working order	10			
	49	▲ Floatation Tank: Ozone or UV system meets volumetric turnover requirements	10			
	50	Floatation Tank: Interior surfaces cleaned to prevent build-up of slime and biofilm layers	5			
	51	▲ Substantial unauthorized alterations/equipment replacement	10			
	52	▲ Other: Imminent Health Hazards are a 10-point critical violation	5 or 10			

Risk Type\*:  
1 2 3

Time:  
In \_\_\_\_\_  
Out \_\_\_\_\_

Score: \_\_\_\_\_ %

Letter Grade: \_\_\_\_\_

Previous Score: \_\_\_\_\_

Purpose of Visit (Select one)

- ☐ Routine  
☐ Complaint  
☐ Follow-Up  
☐ Illness  
☐ Incident  
☐ Other

Water Quality Readings

Free chlorine	_____
Free bromine	_____
pH	_____
Total alkalinity	_____
Calcium hardness	_____
Cyanuric acid	_____
Water Temp	_____

Grading System:

- A = 95–100%  
B = 85–94%  
C = 75–84%  
F = 74% or less or critical item

## Recreational Water Inspection Report

Facility Name: Test Permit Name	Owner Name: Deb McBride2
Address: 101 Test Street Charlotte NC 28216	
Date: 07/19/2022	Inspection Type: Other
Inspection Frequency: 12 months	Venue Type: Year-Round Pool
Filter Type: Cartridge	Venue Volume (gallons): 500

Compliance status to be designated as IN, OUT, NA, NO for each numbered item.

IN= in compliance OUT=not in compliance NO=not observed NA=not applicable COS=corrected on site R=repeat violation

Item #	Compliance	Violation Descriptions	COS	R
1		Enclosure: fencing, walls, gates and doors in good repair and function as intended		
2		Protected overhead electrical wires		
3		GFCI protected electrical receptacles within 20 feet of inside wall of venue		
4		Proper depth & "no diving" markers; stair stripes in good repair and visible		
5		Main drain grate/submerged suction outlet grate present, secure, and unbroken		
6		Aquatic venue bottom visible		
7		Required safety equipment accessible		
8		Adequate facility supervision, where applicable		
9		Minimum disinfectant level provided		
10		pH between 7.0 and 8.0 provided		
11		Recirculation pump approved, in good condition, and operating		
12		Filter approved, in good repair, and operating		
13		No plumbing cross-connections with potable and non-potable sources		
14		Emergency lighting maintained		
15		Approved chemicals and usage		
16		Theoretical Peak Occupancy not exceeded		
17		No broken glass or sharp objects present in venue or deck area		
18		Water temperature does not exceed 104 degrees F		
19		Bacteria within acceptable limits (sampled for interactive play features/fountains)		
20		Approved water supply source		
21		Other public health hazard as determined by department		
22		Substantial unauthorized alterations/equipment replacement		
23		Current Certificate of Operation		

## Water Quality Readings

Free Chlorine	Total Chlorine	Combined Chlorine
Free Bromine	pH	Total Alkalinity
Calcium Hardness	Cyanuric Acid	Water Temperature
ORP Reading	Flow Meter Reading	Turnover Rate

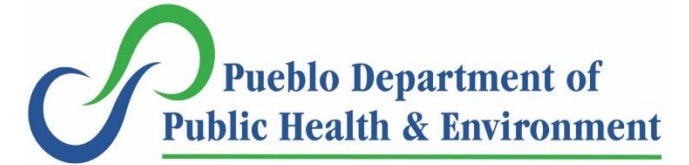
# Program Revamp and Standardization

- Program manual
  - References SOPs and forms
  - IHHs, risk control measures, performance elements, inspection types/definitions, enforcement, training requirements, etc.
- Training Plan and Log (CFP template)

## INSPECTION TRAINING AREAS

### I.Pre-Inspection

<input type="checkbox"/>	1. Has required equipment and forms to conduct inspection.	Training Method	Date Demonstrated By Trainee	Trainee's Initials	Training Officer
<input type="checkbox"/>	Necessary inspection forms and administrative materials.				
<input type="checkbox"/>	Palintest device, photometer chemicals, test tubes, tablet crusher.				
<input type="checkbox"/>	Thermometer for measuring water temperature.				
<input type="checkbox"/>	Clean and treated (sodium thiosulfate) water sample bottle(s).				
<input type="checkbox"/>	Deionized water, water sample grabber, measuring cup, and towel.				
<input type="checkbox"/>	Scissors/tape.				
Comments:					
Trainee has demonstrated acceptable performance for all competencies listed					
Date:	Trainee's Initials:	Trainer's Signature:			



Office of Environmental Health

## Pool Inspection Program Procedure Manual

Updated: June 2023

# What Pre-MAHC strategies changed?

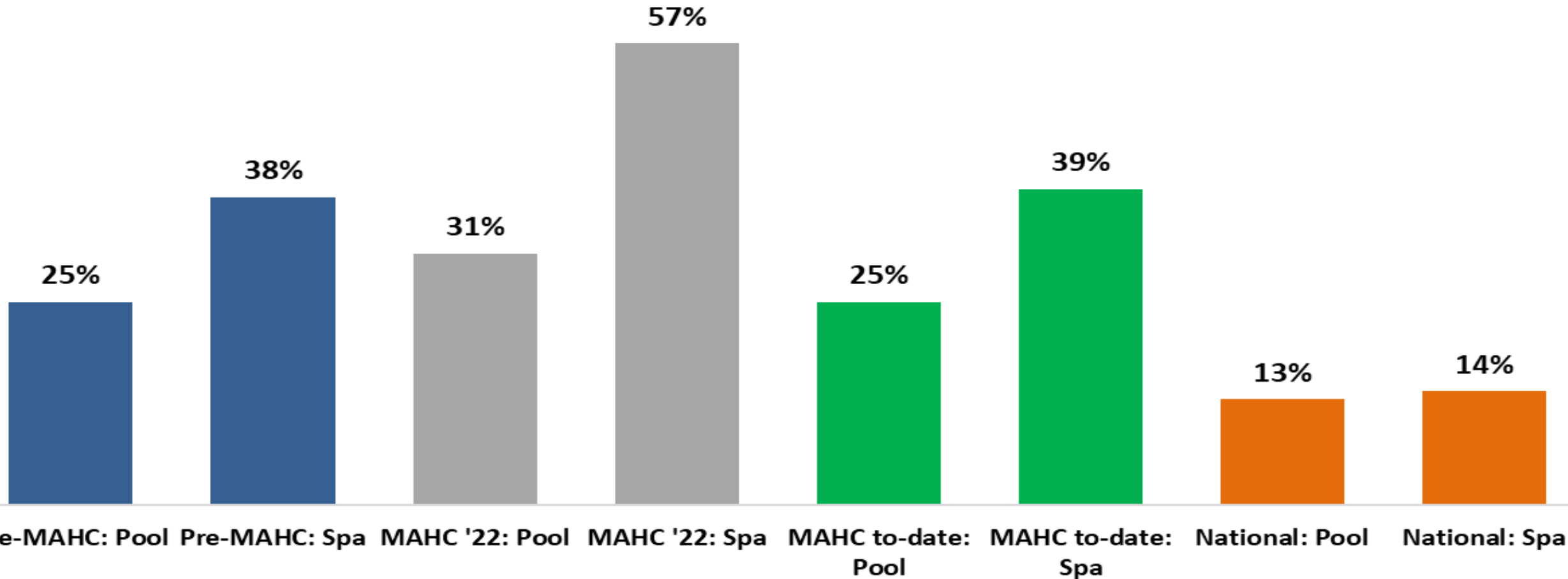
- Enforcement strategies- Inspection procedures for closures and follow ups
- Compliance Agreement process updated
- Variance process established
- No more routine total coliform sampling at all venues
- Streamlined administrative work with use of Certificate of Operation
- Tracking "Total EHS Time" spent on inspection work (field and administrative)



# What does the data say now?

## Percent of inspections resulting in closure

Pre-MAHC: 2016-2021, MAHC: 2022-2023, National: 2018



# What does the data say now?

- 140 routine inspections (4/2022 to 7/2023)
- Violations marked “OUT” of compliance  $\geq 20\%$  of routine inspections:
  1. IHH: Proper depth & “no diving” markers; stair stripes in good repair and visible (32%)
  2. Signs: Bathing load/rules/chemicals/spa legible and in good repair (34%)
  3. Automated feeder operable (30%)
  4. Total Alkalinity between 60 and 180 ppm (28%)
  5. Combined chlorine  $< 0.4$  ppm (27%)
  6. Grab rails, ladders secured; shell, deck in good repair (26%)
  7. Chemicals: labeled, stored safely, secured (24%)

# Grant-funded incentives for stakeholders

- Bloodborne pathogen kits
- CPR masks and posters
- Buoys and 50' line
- “No Diving” Markers
- No lifeguard on duty signs
- Dialing instructions
- Diaper changing units
- ColorQ test kits
- Taylor test kits and reagents
- CPO class vouchers



# Stakeholder Response after Adoption



# Best Practices and Lessons Learned

- Early education and involvement of stakeholders
- Create and foster partnerships (local level and beyond)
  - County attorney/legal team, BOH, LPHAs, state health department
- Ensure ample opportunities for collaboration and feedback among stakeholders
- Setting deadlines and expectations

# Next Steps

- Develop Pool Safety and You Course (July 3, 2023, incident)
- HAZMAT training and Plan Review training
- Pulse check survey and analysis for stakeholders after 1 year of adoption
- Inspection data analysis after 1 year of adoption
- Program evaluation in 2023

# Takeaways

- Don't reinvent the wheel
- Stick with it...it is a process
- You are not alone
- Remember the end goal – SAFER SWIMMING

# Acknowledgements

- NACCHO
- Pool Team Members
  - Robbie Boyer, Julian Lucero, Chad Wolgram, Vicki Carlton, Dayton Ryden, Cori Ocanas, Megan Collins
- Pueblo County Stakeholders
- PDPHE BOH
- NEHA
- CDC and CMAHC
- CDPHE and Colorado Swimming Pool Group
- Pool & Hot Tub Alliance - Dr. Neil R. Lowry Grant

# Questions?



**Autumn Whittaker, EHS**  
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**Scott Cowan, Program Manager**  
**[cowans@pueblocounty.us](mailto:cowans@pueblocounty.us)**

# Questions?

Use the Q&A box to submit your questions for the panelists!

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