Quality Improvement during Disaster Recovery: Using the Plan-Do-Study-Act Cycle to Evaluate and Improve Disaster Recovery Operations

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Objectives

1. Identify current priority areas in public health preparedness resilience and recovery at the local, state, tribal, and national levels.
2. Define public health and healthcare roles and responsibilities during disaster recovery operations and evaluate current public health disaster recovery planning using the PDSA cycle.
3. Extend technical assistance to local health departments and healthcare coalitions for the development of local public health recovery plans that can be adapted to meet the needs and objectives of local jurisdictions.

Background

Ellicott City (a Maryland community dating back to 1772) flooded on July 30, 2016 after receiving six inches of rain in two hours, flooding nearby rivers which swept through the historic downtown area. This flash flood resulted in 9 injuries and two deaths, along with significant damage to 20-30 buildings and complete damage to four to five buildings. Damaged sidewalks, electrical lines, and gas leaks also posed a threat to those in the area.

Both the state and local governments declared states of emergency, allowing them access to resources outside of the region. As the Emergency Support Function 8 lead, the Maryland Department of Health and Mental Hygiene (DHMH) ramped up operations, including:

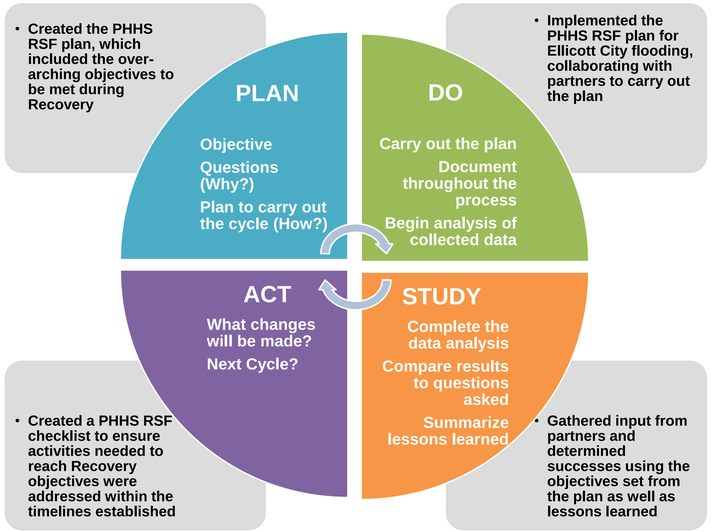
- Providing tetanus vaccines and insect repellant to responders
- Investigating deaths associated with the flooding
- Conducting surveillance for diseases and injuries associated with the flooding
- Providing public health safety messaging
- Assessing affected public health and healthcare entities
- Supporting local health department operations

DHMH also ramped up recovery operations as the Public Health and Healthcare Services (PHHS) Recovery Support Function (RSF) lead.

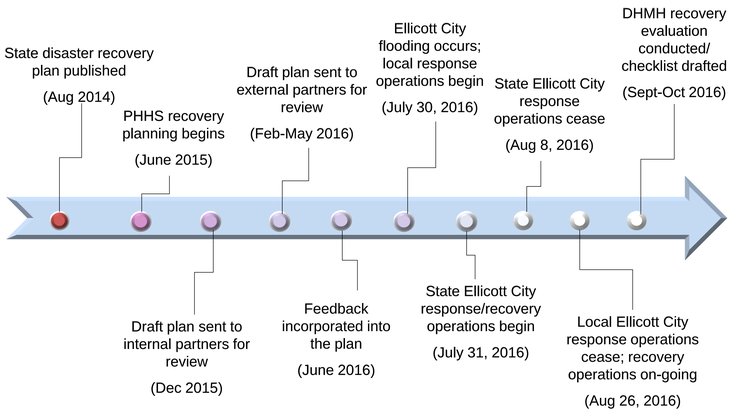
Methods

DHMH had written and vetted a PHHS Recovery plan with partners. However, the formalized process had yet to be tested. The Plan-Do-Study-Act (PDSA) cycle was used to evaluate recovery operations (starting with Plan: formally defining our operations within the PHHS Recovery plan) and incorporate lessons learned for more efficient recovery processes. Recovery operations (Do) included coordinating assistance through the local Disaster Assistance Center (e.g. behavioral health and Vital Records), providing technical assistance to the local health department and state agencies, and coordinating public health assessments to aid residents and businesses.

PHHS Recovery Plan Quality Improvement Test of Change: Plan-Do-Study-Act Cycle



PHHS Recovery Planning/Implementation Timeline



Results

A major finding in evaluating (Study) these operations was that the PHHS recovery plan was very useful and appropriate in guiding overall operations; the below objectives from the plan were used to guide recovery activities:

- Collaborate with the Long-Term Recovery committee to establish and accomplish applicable milestones.
- Provide data to inform the request for a presidential disaster declaration within one to four weeks of an event.
- Within one week following an incident, conduct a public health impact assessment.
- Within one week following an incident, ensure impacted residents have access to essential public health and healthcare services.
- Prioritize the restoration of all other public health and medical services necessary to meet the demand of the population and begin the implementation to restore these services within one month of the transition to recovery operations.
- Ensure 100% of displaced patients evacuated to other facilities are transferred to appropriate permanent facilities within one month of the transition to recovery operations.

However, there were gaps in lower level planning at the DHMH level to achieve these higher level objectives. In response to this finding, a PHHS recovery checklist was created (Act) to document specific activities necessary for DHMH to more efficiently lead PHHS recovery at the state level and support/provide technical assistance to health departments at the local level. For example, to ensure impacted residents have access to essential health services within one week of the incident, activities such as inventorying all impacted healthcare facilities must occur within the first few days of recovery.

Conclusion

There were many lessons learned from these recovery operations, which will be addressed in future planning, training, and exercising. Using this Quality Improvement Test of Change process to continually evaluate our Recovery Program and incrementally test improvements has been helpful to systematically review the program, define what works well, and address barriers/challenges.

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