



Developing a Bureau-Level Incident Response Program: Lessons from the Ottawa Lake Diesel Spill



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Background

On April 1, 2024, a diesel fuel spill was detected in Whiteford Township, Monroe County, MI threatening local waterways and private wells due to the area’s vulnerable karst geology. Over the following weeks, more than 580 water samples were collected, public meetings were held, and incident command transitioned to long-term monitoring and management led by MDHHS.

Research Question

How can lessons learned from the Ottawa Lake Diesel Spill inform the design and implementation of a Bureau-Level Incident Response Program that enhances readiness, coordination, and capability alignment?

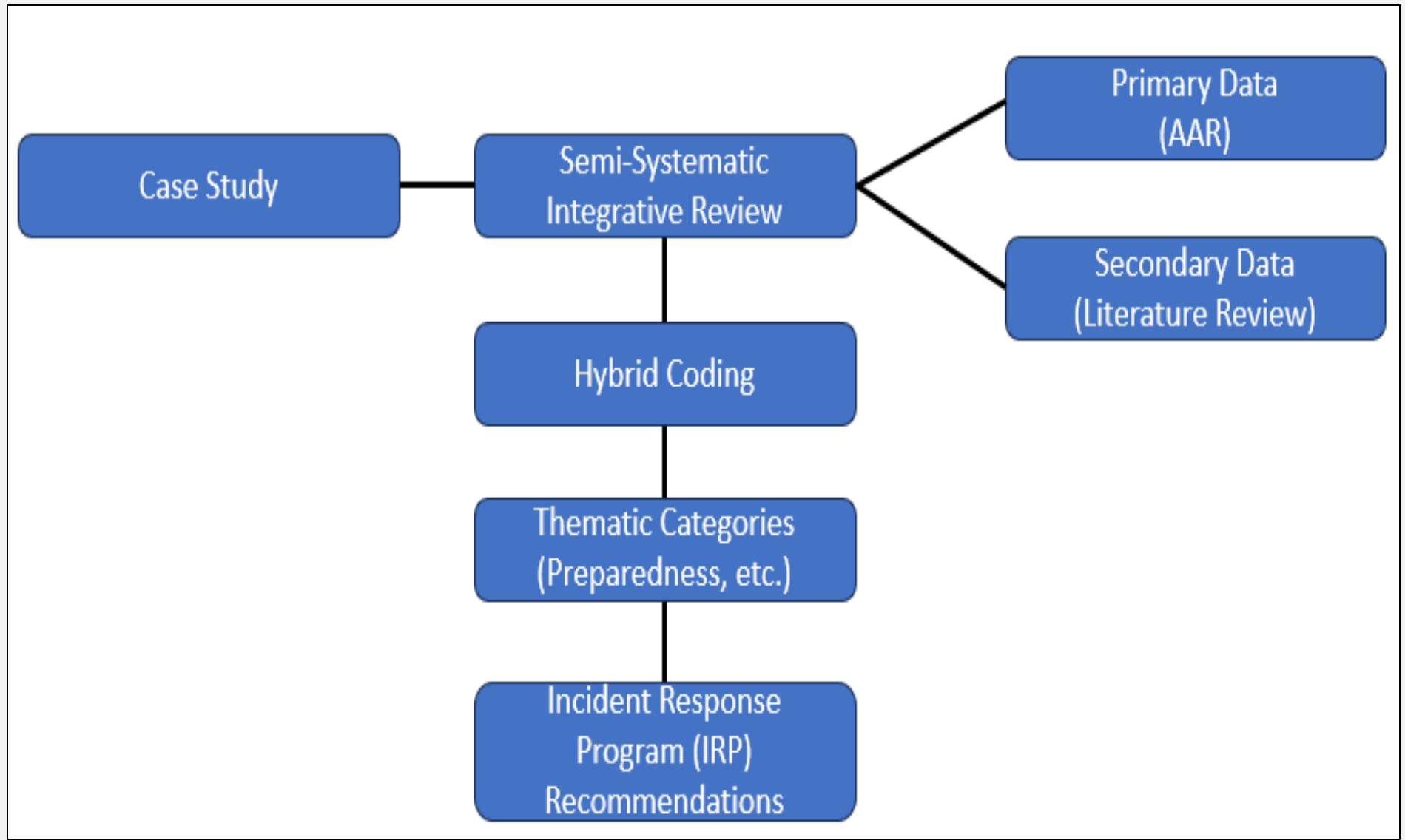
Sub-Questions

- Q1.** Does embedding CDC Public Health Emergency Preparedness and Response (PHEP) Capabilities improve operational effectiveness and interagency coordination?
- Q2.** Does the absence of pre-deployment staffing and untested data systems reduce response efficiency?
- Q3.** Can structured community engagement increase public trust and cooperation during emergency response efforts?

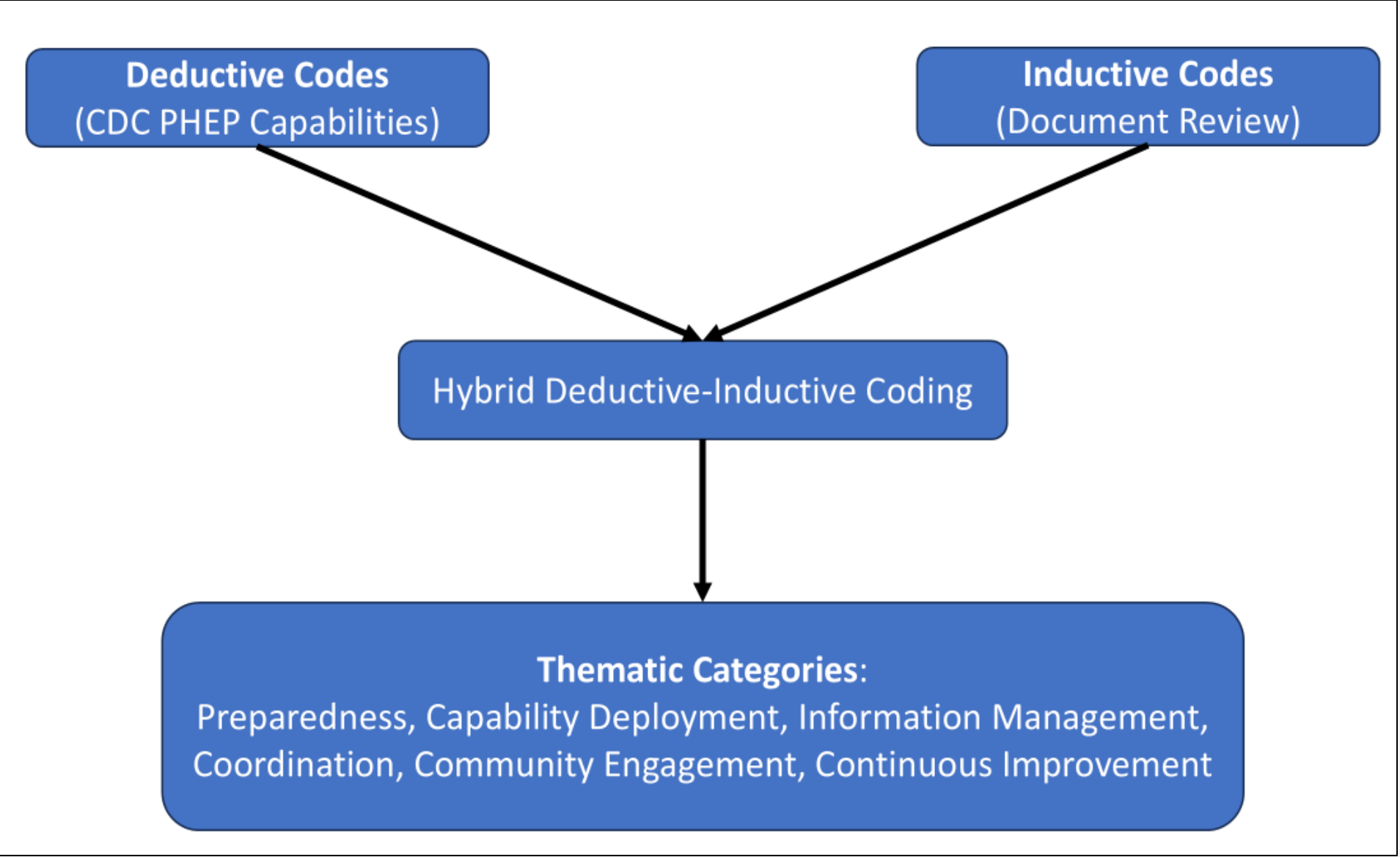
Literature/Context

Capability-Based Planning: Embedding capabilities makes actions measurable and improvable (Lurie et al., 2013); vertical and horizontal alignment prevents coordination gaps (Kapucu & Garayev, 2016).
Readiness: Poor planning and untested systems delay response (Perry & Lindell, 2003; Bharosa et al., 2010).
Coordination: ICS/NIMS enable integration when properly trained (Moynihan, 2009; FEMA, 2021).
Community Engagement: Effective risk communication requires empathy, clarity, and inclusivity (Covello, 2003; Reynolds & Seeger, 2005).

Research Design



Analytical Approach



Method

Design: Qualitative case study using a semi-systematic integrative literature review.
Data Sources: Primary (After Action Report) and secondary (CDC PHEP, FEMA CPG 101, peer-reviewed literature).
Data Collection: Documents cataloged, mapped to PHEP capabilities, and coded for deductive (plans) and inductive (observed actions) evidence.
Analysis: Hybrid coding organized into five themes (Preparedness, Operations, Information, Coordination, Community Engagement) with thematic, gap, and synthesis phases.

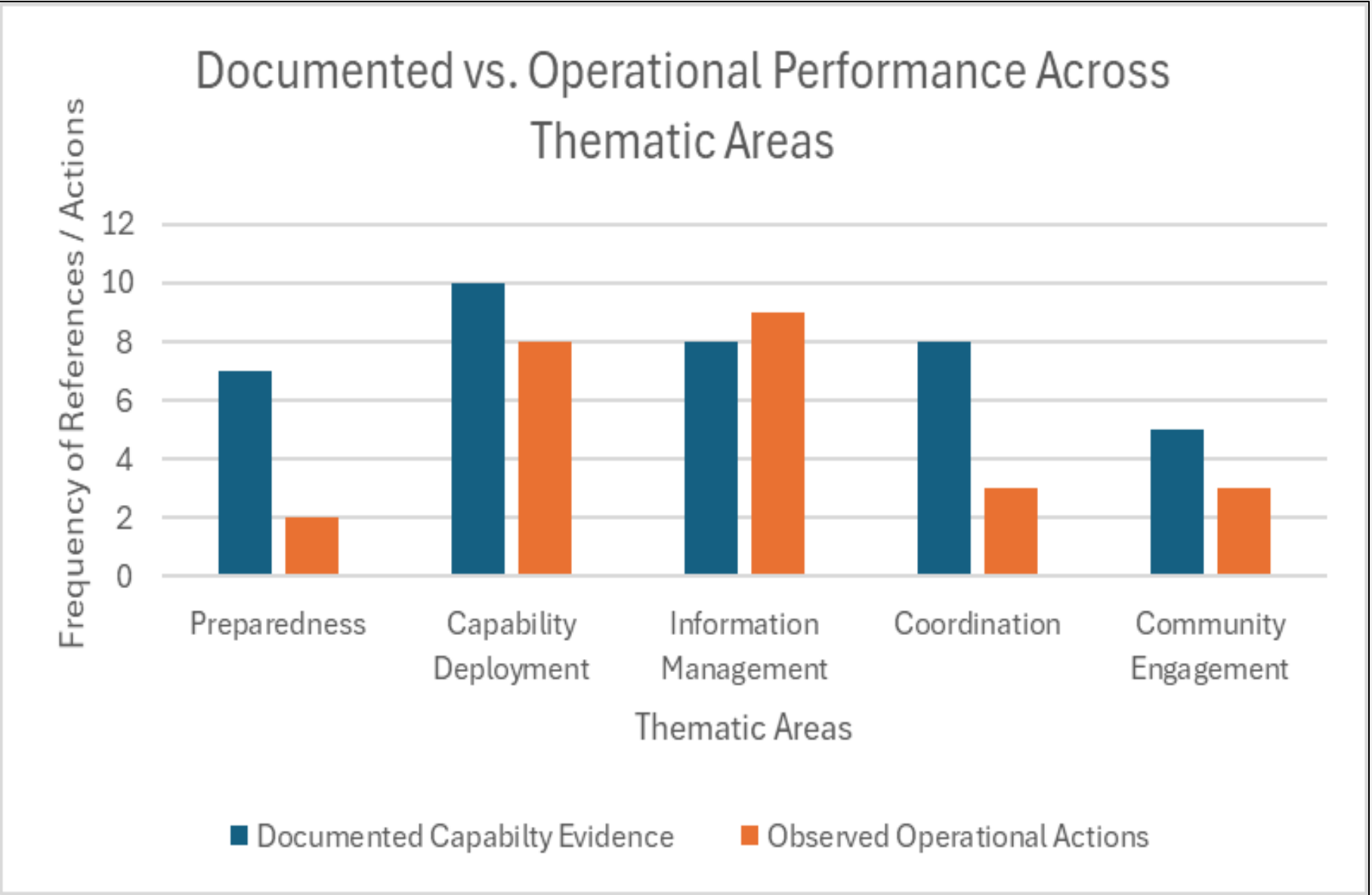


Chart 1: Documented plans and observed actions reveal strong capability deployment but gaps in preparedness, coordination, and inclusive community engagement—highlighting areas for targeted IRP enhancement.

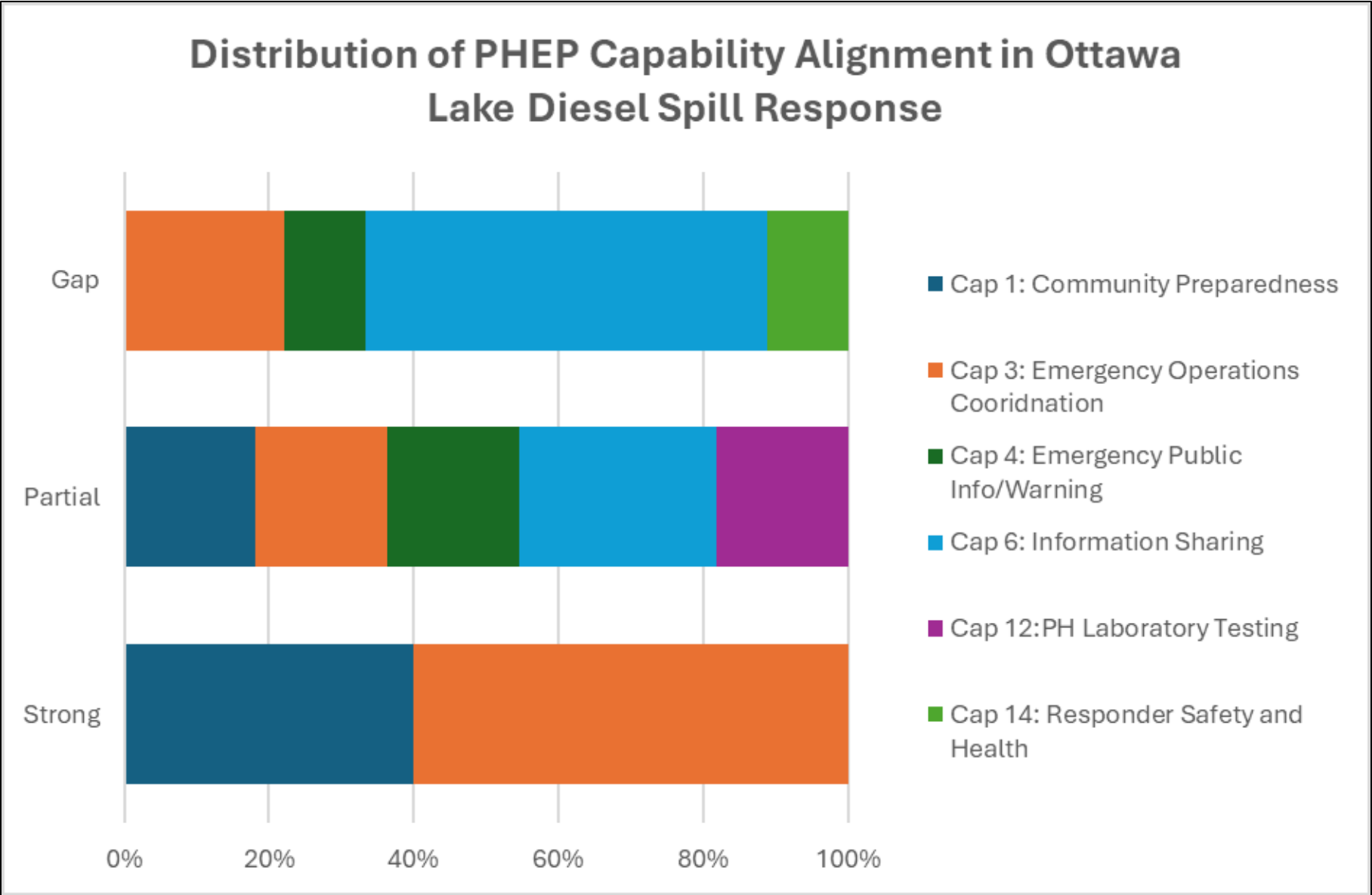


Chart 2 : CDC preparedness capabilities performed during the Ottawa Lake response. Capabilities 1 and 3 were strongly integrated, while Capabilities 6, 12, and 14 revealed major gaps—highlighting key areas for IRP improvement.

Capability-to-Theme Crosswalk Matrix					
	Preparedness	Emergency Operations	Information Management	Coordination	Community Engagement
Cap 1: Community Preparedness	Strong	Strong	Partial	Strong	Partial
Cap 3: Emergency Operations Coordination	Partial	Strong	Partial	Strong	None
Cap 4: Emergency Public Information/Warning	None	Partial	Partial	None	Partial
Cap 6: Information Sharing	Partial	None	Gap	Partial	None
Cap 12: PH Laboratory Testing	None	Partial	Partial	None	None
Cap 14: Responder Safety and Health	None	Gap	None	Partial	Partial

Table 1: The Capability to Theme Crosswalk Matrix maps CDC PHEP capabilities across five response domains, revealing strong integration in Preparedness and Coordination (H1), partial execution in Information Sharing and Public Communication (H2, H3), and critical gaps in Responder Safety—pinpointing where doctrinal intent failed to translate into operational practice.

PHEP Capability Coverage Heat Map			
PHEP Capability	Strong	Partial	Gap
Cap 1: Community Preparedness	0.50	0.50	0.00
Cap 3: Emergency Operations Coordination	0.43	0.29	0.29
Cap 4: Emergency Public Info/Warning	0.00	0.67	0.33
Cap 6: Information Sharing	0.00	0.38	0.63
Cap 12: PH Laboratory Testing	0.00	1.00	0.00
Cap 14: Responder Safety and Health	0.00	0.00	1.00

Table 2: The Heat Map shows strengths in Community Preparedness, mixed Emergency Operations Coordination, and gaps in Information Sharing, Lab Testing, and Responder Safety.

Gap Analysis: Ottawa Lake Diesel Spill Response		
Preparedness	S	O
Capability Deployment	G	S
Information Management	O	G
Coordination	S	O
Community Engagement	O	S
	CDC PHEP	CPG 101
Color Key:	Strength	Opportunity Gaps

Table 3: Gap Analysis of Ottawa Lake Response Activities shows strengths in capability deployment, moderate gaps in preparedness and coordination, and underperformance in community engagement—highlighting priorities for targeted IRP improvements.

Findings

- Q1:** Yes. Early activation of PHEP capabilities enhanced operational effectiveness and coordination. However, gaps in laboratory processes, information systems, and interagency role clarity revealed the need for more defined procedures and regular testing.
- Q2:** Yes. The lack of validated systems and standardized protocols led to inefficiencies, reinforcing the importance of pre-assigned roles and tested workflows.
- Q3:** Yes. Community engagement efforts helped build trust, but the response highlighted the need for more inclusive practices and proactive, multilingual messaging.
- Overall:** Lessons from the Ottawa Lake Diesel Spill demonstrate that embedding CDC PHEP capabilities, ensuring surge-ready staffing and systems, and prioritizing inclusive community engagement are all critical to designing an effective Bureau-Level Incident Response Program. The response highlighted both strengths and areas for growth, offering a clear path to enhance readiness, coordination, and capability alignment through targeted improvements in planning, systems integration, and communication strategies.

Next Steps & Conclusions

Capability-to-Action Map		
Recommendation Area	Relevant PHEP Capabilities	Recommended IRP Actions
Capability Operationalization	Cap. 1 – Community Preparedness, Cap. 3 – Emergency Operations Coordination, Cap. 4 – Emergency Public Information & Warning, Cap. 6 – Information Sharing, Cap. 12 – Public Health Laboratory Testing	• Develop capability-specific SOPs with activation triggers, responsible entities, and timelines, • Conduct capability stress tests to identify thresholds/interdependencies, • Align horizontal & vertical coordination so field data informs strategic decisions,
Surge Staffing	Cap. 3 – Emergency Operations Coordination, Cap. 15 – Volunteer Management	• Create surge staffing rosters with pre-assigned roles & shift redistribution protocols, • Integrate staffing models into ICS activation protocols, • Simulate surge scenarios to test elasticity and coordination
Information Management & Technology Readiness	Cap. 6 – Information Sharing, Cap. 12 – Public Health Laboratory Testing	• Stress-test all data platforms under simulated surge conditions, • Establish unified reporting protocols across agencies, • Conduct cross-agency technology drills on data entry, validation, and situational reporting
Multi-Agency Coordination & Governance	Cap. 3 – Emergency Operations Coordination, Cap. 6 – Information Sharing	• Assign liaison officers in each partner agency pre-incident, • Define unified decision-making protocols clarifying operational & strategic command, • Conduct joint coordination exercises to stress-test governance
Community Engagement & Public Trust	Cap. 1 – Community Preparedness, Cap. 4 – Emergency Public Information & Warning	• Integrate staff into the Joint Information Center or designate a PIO • Integrate community liaison roles for two-way communication

Significance for EM Professionals

Lessons from the Ottawa Lake Diesel Spill show that translating preparedness capabilities into clearly defined, testable actions is key to building a more effective Incident Response Program. The project offers a practical model for validating action and improvement planning, thereby helping emergency management professionals move from doctrine to execution with greater speed, clarity, and inclusivity.

Reference

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Acknowledgement

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