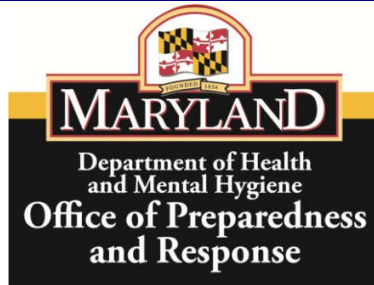


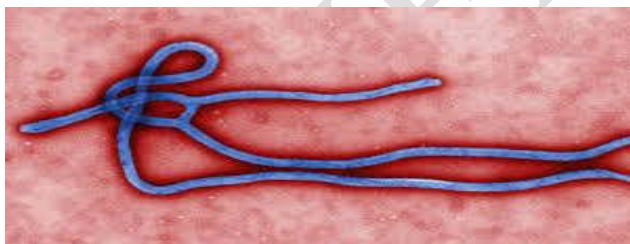
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After Action Report/Improvement Plan

2014 Maryland Regional Ebola TTX



2014 Maryland Regional Ebola Table Top Exercises



Fall 2014

AFTER ACTION REPORT /IMPROVEMENT PLAN

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EXECUTIVE SUMMARY

Introduction:

The Maryland Department of Health and Mental Hygiene (DHMH) Office of Preparedness and Response (OP&R) developed and conducted the regional 2014 Maryland Regional Ebola Table Top Exercises in October and November 2014.

These table top exercises (TTX) were developed and conducted in Maryland's sub-state regions (Regions 1&2, Region 3, Region 4 and Region 5) to address critical issues related to Emergency Support Function 8: Public Health and Medical (ESF 8) preparedness, response and recovery to the presence of an emerging infectious disease, Ebola Virus Disease (EVD) in West Africa. Exercise participants were asked to imagine that they were deployed to West Africa to assist in EDV response activities in the austere African environment.

They were asked to approach response activities from the perspective of the Incident Command System leadership positions of Incident Commander (IC), Planning Section Chief and Operations Section Chief.

Facilitated discussion focused on their response activities while in Africa with transition to application of the identified response activities to those applicable to their respective jurisdictions.

Exercise participation included invitations to local health departments and Maryland acute care hospitals as well as DHMH related state facilities and state government partners.

Ebola Virus Disease Synopsis:

Ebola Virus disease (EVD) is an illness, caused by infection with Ebola Hemorrhagic Virus, with a mortality rate between 60 and 95%. EVD presents much like any viral illness with fever, muscle aches and sore throat progressing to nausea, vomiting, diarrhea and malaise.

Subsequently, multiple organ failure occurs with bleeding from multiple sites. It is contact with bodily fluids, which are highly infectious, which results in the high contagiousness of the illness.

Early in 2014, it became apparent that the Ebola outbreak in West Africa was unlike previous outbreaks observed since 1975. This outbreak spread from the rural areas of the countries of Sierra Leone, Guinea and Liberia to urban areas. The pathophysiology of EVD in combination of societal norms, cultural practices and socio-economic characteristics of these countries as well as delayed international response and support have resulted in the largest outbreak of EVD on record.

There is no vaccine and no known medical treatment for EVD other than supportive care. Therefore, control of EVD is focused on sound public health principles to reduce exposure to

EVD ill individuals and infectious fluids.

Protection of general populations includes traditional public health interventions such as hygiene recommendations, public education and messaging and contact tracing in conjunction with isolation and quarantine.

In the current outbreak, as well as previous outbreaks, health care providers are at distinct high risk related to the "non specific" symptoms of early EVD, which exposes them to contagious patients and infectious materials. The only protection available to health care providers is afforded by identification of highly suspect patients by close questioning to determine if they fit the EVD case definition and by use of appropriate personal protective equipment (PPE), such as gloves, gowns and face shields

Although the EVD epidemic has been centered in West Africa, the World Health Organization and several national health agencies are concerned about the spread of EVD outside West Africa as a result of international travel of asymptomatic infected individuals.

Ebola Table Top Exercise Scenario:

As a prelude to the TTX, participants were shown a Public Broadcasting System (PBS) Frontline documentary video of the Ebola outbreak in West Africa (<http://video.pbs.org/video/2365321806/>). A transcript of the show is located in *Appendix B: Transcript of PBS Frontline Video* on page 149.

This Frontline show discussed several issues and difficulties encountered by public health agencies in affected countries. In addition, it presented Ebola Treatment Center operations at a center run and staffed by Médecins Sans Frontières (MSF) International (*Doctors Without Borders*) in Sierra Leone.

Table top participants were asked to consider themselves as part of an incident command team sent to Sierra Leone to apply their leadership training in public health response. During facilitated discussion, participants were asked to approach problems, concerns and issues identified in the Frontline video from the perspective of the Incident Commander, Planning Section Chief and Operations Section Chief.

Table Top Exercise Data Collection And Analysis:

Immediately following the TTX, a hotwash discussion of the TTX was conducted with participants.

A Strengths, Weaknesses, Opportunities and Threat (SWOT) Analysis based participant survey was distributed to all TTX participants (*Appendix D: After Exercise Analysis Tool*). Participants were asked for input on the TTX design and conduct (*Appendix C: Participant Feedback Survey*) as well as asked for further comments about planning, responding and recovery from an Ebola public health threat and incident.

The following Capability Domains were mentioned during the post exercise hot wash and or feedback survey in various degrees of detail and frequency:

- Incident Management
- Information Management
- Resource Management
- Planning
- Exercise and Training
- Community Preparedness and Recovery
- Mass Care and Medical Surge
- Responder Safety
- Public Health Surveillance and Epidemiological Investigation
- Fatality Management
- Non-pharmaceutical Intervention
- Volunteer Management

Comments from the hotwash and participant SWOT survey were categorized into one of the capability domains. The overall frequency with which each capability was noted within the SWOT analysis was determined. This provided insight into the "hot topic" capabilities of interest to the participants.

In addition, the frequency that each capability was noted within the respective SWOT categories (Strength, Weakness, Opportunity and Threat) was calculated. The data was then combined into a single table to demonstrate the relationship of individual capabilities across the SWOT categories (*Table XXX Maryland Statewide Capability Relationships Across SWOT Categories*).

Capability Differential for each capability was determined using a weighted valuation system, thus, permitting the identification of preparedness gaps and insufficiencies or preparedness competencies for each capability.

These methods of data presentation and analysis facilitate identification of preparedness capabilities in need of the most attention and hence the greatest cost to benefit ratio for expenditure of time, effort and money.

Lastly, all comments were compiled into a narrative summary within SWOT categories for each capability. These summary tables thus permit the development of sustainment, corrective actions and improvement plans across the spectrum of preparedness capability domains determined to be of high priority.

Findings:

The purpose of this After Action Report (AAR) is to analyze exercise results, identify strengths to be maintained and built upon, identify potential areas for further improvement and support

development of sustainment activities, implementation of corrective actions and development of improvement plans.

Although the data was collected from four individual regional exercises, data was compiled to permit overall statewide assessment of preparedness capabilities for Maryland (*Section 6: Maryland Statewide Capability Analysis and Recommendations and Improvement Matrices*). In addition, similar data analysis and presentation has been performed for each sub-state region (*Sections 7, 8, 9 and 10*).

Several significant findings and observations were identified and noted during the exercise(s) as described throughout this AAR. Only major findings for Maryland statewide assessment will be presented below.

The major Maryland statewide findings identified are as follows:

- Incident management, resource management, planning and information management were cited with a frequency of 19%, 19%, 18% and 17%, respectively, out of all comments within the SWOT analysis. These appear to be the "hot topic" capabilities related to responding to an emerging infectious disease.
- The capabilities of incident and resource management appear to fall into a reciprocal pattern when compared across SWOT categories. For example, incident management was most frequently cited as a strength (31%) and opportunity (25%) with a weakness citation frequency rate of 16% and a sixth ranked 6% threat citation frequency. However, resource management was the fourth ranked strength at 10%, top ranked weakness (20%) with fourth ranked opportunity rating (18%) and the highest cited threat (29%).
- Capability differential calculation demonstrates a negative 43% for resource management compared to positive 11% for incident management. This suggests significant capability gaps or insufficiencies for EDV resource management relative to incident management preparedness competency.

Preparedness Implications:

Although the above findings do not represent the whole Maryland assessment nor those of the individual sub-state regions, it is possible to infer that sustainment, corrective action and improvement plans should focus on resource management rather than incident management. This is not to say that incident management should be ignored, just that the best and greatest efficiency and advancements for preparedness enhancements related to responding to an emerging infectious disease may lie with resource management.

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SUPPORTING DOCUMENTATION

The following exercise associated documents can provide additional background and information regarding exercise design, conduct and evaluation.

- Maryland 2014 Regional Ebola Table Top Exercises: *Post-exercise Participant Feedback Survey*
- Maryland 2014 Regional Ebola Table Top Exercises: *Cross Training Agenda*
- Maryland 2014 Regional Ebola Table Top Exercises: *Facilitator Questions*
- Maryland 2014 Regional Ebola Table Top Exercises: *ICS forms*
 - Incident Commander
 - Planning Section Chief
 - Operations Section Chief
 - Logistics Section Chief

SECTION 1: EXERCISE OVERVIEW

Exercise Details

Exercise Name	Maryland 2014 Regional Ebola Table Top Exercises
Exercise Dates	Fall 2014: Region 3: 3 Oct 2014 Regions 1&2: 10 Oct 2014 Region 4: 17 Oct 2014 Region 5: 24 Oct 2014
Scope	This exercise was a half day facilitated table top exercise (TTX) planned for Maryland's health and medical sub-state regions. Exercise play was limited to Maryland's Emergency Support Function 8: Public Health and Medical (ESF 8) partners including local health departments and acute care facilities and other key and critical regional stakeholders.
Mission Area(s)	Prevention, Protection, Mitigation and Response
Objectives	<ol style="list-style-type: none"> 1. Provide an understanding of the complexity of responding to an emerging infectious disease outbreak caused by Ebola virus. 2. Identify best practices for prevention, protection, mitigation and response to an Ebola Virus Disease (EVD) outbreak through collaborative and facilitated interaction of ESF 8 partners and stakeholders. 3. Enhancing coalition team building between regional stakeholders and partners to strengthen overall ESF 8 response to an EVD outbreak. 4. To test initiation and operational aspects of incident operations command and control coordination, and flexibility within the context of an emerging infectious disease caused by the Ebola virus. 5. Provide participants with broad and varied experience within Incident Command System (ICS) function related to different ICS sections and branches 6. Provide basic information concerning emergency plans of the participant ESF 8 partners and stakeholders in response to EVD under austere conditions.

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Threat or Hazard	Ebola virus disease (EVD), emerging infectious disease, epidemic outbreak.
Scenario	The exercise involves an Ebola emerging infectious disease outbreak affecting West Africa. It is designed to trigger the request for public health support through the deployment of public health and medical management teams to organize and direct public health and medical response to contain the outbreak and enhance the provision of healthcare services.
Sponsor	Maryland Department of Health and Mental Hygiene (DHMH), Office of Preparedness and Response (OP&R)
Point of Contact	Albert J Romanosky, DHMH OP&R

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Participating Organizations

Table 1.1: Maryland 2014 Regional Ebola Table Top Exercises Participants highlights all agencies and organizations participating in the Maryland 2014 Regional Ebola Table Top Exercises. They represent all stakeholders including government (federal, state and local) and private partners.

The following are the total number of participating agencies and organizations:

- Local Health Departments: 24/24
- Hospitals/Acute Care Facilities: 33/46
- State Agencies: 3
- Federal Agencies: 2
- State Facilities: 6/10
- Community Health Centers 5
- Home Care: 1
- Nursing Rehab Center 1

Table 1.1: Maryland 2014 Regional Ebola Table Top Exercise Participant Organizations

Local Health Departments	
Allegany County Health Department	Howard County Health Department
Anne Arundel County Health Department	Kent County Health Department
Baltimore City Health Department	Montgomery County Health Department
Baltimore County Health Department	Prince Georges Health Department
Calvert County Health Department	Queen Anne's County Health Department
Carroll County Health Department	Saint Mary's county Health Department
Cecil County Health Department	Somerset County Health Department
Charles County Health Department	Talbot County Health Department
Dorchester County Health Department	Washington County Health Department
Frederick County Health Department	Wicomico County Health Department
Garrett County Health Department	Worcester County Health Department
State Facilities	
Clifton T Perkins Hospital Center	RICA- Gildner
Eastern Shore Hospital Center	RICA Baltimore
Deer's Head Hospital Center	Spring Grove Hospital Center
Holly Center	Springfield Hospital Center
Potomac Center	Western Maryland Health System
State Agencies	
Department of Health and Mental Hygiene	Maryland Emergency Management Agency
Maryland Institute of Emergency Medical Services System	UMBC: Department of Emergency Health Services
Federal Agencies	
DoD: Ft Detrick: US Army Medical Research and Materiel Command	Centers for Disease Control and Prevention

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Hospitals / Acute Care Facilities	
Anne Arundel County Medical Center	
Atlantic General Hospital	Maryland General Hospital
Baltimore Washington Medical Center	Laurel Regional Hospital
Bon Secours Hospital	McCready Hospital
Calvert Memorial Hospital	Meritus Medical Center
Carroll Hospital General	Mercy Medical Center
Charles Regional Medical Center	Montgomery Medical Center
Chester River Hospital Center	Northwest Hospital
Doctor's Community Hospital	Peninsula Regional Medical Center
Dorchester General Hospital	Prince George's Hospital
Easton Memorial Hospital	Shady Grove Adventist Hospital
Franklin Square Medical Center	Sinai Hospital
Frederick Memorial Hospital	Southern Maryland Hospital Center
Ft. Washington Medical Center	St. Agnes Hospital
Garrett County Memorial Hospital	St. Joseph's Medical Center
Good Samaritan Hospital	St. Mary's Hospital
Greater Baltimore Medical Center	Suburban Hospital
Harbor Hospital	Union Hospital of Cecil County
Harford Memorial Hospital	Union Memorial Hospital
Holy Cross Hospital	University of Maryland Medical Center
Howard County General Hospital	Upper Chesapeake Medical Center
JHU Bayview Medical Center	Western Maryland Regional Medical Center
JHU Hopkins Hospital	Washington Adventist Hospital
Private Partners / Stakeholders	
Community Health Centers: Total Health Care Family Health Center Baltimore Walnut Street Community Health Center Mountain Laurel Medical Center Choptank Community Health Center Greater Baden Medical Services	Mid-Atlantic Association of Community Health Centers
Maryland National Capital Home Care Association	Hartley Hall Nursing Rehab Center
Critical Infrastructure	
Health Care and Public Health Sector	Military
Government: Local, State, Federal	

*** Participating agencies and organizations highlighted in yellow.**

Number of Participants

An average of 34 participants attended the 4 table top exercises (not including DHMH OP&R staff

- Participants: Total: 145
 - DHMH: 11
 - Local Health Department: Total: 36
 - State Facilities: Total: 9
 - Hospitals: 31
 - Community Health Centers: 9
 - DOD / CDC: 2
 - Home Health: 2
 - LTCF: 2
 - State Agencies: 4
 - Unknown Affiliation: 39
- Controllers / Lead Facilitator: 1
- Evaluators: NA
- Facilitators: 10
- Observers: 0
- Victim Role Players: NA

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SECTION 2: EXERCISE VALIDITY, DESIGN AND CONDUCT

Exercise Participant Feedback Survey

A major concern when designing any exercise or drill is determination of whether the exercise or drill is executed properly and valid in terms of testing specific objectives of emergency preparedness operational plans.

A properly designed and executed exercise will achieve the ultimate goal of any exercise or drill: *the identification of not only best practices but also planning gaps in emergency operations plans.*

By soliciting feedback from participants of the Maryland 2014 Regional Ebola Table Top Exercises through the Participant Feedback Survey (Appendix C: Participant Feedback Survey), the DHMH Office of Preparedness and Response attempted to assess exercise design and execution, exercise validity as well as its value to participants in enhancing emergency preparedness planning centered around regional collaboration in command, control and response to an Ebola Virus Disease (EVD) emerging infectious disease outbreak..

For meaningful survey results, three criteria must be met:

- The appropriate sample of respondents must complete the survey;
- The right questions must be asked to solicit the information desired;
- The questions must be worded properly to clearly reflect the information requested.

As part of the Maryland 2014 Regional Ebola Table Top Exercises (October and November 2014), all participants of record were asked to complete a participant feedback survey. The survey was designed and conducted using the web based Survey Monkey survey tool. It consisted of 15 questions.

Three types of questions were used in the survey.

- Demographic multiple choice to identify information about respondents' background and participation during the exercise(s);
- Rating scale questions using a Level of Agreement Likert Scale to measure participant opinions about the exercise(s); and finally
- Open-ended comment essay questions providing the survey participants the opportunity to provide focused directed feedback.

The post-exercise participant survey was developed and presented to exercise participants in three sections:

- Participant Activity
- Value of the Exercise to Your Organization
- Assessment of Exercise Design and Conduct

The survey url/link was sent to a minimum 145 participants immediately following completion of exercise activities in November 2014. *Ninety-one responses have been received from participants for a 63% survey response rate.*

Survey Respondent Profile

Review of demographic data from the "Participant Activity" section of the survey supports the finding that the survey results collected reflect the correct sampling of exercise participants capable to comment on the validity and value of the exercise.

In general, the majority of exercise participants completing the survey represented either: local health departments, health care facilities (hospitals and state facilities) and community health centers; all key stakeholders in response to an emerging infectious disease outbreak. These participants accounted for 85% of survey respondents.

Furthermore, adding to the validity of the survey results is the finding that 80% of respondents were involved in roles as emergency planners (hospital, state facility or local health department) and incident command staff. Therefore, these two groups are, experienced and well-qualified to comment about exercise design, conduct and value in identifying best practices and planning gaps.

Therefore, survey questions were answered by the most experienced knowledgeable and competent participants to provide insight into the quality of exercise design and conduct in addition to its emergency preparedness value.

Validity of Exercise Design and Conduct

Ninety-two percent and eighty-seven percent of the respondents indicated that the exercises were well organized and of high quality, respectively. In addition, 100% indicated that participation and interaction during the discussions were encouraged.

Based upon these survey results, it is possible to conclude that the exercise was well designed, conducted and more importantly appropriately tested participant capabilities as well as regional coalitions' ability to respond to an EVD incident.

Exercise Value to Emergency Preparedness

Likewise, the table top exercises received high marks for the value of the exercise to the attendees' respective organizations. Seventy-nine percent indicated the exercise was relevant to attendee needs. The exercises were felt to help attendees gain new information and skills by 90% of the respondents, while 77% felt that the exercise helped them grow professionally. Overall 85% felt that they would benefit from doing an exercise like this in the future.

In conclusion, the survey results support the validity of the exercise in its design and execution as a means to test exercise objectives. More importantly, survey findings also demonstrate the importance of the exercise in identification of best practices and planning gaps related to critical capabilities required for response to emerging infectious disease public health threats and events.

SECTION 3: EXERCISE DESIGN SUMMARY

Exercise Purpose and Design

General: The Maryland 2014 Regional Ebola Table Top Exercise was designed to test the expertise and capability of several components of the Emergency Support Function 8: Public Health and Medical (ESF 8) community to respond to an emerging infectious disease public health threat.

Purpose: The purpose of this exercise was to test the ability of participants to function in several ICS roles and positions in the setting of a multi-disciplinary coalition.

Several core public health capabilities such as information sharing, incident management and resource management were discussed during the TTX. In addition, the exercise was designed to assess the ability of Maryland's Emergency Support Function 8: Public Health and Medical (ESF8) partners to collaborate in multidisciplinary groups while functioning as Incident Commander and ICS section chiefs.

Scope: The exercise involved a communicable disease, Ebola Virus Disease, outbreak affecting West Africa. Seasoned and experienced ESF 8 stakeholders were requested and subsequently deployed to West Africa to formulate and coordinate a public health response to EVD. Participants were purposely placed in an austere environment (West Africa) to facilitate the identification of key problems and issues of response activities within their respective ICS roles and duties.

Design: The exercise was designed and developed by a group of trusted agents from the DHMH Office of Preparedness and Response. Financially, the exercise was supported through the CDC Public Health Emergency Preparedness (PHEP) and HHS Office of the Assistant Secretary for Preparedness and Response (ASPR) Hospital Preparedness Program (HPP) cooperative agreements.

General Exercise Objectives, Capabilities and Activities

Capabilities-based planning allows for exercise planning teams to develop exercise objectives and observe exercise outcomes through a framework of specific action items that are derived from the CDC PHEP and ASPR HPP Core Capabilities.

The capabilities listed below form the foundation for the organization of all observations in this exercise. These capabilities were identified during the facilitated discussion by participants as they considered their response activities while assuming their respective ICS roles, duties and responsibilities.

The primary and most frequently discussed preparedness capabilities included the following:

- Incident Management (Primary focus of the exercise)
 - Emergency Operations Coordination
 - Incident Command System (ICS)/Unified Command
- Resource Management
 - Medical Materiel Management and Distribution
- Information Management
 - Information Sharing
 - Situational Awareness

CDC PHEP and ASPR HPP Capabilities exercised and tested during the 2014 Maryland Regional Ebola TTX are noted in Table 2.1: Directly and Indirectly Exercised Capabilities During the 2014 Maryland Regional Ebola TTX.

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Table 3.1: Directly Exercised Capabilities During the 2014 Maryland Regional Ebola TTX

Capability Domain	CDC PHEP Capability	ASPR HPP Capability	Exercised Capabilities
Biosurveillance			
	Public Health Laboratory Testing		
	Public Health Surveillance and Epidemiological Investigation		
Community Resilience			
	Community Preparedness	Healthcare System Preparedness	Directly Discussed: Resource Management
	Community Recovery	Healthcare System Recovery	
Countermeasures and Mitigation			
	Medical Countermeasure Dispensing		
	Medical Material Managements and Distribution		Directly Discussed: Resource Management
	Non-pharmaceutical Interventions		
	Responder Safety and Health	Responder Safety and Health	Directly Discussed: PPE
Incident Management			
	Emergency Operations Coordination	Emergency Operations Coordination	Primary Exercise Focus including Command and Control
Information Management			
	Emergency Public Information and Warning		
	Information Sharing	Information Sharing	Directly Discussed
Surge Management			
	Fatality Management	Fatality Management	
	Mass Care		
	Medical Surge	Medical Surge	
	Volunteer Management	Volunteer Management	

Capability Domain: Incident Management

Core Capabilities

- Command and Control (ICS)
 - Establish and maintain a unified and coordinated operational structure and process that appropriately integrates all critical stakeholders and supports the execution of core capabilities.
- Emergency Operations Coordination
 - Emergency operations coordination is the ability to direct and support an event or incident with public health or medical implications by establishing a standardized, scalable system of oversight, organization and supervision consistent with jurisdictional standards and practices and with the National Incident Management System.
 - Emergency operations coordination regarding healthcare is the ability for healthcare organizations to engage with incident management at the Emergency Operations Center or with on-scene incident management during an incident to coordinate information and resource allocation for affected healthcare organizations.

Capability Domain: Information Management

Core Capabilities

- Information Sharing
 - Information sharing is the ability to conduct multijurisdictional, multidisciplinary exchange of health-related information and situational awareness data among federal, state, local, territorial and tribal levels of government, and the private sector.
- Situational Awareness
 - Provide all decision makers with decision relevant information regarding the nature and extent of the hazard, any cascading effects and the status of the response that contributes to the incident common operating picture.
- Communications
 - Ensure the capacity for timely communications in support of security, situational awareness and operations by any and all means available, among and between affected communities in the impact area and all response forces. Including the development, refinement and sustainment of redundant interoperable communications systems.

Capability Domain: Resource Management

Core Capabilities

- Distribution
 - Coordinate resource allocation for healthcare organizations by assisting incident management with decisions regarding resource availability and needs. This process should continue throughout incident response and recovery; including ongoing coordination to track resources for decision-making and optimal resource allocation.
- Materiel Management
 - Medical materiel management and distribution is the ability to acquire, maintain (e.g., cold chain storage or other storage protocol), transport, distribute, and track medical materiel (e.g., pharmaceuticals, gloves, masks, and ventilators) during an incident and to recover and account for unused medical materiel, as necessary, after an incident.

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SECTION 4: SCENARIO SUMMARY

The exercise scenario represents the consequences of an emerging ebola virus responsible for Ebola Virus Disease (EVD) which has migrated from rural West African regions to major cities of Liberia, Sierra Leone, Guinea and Nigeria. The effect of which is increased demand for health care delivery in an austere environment with limited public health and medical infrastructure. The following sections provide preliminary information provided to exercise participants which triggered the exercise.

Background

Among the many potential disasters we face today, pandemics resulting from emerging infectious diseases is an ever increasing likelihood. Currently the World Health Organization (WHO), Centers for Disease Control and Prevention (CDC) and other national health agencies are tracking the outbreak of serious illnesses whose etiology is represented by infectious disease agents. These include the current coronavirus outbreak causing Middle Eastern Respiratory Syndrome (MERS), H3N2 human influenza variant in the US and the H7N9 avian influenza outbreak in China.

Although the impact of the recent H1N1 pandemic as a public health crisis could be described as mild with morbidity and mortality and affected healthcare facility operations no worse than that of seasonal flu, recent emerging infectious diseases have the potential for a greater impact. For instance, the mortality associated with EVD is 25% to 95%.

A critical component of community healthcare and public health resiliency to meet the increased need for healthcare delivery is the ability of ESF 8 partners and stakeholders to develop coordinated response paradigms while operating within the confines of Incident Command System.

The importance of a comprehensive and coordinated public health and medical response has been recognized as reflected in the National Healthcare Security Strategy and Implementation Plan. This is ever more critical since there is no specific treatment for EVD.

Ebola Virus Disease (EVD)

The CDC is working closely with the World Health Organization and other partners to better understand the public risk posed by the current EVD outbreak in West Africa and also the threat posed by possible spread outside West Africa.

Epidemiology Review

Ebola Virus disease illness is primarily associated with cases identified as having direct association and relationships in rural West African countries. In addition, cases have been identified in other countries where travelers to these countries have imported the disease e.g. the lone US death from EVD.

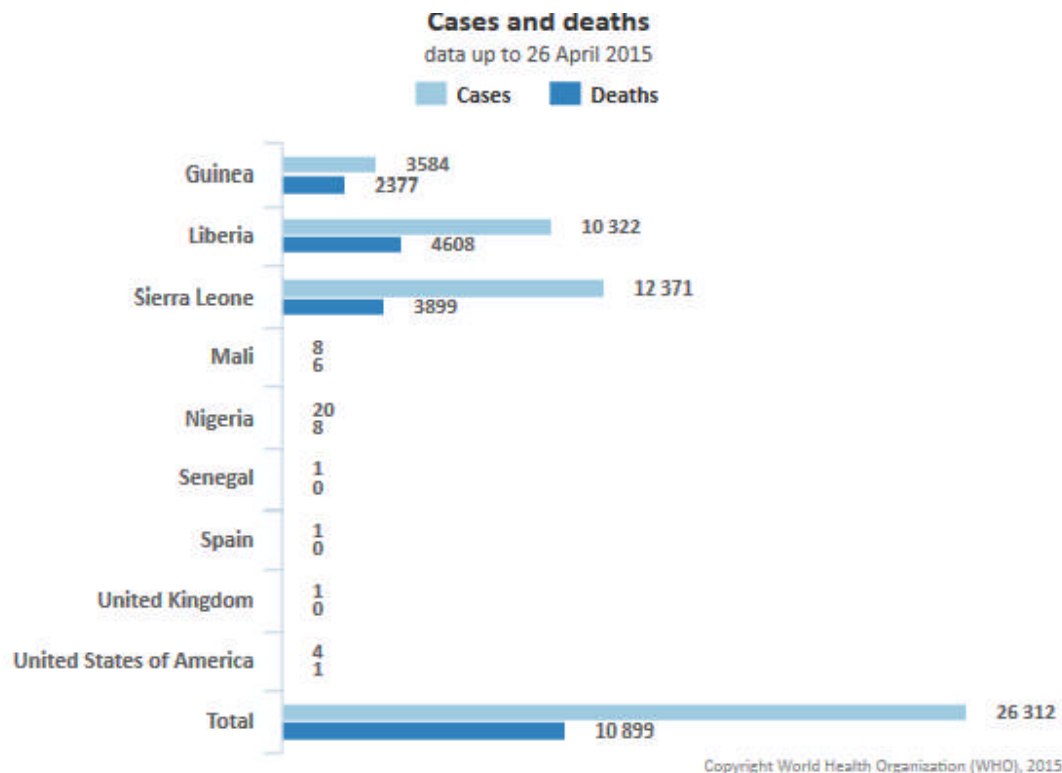
EVD is transmissible between close human contacts having direct exposure to bodily fluids.

Several outbreak clusters have been identified including healthcare related outbreaks. Transmission of EVD illness has been observed within the health care setting most notably within West African countries. Previous EVD outbreaks occurred in rural communities and thus "burned" out, extinguishing the outbreak. The current outbreak is unique in that EVD has spread to major West African cities.

The US Department of Health and Human Services has determined that EVD poses a significant potential as a public health emergency in the United States.

Key Ebola Virus Disease Facts

- Ebola virus disease (EVD), formerly known as Ebola hemorrhagic fever, is a severe, often fatal illness in humans.
- The virus is transmitted to people from wild animals and spreads in the human population by human-to-human transmission through contact with bodily fluids of sick or deceased individuals.
- The average EVD case fatality rate is around 50%. Case fatality rates have varied from 25% to 90% in past outbreaks.
- The first EVD outbreaks occurred in remote villages in Central Africa, near tropical rainforests, but the most recent outbreak in West Africa has involved major urban as well as rural areas.



Clinical Review

Currently there are no vaccines available to prevent Ebola Virus associated illness and disease. There are no anti-viral medications available to treat EVD infections; therefore, medical management is supportive care with medical treatment for those complications where medications are recommended (i.e. associated bacterial pneumonia, nausea and vomiting, dehydration).

Early supportive care with rehydration and symptomatic treatment (nausea and vomiting) improves survival. There is as yet no licensed treatment proven to neutralize the virus but a range of blood, immunological and drug therapies are under development.

Public Health Intervention

Community engagement is essential to successfully controlling EVD outbreaks.

Effective outbreak control relies on applying a package of interventions primarily social distancing between non-infected and infected individuals or contagious body fluids of the sick and deceased. Additional intervention activities include: , namely case management, surveillance and contact tracing, good laboratory services, safe burials and social mobilization. These interventions are focused on interrupting the chain of human to human transmission.

Likewise, prompt recommendations to healthcare providers for case investigation, identification and recognition as well as guidelines for personal protective equipment and laboratory collection and processing of clinical samples are critical.

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SECTION 5: MARYLAND STATEWIDE AND REGIONAL CAPABILITY ANALYSIS

Within this AAR, assessments of Maryland statewide and Maryland sub-state regional capabilities are presented as tables. Data pertaining to capability assessments were tabulated and presented in the following manner:

- To identify capability topics most important to participants, each identified capability is prioritized and listed by its frequency of citation relative to the total number of citations;
- To prioritize capabilities across the SWOT paradigm, the citation frequency of each preparedness capability as a Strength, Weakness, Opportunity or Threat was determined;
 - Besides presentation in individual tables, these data is presented in a summary table to permit determination of each capability's relationship as a strength, weakness, opportunity or threat.
- To identify those capabilities with the greatest preparedness gaps, capabilities were ordinarily ranked by determining the relative preparedness gap for each capability (Strengths and Opportunities versus Weaknesses and Threats) using a mathematical algorithm;
- To provide detailed insight into each preparedness capability, SWOT summary narratives for each corresponding capability were compiled from participant observations and comments.

The first group of tables presents data on the frequency that preparedness capabilities were discussed or listed by exercise participants. The frequency with which each capability is listed (i.e. citation frequency) provides insight into how significant or important a concern each capability is to the participants. Thereby, helping to set the priority with which sustainment, corrective actions or improvement plans could be developed and incorporated into preparedness plans.

For example, for Maryland statewide tables, incident management is the most frequently noted strength and opportunity. Therefore, emergency planners may select to sustain current incident management planning and response activities. In contrast, resource management is the top rated weakness and threat to an Ebola Virus Disease incident in Maryland. Subsequently, planners may categorize resource management for Ebola or emerging infectious disease public health emergencies as a high priority; thus, requiring more robust corrective actions or aggressive improvement plans.

The second type of analysis and data presentation utilizes the frequency that each preparedness capability is noted within the SWOT categories to assist with a gap analysis of the capabilities.

These values are applied to a mathematical algorithm to assess a preparedness capability's respective strengths and opportunities relative to its weaknesses and threats permitting prioritization of preparedness capabilities relative to each other.

Each table of the third group presents a narrative summary of all comments pertaining to the respective capability segregated using a SWOT paradigm. This reporting structure thus permits a comprehensive review, assessment and snapshot of each individual capability within Maryland and sub-state region.

Having overall assessments from the combined tables of the strengths, weaknesses, opportunities and threats related to each capability allows state planners and regional coalitions to address sustainment, corrective actions and improvement interventions in a more complete and comprehensive manner.

Therefore, included with each table in the third group are recommendations as well as the sustainment, improvement and corrective actions for each corresponding capability.

SECTION 6: MARYLAND STATEWIDE CAPABILITY ANALYSIS AND RECOMMENDATIONS AND IMPROVEMENT MATRICES

Several different Preparedness Capabilities were discussed during the facilitated table top exercises as well as cited in participant feedback surveys and exercise assessments. The following sections attempt to provide a systematic approach to the assessment and prioritization of cited capabilities within the analysis of statewide SWOT comments and observations.

Summary of Maryland Statewide Findings

Fourteen capabilities were discussed during exercises conducted across Maryland. There were a total of 295 comments (Table 6.1). The capabilities most frequently mentioned and discussed were:

Capability	Frequency Cited
Incident Management	19%
Resource Management	19%
Planning	18%
Information Management	17%
Exercise and Training	7%

These capabilities represented those of most importance and concern to the participants as they pertain to EVD response.

To refine and discriminate the relative strengths, weaknesses, opportunities and threats represented by each capability, the frequency that each capability was mentioned as a strength, weakness, opportunity or threat was calculated (Tables 6.2, 6.3, 6.4 and 6.5). This data is compiled in Table 6.6 to permit the cross comparison of each capability as a strength, weakness, opportunity and threat, respectively.

A pattern is observed across the SWOT spectrum. Those capabilities highly ranked as strengths, (incident management, information management, planning and resource management) have a different sequential rank order when assessed as a weakness, opportunity or threat.

For example, incident management is the top ranked strength and opportunity upon which to further enhance EVD response activities. Conversely, it represents the third and sixth ranked weakness and threat to EVD response activities, respectively. In contrast, resource management is the fourth ranked strength and opportunity. It is the top ranked weakness and top ranked threat to EVD response operations.

Planning as a capability was also a top ranked weakness but the third ranked strength, opportunity and threat to EVD response. Suggesting that although a top ranked weakness,

planning may not be considered as critical to EVD response as resource and information management.

Likewise, information management was the second ranked strength, fifth ranked weakness and second ranked opportunity and threat to EVD response. Although the second ranked strength, its simultaneous high ranking within the opportunity and threat categories suggests participants were concerned about the lack of specific information related to EVD planning and response.

This is understandable, since initial information concerning EVD such as infection control and personal protective equipment (PPE) protocols, traveler screening, etc. were not yet formalized and shared with ESF 8 partners by the CDC and other lead organizations.

The rank order of exercise and training is in contrast to the capabilities discussed above. Although ranked as a moderate weakness and opportunity to enhance EVD response, it was not seen as a significant threat to EVD response activities.

As is evident in the data summary above and in the tables below, the decisions of which capabilities to sustain, build upon, enhance and or mitigate is contingent upon the balance between each capability's positive ratings (i.e. strengths and opportunities) relative to their negative or deficient weaknesses and threats impacting EVD response activities. Insomuch, these data, as discussed, permits a *subjective assessment* for the prioritization of which capabilities are most important to address.

Using a capability's weighted frequency cited as a strength and opportunity versus its weakness and threat, permits quantification of a capability's relative positive and negative aspects; as such, a gap determination of preparedness for each capability.

As noted below this analysis demonstrates a preparedness gap of -43% for resource management; indicating a compelling preparedness gap when considered in light of an EVD response. The second ranked preparedness gap is exercise and planning (-13%). When considered in light of the previous data analysis, this appears to be surprising. However, it does represent an important concern of ESF 8 partners. During the facilitated discussions, stakeholders expressed worry about having appropriate training for EVD response activities (e.g. donning and doffing PPE). Of the remaining highly ranked capabilities of concern, planning and information management had negative values of -10% and -5%, respectively. In contrast, incident management's value of +11%, suggests that it is a robust preparedness capability.

Quantitative analysis of capabilities, infers that prioritization of preparedness activities pertaining to EVD should be rank ordered as: resource management, exercise and training followed by information management. Of note, this does not take into account other capabilities which were discussed during the exercises with limited frequencies of citation (e.g. third ranked preparedness gap, community preparedness of -10% cited with a frequency of 2.0%).

Relative Frequencies Of Capabilities Cited

The following table presents data on the number of comments as well as the calculated frequency that each capability was cited in all SWOT data as a strength, weakness, opportunity or threat.

Issues and observations related to Incident Management and Resource Management were the most numerous followed by Planning and Information Management. Given the number as well as frequency these four capabilities were cited within the SWOT analysis, *it can be assumed that these represented those capabilities most important or of concern to Ebola exercise participants.*

Table 6.1: Number and Frequency that Each Capability was Cited in the Statewide SWOT Analysis

Capability	Number	Frequency Cited
Incident Management	57	19%
Resource Management	56	19%
Planning	54	18%
Information Management	50	17%
Exercise and Training	21	7%
Public Health Surveillance and Epidemiological Investigation	14	5%
Responder Safety and Health	11	4%
Fatality Management	10	3%
Community Preparedness	6	2%
Mass Care	7	2%
Volunteer Management	5	2%
Countermeasures	2	1%
Medical Surge	1	0%
Community Recovery	1	0%
Total Comments	295	

Relative Frequencies Of Capabilities Cited As Either A Strength, Weakness, Opportunity Or Threat In Maryland

The following tables present capability rankings by the frequency that the respective capabilities were cited as either a Strength, Weakness, Opportunity or Threat to an Ebola illness or suspected disease case or emerging infectious disease within Maryland.

Therefore, it is possible to infer the relative importance of each cited capability within each relevant SWOT category singular to this specific exercise scenario. Inferences cannot and should not be made for other types of public health emergencies.

Examination of Tables 6.2, 6.3, 6.4 and 6.5 reveals that the same capability may have different rankings of importance as a Strength, Weakness, Opportunity or Threat SWOT categories. This apparent conundrum can be explained by understanding that several different activities, roles and responsibilities make up each capability.

For example, one aspect or activity comprising a capability such as *Emergency Operations Coordination* may be considered as a strength while *Command and Control* may be evaluated as a weakness, opportunity or threat to *Incident Management Operations*.

Table 6.6: Maryland Statewide Capability Relationships Across SWOT Categories presents the capability rankings for each SWOT category in a combined table. This permits the determination of the relative importance of each capacity across the respective SWOT categories.

Maryland Statewide: Strengths**Table 6.2: Frequency that Capabilities were Cited as Strengths.**

Capabilities	Frequency Cited
Incident Management	31%
Information Management	23%
Planning	22%
Resource Management	10%
Public Health Surveillance and Epidemiological Investigation	4%
Countermeasures	2%
Mass Care	2%
Responder Safety and Health	2%
Community Recovery	1%
Exercise / training	1%
Fatality Management	1%
Volunteer Management	1%

Maryland Statewide: Weaknesses**Table 6.3: Frequency that Capabilities were Cited as Weaknesses**

Capabilities	Frequency Cited
Resource Management	20%
Planning	20%
Incident Management	16%
Exercise / training	14%
Information Management	12%
Fatality Management	7%
Responder Safety and Health	4%
Volunteer Management	3%
Public Health Surveillance and Epidemiological Investigation	3%
Medical Surge	1%
Mass Care	1%
Countermeasures	0%
Community Recovery	0%

Maryland Statewide: Opportunities**Table 6.4: Frequency that Capabilities were Cited as Opportunities**

Capabilities	Frequency Cited
Incident Management	22%
Information Management	17%
Planning	17%
Resource Management	16%
Exercise and Training	10%
Public Health Surveillance and Epidemiological Investigation	5%
Fatality Management	2%
Responder Safety and Health	2%

Maryland Statewide: Threats**Table 6.5: Frequency that Capabilities were Cited as Threats**

Capabilities	Frequency Cited
Resource Management	29%
Information Management	14%
Planning	13%
Public Health Surveillance and Epidemiological Investigation	8%
Community Preparedness	8%
Incident Management	6%
Responder Safety and Health	6%
Mass Care	5%
Fatality Management	4%
Exercise and Training	4%
Volunteer Management	3%

The following table presents combined data from the previous four tables and highlights preparedness capabilities to visually demonstrate the relationship of each capability within the SWOT categories.

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Table 6.6: Maryland Statewide Capability Relationships Across SWOT Categories

Strengths	Weaknesses	Opportunities	Threats
Incident Management 31%	Planning 20%	Incident Management 25%	Resource Management 29%
Information Management 23%	Resource Management 20%	Information Management 19%	Information Management 14%
Planning 22%	Incident Management 16%	Planning 19%	Planning 13%
Resource Management 10%	Exercise / training 14%	Resource Management 18%	Public Health Surveillance and Epidemiological Investigation
Public Health Surveillance and Epidemiological Investigation	Information Management 12%	Exercise / Training 11%	Community Preparedness
Countermeasures	Fatality Management	Public Health Surveillance and Epidemiological Investigation	Incident Management 6%
Mass Care	Responder Safety and Health	Fatality Management	Responder Safety and Health
Responder Safety and Health	Public Health Surveillance and Epidemiological Investigation	Responder Safety and Health	Mass Care
Community Recovery	Volunteer Management		Fatality Management
Exercise / training 1%	Mass Care		Exercise / Training 4%
Fatality Management	Medical Surge		Volunteer Management
Volunteer Management	Community Recovery		

Prioritization Of Capabilities For Interventions To Improve Statewide Ebola Preparedness Planning And Response

The difficult question raised as a result of the Regional Ebola Exercises from the perspective of the Office of Preparedness and Response is, "How do DHMH and OPR prioritize the expenditure of funds, as well as time and effort, for the enhancement and improvement of preparedness capabilities related to Ebola?"

Determination of where to focus time and effort for the maximum benefit and impact is not easy to determine by examination of the data in the previous section. Therefore, another means of assessing the value, importance and impact of each capability during an emerging infectious disease public health threat and incident is required.

One method to assess the relative efficacy and value of each preparedness capability during an Ebola response, is to determine the differential between the number of positive (Strengths and Opportunities) and negative (Weaknesses and Threats) observations for each capability noted in the SWOT analysis.

Therefore, the following formula was used to differentiate and quantify the relative differences between a capability's positive and negative comments.

$$\text{Capability Differential} = (C_S * A) + (C_W * B) + (C_O * C) + (C_T * D) / \text{Total Number of SWOT Observations}$$

Where C_S , C_W , C_O and C_T represent the number of times the capability was noted as a Strength (C_S), Weakness, Opportunity or Threat within the SWOT analysis. Whereas, A, B, C and D are correction factors for the weighted value assigned to each SWOT category. These values are presented in the following table.

Table 6.7: Weighted Values for SWOT Categories Used in Capability Gap Analysis

Weighted Values		
A	Strength	3
B	Weakness	-3
C	Opportunity	1
D	Threat	-5

For this analysis, strengths are assigned a weighed value factor of +3. Opportunities are given a weighed value of +1 because they can be thought of as hypothetical activities not yet completed or incorporated into emergency preparedness paradigms; whereas, strengths are "real" and

tangible as an operational component.

In a traditional business SWOT analysis, weaknesses are internal to the business while Threats are external. However, in this application, weaknesses and threats are considered "internal" to Maryland and thus both impact Ebola response. In addition, threats are considered to have greater potential negative impact on public health response and thus given a weighted value of -5 relative to the -3 for Weaknesses.

Why are Threats given -5 or higher value relative to Strengths +3? The inherent bias introduced by this differential is purposeful. The intent is to emphasize the relative gap between capability strengths and opportunities versus their weaknesses and threats.

Table 6.8: *Relative Preparedness Gap Assessment for Each Preparedness Capability Relative to Strengths and Opportunities versus Weaknesses and Threats*, presents the prioritization of preparedness capabilities according to the calculated gap between their respective positive and negative observations.

Table 6.8: Relative Preparedness Gap Assessment for Each Preparedness Capability Relative to Strengths and Opportunities versus Weaknesses and Threats

Capability	Frequency Cited	Preparedness Gap	Interpretation
Resource Management	19.0%	-43%	Negative values equate to capability insufficiencies
Exercise and Training	7.1%	-13%	
Planning	18.3%	-10%	
Community Preparedness	2.0%	-10%	
Responder Safety and Health	3.7%	-9%	
Fatality Management	3.4%	-9%	
Public Health Surveillance and Epidemiological Investigation	4.7%	-8%	
Mass Care	2.4%	-6%	
Information Management	16.9%	-5%	
Volunteer Management	1.7%	-4%	
Medical Surge	0.3%	-1%	
Community Recovery	0.3%	1%	
Countermeasures	0.7%	2%	
Incident Management	19.3%	11%	Positive values equate to preparedness competency

The above table presents data on the relative gap between a capability's strengths and opportunities versus its weaknesses and threats as they pertain to an Ebola or emerging infectious disease public health threat.

The statewide preparedness gap determinations are included to permit comparison of the regional determinations to those of Maryland statewide.

*Preparedness capabilities with **negative values** represent those capabilities with insufficiencies and/or public health threats possibly resulting in adverse consequences during incidents involving an emerging infectious disease such as Ebola. Whereas, capabilities with **positive values** are those capabilities for which Maryland ESF 8 partners and stakeholders rate themselves most competent.*

Also included in the above table are the frequencies with which each capability was cited within the SWOT Analysis. As mentioned earlier, the frequencies with which a capability was cited in the SWOT Analysis as well as within each SWOT category, reflects the relative importance of each capability for participants and survey respondents. These values were included to assist reviewers in identifying those capabilities requiring corrective actions and or improvement plans.

For example, under the statewide column, both planning and community preparedness both demonstrate preparedness insufficiencies of - 10. However, planning was cited with a frequency of 18% relative to responder safety and health of 4%. Therefore, the preparedness capability, planning, carries relatively more importance for the ESF 8 stakeholders and partners and subsequently should be the focus of more robust corrective actions and improvement plans.

Maryland Statewide Capability Analysis with Recommendations and Sustainment, Improvement and Corrective Actions Matrix by Capability

Maryland Statewide Capability Analysis: Incident Management

Maryland Statewide: Incident Management	Recommended Sustainment, Improvements and Corrective Actions	Priority: High Med Low
Strengths:		
<p>Emergency Operations Coordination:</p> <ul style="list-style-type: none"> Under the leadership of DHMH, regions across Maryland have established close working relationships with ESF 8 partners (hospitals, emergency medical services and other government agencies) and other stakeholders. These strong relationships, developed through networking and shared policies and processes, are enhanced through pre-existing relationships as well as incident management experience and emergency operations coordination. 	<ul style="list-style-type: none"> Sustain 	
Weaknesses:		
<p>Incident Command:</p> <ul style="list-style-type: none"> There is insufficient understanding and/or experience with the standardized approach to Incident Command and the establishment of Unified Command amongst some participants, resulting in difficulty identifying and establishing priorities and necessary response measures. This is also compounded by the failure of some partners to understand public health capabilities. 	<ul style="list-style-type: none"> Recommend staff take IS 100, 200, 700, and 800 courses at a minimum, and attend ICS 300 and 400 <u>level</u> courses to gain better understanding in an interactive classroom setting. If attending locally hosted courses, this presents an opportunity to meet/interact with partners from different sectors of response/emergency operations Recommend including Incident Command as one of the objectives in every exercise being developed. 	

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Maryland Statewide: Incident Management	Recommended Sustainment, Improvements and Corrective Actions	Priority: High Med Low
Opportunities:		
<p>Emergency Operations Coordination:</p> <ul style="list-style-type: none"> • There is opportunity to build stronger working relationships and coalitions between ESF 8 partners and stakeholders, locally and at the state level, as well as • Expanding the base of participating partners and stakeholders in emergency preparedness planning activities. 	<ul style="list-style-type: none"> • Are the Regional Coalitions engaged and actively recruiting to expand the base of participating partners? If so, are the Regional Coalitions able to offer planning activities and exercises which actively engage these partners? • Recommend that Regional Coalitions continue to seek out and provide opportunities for ICS training to their members. 	
Threats:		
<p>Emergency Operations Coordination:</p> <ul style="list-style-type: none"> • The presence of silos between ESF 8 partners and stakeholders resulting in disparate and uncoordinated response efforts. • For some counties and regions, this is compounded by the need for cross border collaboration where different priorities and regulations apply. 	<ul style="list-style-type: none"> • Can the Regional Coalitions assist with coordination for response efforts, possibly assisting with facilitation of MOUs or other agreements to navigate cross-border collaboration? • Reinforce the use of the Coalition Development Framework in forming and sustaining coalitions to ensure broad based partnerships that work toward breaking down silos. 	

Maryland Statewide Capability Analysis: Resource Management

Maryland Statewide: Resource Management	Recommended Sustainment, Improvements and Corrective Actions	Priority High Med Low
Strengths:		
<p>PPE:</p> <ul style="list-style-type: none"> Pre-existing PPE caches with community resource sharing of scarce or limited supplies is a strength, as is the ability to leverage stakeholder capabilities. 	<ul style="list-style-type: none"> Sustain PPE caches, to include an updated inventory. Replace expiring PPE as appropriate and able. 	
Weaknesses:		
<p>PPE:</p> <ul style="list-style-type: none"> Limited access to sufficient PPE impaired by a lack of PPE guidance. <p>Waste:</p> <ul style="list-style-type: none"> The lack of policies regarding waste management, removal and disposal. 	<ul style="list-style-type: none"> CDC has published guidance regarding EVD PPE specs. DHMH has distributed this information to healthcare partners. DHMH will be issuing guidance regarding waste management, removal, and disposal. 	
Opportunities:		
<p>Medical Materiel Management and Distribution:</p> <ul style="list-style-type: none"> Identification and tracking of available scarce resources including staff, equipment, supplies, etc., for improved resource sharing, especially in rural regions. <p>PPE</p> <ul style="list-style-type: none"> Increased procurement of PPE which can be shared as required. 	<ul style="list-style-type: none"> DHMH and Regional Coordinators will continue to inventory resources. Hospitals should continue to assist with this process and be proactive in monitoring resources. DHMH/Regional Coalitions have access to Ebola specific funds which will be expended in accordance with CDC and DHMH guidance and may include PPE procurement. 	

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Maryland Statewide: Resource Management	Recommended Sustainment, Improvements and Corrective Actions	Priority High Med Low
Threats:		
<p>Medical Materiel Management and Distribution:</p> <ul style="list-style-type: none"> Insufficient resources and supplies connected to limited funding and a deficit of personnel and resources in rural areas. <p>PPE:</p> <ul style="list-style-type: none"> Lack or limited PPE resources in the face of increased demand. <p>Waste Management</p> <ul style="list-style-type: none"> Waste management issues related to increased resources needed to clean and dispose of Ebola-contaminated materials as well as transportation of materials. 	<ul style="list-style-type: none"> DHMH has access to Ebola specific funds which will be expended in accordance with CDC and DHMH guidance. Partners should keep an up-to-date inventory of resources, supplies, and appropriately trained staff to be able to quantify their need. Partners should also engage or stay engaged with Regional Coalitions, and participate in DHMH sponsored resource request training which may facilitate resource sharing as appropriate. Regional Coalitions should exercise their Resource Management Plans and update them as appropriate DHMH will be issuing guidance regarding waste management, removal, and disposal. 	

Maryland Statewide Capability Analysis: Information Management

Maryland Statewide: Information Management	Recommended Sustainment, Improvements and Corrective Actions	Priority High Med Low
Strengths:		
<p>Communications:</p> <ul style="list-style-type: none"> DHMH is a valuable source of information and regularly communicates through frequent email, conference calls, and postings in the Health Alert Network (HAN). Open communication exists amongst partners as a result of the application of communication tools, protocols and best practices even as guidance changes. <p>Information Sharing:</p> <ul style="list-style-type: none"> Communication is strong between partners sharing planning efforts and subject matter experts are readily available 	<ul style="list-style-type: none"> Sustain communication and ensure contact lists are up-to-date. Partners can engage by participating in HAN and other communication exercises. DHMH and partners should continue to train and keep up-to-date on evolving guidance. 	
Weaknesses:		
<p>Information Sharing:</p> <ul style="list-style-type: none"> Difficulty in exchange of technical information, mixed messages and resulting misinformation outside DHMH. Failure to set national guidelines by the Federal authorities. Apparent lack of Ebola educational efforts. 	<ul style="list-style-type: none"> DHMH and partners should continue to train and keep up-to-date on evolving guidance. Continue use of subject matter experts to promote clarity of technical information. DHMH has finalized the EVD website containing technical information on various aspects of EVD response. During a specific operation, DHMH will coordinate with local partners to determine appropriate information sharing protocols. 	

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Maryland Statewide: Information Management	Recommended Sustainment, Improvements and Corrective Actions	Priority High Med Low
Opportunities:		
<p>Communications:</p> <ul style="list-style-type: none"> Strengthen communications networking and efforts focused on professionals and the public through various and alternative communications channels. Proactive communications to the public. 	<ul style="list-style-type: none"> Sustain communication and ensure contact lists are up-to-date. Partners can engage by participating in HAN and other communication exercises. DHMH and other state agencies will continue to use traditional and social media to provide proactive communications to the public. DHMH has established and sustains a virtual Joint Information Center through which a wide variety of communications products are shared at the state level 	
Threats:		
<p>Information Sharing:</p> <ul style="list-style-type: none"> Improper messaging and misinformation resulting in negative media attention, can result in panic and misunderstanding. 	<ul style="list-style-type: none"> DHMH will continue to use traditional and social media to provide proactive communications to the public. Partners can "like", "share", or "post/repost" these communications for clear and consistent messaging. 	

Maryland Statewide Capability Analysis: Planning

Maryland Statewide: Planning	Recommended Sustainment, Improvements and Corrective Actions	Priority High Med Low
Strengths:		
<ul style="list-style-type: none"> Previous experience with planning, as well as with existing emergency plans and identification of planning gaps related to completed all-hazard planning efforts. This has resulted in prepared ESF 8 partners. 	<ul style="list-style-type: none"> Continue planning efforts and update plans as appropriate. 	
Weaknesses:		
<ul style="list-style-type: none"> Shifting policies, responses, advisories and procedures from CDC erodes existing effectiveness of current plans. Complacency in health care facilities also impacts planning effectiveness Lack of occupation specific planning, e.g., correctional health care workers Planning weaknesses in the following areas: Isolation and quarantine, law enforcement directives and guidelines, PPE guidelines and recommendations and waste management. 	<ul style="list-style-type: none"> State partners will collaborate to provide guidance in areas deemed planning weaknesses as possible depending on the facts of an operation. Encourage local partners to participate in planning and exercises with their LHD to more clearly define their roles in an EVD response. 	
Opportunities:		
<ul style="list-style-type: none"> Review of existing plans and MOUs to identify gaps, as well as review, existing policies and protocols. Identification of different strategies through the review as well as enhancing partnerships and coalitions. Identification of Ebola hospitals and to define expectations of all health care facilities for their respective roles. 	<ul style="list-style-type: none"> Hospitals providing assessment and/or treatment are being identified and assessed and procedures defined. 	

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Maryland Statewide: Planning	Recommended Sustainment, Improvements and Corrective Actions	Priority High Med Low
Threats:		
<ul style="list-style-type: none"> • Competing priorities • Reactive, rather than proactive planning in an environment of silos. • Items of importance are legal issues, transportation and notification issues that revolve around suspected travelers and Ebola patients. 	<ul style="list-style-type: none"> • The State will issue EVD guidance to address these areas of concern. • DHMH continues to incorporate Emerging Infectious Diseases into its response plans. 	

Maryland Statewide Capability Analysis: Exercise and Training

Maryland Statewide: Exercise and Training	Recommended Sustainment, Improvements and Corrective Actions	Priority High Med Low
Strengths:		
<ul style="list-style-type: none"> Educational efforts and outreach. 	<ul style="list-style-type: none"> Sustain efforts and continue to communicate to a broad audience, including vulnerable populations DHMH will continue to develop and disseminate culturally appropriate messaging for special populations aimed at information sharing and eliminating stigma 	
Weaknesses:		
<ul style="list-style-type: none"> Lack of Ebola-specific training and trained personnel, especially relating to PPE. 	<ul style="list-style-type: none"> DHMH/Regional Coalitions have access to Ebola specific funds which will be expended according to CDC and DHMH guidance and may include Ebola-specific training relating to PPE EVD funding requires annual exercises to test and validate EVD preparedness including PPE. 	
Opportunities:		
<ul style="list-style-type: none"> Ebola-specific training standardized across Maryland and geared to facility needs, e.g., PPE. More plan/ConOps-focused exercises. 	<ul style="list-style-type: none"> DHMH/Regional Coalitions have access to Ebola specific funds which will be expended according to CDC and DHMH guidance and may include Ebola-specific training and exercising EVD funding requires annual exercises to test and validate EVD preparedness including PPE. 	

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Maryland Statewide: Exercise and Training	Recommended Sustainment, Improvements and Corrective Actions	Priority High Med Low
Threats:		
<ul style="list-style-type: none"> Limited funds for Ebola specific training and exercises resulting in insufficient staff training for the care of Ebola patients. 	<ul style="list-style-type: none"> DHMH/Regional Coalitions have access to Ebola specific funds which will be expended according to CDC and DHMH guidance and may include Ebola-specific training and exercising EVD funding requires annual exercises to test and validate EVD preparedness including PPE. 	

Maryland Statewide Capability Analysis: Community Preparedness and Recovery

Maryland Statewide: Community Preparedness and Recovery	Recommended Sustainment, Improvements and Corrective Actions	Priority High Med Low
Strengths:		
<ul style="list-style-type: none"> Understanding the broad needs of residents in an austere environment. 	<ul style="list-style-type: none"> Sustain 	
Weaknesses:		
None noted		
Opportunities:		
None noted		
Threats:		
<ul style="list-style-type: none"> Interference and interjection of political influence and overriding concerns An environment of limited funding makes preparedness planning difficult and is compounded by lack of readiness and cultural sensitivity. 	<ul style="list-style-type: none"> DHMH will continue to provide information and training to Maryland senior officials regarding Emerging Infectious Diseases. DHMH will engage in advanced EVD planning to include senior government officials. 	

Maryland Statewide Capability Analysis: Mass Care and Medical Surge

Maryland Statewide: Mass Care and Medical Surge	Recommended Sustainment, Improvements and Corrective Actions	Priority High Med Low
Strengths:		
<ul style="list-style-type: none"> Sustain alternate care sites and medical surge. 	<ul style="list-style-type: none"> Sustain 	
Weaknesses:		
<ul style="list-style-type: none"> Lack of comprehensive isolation capacity for handling highly infectious patients. Lack of Ebola virus disease treatment facilities. 	<ul style="list-style-type: none"> DHMH has designed and funded a statewide system to ensure potential EVD patients can be appropriately isolated, assessed, transported, and treated. EVD Treatment facilities have been identified and are being assessed. 	
Opportunities:		
None noted.		
Threats:		
<ul style="list-style-type: none"> Patient care. 24-7 care needs combined with holistic care, in the face of Limited bed availability. 	<ul style="list-style-type: none"> Front Line, Assessment and Treatment hospitals will be identified to meet these needs. 	

Maryland Statewide Capability Analysis: Responder Safety

Maryland Statewide: Responder Safety	Recommended Sustainment, Improvements and Corrective Actions	Priority High Med Low
Strengths:		
<ul style="list-style-type: none"> • Responder safety and health. • Employee safety assurances. 	<ul style="list-style-type: none"> • Continue to provide training/exercises to responders. Provide appropriate PPE for employees interacting with PUIs/EVD patients. 	
Weaknesses:		
<p>PPE:</p> <ul style="list-style-type: none"> • PPE guidelines can be standardized for increased effectiveness across jurisdictions through development of general protocols for health departments and hospitals. 	<ul style="list-style-type: none"> • See comment in previous section regarding CDC and DHMH PPE guidance. 	
Opportunities:		
<ul style="list-style-type: none"> • Improved PPE for responders. 	<ul style="list-style-type: none"> • PPE caches will be developed at the State and local levels to augment existing responder caches. 	
Threats:		
<p>PPE:</p> <ul style="list-style-type: none"> • Lack of PPE and the threat of Ebola exposure during donning and doffing. <p>Responder:</p> <ul style="list-style-type: none"> • Restriction on those who have treated Ebola patients may become a problem. 	<ul style="list-style-type: none"> • PPE caches will be developed at the State and local levels to augment existing responder caches. • DHMH will continue to provide PPE training to partners to include donning and doffing procedures. Partners should provide donning/doffing training to employees expected to interact with PUIs/Ebola patients. • DHMH will issue guidance based on CDC recommendations for the monitoring of health care workers. 	

Maryland Statewide Capability Analysis: Volunteer Management

Maryland Statewide: Volunteer Management	Recommended Sustainment, Improvements and Corrective Actions	Priority High Med Low
Strengths:		
None noted		
Weaknesses:		
<ul style="list-style-type: none"> Lack of volunteers resulting in inadequate staff to handle a large event. 	<ul style="list-style-type: none"> Continue to recruit volunteers and provide appropriate training. DHMH will ensure that all LHDs have Volunteer Management Plans for the recruitment, training, and deployment of Maryland Responds volunteers. 	
Opportunities:		
None noted		
Threats:		
<ul style="list-style-type: none"> Lack of human resources available to manage an outbreak. 	<ul style="list-style-type: none"> Continue to recruit volunteers and provide appropriate training. Other staff may be available for cross-training or just-in-time training to provide support. All partners can engage leadership to make these options available. 	

Maryland Statewide Capability Analysis: Public Health Surveillance and Epidemiological Investigation

Maryland Statewide: Public Health Surveillance and Epidemiological Investigation	Recommended Sustainment, Improvements and Corrective Actions	Priority High Med Low
Strengths:		
<ul style="list-style-type: none"> Screening and surveillance efforts for illness and disease in conjunction with policies for isolation. 	<ul style="list-style-type: none"> DHMH will engage in surveillance activities to identify and monitor individuals at risk and provide laboratory testing to identify Ebola. 	
Weaknesses:		
<ul style="list-style-type: none"> Lack of clear plans to restrict individuals to prevent spread of disease. 	<ul style="list-style-type: none"> DHMH will collaborate with partners to produce appropriate planning documents and protocols to prevent spread of disease. 	
Opportunities:		
<ul style="list-style-type: none"> Outbreak planning. Including determination and identification of the population at risk, based upon the true infection rate in support of patient tracking 	<ul style="list-style-type: none"> DHMH will engage in surveillance activities to identify and monitor individuals at risk and provide laboratory testing to identify Ebola. 	
Threats:		
<p>Isolation and Quarantine:</p> <ul style="list-style-type: none"> Difficulty in identifying and tracking possibly exposed individuals entering Maryland. Non-compliance of isolation and quarantine orders by individuals. 	<ul style="list-style-type: none"> DHMH will engage in surveillance activities to identify and monitor individuals at risk and provide laboratory testing to identify Ebola. DHMH will provide guidance regarding isolation/quarantine. 	

Maryland Statewide Capability Analysis: Fatality Management

Maryland Statewide: Fatality Management	Recommended Sustainment, Improvements and Corrective Actions	Priority High Med Low
Strengths:		
<ul style="list-style-type: none"> Mass fatality management. 		
Weaknesses:		
<ul style="list-style-type: none"> Lack of policy for issues surrounding fatality management including disposal of remains. Fatality Management not well planned. 	<ul style="list-style-type: none"> DHMH will provide guidance regarding after death care and proper disposal of human remains infected with Ebola 	
Opportunities:		
<ul style="list-style-type: none"> Development of policies related to handling human remains. Outbreak planning. 	<ul style="list-style-type: none"> DHMH will provide guidance regarding after death care and proper disposal of human remains infected with Ebola 	
Threats:		
<ul style="list-style-type: none"> After death care. Mass fatalities with failure to properly dispose of decedent remains in a manner which poses no or little threat to the living. 	<ul style="list-style-type: none"> DHMH will provide guidance regarding after death care and proper disposal of human remains infected with Ebola 	

Maryland Statewide Capability Analysis: Non-pharmaceutical Intervention

Maryland Statewide: Non-pharmaceutical Intervention	Recommended Sustainment, Improvements and Corrective Actions	Priority High Med Low
Strengths:		
<ul style="list-style-type: none"> Isolation and quarantine and application of non-pharmaceutical interventions. 	<ul style="list-style-type: none"> DHMH will provide guidance regarding isolation/quarantine. 	
Weaknesses:		
None noted		
Opportunities:		
None noted		
Threats:		
None noted		

SECTION 7: MARYLAND STATEWIDE AND REGIONS 1 & 2 CAPABILITY ANALYSIS

Several different Preparedness Capabilities were discussed as well as cited in the participant feedback surveys and exercise assessments. The following sections attempt to provide a systematic approach to the assessment and prioritization of the cited capabilities within the analysis of statewide SWOT comments and observations.

The following table presents data on the number of comments as well as the calculated frequency that each capability was cited in the total SWOT data as a strength, weakness, opportunity or threat.

Issues and observations related to Incident Management and Resource Management were the most numerous followed by Planning and Information Management. Given the number as well as frequency these four capabilities were cited within the SWOT analysis, it can be assumed that these represented those capabilities most important or of concern to Ebola exercise participants.

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Table 7.1: Number and Frequency that Each Capability was Cited in the Maryland Statewide and Regions 1 & 2 SWOT Analysis

Capability	Statewide		Regions 1 & 2	
	Number	Frequency Cited	Number	Frequency Cited
Incident Management	57	19%	18	21%
Resource Management	56	19%	19	22%
Planning	54	18%	10	11%
Information Management	50	17%	19	22%
Exercise and Training	21	7%	11	13%
Public Health Surveillance and Epidemiological Investigation	14	5%	2	2%
Responder Safety and Health	11	4%	2	2%
Fatality Management	10	3%	1	1%
Community Preparedness	6	2%	1	1%
Mass Care	7	2%	1	1%
Volunteer Management	5	2%	2	2%
Countermeasures	2	1%	0	0%
Medical Surge	1	0%	1	1%
Community Recovery	1	0%	0	0%
Total Comments	295		87	

SECTION 8: REGIONS 1 AND 2 CAPABILITY ANALYSIS AND RECOMMENDATIONS AND IMPROVEMENT MATRICES

Relative Frequencies Of Capabilities Cited As Either A Strength, Weakness, Opportunity Or Threat In Regions 1 and 2

The following tables present capability rankings by the frequency that the respective capabilities were cited as either a Strength, Weakness, Opportunity or Threat to an Ebola illness or suspected disease case or emerging infectious disease within the corresponding Maryland sub-state region.

Therefore, it is possible to infer the relative importance of each cited capability within each relevant SWOT category singular to this specific exercise scenario. Inferences cannot and should not be made for other types of public health emergencies.

Examination of the tables may reveal that the same capability maybe highly important as a Strength, Weakness, Opportunity and or Threat in more than one SWOT category. This apparent conundrum can be explained by the understanding that several different activities, roles and responsibilities make up each capability.

For example, one aspect or activity comprising a capability such as *Emergency Operations Coordination* may be considered as a strength while *Command and Control* may be evaluated as a weakness, opportunity to threat to *Incident Management Operations*.

Table 8.5: Regions 1 & 2 Capability Relationships Across SWOT Categories presents the capability rankings for each SWOT category in a combined table. This permits the determination of the relative importance of each capacity across the respective SWOT categories.

Regions 1&2: Strengths**Table 8.1: Frequency of Importance that the Respective Capabilities were Cited as Strengths.**

Capabilities	Frequency Cited
Information Management	40%
Incident Management	35%
Planning	15%
Resource Management	5%
Community Recovery	5%

Regions 1&2: Weaknesses**Table 8.2: Frequency of Importance that the Respective Capabilities were Cited as Weaknesses**

Capabilities	Frequency Cited
Incident Management	23%
Resource Management	23%
Exercise and Training	19%
Information Management	8%
Planning	8%
Fatality Management	4%
Volunteer Management	4%
Legal	4%
Mass Care	4%
Medical Surge	4%

Regions 1&2: Opportunities

Table 8.3: Frequency of Importance that the Respective Capabilities were Cited as Opportunities

Capabilities	Frequency Cited
Information Management	24%
Resource Management	24%
Incident Management	19%
Exercise and Training	19%
Planning	10%
Responder Safety and Health	5%

Regions 1&2: Threats

Table 8.4: Frequency of Importance that the Respective Capabilities were Cited as Threats

Capabilities	Frequency Cited
Resource Management	35%
Information Management	20%
Planning	15%
Incident Management	5%
Exercise and Training	5%
Responder Safety and Health	5%
Volunteer Management	5%
Public Health Surveillance and Epidemiological Investigation	5%
Community Preparedness	5%

The following table presents the combined data from the previous four tables and highlights preparedness capabilities to visually demonstrate the relationship of each capability within the SWOT categories.

Table 8.5: Regions 1& 2 Capability Relationships Across SWOT Categories

Regions 1 & 2 Capability Relationships Across the SWOT Categories			
Strengths	Weaknesses	Opportunities	Threats
Information Management 40%	Incident Management 23%	Information Management 24%	Resource Management 35%
Incident Management 35%	Resource Management 23%	Resource Management 24%	Information Management 20%
Planning 15%	Exercise and Training 19%	Incident Management 19%	Planning 15%
Resource Management 5%	Information Management 8%	Exercise and Training 19%	Incident Management 5%
Community Recovery 5%	Planning 8%	Planning 10%	Exercise and Training 5%
	Fatality Management	Responder Safety and Health	Responder Safety and Health
	Volunteer Management		Volunteer Management
	Public Health Surveillance and Epidemiological Investigation		Public Health Surveillance and Epidemiological Investigation
	Mass Care		Community Preparedness
	Medical Surge		

Prioritization Of Capabilities For Interventions To Improve Statewide Ebola Preparedness Planning And Response

The difficult question raised as a result of the Regional Ebola Exercises from the perspective of the Office of Preparedness and Response is, "How do DHMH, OPR and regional coalitions prioritize the expenditure of funds as well as time and effort for the enhancement and improvement of Preparedness Capabilities related to the emerging infectious disease of Ebola?"

Determination of where to focus time and effort for the maximum benefit and impact is not easy to determine by examination of the data in the previous section. Therefore, another means of assessing the value, importance and impact of each capability during an emerging infectious disease public health threat and incident is required.

One method to assess the relative efficacy and value of each preparedness capability during an Ebola response is to determine the differential between the number of positive (Strengths and Opportunities) and negative (Weaknesses and Threats) observations for each capability noted in the SWOT analysis.

Therefore, the following formula was used to differentiate and quantify the relative differences between a capability's positive and negative comments.

$$\text{Capability Differential} = (C_S * A) + (C_W * B) + (C_O * C) + (C_T * D) / \text{Total Number of SWOT Observations}$$

Where C_S , C_W , C_O and C_T represent the number of times the capability was noted as a Strength (C_S), Weakness, Opportunity or Threat within the SWOT analysis. Whereas, A, B, C and D are correction factors for the weighted value assigned to each SWOT category. These values are presented in the following table.

Table 8.6: Weighted Values for SWOT Categories Used in Capability Gap Analysis

Weighted Values		
A	Strength	3
B	Weakness	-3
C	Opportunity	1
D	Threat	-5

Opportunities are given a weighed value of +1 because they can be thought of as activities not yet completed or incorporated into emergency preparedness paradigm, whereas, strengths are "real" and tangible as an operational component. Therefore, Strengths are assigned a weighted

value/correction factor of +3.

Although in a traditional business SWOT analysis, Weaknesses are internal to the business while Threats are external. However, in this application, Weaknesses and Threats are considered "internal" to Maryland and thus both impact Ebola response. In addition, threats are considered to have greater potential negative impact and thus given a weighted value of -5 relative to the -3 for Weaknesses.

Why are Threats given -5 or higher value relative to Strengths +3? The inherent bias introduced by this differential is purposeful. The intent is to emphasize the relative gap between capability strengths and opportunities versus their weaknesses and threats.

Table 8.7: *Relative Preparedness Gap Assessment for Each Preparedness Capability Relative to Strengths and Opportunities Versus Weaknesses and Threats*, presents the prioritization of Preparedness Capabilities according to the calculated gap between their respective positive and negative observations.

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Table 8.7: Relative Preparedness Gap Assessment for Each Preparedness Capability Relative to Strengths and Opportunities versus Weaknesses and Threats

Capability	Statewide		Regions 1& 2		Interpretation
	Frequency Cited	Preparedness Gap	Frequency Cited	Preparedness Gap	
Resource Management	19.0%	-43%	22%	-52%	Negative values equate to capability insufficiencies
Exercise and Training	7.1%	-13%	13%	-15%	
Community Preparedness	2.0%	-10%	1%	-6%	
Planning	18.3%	-10%	11%	-11%	
Responder Safety and Health	3.7%	-9%	2%	-5%	
Fatality Management	3.4%	-9%	1%	-3%	
Public Health Surveillance and Epidemiological Investigation	4.7%	-8%	2%	-9%	
Mass Care	2.4%	-6%	1%	-3%	
Information Management	16.9%	-5%	22%	3%	
Volunteer Management	1.7%	-4%	2%	-9%	
Medical Surge	0.3%	-1%	1%	-3%	
Community Recovery	0.3%	1%	0%		
Countermeasures	0.7%	2%	0%		
Incident Management	19.3%	11%	21%	2%	Positive values equate to preparedness competency

The above table presents data on the relative gap between a capability's strengths and opportunities versus its weaknesses and threats as they pertain to an Ebola or emerging infectious disease public health threat.

The statewide preparedness gap determinations are included to permit comparison of the regional determinations to those of Maryland statewide.

*Preparedness capabilities with **negative values** represent those capabilities with insufficiencies possibly resulting in adverse consequences during incidents and public health threats involving*

*an emerging infectious disease such as Ebola. Whereas, capabilities with **positive values** are those capabilities for which Maryland ESF 8 partners and stakeholders are most competent.*

Also included in the above table are the frequencies with which each capability was cited within the SWOT Analysis. As mentioned earlier, the frequencies with which a capability was cited in the SWOT Analysis as well as within each SWOT category, reflects the relative importance of each capability for survey respondents. These values were included to assist reviewers in identifying those capabilities requiring corrective actions and or improvement plans.

For example, under the statewide column, both Planning and Responder Safety and Health both demonstrate preparedness insufficiencies of minus 10. However, Planning was cited with a frequency of 18% relative to Responder Safety and Health of 4%. Therefore, the preparedness capability, planning, carries relatively more importance for the ESF 8 stakeholders and partners and subsequently should be the focus of more robust corrective actions and improvement plans.

Regions 1&2 Capability Analysis with Recommendations and Sustainment, Improvement and Corrective Actions Matrix by Capability

Regions 1&2 Capability Analysis: Incident Management

Regions 1&2: Incident Management	Recommended Sustainment, Improvements and Corrective Actions	Priority: High Med Low
Strengths:		
<ul style="list-style-type: none"> Clear lines of authority can be established with the benefit of a close relationship and collaboration between public health, emergency medical services, emergency management agencies and healthcare systems. 	<ul style="list-style-type: none"> Sustain lines of authority through established priorities/policy/procedure, ongoing communications. 	<ul style="list-style-type: none">
Weaknesses:		
<ul style="list-style-type: none"> Some participants fail to understand how to manage and set up an incident command system causing a failure to establish a standardized approach. This resulted in difficulty in establishing priorities and necessary response measures. 	<ul style="list-style-type: none"> LHD and other facilities become members of IMT. Getting people to have an understanding of what we are referring to, Get out to regions and entertain discussions understanding IM not just training in ICS but also exercising and understanding becoming a part of a team and ICS. Exercise training together training people in the agencies so they are aware of ICS Planning Anything of significance using ICS should be the basic structure into to plan the event. 	<ul style="list-style-type: none">
Opportunities:		

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Regions 1&2: Incident Management	Recommended Sustainment, Improvements and Corrective Actions	Priority: High Med Low
<ul style="list-style-type: none"> Opportunities to contact new partners, especially community leaders, and establish working relationships for better collaboration among all health care partners. 	<ul style="list-style-type: none"> Inclusion of political leadership and medical facilities private practice, constant question arises, who are we missing on a local and regional level?? Identification of who REALLY should be involved IMT everyone getting out and talking on a local level to , faith based, LEPCs etc Getting them involved in HCC Conducting regional exercises using unified command. 	
Threats:		
<ul style="list-style-type: none"> The need for the Region 1 & 2 coalition to develop closer working relationships for the provision of mutual aid across the region especially with bordering states e.g. west Virginia. 	<ul style="list-style-type: none"> Development of protocol of CONOPS. Communications have created a partnership across state lines. Including WV, VA, and PA into across state planning, formalize a CONOPs. 	

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Regions 1&2 Capability Analysis: Resource Management

Regions 1&2: Resource Management	Recommended Sustainment, Improvements and Corrective Actions	Priority High Med Low
Strengths:		
<ul style="list-style-type: none"> Sharing of Supplies 	<ul style="list-style-type: none"> Maintain current IRMS, RMP, MOU 	
Weaknesses:		
<ul style="list-style-type: none"> The lack of and availability of sufficient personal protective equipment (PPE) or a statewide cache in addition to other relevant resources. In addition waste disposal and removal were cited. 	<ul style="list-style-type: none"> Maintain awareness interaction with state level procurement activities for PPE. Come to a consensus of idea of what PPE has been established/procured, amounts, etc and how much do we need as a backup. Come up with pre established waste management company contact list. 	
Opportunities:		
<ul style="list-style-type: none"> Development of coordination for resource sharing in addition to procurement of PPE. Identification of resources for transportation of bio-hazardous materials. 	<ul style="list-style-type: none"> Maintain awareness interaction with state level procurement activities for PPE. Come to a consensus of idea of what PPE has been established/procured, amounts, etc and how much do we need as a backup. Come up with pre established waste management company contact list. 	

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Regions 1&2: Resource Management	Recommended Sustainment, Improvements and Corrective Actions	Priority High Med Low
Threats:		
<ul style="list-style-type: none"> • A statewide catastrophe will place a burden on existing resources and supplies. This may result in a significant burden in rural areas where there are fewer resources available and or resources maybe re-directed to more populous urban areas. • Besides the relative disparity of material resources, rural areas also face a deficit of personnel and staff. • These short comings are magnified by the lack of funds and training as well as clear regulations for disposal of hazardous wastes which maybe disproportionate to the threat. 	<ul style="list-style-type: none"> • Ensure a region I and II has an active voice in terms of what is going on at the state level. So we are voiced and heard. • Continue to inform the community of SNS and Maryland Responds plans enhancing individual county volunteers. • On a regional level sponsor a recruitment event to beef up Maryland Responds. • Develop distribution authorities within the RMP as an annex. 	

Regions 1&2 Capability Analysis: Information Management

Regions 1&2: Information Management	Recommended Sustainment, Improvements and Corrective Actions	Priority High Med Low
Strengths:		
<ul style="list-style-type: none"> Within the Region information sharing is a noted strength as established thorough open communications among partners. Information exchange and communications supports awareness and education across the region. 	<ul style="list-style-type: none"> Sustain enhance and formulize existing communication channels. 	
Weaknesses:		
<ul style="list-style-type: none"> Lack of communication and exchange of technical information across organizations. 	<ul style="list-style-type: none"> Develop Information Management/Sharing Plan 	
Opportunities:		
<ul style="list-style-type: none"> Information sharing can be improved through improved communications including alternative communication channels. A need to focus education of professionals and the general public. 	<ul style="list-style-type: none"> Develop Information Management/Sharing Plan Develop risk communication messaging (i.e. develop some kind of education to providers and public of preventative measures) 	
Threats:		
<ul style="list-style-type: none"> The lack of credible information and negative media attention related to Ebola Virus Disease and misinformation has lead to panic. 	<ul style="list-style-type: none"> Develop risk communication messaging (i.e. develop some kind of education to providers and public of preventative measures) 	

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Regions 1&2 Capability Analysis: Planning

Regions 1&2: Planning	Recommended Sustainment, Improvements and Corrective Actions	Priority High Med Low
Strengths:		
<ul style="list-style-type: none"> Existing plans and planning for EVD as well as development of action plans are something done every day. Other activities include the following: patient monitoring, conducting patient education, working with partners and surveillance and contact tracing 	<ul style="list-style-type: none"> Sustain current activities 	
Weaknesses:		
<ul style="list-style-type: none"> Complacency of facilities to the threat as well as Draft quarantine agreements. 	<ul style="list-style-type: none"> Maintain communication and situational awareness activities. Incorporate law enforcement protocols for civil unrest and curfew as a model for quarantine 	
Opportunities:		
<ul style="list-style-type: none"> Assisting facilities to plan and prepare since they may not be as ready as they assumed they were through improved policies. 	<ul style="list-style-type: none"> Strengthen HCC and partnerships so that consistent plans can be developed across the region. 	
Threats:		
<ul style="list-style-type: none"> Reactive planning rather than proactive planning especially where no plans exist or preparation is fairly low. 	<ul style="list-style-type: none"> Strengthen HCC and partnerships so that consistent plans can be developed across the region 	

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Regions 1&2 Capability Analysis: Exercise and Training

Regions 1&2: Exercise and Training	Recommended Sustainment, Improvements and Corrective Actions	Priority High Med Low
Strengths:		
Weaknesses:		
<ul style="list-style-type: none"> Lack of information about PPE training and the need to conduct and train personnel. 	<ul style="list-style-type: none"> Develop training programs for PPE. Creation of a standard checklist/sheet for donning/doffing Ebola specific PPE protocols/standards 	
Opportunities:		
<ul style="list-style-type: none"> Regional PPE training. Training and exercises geared more towards specific facility needs and requirements. 	<ul style="list-style-type: none"> Develop training programs for PPE. Creation of a standard checklist/sheet for donning/doffing Ebola specific PPE protocols/standards. 	
Threats:		
<ul style="list-style-type: none"> Lack of funds for training. 	<ul style="list-style-type: none"> Use HPP funding PPE Training Develop training programs for PPE. Creation of a standard checklist/sheet for donning/doffing Ebola specific PPE protocols/standards 	

Regions 1&2 Capability Analysis: Community Preparedness and Recovery

Regions 1&2: Community Preparedness and Recovery	Recommended Sustainment, Improvements and Corrective Actions	Priority High Med Low
Strengths:		
<ul style="list-style-type: none"> Understanding the broad needs of residents in an austere environment 		
Weaknesses:		
Opportunities:		
Threats:		
<ul style="list-style-type: none"> Interjection of political influence on preparedness planning and response activities. 	<ul style="list-style-type: none"> Ensure they have understanding of the situation and bring them into the planning process prior to the incident/emergency unfolding 	

Regions 1&2 Capability Analysis: Mass Care and Medical Surge

Regions 1&2: Mass Care and Medical Surge	Recommended Sustainment, Improvements and Corrective Actions	Priority High Med Low
Strengths:		
Weaknesses:		
<ul style="list-style-type: none"> Lack of comprehensive isolation capacity for handling highly infectious patients. Lack of EVD treatment facilities 	<ul style="list-style-type: none"> All hospitals have negative pressurized areas. Rely on state and federal authorities and direction (i.e. Hopkins is regional Ebola Treatment facility) 	
Opportunities:		
Threats:		

Regions 1&2 Capability Analysis: Responder Safety

Regions 1&2: Responder Safety	Recommended Sustainment, Improvements and Corrective Actions	Priority High Med Low
Strengths:		
Weaknesses:		
Opportunities:		
<ul style="list-style-type: none"> Improved PPE for responders 	<ul style="list-style-type: none"> State level cache 	
Threats:		
<ul style="list-style-type: none"> Lack of PPE at the responder and hospital levels 	<ul style="list-style-type: none"> State level cache 	

Regions 1&2 Capability Analysis: Volunteer Management

Regions 1&2: Volunteer Management	Recommended Sustainment, Improvements and Corrective Actions	Priority High Med Low
Strengths:		
Weaknesses:		
<ul style="list-style-type: none"> Lack of Volunteers 	<ul style="list-style-type: none"> Enhance Maryland Responds recruitment of a regional level 	
Opportunities:		
Threats:		
<ul style="list-style-type: none"> Lack of Staff 	<ul style="list-style-type: none"> Enhance Maryland Responds recruitment of a regional level Enhance MOUs between healthcare facilities to exchange/share staff 	

Regions 1&2 Capability Analysis: Public Health Surveillance and Epidemiological Investigation

Regions 1&2: Public Health Surveillance and Epidemiological Investigation	Recommended Sustainment, Improvements and Corrective Actions	Priority High Med Low
Strengths:		
Weaknesses:		
Opportunities:		
Threats:		
<ul style="list-style-type: none"> Entry of possibly exposed travelers with a BSL 4 agent exposure 	<ul style="list-style-type: none"> Maintain active involvement ESSENCE System and DHMH active tracking. Keeping good relationship with ICP, EDs Continue to keep them involved in active information exchange 	

SECTION 9: MARYLAND STATEWIDE AND REGION 3 CAPABILITY ANALYSIS

Several different Preparedness Capabilities were discussed as well as cited in the participant feedback surveys and exercise assessments. The following sections attempt to provide a systematic approach to the assessment and prioritization of the cited capabilities within the analysis of statewide SWOT comments and observations.

The following table presents data on the number of comments as well as the calculated frequency that each capability was cited in the total SWOT data as a strength, weakness, opportunity or threat.

Issues and observations related to Incident Management and Resource Management were the most numerous followed by Planning and Information Management. Given the number as well as frequency these four capabilities were cited within the SWOT analysis, it can be assumed that these represented those capabilities most important or of concern to Ebola exercise participants.

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Table 9.1: Number and Frequency that Each Capability was Cited in the Statewide and Regions 3 SWOT Analysis

Capability	Statewide		Region 3	
	Number	Frequency Cited	Number	Frequency Cited
Incident Management	57	19%	10	15%
Resource Management	56	19%	15	22%
Planning	54	18%	10	15%
Information Management	50	17%	13	19%
Exercise and Training	21	7%	7	10%
Public Health Surveillance and Epidemiological Investigation	14	5%	4	6%
Responder Safety and Health	11	4%	2	3%
Fatality Management	10	3%	4	6%
Community Preparedness	6	2%	2	3%
Mass Care	7	2%	1	1%
Volunteer Management	5	2%	0	0%
Countermeasures	2	1%	0	0%
Medical Surge	1	0%	0	0%
Community Recovery	1	0%		0%
Total Comments	295		68	0%

SECTION 10: REGION 3 CAPABILITY ANALYSIS AND RECOMMENDATIONS AND IMPROVEMENT MATRICES

Relative Frequencies Of Capabilities Cited As Either A Strength, Weakness, Opportunity Or Threat In Region 3

The following tables present capability rankings by the frequency that the respective capabilities were cited as either a Strength, Weakness, Opportunity or Threat to an Ebola illness or suspected disease case or emerging infectious disease within the corresponding Maryland sub-state region.

Therefore, it is possible to infer the relative importance of each cited capability within each relevant SWOT category singular to this specific exercise scenario. Inferences cannot and should not be made for other types of public health emergencies.

Examination of the tables may reveal that the same capability maybe highly important as a Strength, Weakness, Opportunity and or Threat in more than one SWOT category. This apparent conundrum can be explained by the understanding that several different activities, roles and responsibilities make up each capability.

For example, one aspect or activity comprising a capability such as *Emergency Operations Coordination* may be considered as a strength while *Command and Control* may be evaluated as a weakness, opportunity to threat to *Incident Management Operations*.

Table 10.5: Region 3 Capability Relationships Across SWOT Categories presents the capability rankings for each SWOT category in a combined table. This permits the determination of the relative importance of each capacity across the respective SWOT categories.

Region 3: Strengths**Table 10.1: Frequency of Importance that the Respective Capabilities were Cited as Strengths.**

Capabilities	Frequency Cited
Information Management	32%
Incident Management	26%
Resource Management	21%
Planning	11%
Public Health Surveillance and Epidemiological Investigation	5%
Exercise / training	5%

Region 3: Weaknesses**Table 10.2: Frequency of Importance that the Respective Capabilities were Cited as Weaknesses**

Capabilities	Frequency Cited
Exercise and Training	27%
Information Management	20%
Planning	20%
Resource Management	20%
Fatality Management	13%

Region 3: Opportunities**Table 10.3: Frequency of Importance that the Respective Capabilities were Cited as Opportunities**

Capabilities	Frequency Cited
Incident Management	24%
Resource Management	24%
Planning	18%
Public Health Surveillance and Epidemiological Investigation	12%
Information Management	12%
Fatality Management	6%
Exercise and Training	6%

Region 3: Threats**Table 10.4: Frequency of Importance that the Respective Capabilities were Cited as Threats**

Capabilities	Frequency Cited
Resource Management	24%
Information Management	12%
Planning	12%
Community Preparedness	12%
Responder Safety and Health	12%
Incident Management	6%
Exercise and Training	6%
Fatality Management	6%
Public Health Surveillance and Epidemiological Investigation	6%
Mass Care	6%

The following table presents the combined data from the previous four tables and highlights preparedness capabilities to visually demonstrate the relationship of each capability within the SWOT categories.

Table 10.5: Region 3 Capability Relationships Across SWOT Categories

Region 3 Capability Relationships Across the SWOT Categories			
Strengths	Weaknesses	Opportunities	Threats
Information Management 32%	Exercise and Training 27%	Incident Management 42%	Resource Management 24%
Incident Management 26%	Information Management 20%	Resource Management 24%	Information Management 12%
Resource Management 21%	Planning 20%	Planning 18%	Planning 12%
Planning 11%	Resource Management 20%	Public Health Surveillance and Epidemiological Investigation	Community Preparedness
Public Health Surveillance and Epidemiological Investigation	Fatality Management	Information Management 12%	Responder Safety and Health
Exercise / training 5%		Fatality Management	Incident Management 6%
		Exercise and Training 6%	Exercise and Training 6%
			Fatality Management
			Public Health Surveillance and Epidemiological Investigation
			Mass Care

Prioritization Of Capabilities For Interventions To Improve Statewide Ebola Preparedness Planning And Response

The difficult question raised as a result of the Regional Ebola Exercises from the perspective of the Office of Preparedness and Response is, "How do DHMH, OPR and regional coalitions prioritize the expenditure of funds as well as time and effort for the enhancement and improvement of Preparedness Capabilities related to the emerging infectious disease of Ebola?"

Determination of where to focus time and effort for the maximum benefit and impact is not easy to determine by examination of the data in the previous section. Therefore, another means of assessing the value, importance and impact of each capability during an emerging infectious disease public health threat and incident is required.

One method to assess the relative efficacy and value of each preparedness capability during an Ebola response is to determine the differential between the number of positive (Strengths and Opportunities) and negative (Weaknesses and Threats) observations for each capability noted in the SWOT analysis.

Therefore, the following formula was used to differentiate and quantify the relative differences between a capability's positive and negative comments.

$$\text{Capability Differential} = (C_S * A) + (C_W * B) + (C_O * C) + (C_T * D) / \text{Total Number of SWOT Observations}$$

Where C_S , C_W , C_O and C_T represent the number of times the capability was noted as a Strength (C_S), Weakness, Opportunity or Threat within the SWOT analysis. Whereas, A, B, C and D are correction factors for the weighted value assigned to each SWOT category. These values are presented in the following table.

Table 10.6: Weighted Values for SWOT Categories Used in Capability Gap Analysis

Weighted Values		
A	Strength	3
B	Weakness	-3
C	Opportunity	1
D	Threat	-5

Opportunities are given a weighed value of +1 because they can be thought of as activities not yet completed or incorporated into emergency preparedness paradigm, whereas,

strengths are "real" and tangible as an operational component. Therefore, Strengths are assigned a weighted value/correction factor of +3.

Although in a traditional business SWOT analysis, Weaknesses are internal to the business while Threats are external. However, in this application, Weaknesses and Threats are considered "internal" to Maryland and thus both impact Ebola response. In addition, threats are considered to have greater potential negative impact and thus given a weighted value of -5 relative to the -3 for Weaknesses.

Why are Threats given -5 or higher value relative to Strengths +3? The inherent bias introduced by this differential is purposeful. The intent is to emphasize the relative gap between capability strengths and opportunities versus their weaknesses and threats.

Table 10.7: *Relative Preparedness Gap Assessment for Each Preparedness Capability Relative to Strengths and Opportunities Versus Weaknesses and Threats*, presents the prioritization of Preparedness Capabilities according to the calculated gap between their respective positive and negative observations.

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Table 10.7: Relative Preparedness Gap Assessment for Each Preparedness Capability Relative to Strengths and Opportunities versus Weaknesses and Threats

Capability	Statewide		Region 3		Interpretation
	Frequency Cited	Preparedness Gap	Frequency Cited	Preparedness Gap	
Resource Management	19.0%	-43%	22%	-19%	Negative values equate to capability insufficiencies
Exercise and Training	7.1%	-13%	10%	-19%	
Community Preparedness	2.0%	-10%	3%	-15%	
Planning	18.3%	-10%	15%	-15%	
Responder Safety and Health	3.7%	-9%	3%	-15%	
Fatality Management	3.4%	-9%	6%	-15%	
Public Health Surveillance and Epidemiological Investigation	4.7%	-8%	6%	0%	
Mass Care	2.4%	-6%	1%	-7%	
Information Management	16.9%	-5%	19%	1%	
Volunteer Management	1.7%	-4%	0%		
Medical Surge	0.3%	-1%	0%		
Community Recovery	0.3%	1%	0%		
Countermeasures	0.7%	2%	0%		
Incident Management	19.3%	11%	15%	21%	Positive values equate to preparedness competency

The above table presents data on the relative gap between a capability's strengths and opportunities versus its weaknesses and threats as they pertain to an Ebola or emerging infectious disease public health threat.

The statewide preparedness gap determinations are included to permit comparison of the regional determinations to those of Maryland statewide.

*Preparedness capabilities with **negative values** represent those capabilities with insufficiencies possibly resulting in adverse consequences during incidents and public health*

threats involving an emerging infectious disease such as Ebola. Whereas, capabilities with **positive values** are those capabilities for which Maryland ESF 8 partners and stakeholders are most competent.

Also included in the above table are the frequencies with which each capability was cited within the SWOT Analysis. As mentioned earlier, the frequencies with which a capability was cited in the SWOT Analysis as well as within each SWOT category, reflects the relative importance of each capability for survey respondents. These values were included to assist reviewers in identifying those capabilities requiring corrective actions and or improvement plans.

For example, under the statewide column, both Planning and Responder Safety and Health both demonstrate preparedness insufficiencies of minus 10. However, Planning was cited with a frequency of 18% relative to Responder Safety and Health of 4%. Therefore, the preparedness capability, planning, carries relatively more importance for the ESF 8 stakeholders and partners and subsequently should be the focus of more robust corrective actions and improvement plans.

Region 3 Capability Analysis with Recommendations and Sustainment, Improvement and Corrective Actions Matrix by Capability

Region 3 Capability Analysis: Incident Management

Region 3: Incident Management	Recommended Sustainment, Improvements and Corrective Actions	Priority : High Med Low
Strengths:		
Emergency Operations Coordination: <ul style="list-style-type: none"> Networking, strong relationships and the collaboration among and between local health department, emergency medical services, offices of emergency management and DHMH 	<ul style="list-style-type: none"> Sustain Region III Health and Medical Coalition 	High
Weaknesses:		
Opportunities:		
<ul style="list-style-type: none"> Lots of opportunities to create local collaborative efforts among health care services and planning sections 	<ul style="list-style-type: none"> Sustain Region III Health and Medical Coalition 	Low
Threats:		
<ul style="list-style-type: none"> State, local and private facilities are doing their own thing and not working truly together 	<ul style="list-style-type: none"> Region disagrees that this is a threat. 	

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Region 3 Capability Analysis: Resource Management

Region 3: Resource Management	Recommended Sustainment, Improvements and Corrective Actions	Priority High Med Low
Strengths:		
<ul style="list-style-type: none"> Logistical support and community resource sharing discussions including PPE that is currently on-hand 	<ul style="list-style-type: none"> Sustain Region III Resource Management Plan 	High
Weaknesses:		
<ul style="list-style-type: none"> Lack of policies related to waste management as well as PPE guidance 	<ul style="list-style-type: none"> Await State documents on waste management procedures 	High
Opportunities:		
<ul style="list-style-type: none"> Identification and tracking of available resources (i.e. staff, equipment, supplies, space , beds) and how to handle waste and contaminated resources 	<ul style="list-style-type: none"> Region disagrees with this opportunity 	
Threats:		
<ul style="list-style-type: none"> Lack of adequate resources especially PPE Waste management issues e.g. how linen and patient care items are handled 	<ul style="list-style-type: none"> Utilize HPP and Ebola funding to purchase regional cache for all partners within Region III. Await State documents on waste management procedures. 	High

Region 3 Capability Analysis: Information Management

Region 3: Information Management	Recommended Sustainment, Improvements and Corrective Actions	Priority High Med Low
Strengths:		
<ul style="list-style-type: none"> Communication and information sharing across the region with sharing of planning efforts and availability to subject matter experts 	<ul style="list-style-type: none"> Sustain current Coalition efforts regarding communication and information sharing assets. 	High
Weaknesses:		
<ul style="list-style-type: none"> Lack of information specific top the virus (viability on surfaces, bleach concentrations for disinfection). Complications resulting from mixed messages coming from the federal authorities and failure to set national guidelines especially resulting in knowledge deficits where first responders and hospital staff are caring for suspected and exposed patients. 	<ul style="list-style-type: none"> Await State documents on waste management procedures This is a Federal government issue which Region III Health and Medical Coalition cannot address at the Coalition level. 	Med
Opportunities:		
<ul style="list-style-type: none"> Strengthen communications networking to improve messaging and establishing trust 	<ul style="list-style-type: none"> Utilize coalition Ebola funds on personnel to manage communication network. 	Med
Threats:		
<ul style="list-style-type: none"> Improper messaging and promulgation of misinformation 	<ul style="list-style-type: none"> More details needed in order to create a corrective action. 	

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Region 3 Capability Analysis: Planning

Region 3: Planning	Recommended Sustainment, Improvements and Corrective Actions	Priority High Med Low
Strengths:		
<ul style="list-style-type: none"> Pre-existing plans as well as experience in emergency planning and management 	<ul style="list-style-type: none"> Continue best practice sharing at the coalition level 	High
Weaknesses:		
<ul style="list-style-type: none"> Rapidly changing information and guidelines which erode existing planning such as failure to identify what hospitals will care for suspected and confirmed Ebola victims Incomplete isolation and quarantine policy especially relating to law enforcement use of force for enforcing I&Q orders 	<ul style="list-style-type: none"> Treatment and Assessment hospitals are currently identified. Maintain status of these hospitals. State discretion, decisions cannot be made at the Coalition level 	Low
Opportunities:		
<ul style="list-style-type: none"> Ability to assess pre-existing plans and adapt as required for the threat (e.g. adapting TB quarantine) The need to identify and designate hospitals for the acceptance and care of Ebola patients 	<ul style="list-style-type: none"> Review current plans establish in the Region. State designated treatment and assessment hospitals 	Low
Threats:		
<ul style="list-style-type: none"> Complete silo thinking and the failure to establish and address legal issues. 	<ul style="list-style-type: none"> Region disagrees with this threat. 	

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Region 3 Capability Analysis: Exercise and Training

Region 3: Exercise and Training	Recommended Sustainment, Improvements and Corrective Actions	Priority High Med Low
Strengths:		
<ul style="list-style-type: none"> Educational outreach and efforts 	<ul style="list-style-type: none"> Maintain the establishment of the Regional exercise team. 	Med
Weaknesses:		
Opportunities:		
<ul style="list-style-type: none"> Standardized training 	<ul style="list-style-type: none"> Continue to examine best practices and training modalities 	Med
Threats:		
<ul style="list-style-type: none"> Limited training related to Ebola 	<ul style="list-style-type: none"> Continue to examine best practices and training modalities 	

Region 3 Capability Analysis: Community Preparedness and Recovery

Region 3: Community Preparedness and Recovery	Recommended Sustainment, Improvements and Corrective Actions	Priority High Med Low
Strengths:		
Weaknesses:		
Opportunities:		
Threats:		
<ul style="list-style-type: none"> Fiscal limitations and issues with interjection of politics resulting in political ramifications for management of Ebola outbreak. 	<ul style="list-style-type: none"> Use of HPP and Ebola funds as a priority to the Regions 	Med

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Region 3 Capability Analysis: Mass Care and Medical Surge

Region 3: Mass Care and Medical Surge	Recommended Sustainment, Improvements and Corrective Actions	Priority High Med Low
Strengths:		
Weaknesses:		
Opportunities:		
Threats:		
<ul style="list-style-type: none"> Patient care 	<ul style="list-style-type: none"> More details needed in order to create a corrective action. 	

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Region 3 Capability Analysis: Responder Safety

Region 3: Responder Safety	Recommended Sustainment, Improvements and Corrective Actions	Priority High Med Low
Strengths:		
Weaknesses:		
Opportunities:		
Threats:		
<ul style="list-style-type: none"> Threat of exposure even when donning and doffing PPE properly resulting in increased staff illness and death 	<ul style="list-style-type: none"> Continue current established training techniques tactics and procedures 	High

Region 3 Capability Analysis: Volunteer Management

Region 3: Volunteer Management	Recommended Sustainment, Improvements and Corrective Actions	Priority High Med Low
Strengths:		
Weaknesses:		
Opportunities:		
Threats:		

SECTION 11: MARYLAND STATEWIDE AND REGION 4 CAPABILITY ANALYSIS

Several different Preparedness Capabilities were discussed as well as cited in the participant feedback surveys and exercise assessments. The following sections attempt to provide a systematic approach to the assessment and prioritization of the cited capabilities within the analysis of statewide SWOT comments and observations.

The following table presents data on the number of comments as well as the calculated frequency that each capability was cited in the total SWOT data as a strength, weakness, opportunity or threat.

Issues and observations related to Incident Management and Resource Management were the most numerous followed by Planning and Information Management. Given the number as well as frequency these four capabilities were cited within the SWOT analysis, it can be assumed that these represented those capabilities most important or of concern to Ebola exercise participants.

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Table 11.1: Number and Frequency that Each Capability was Cited in the Statewide and Region 4 SWOT Analysis

Capability	Statewide		Region 4	
	Number	Frequency Cited	Number	Frequency Cited
Incident Management	57	19%	17	20%
Resource Management	56	19%	14	16%
Planning	54	18%	12	14%
Information Management	50	17%	14	16%
Exercise and Training	21	7%	3	3%
Public Health Surveillance and Epidemiological Investigation	14	5%	7	8%
Responder Safety and Health	11	4%	4	5%
Fatality Management	10	3%	4	5%
Community Preparedness	6	2%	1	1%
Mass Care	7	2%	5	6%
Volunteer Management	5	2%	3	3%
Countermeasures	2	1%	2	2%
Medical Surge	1	0%	0	0%
Community Recovery	1	0%	0	0%
Total Comments	295		86	

SECTION 12: REGION 4 CAPABILITY ANALYSIS AND RECOMMENDATIONS AND IMPROVEMENT MATRICES

Relative Frequencies Of Capabilities Cited As Either A Strength, Weakness, Opportunity Or Threat In Regions 4

The following tables present capability rankings by the frequency that the respective capabilities were cited as either a Strength, Weakness, Opportunity or Threat to an Ebola illness or suspected disease case or emerging infectious disease within the corresponding Maryland sub-state region.

Therefore, it is possible to infer the relative importance of each cited capability within each relevant SWOT category singular to this specific exercise scenario. Inferences cannot and should not be made for other types of public health emergencies.

Examination of the tables may reveal that the same capability maybe highly important as a Strength, Weakness, Opportunity and or Threat in more than one SWOT category. This apparent conundrum can be explained by the understanding that several different activities, roles and responsibilities make up each capability.

For example, one aspect or activity comprising a capability such as *Emergency Operations Coordination* may be considered as a strength while *Command and Control* may be evaluated as a weakness, opportunity to threat to *Incident Management Operations*.

Table 12.5: Region 4 Capability Relationships Across SWOT Categories presents the capability rankings for each SWOT category in a combined table. This permits the determination of the relative importance of each capacity across the respective SWOT categories.

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Region 4: Strengths

Table12.1: Frequency of Importance that the Respective Capabilities were Cited as Strengths.

Capabilities	Frequency Cited
Incident Management	30%
Planning	20%
Information Management	13%
Resource Management	7%
Mass Care	7%
Non-pharmaceutical Interventions	7%
Public Health Surveillance and Epidemiological Investigation	7%
Fatality Management	3%
Responder Safety and Health	3%
Volunteer Management	3%

Region 4: Weaknesses

Table12.2: Frequency of Importance that the Respective Capabilities were Cited as Weaknesses

Capabilities	Frequency Cited
Resource Management	29%
Planning	18%
Incident Management	12%
Information Management	12%
Volunteer Management	6%
Responder Safety and Health	6%
Public Health Surveillance and Epidemiological Investigation	6%
Exercise / Training	6%
Fatality Management	6%

Region 4: Opportunities**Table12.3: Frequency of Importance that the Respective Capabilities were Cited as Opportunities**

Capabilities	Frequency Cited
Incident Management	42%
Information Management	33%
Planning	17%
Exercise / Training	8%

Region 4: Threats**Table12.4: Frequency of Importance that the Respective Capabilities were Cited as Threats**

Capabilities	Frequency Cited
Resource Management	26%
Information Management	15%
Public Health Surveillance and Epidemiological Investigation	15%
Mass Care	11%
Responder Safety and Health	7%
Fatality Management	7%
Exercise and Training	4%
Volunteer Management	4%
Community Preparedness	4%
Incident Management	4%
Planning	4%

The following table presents the combined data from the previous four tables and highlights preparedness capabilities to visually demonstrate the relationship of each capability within the SWOT categories.

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Table 12.5: Region 4 Capability Relationships Across SWOT Categories

Region 4 Capability Relationships Across the SWOT Categories			
Strengths	Weaknesses	Opportunities	Threats
Incident Management 30%	Resource Management 29%	Incident Management 42%	Resource Management 26%
Planning 20%	Planning 18%	Information Management 33%	Information Management 15%
Information Management 13%	Incident Management 12%	Planning 18%	Public Health Surveillance and Epidemiological Investigation
Resource Management 7%	Information Management 12%	Exercise / Training 8%	Mass Care
Mass Care	Volunteer Management		Responder Safety and Health
Non-pharmaceutical Interventions	Responder Safety and Health		Fatality Management
Public Health Surveillance and Epidemiological Investigation	Public Health Surveillance and Epidemiological Investigation		Exercise and Training 6%
Fatality Management	Exercise / Training 6%		Volunteer Management
Responder Safety and Health	Fatality Management		Community Preparedness
Volunteer Management			Incident Management 6%
			Planning 4%

Prioritization Of Capabilities For Interventions To Improve Statewide Ebola Preparedness Planning And Response

The difficult question raised as a result of the Regional Ebola Exercises from the perspective of the Office of Preparedness and Response is, "How do DHMH, OPR and regional coalitions prioritize the expenditure of funds as well as time and effort for the enhancement and improvement of Preparedness Capabilities related to the emerging infectious disease of Ebola?"

Determination of where to focus time and effort for the maximum benefit and impact is not easy to determine by examination of the data in the previous section. Therefore, another means of assessing the value, importance and impact of each capability during an emerging infectious disease public health threat and incident is required.

One method to assess the relative efficacy and value of each preparedness capability during an Ebola response is to determine the differential between the number of positive (Strengths and Opportunities) and negative (Weaknesses and Threats) observations for each capability noted in the SWOT analysis.

Therefore, the following formula was used to differentiate and quantify the relative differences between a capability's positive and negative comments.

$$\text{Capability Differential} = (C_S * A) + (C_W * B) + (C_O * C) + (C_T * D) / \text{Total Number of SWOT Observations}$$

Where C_S , C_W , C_O and C_T represent the number of times the capability was noted as a Strength (C_S), Weakness, Opportunity or Threat within the SWOT analysis. Whereas, A, B, C and D are correction factors for the weighted value assigned to each SWOT category. These values are presented in the following table.

Table 12.6: Weighted Values for SWOT Categories Used in Capability Gap Analysis

Weighted Values		
A	Strength	3
B	Weakness	-3
C	Opportunity	1
D	Threat	-5

Opportunities are given a weighed value of (+) 1 because they can be thought of as activities not yet completed or incorporated into emergency preparedness paradigm, whereas, strengths are "real" and tangible as an operational component. Therefore, Strengths are assigned a weighted

value/correction factor of (+) 3.

Although in a traditional business SWOT analysis, Weaknesses are internal to the business while Threats are external. However, in this application, Weaknesses and Threats are considered "internal" to Maryland and thus both impact Ebola response. In addition, threats are considered to have greater potential negative impact and thus given a weighted value of (-) 5 relative to the (-) 3 for Weaknesses.

Why are Threats given (-) 5 or higher value relative to Strengths (+) 3? The inherent bias introduced by this differential is purposeful. The intent is to emphasize the relative gap between capability strengths and opportunities versus their weaknesses and threats.

Table 2: *Relative Preparedness Gap Assessment for Each Preparedness Capability Relative to Strengths and Opportunities Versus Weaknesses and Threats*, presents the prioritization of Preparedness Capabilities according to the calculated gap between their respective positive and negative observations.

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Table 12.7: Relative Preparedness Gap Assessment for Each Preparedness Capability Relative to Strengths and Opportunities versus Weaknesses and Threats

Capability	Statewide		Region 4		Interpretation
	Frequency Cited	Preparedness Gap	Frequency Cited	Preparedness Gap	
Resource Management	19.0%	-43%	16%	-51%	Negative values equate to capability insufficiencies
Exercise and Training	7.1%	-13%	3%	-8%	
Community Preparedness	2.0%	-10%	1%	-6%	
Planning	18.3%	-10%	14%	7%	
Responder Safety and Health	3.7%	-9%	5%	-12%	
Fatality Management	3.4%	-9%	5%	-12%	
Public Health Surveillance and Epidemiological Investigation	4.7%	-8%	8%	-20%	
Mass Care	2.4%	-6%	6%	-10%	
Information Management	16.9%	-5%	16%	-12%	
Volunteer Management	1.7%	-4%	3%	-6%	
Medical Surge	0.3%	-1%	0%		
Community Recovery	0.3%	1%	0%		
Countermeasures	0.7%	2%	2%	7%	
Incident Management	19.3%	11%	20%	24%	Positive values equate to preparedness competency

The above table presents data on the relative gap between a capability's strengths and opportunities versus its weaknesses and threats as they pertain to an Ebola or emerging infectious disease public health threat.

The statewide preparedness gap determinations are included to permit comparison of the regional determinations to those of Maryland statewide.

Preparedness capabilities with negative values represent those capabilities with insufficiencies possibly resulting in adverse consequences during incidents and public health threats involving

an emerging infectious disease such as Ebola. Whereas, capabilities with positive values are those capabilities for which Maryland ESF 8 partners and stakeholders are most competent.

Also included in the above table are the frequencies with which each capability was cited within the SWOT Analysis. As mentioned earlier, the frequencies with which a capability was cited in the SWOT Analysis as well as within each SWOT category, reflects the relative importance of each capability for survey respondents. These values were included to assist reviewers in identifying those capabilities requiring corrective actions and or improvement plans.

For example, under the statewide column, both Planning and Responder Safety and Health both demonstrate preparedness insufficiencies of minus 10. However, Planning was cited with a frequency of 18% relative to Responder Safety and Health of 4%. Therefore, the preparedness capability, planning, carries relatively more importance for the ESF 8 stakeholders and partners and subsequently should be the focus of more robust corrective actions and improvement plans.

Region 4 Capability Analysis with Recommendations and Sustainment, Improvement and Corrective Actions Matrix by Capability Corrective Actions Matrix by Capability

Region 4 Capability Analysis: Incident Management

Region 4: Incident Management	Recommended Sustainment, Improvements and Corrective Actions	Priority : High Med Low
Strengths:		
<ul style="list-style-type: none"> Pre-existing partnerships and a good ESF 8 base permitting local agencies to work well together to support operations. These are also enhanced through the support of DHMH, incident management experience and emergency operations coordination. Excellent leadership at the state level by DHMH in conjunctions with a very strong network of providers. 	<ul style="list-style-type: none"> 	
Weaknesses:		
<ul style="list-style-type: none"> Failure of agencies to provide adequate NIMS training in Unified Command combined with a lack of understanding by some partners of public health capabilities. 	<ul style="list-style-type: none"> Allocate HPP or other funding for NIMS, ICS and HICS training for healthcare coalition members in order to increase understanding of incident management principles and applications Encourage attendance to advanced courses, including level ICS 300 and 400 classes Conduct exercises to test incident management understanding and application during an infectious disease response. 	

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Region 4: Incident Management	Recommended Sustainment, Improvements and Corrective Actions	Priority : High Med Low
Opportunities:		
<ul style="list-style-type: none"> • Building further collaboration between existing partners as well as expanding the partner base to include new members as well as maintaining strong relationships with local health departments. • Sharing of experiences of those partners and individuals who are familiar with and evaluated regional responses to emerging infectious diseases. 	<ul style="list-style-type: none"> • Recruit new members to the Region IV healthcare coalition in order to improve understanding of existing resources and plans for an infectious disease outbreak. • Develop a mechanism to share lessons learned among Region IV healthcare partners. 	
Threats:		
<ul style="list-style-type: none"> • Presence of silos and failure to break them down 	<ul style="list-style-type: none"> • Continue to develop a regional healthcare coalition structure that limits the presence of silos by incorporating cross-training and interagency learning opportunities. • Identify key points that draw individuals and agencies into the group discussions to provide an understanding of the benefits of collaboration • Develop regional plans or guidance that improves transparency regarding roles and responsibilities of each sector during an infectious disease outbreak. 	

Region 4 Capability Analysis: Resource Management

Region 4: Resource Management	Recommended Sustainment, Improvements and Corrective Actions	Priority High Med Low
Strengths:		
<ul style="list-style-type: none"> Sharing of scarce resources and the use of available stakeholders both internally and externally to leverage their capabilities 	<ul style="list-style-type: none"> Review and revise the DRHMAG MOU to include broad-based resource sharing agreements among members. 	
Weaknesses:		
<ul style="list-style-type: none"> Sharing of scarce resources and the use of available stakeholders both internally and externally to leverage their capabilities 	<ul style="list-style-type: none"> Review and revise the DRHMAG MOU to include broad-based resource sharing agreements among members. 	
Opportunities:		
Threats:		
<ul style="list-style-type: none"> Increased demand for limited availability of resources such as PPE. This in the face of overwhelmed resource needs for cleaning and disposal of ebola contaminated items. 	<ul style="list-style-type: none"> Develop a regional resource management plan that addresses a variety of infectious disease or environmental hazard responses to ensure all-hazards preparation. Develop a regional cache of PPE resources that can be used for a variety of infectious disease or environmental hazard responses to ensure all-hazards preparation. 	

Region 4 Capability Analysis: Information Management

Region 4: Information Management	Recommended Sustainment, Improvements and Corrective Actions	Priority High Med Low
Strengths:		
<ul style="list-style-type: none"> Information sharing and communications including emergency public information and warning through the application of communications tools, protocols and best practices among local health departments, hospitals and other public health agencies regarding information sharing. DHMH is a good source through frequent emails being pushed out as well as accessibility to HAN for up-to the minute updates from CDC. 	<ul style="list-style-type: none"> Develop regional information sharing standards of operation that leverage existing emergency information and warning networks and reach across agency/geographic boundaries. 	
Weaknesses:		
<ul style="list-style-type: none"> Lack of educational efforts directed to the healthcare team about Ebola virus disease and its transmission. "Ebola Fear" 	<ul style="list-style-type: none"> Develop regional information sharing standards of operation that leverage existing emergency information and warning networks and reach across agency/geographic boundaries. Work with State and Federal partners to clarify local/regional information requirements. 	
Opportunities:		
<ul style="list-style-type: none"> Building better communications between local emergency preparedness professionals 	<ul style="list-style-type: none"> Develop regional information sharing standards of operation that leverage existing emergency information and warning networks and reach across agency/geographic boundaries. 	

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Region 4: Information Management	Recommended Sustainment, Improvements and Corrective Actions	Priority High Med Low
Threats:		
<ul style="list-style-type: none"> Public panic and hysteria due to the lack of understanding of Ebola disease and the spread of myths and rumors 	<ul style="list-style-type: none"> Allocate funding for public information and risk management training to expand regional understanding and expertise, as well as to develop targeted messages during public health or medical emergencies. Leverage existing resources to develop PIO infrastructure that can virtually support regional operations. 	

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Region 4 Capability Analysis: Planning

Region 4: Planning	Recommended Sustainment, Improvements and Corrective Actions	Priority High Med Low
Strengths:		
<ul style="list-style-type: none"> Ongoing regional planning from an all hazards operational perspective as well as addressing planning from the view point of limited communications, facilities, transportation, etc. Important to regional planning is the identification of gaps so the regional can move towards ensuring we do not experience the same gaps through mitigation. Well prepared Emergency Medical Services 	<ul style="list-style-type: none"> Sustain current regional planning efforts. Sustain relationships between ESF-8 entities. 	
Weaknesses:		
<ul style="list-style-type: none"> Shifting policy, responses, advisories and procedures pushed out from CDC to DHMH but with limited direction. Lack of planning, training and support for correctional healthcare workers. 	<ul style="list-style-type: none"> Work with State and Federal partners to clarify local/regional information requirements. Develop/improve relationships with correctional healthcare workers through invitations to participate in regional and local healthcare coalitions. Provide regional healthcare coalition training on correctional healthcare system, policies and procedures during public health emergencies. 	
Opportunities:		
<ul style="list-style-type: none"> Partnering of all healthcare infrastructure through the coalition with the opportunity to refine plans involving communications, 	<ul style="list-style-type: none"> Develop regional healthcare coalition standards of operation guidelines for membership and ESF-8 partners. 	

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Region 4: Planning	Recommended Sustainment, Improvements and Corrective Actions	Priority High Med Low
decontamination, transportation, surveillance and treatment.		
Threats:		
<ul style="list-style-type: none"> The notion of a "Health Authority". 		

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Region 4 Capability Analysis: Exercise and Training

Region 4: Exercise and Training	Recommended Sustainment, Improvements and Corrective Actions	Priority High Med Low
Strengths:		
Weaknesses:		
<ul style="list-style-type: none"> Lack of training 	<ul style="list-style-type: none"> Support local training efforts for ESF-8 emergencies through allocation of funding or organization of opportunities. 	
Opportunities:		
<ul style="list-style-type: none"> Practicing plans through exercises 	<ul style="list-style-type: none"> Develop comprehensive, all-hazards regional training and exercise plan based on signed local agency and regional healthcare coalition plans. 	
Threats:		
<ul style="list-style-type: none"> Health care workers do not possess sufficient training in caring for suspected Ebola patients 	<ul style="list-style-type: none"> Assist local agencies and healthcare coalition members in identifying and setting healthcare worker training standards for infectious disease emergencies. 	

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Region 4 Capability Analysis: Community Preparedness and Recovery

Region 4: Community Preparedness and Recovery	Recommended Sustainment, Improvements and Corrective Actions	Priority High Med Low
Strengths:		
Weaknesses:		
Opportunities:		
Threats:		
<ul style="list-style-type: none"> Lack of cultural sensitivity. 	<ul style="list-style-type: none"> Leverage personnel within the State or region trained in public information and risk management to develop cultural sensitivity training for healthcare coalition members. Request State guidelines on culturally sensitive communication for emerging infectious diseases. 	

Region 4 Capability Analysis: Mass Care and Medical Surge

Region 4: Mass Care and Medical Surge	Recommended Sustainment, Improvements and Corrective Actions	Priority High Med Low
Strengths:		
<ul style="list-style-type: none"> Alternate care sites and medical surge 	<ul style="list-style-type: none"> Continue regional plan and guidance development for medical surge and alternate care sites. 	
Weaknesses:		
Opportunities:		
Threats:		
<ul style="list-style-type: none"> 24-7 care needs combined with holistic care in the face of limited bed availability 	<ul style="list-style-type: none"> Leverage relationships between regional healthcare coalitions to determine appropriate partnerships during public health emergencies. Continue to develop realistic medical surge and alternate care site plans/guidance based on existing limitations for bed availabilities. 	

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Region 4 Capability Analysis: Responder Safety

Region 4: Responder Safety	Recommended Sustainment, Improvements and Corrective Actions	Priority High Med Low
Strengths:		
<ul style="list-style-type: none"> Responder safety and health 	<ul style="list-style-type: none"> Continue to support local agency efforts in training responders for appropriate health and safety considerations. Develop regional guidance for responder safety and health training and standards. 	
Weaknesses:		
<ul style="list-style-type: none"> Lack of general protocols regarding PPE for health departments and hospitals. 	<ul style="list-style-type: none"> Assist local agencies and healthcare coalition members in identifying and setting healthcare worker training standards for infectious disease emergencies. 	
Opportunities:		
Threats:		
<ul style="list-style-type: none"> Restriction on those that have treated Ebola patients. Failure to understand how decontamination can be enhanced through sunlight. 	<ul style="list-style-type: none"> Maintain an open and consistent dialogue with State and Federal partners regarding recommended quarantine or other protective measures required for healthcare workers. The State should improve transparency by providing timely and complete information to regional healthcare coalitions and local ESF-8 partners. 	

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Region 4 Capability Analysis: Volunteer Management

Region 4: Volunteer Management	Recommended Sustainment, Improvements and Corrective Actions	Priority High Med Low
Strengths:		
Weaknesses:		
<ul style="list-style-type: none"> Inadequate staff to handle a large event 	<ul style="list-style-type: none"> Develop healthcare coalition partnerships and MOUs that enable local agencies to leverage all available personnel. Establish common credentialing for Region IV healthcare workers and incident management staff. 	
Opportunities:		
Threats:		
<ul style="list-style-type: none"> Lack of human resources available to manage an outbreak 	<ul style="list-style-type: none"> Develop healthcare coalition partnerships and MOUs that enable local agencies to leverage all available personnel. Establish common credentialing for Region IV healthcare workers and incident management staff. Improve relationships with academic centers in Region IV for recruitment and use of staff and students during public health emergencies. 	

Region 4 Capability Analysis: Public Health Surveillance and Epidemiological Investigation

Region 4: Public Health Surveillance and Epidemiological Investigation	Recommended Sustainment, Improvements and Corrective Actions	Priority High Med Low
Strengths:		
<ul style="list-style-type: none"> Surveillance for illness and disease 	<ul style="list-style-type: none"> Sustain. 	
Weaknesses:		
<ul style="list-style-type: none"> Lack of clear plans to restrict individuals to prevent spread of disease 	<ul style="list-style-type: none"> The State should improve understanding and transparency by providing timely and complete guidelines regarding public/individual quarantine to regional healthcare coalitions and local ESF-8 partners. 	
Opportunities:		
Threats:		
<ul style="list-style-type: none"> Failure of individuals to follow isolation and quarantine orders Inability to contain exposure due to noncompliance with quarantine orders thus requiring law enforcement intervention 	<ul style="list-style-type: none"> The State should improve understanding and transparency by providing timely and complete guidelines regarding public/individual quarantine to regional healthcare coalitions and local ESF-8 partners. 	

Region 4 Capability Analysis: Fatality Management

Region 4: Fatality Management	Recommended Sustainment, Improvements and Corrective Actions	Priority High Med Low
Strengths:		
<ul style="list-style-type: none"> Mass fatality management 		
Weaknesses:		
Opportunities:		
Threats:		
<ul style="list-style-type: none"> Mass fatalities with failure to properly dispose of decedent remains in a manner which poses no or little threat to the living 	<ul style="list-style-type: none"> Improve understanding of local and State Mass Fatality Plans among healthcare coalition members. Consider regional mass fatality guidance if necessary. 	

Region 4 Capability Analysis: Non-pharmaceutical Intervention

Region 4: Non-pharmaceutical Intervention	Recommended Sustainment, Improvements and Corrective Actions	Priority High Med Low
Strengths:		
<ul style="list-style-type: none"> Isolation and quarantine and application of non-pharmaceutical interventions 		
Weaknesses:		
Opportunities:		
Threats:		

SECTION 13: MARYLAND STATEWIDE AND REGION 5 CAPABILITY ANALYSIS

Several different Preparedness Capabilities were discussed as well as cited in the participant feedback surveys and exercise assessments. The following sections attempt to provide a systematic approach to the assessment and prioritization of the cited capabilities within the analysis of statewide SWOT comments and observations.

The following table presents data on the number of comments as well as the calculated frequency that each capability was cited in the total SWOT data as a strength, weakness, opportunity or threat.

Issues and observations related to Incident Management and Resource Management were the most numerous followed by Planning and Information Management. Given the number as well as frequency these four capabilities were cited within the SWOT analysis, it can be assumed that these represented those capabilities most important or of concern to Ebola exercise participants.

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Table 3: Number and Frequency that Each Capability was Cited in the Statewide and Regions 5 SWOT Analysis

Capability	Statewide		Region 5	
	Number	Frequency Cited	Number	Frequency Cited
Incident Management	57	19%	12	22%
Resource Management	56	19%	8	15%
Planning	54	18%	22	41%
Information Management	50	17%	4	7%
Exercise and Training	21	7%	1	2%
Public Health Surveillance and Epidemiological Investigation	14	5%	1	2%
Responder Safety and Health	11	4%	3	6%
Fatality Management	10	3%	1	2%
Community Preparedness	6	2%	2	4%
Mass Care	7	2%	0	0%
Volunteer Management	5	2%	0	0%
Countermeasures	2	1%	0	0%
Medical Surge	1	0%	0	0%
Community Recovery	1	0%	0	0%
Total Comments	295		54	

SECTION 14: REGION 5 CAPABILITY ANALYSIS AND RECOMMENDATIONS AND IMPROVEMENT MATRICES

Relative Frequencies Of Capabilities Cited As Either A Strength, Weakness, Opportunity Or Threat In Regions 5

The following tables present capability rankings by the frequency that the respective capabilities were cited as either a Strength, Weakness, Opportunity or Threat to an Ebola illness or suspected disease case or emerging infectious disease within the corresponding Maryland sub-state region.

Therefore, it is possible to infer the relative importance of each cited capability within each relevant SWOT category singular to this specific exercise scenario. Inferences cannot and should not be made for other types of public health emergencies.

Examination of the tables may reveal that the same capability maybe highly important as a Strength, Weakness, Opportunity and or Threat in more than one SWOT category. This apparent conundrum can be explained by the understanding that several different activities, roles and responsibilities make up each capability.

For example, one aspect or activity comprising a capability such as *Emergency Operations Coordination* may be considered as a strength while *Command and Control* may be evaluated as a weakness, opportunity to threat to *Incident Management Operations*.

Table 14.5: Region 5 Capability Relationships Across SWOT Categories presents the capability rankings for each SWOT category in a combined table. This permits the determination of the relative importance of each capacity across the respective SWOT categories.

Region 5: Strengths**Table14.1: Frequency of Importance that the Respective Capabilities were Cited as Strengths.**

Capabilities	Frequency Cited
Planning	47%
Incident Management	33%
Information Management	7%
Resource Management	7%
Responder Safety and Health	7%

Region 5: Weaknesses**Table14.2: Frequency of Importance that the Respective Capabilities were Cited as Weaknesses**

Capabilities	Frequency Cited
Planning	39%
Incident Management	22%
Information Management	11%
Responder Safety and Health	11%
Resource Management	6%
Exercise / Training	6%
Fatality Management	6%

Region 5: Opportunities**Table14.3: Frequency of Importance that the Respective Capabilities were Cited as Opportunities**

Capabilities	Frequency Cited
Planning	57%
Incident Management	14%
Resource Management	14%
Public Health Surveillance and Epidemiological Investigation	14%

Region 5: Threats**Table14.4: Frequency of Importance that the Respective Capabilities were Cited as Threats**

Capabilities	Frequency Cited
Resource Management	36%
Planning	29%
Community Preparedness	14%
Incident Management	14%
Information Management	7%

The following table presents the combined data from the previous four tables and highlights preparedness capabilities to visually demonstrate the relationship of each capability within the SWOT categories.

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Table 14.5: Region 5 Capability Relationships Across SWOT Categories

Region 5 Capability Relationships Across the SWOT Categories			
Strengths	Weaknesses	Opportunities	Threats
Planning 47%	Planning 39%	Planning 57%	Resource Management 36%
Incident Management 33%	Incident Management 22%	Incident Management 14%	Planning 29%
Information Management 7%	Information Management 11%	Resource Management 14%	Community Preparedness
Resource Management 7%	Responder Safety and Health	Public Health Surveillance and Epidemiological Investigation	Incident Management 14%
Responder Safety and Health	Resource Management 6%		Information Management 7%
Fatality Management	Exercise / Training 6%		
Volunteer Management	Fatality Management		
Mass Care			
Non-pharmaceutical Interventions			
Public Health Surveillance and Epidemiological Investigation			

Prioritization Of Capabilities For Interventions To Improve Statewide Ebola Preparedness Planning And Response

The difficult question raised as a result of the Regional Ebola Exercises from the perspective of the Office of Preparedness and Response is, "How do DHMH, OPR and regional coalitions prioritize the expenditure of funds as well as time and effort for the enhancement and improvement of Preparedness Capabilities related to the emerging infectious disease of Ebola?"

Determination of where to focus time and effort for the maximum benefit and impact is not easy to determine by examination of the data in the previous section. Therefore, another means of assessing the value, importance and impact of each capability during an emerging infectious disease public health threat and incident is required.

One method to assess the relative efficacy and value of each preparedness capability during an Ebola response is to determine the differential between the number of positive (Strengths and Opportunities) and negative (Weaknesses and Threats) observations for each capability noted in the SWOT analysis.

Therefore, the following formula was used to differentiate and quantify the relative differences between a capability's positive and negative comments.

$$\text{Capability Differential} = (C_S * A) + (C_W * B) + (C_O * C) + (C_T * D) / \text{Total Number of SWOT Observations}$$

Where C_S , C_W , C_O and C_T represent the number of times the capability was noted as a Strength (C_S), Weakness, Opportunity or Threat within the SWOT analysis. Whereas, A, B, C and D are correction factors for the weighted value assigned to each SWOT category. These values are presented in the following table.

Table 14.6: Weighted Values for SWOT Categories Used in Capability Gap Analysis

Weighted Values		
A	Strength	3
B	Weakness	-3
C	Opportunity	1
D	Threat	-5

Opportunities are given a weighed value of (+) 1 because they can be thought of as activities not yet completed or incorporated into emergency preparedness paradigm, whereas, strengths are "real" and tangible as an operational component. Therefore, Strengths are assigned a weighted value/correction factor of (+) 3.

Although in a traditional business SWOT analysis, Weaknesses are internal to the business while Threats are external. However, in this application, Weaknesses and Threats are considered "internal" to Maryland and thus both impact Ebola response. In addition, threats are considered to have greater potential negative impact and thus given a weighted value of (-) 5 relative to the (-) 3 for Weaknesses.

Why are Threats given (-) 5 or higher value relative to Strengths (+) 3? The inherent bias introduced by this differential is purposeful. The intent is to emphasize the relative gap between capability strengths and opportunities versus their weaknesses and threats.

Table 8: *Relative Preparedness Gap Assessment for Each Preparedness Capability Relative to Strengths and Opportunities Versus Weaknesses and Threats*, presents the prioritization of Preparedness Capabilities according to the calculated gap between their respective positive and negative observations.

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Table 14.7: Relative Preparedness Gap Assessment for Each Preparedness Capability Relative to Strengths and Opportunities versus Weaknesses and Threats

Capability	Statewide		Regions 5		Interpretation
	Frequency Cited	Preparedness Gap	Frequency Cited	Preparedness Gap	
Resource Management	19.0%	-43%	15%	-44%	Negative values equate to capability insufficiencies
Exercise and Training	7.1%	-13%	2%	-6%	
Community Preparedness	2.0%	-10%	4%	-19%	
Planning	18.3%	-10%	41%	-30%	
Responder Safety and Health	3.7%	-9%	6%	-6%	
Fatality Management	3.4%	-9%	2%	-6%	
Public Health Surveillance and Epidemiological Investigation	4.7%	-8%	2%	2%	
Mass Care	2.4%	-6%	0%		
Information Management	16.9%	-5%	7%	-15%	
Volunteer Management	1.7%	-4%	0%		
Medical Surge	0.3%	-1%	0%		
Community Recovery	0.3%	1%	0%		
Countermeasures	0.7%	2%	0%		
Incident Management	19.3%	11%	22%	-11%	Positive values equate to preparedness competency

The above table presents data on the relative gap between a capability's strengths and opportunities versus its weaknesses and threats as they pertain to an Ebola or emerging infectious disease public health threat.

The statewide preparedness gap determinations are included to permit comparison of the regional determinations to those of Maryland statewide.

Preparedness capabilities with negative values represent those capabilities with insufficiencies possibly resulting in adverse consequences during incidents and public health threats involving an emerging infectious disease such as Ebola. Whereas, capabilities with positive values are those capabilities for which Maryland ESF 8 partners and stakeholders are most competent.

Also included in the above table are the frequencies with which each capability was cited within the SWOT Analysis. As mentioned earlier, the frequencies with which a capability was cited in the SWOT Analysis as well as within each SWOT category, reflects the relative importance of each capability for survey respondents. These values were included to assist reviewers in identifying those capabilities requiring corrective actions and or improvement plans.

For example, under the statewide column, both Planning and Responder Safety and Health both demonstrate preparedness insufficiencies of minus 10. However, Planning was cited with a frequency of 18% relative to Responder Safety and Health of 4%. Therefore, the preparedness capability, planning, carries relatively more importance for the ESF 8 stakeholders and partners and subsequently should be the focus of more robust corrective actions and improvement plans.

Region 5 Capability Analysis with Recommendations and Sustainment, Improvement and Corrective Actions Matrix by Capability

Region 5 Capability Analysis: Incident Management

Region 5: Incident Management	Recommended Sustainment, Improvements and Corrective Actions	Priority : High Med Low
Strengths:		
<ul style="list-style-type: none"> • Collaboration amongst the regions and leadership by the governor. In addition local collaboration for preparedness and planning by which shared policies and processes were developed 		
Weaknesses:		
<ul style="list-style-type: none"> • Identification of community partners with the lack of any type of incident management structure. For example, the need to establish a chain of command in terms of communication 		
Opportunities:		
Threats:		
<ul style="list-style-type: none"> • Failure of timely response and political maneuvering over CDC recommendations 		

Region 5 Capability Analysis: Resource Management

Region 5: Resource Management	Recommended Sustainment, Improvements and Corrective Actions	Priority High Med Low
Strengths:		
<ul style="list-style-type: none"> A lot of state partners have some PPE 		
Weaknesses:		
<ul style="list-style-type: none"> Access to PPE and its limited supply 		
Opportunities:		
Threats:		
<ul style="list-style-type: none"> Lack of availability of certain types of PPE in addition to dwindling supplies and amounts of material Problems and difficulty with disposing of and transporting large amounts of contaminated infectious waste from Ebola patients 		

Region 5 Capability Analysis: Information Management

Region 5: Information Management	Recommended Sustainment, Improvements and Corrective Actions	Priority High Med Low
Strengths:		
<ul style="list-style-type: none"> Communication of ever changing guidance 		
Weaknesses:		
<ul style="list-style-type: none"> Communications and the misinformation among agencies outside DHMH 		
Opportunities:		
Threats:		
<ul style="list-style-type: none"> Fear 		

Region 5 Capability Analysis: Planning

Region 5: Planning	Recommended Sustainment, Improvements and Corrective Actions	Priority High Med Low
Strengths:		
<ul style="list-style-type: none"> Organization and outbreak planning has already occurred with a lot of state partner having existing protocols in conjunction with discussions of existing protocols. Pre-identification of designated hospitals for the treatment and care of Ebola patients. 	<ul style="list-style-type: none"> 	
Weaknesses:		
<ul style="list-style-type: none"> Planning made on quick decisions based upon fear instead of looking at the total picture and making plan changes based upon accurate knowledge and understanding thus requiring to many changes. Areas felt to be incomplete or lacking include outbreak planning, patient transportation, consistent PPE guidelines and different PPE guidelines and protocols between facilities. 	<ul style="list-style-type: none"> 	
Opportunities:		
<ul style="list-style-type: none"> Opportunity to review existing MOUs and to update them as well as to discuss different strategies with the health care partners who have existing protocols 	<ul style="list-style-type: none"> 	

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Region 5: Planning	Recommended Sustainment, Improvements and Corrective Actions	Priority High Med Low
Threats:		
<ul style="list-style-type: none"> Lack of consistent plans and the impact of competing priorities. Two difficult areas include patient transport and the gap in protocol requirement for speedy notification if infected or persons with symptoms appear 	<ul style="list-style-type: none"> 	

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Region 5 Capability Analysis: Exercise and Training

Region 5: Exercise and Training	Recommended Sustainment, Improvements and Corrective Actions	Priority High Med Low
Strengths:		
Weaknesses:		
Opportunities:		
Threats:		

Region 5 Capability Analysis: Community Preparedness and Recovery

Region 5: Community Preparedness and Recovery	Recommended Sustainment, Improvements and Corrective Actions	Priority High Med Low
Strengths:		
Weaknesses:		
Opportunities:		
Threats:		
Lack of readiness and funding		

Region 5 Capability Analysis: Mass Care and Medical Surge

Region 5: Mass Care and Medical Surge	Recommended Sustainment, Improvements and Corrective Actions	Priority High Med Low
Strengths:		
Weaknesses:		
Opportunities:		
Threats:		

Region 5 Capability Analysis: Responder Safety

Region 5: Responder Safety	Recommended Sustainment, Improvements and Corrective Actions	Priority High Med Low
Strengths:		
<ul style="list-style-type: none"> Employee safety assurances 		
Weaknesses:		
<ul style="list-style-type: none"> PPE needs to be updated and effectiveness improved through standardization to reduce the amount of confusion amongst healthcare workers at several regional facilities 		
Opportunities:		
Threats:		

Region 5 Capability Analysis: Volunteer Management

Region 5: Volunteer Management	Recommended Sustainment, Improvements and Corrective Actions	Priority High Med Low
Strengths:		
Weaknesses:		
Opportunities:		
Threats:		

Region 5 Capability Analysis: Public Health Surveillance and Epidemiological Investigation

Region 5: Public Health Surveillance and Epidemiological Investigation	Recommended Sustainment, Improvements and Corrective Actions	Priority High Med Low
Strengths:		
Weaknesses:		
Opportunities:		
<ul style="list-style-type: none"> Outbreak planning 		
Threats:		

Region 5 Capability Analysis: Fatality Management

Region 5: Fatality Management	Recommended Sustainment, Improvements and Corrective Actions	Priority High Med Low
Strengths:		
Weaknesses:		
<ul style="list-style-type: none"> Fatality Management not well planned 	<ul style="list-style-type: none"> 	
Opportunities:		
<ul style="list-style-type: none"> Outbreak planning 	<ul style="list-style-type: none"> 	
Threats:		

SECTION 15: CONCLUSION

In anticipation of an outbreak of Ebola in Maryland, OPR conducted six tabletop exercises across Maryland. The findings of the respective regional exercises represent information from two data sources. The preparedness analyses conducted for this AAR are based upon the hot wash key points and lessons learned discussed following the table top exercises.

In addition, OPR canvassed participants using a SWOT Analysis based on-line survey tool to assess various public health preparedness capabilities which could directly affect the department's ability to protect community's health during an emerging infectious disease incident.

Information obtained from both sources was identified by preparedness capability and categorized according to the modified SWOT paradigm developed and applied by OPR.

Utilization and application of SWOT analysis permitted quantitative evaluation of effectiveness for prioritizing public health program objectives with significant community impact

The number and frequency of comments made for each SWOT category under each capability was determined. The relationship between capabilities within the SWOT categories was tabulated, as well as the relationship of capabilities across SWOT categories. Lastly, a mathematical computation was utilized to assess the relative insufficiencies vs. competencies for each capability.

Maryland statewide capability analysis demonstrated that incident management was a frequently cited strength (31%) and opportunity (25%); ranking low as a weakness (16%) and threat (6%) when considered within the parameters of the table top exercise. The calculated preparedness gap for incident management was positive 11%. This supports the subjective analysis that Maryland processes a competency for this capability.

Whereas, resource management ranked low as a strength (10%), but rated highly as a weakness (20%) and threat (29%). Whereas, when the preparedness gap was calculated, resource management had a negative 43%. This negative value supports the interpretation that resource management represents a significant preparedness insufficiency within the confines of planning and responding to an EVD outbreak in Maryland. The other most frequently cited capabilities also demonstrated preparedness insufficiencies: exercise and training (-13%), planning (-10%) and information management (-5%).

Determination of relative preparedness of competency gaps between these capabilities indicate greater insufficiencies and gaps in resource management, exercise and training, planning and information management compared to incident management *as delineated within the parameters of the table top exercise scenario.*

Therefore, ESF 8 planning for Ebola at the state level may focus on and prioritize resource management, exercise and training, planning and information management when preparing for an Ebola outbreak.

The findings when examined at the Maryland sub-state regional level have been shown to differ compared to the statewide level. These differences reflect the varying levels of integration across sub-state regional preparedness partners as well as the regional coalitions.

For example Region 4 has a positive 24% preparedness rating for incident management relative to Region 5's negative 11%.

This discrepancy in Maryland sub-state regions holds for other preparedness capabilities. Planning was demonstrated to be a significant concern across Maryland. However, Region 4, planning demonstrated a preparedness competency of positive 7 % whereas Regions 1&2, 3 and 5 had planning capability insufficiencies of negative 11%, 15% and 30%, respectively.

Therefore, each sub-state region must be prepared to prioritize and address capability gaps based upon their individual strengths and weaknesses.

Simultaneously regional preparedness planning efforts should be aligned to those activities occurring at the state level.

Much planning has occurred since the conduct of these Ebola Table Top Exercises. Ongoing activities have included but not been limited to:

- Creation of a draft Maryland EVD ConOps;
- Creation of a draft HHS Region 3 EVD ConOps with our interstate partners;
- Receipt of federal EVD funds to augment current preparedness activities and capabilities with an emphasis on emerging infectious diseases;
- Development of collaborative work groups at several levels to coordinate and address EVD planning and response.

A final comment and caveat is required concerning the findings presented in this AAR. Although some generalization about the capabilities can be drawn, *the findings as they relate to the preparedness capabilities are specific to the Ebola Virus Disease outbreak scenario.*

Therefore, OPR cautions against generalization of the capability deficiencies and insufficiencies identified by this TTX since under other circumstances, incidents and threats they may represent strengths. For example, resource management was identified as a strength during the Maryland Statewide Strategic National Stockpile Exercise in 2013.

APPENDIX A: LESSONS LEARNED

While the After Action Report/Improvement Plan includes recommendations which support development of specific post-exercise corrective actions, exercises may also reveal lessons learned which can be shared with the broader homeland security audience.

Best Practice: Application of SWOT to Exercise Assessment and Evaluation

Utilization of a modified SWOT Analysis is a paradigm for developing a comprehensive narrative of strengths and weakness for each capability exercised or drilled. The benefit of using the SWOT process to analyze exercises and training is further augmented and reinforced through the use of mathematical algorithms for the quantification of gaps and competency for preparedness capabilities. Such quantification will permit emergency planners to justify and prioritize sustainment, recommendations and corrective actions for improvement of emergency response operations.

Best Practice: Formation of Small Groups Reflective of the Regional Coalition as a Whole

For the series of table top exercises, participants were divided into small groups. These small groups mirrored the composition of the regional coalition. By dividing table top participants up into small groups reflective of the regional coalition those new members or ones reticent to talk during full coalition meetings were given the opportunity to:

- Participate fully in "regional" discussions
- Meet new and old members from different disciplines and agencies on a more personal basis;
- Became familiar to the regional coalition members from other small groups when members had to present the activities and findings from each respective small group.

APPENDIX B: TRANSCRIPT OF PBS FRONTLINE VIDEO

<http://www.pbs.org/wgbh/pages/frontline/health-science-technology/ebola-outbreak/transcript-67/>

PBS Frontline: Ebola Outbreak

REPORTER: Shaunagh Connaire

PRODUCED AND DIRECTED BY: Wael Dabbous

July 2014

NARRATOR: In Sierra Leone, West Africa, a catastrophe is unfolding, the world's deadliest outbreak of Ebola. Sebastian Stein is part of the team at an emergency field hospital that's been built by the relief group Doctors Without Borders.

SEBASTIAN STEIN: You see patients in the most horrible states, and— and you can have patients who come in one day, and the next day, I'm packing them in a body bag. People are dying left and right here.

NARRATOR: Another patient has just died. Sebastian, who's in charge of the morgue, must enter the isolation tent to recover the body.

SEBASTIAN STEIN: *[to team member]* You need to be covered everywhere, so you have to have no exposed skin, so that there's no chance of being in direct contact with— with a patient or with bodily fluids from a patient.

NARRATOR: The Ebola virus doesn't travel through the air but through contact with bodily fluids.

SEBASTIAN STEIN: Here's a tiny bit here. OK?

NARRATOR: The virus causes vomiting, diarrhea and bleeding. Simply touching a victim can be fatal.

Beyond the orange barrier are the wards holding patients infected with the virus. The latest victim is a 9-year-old boy. His body is still highly infectious. Sebastian's morgue ledger is filling up.

SEBASTIAN STEIN: So we'll put in number 78 now, in a few minutes. So yeah, and that's just since the first— the first registration here is the 2nd of July, so that's— yeah, that's exactly one month tomorrow.

This isn't a nice book. It's thick. I hope we don't need to fill the whole thing.

NARRATOR: An ambulance brings more victims, six members of the same family.

SEBASTIAN STEIN: This has spread at an unprecedented level. I mean, we've never seen such a large outbreak, ever in recorded history. And so now we come here to try to do to the best of our ability, but we're always stretched.

1st NURSE: *[subtitles]* Ebola is the family destroyer!

2nd NURSE: *[subtitles]* When Ebola infects one person in a family, everybody dies. So be warned!

NARRATOR: Local nurses are on the streets, warning the outbreak is worsening. Even in the Doctors without Borders hospital, Ebola is killing 70 percent of those it infects. Because so few people who go to the hospital ever return, victims are hiding in their homes and infecting their families.

The only way to contain Ebola is to isolate the infected. Manjo Lamin works with one of Sierra Leone's disease surveillance teams. It's their job to find victims and get them to the Doctors without Borders hospital. But Manjo and his seven colleagues can't keep up with the number of cases.

MANJO LAMIN: *[subtitles]* It's not actually easy to find people who are willing to work, so the few willing ones have more work to do.

NARRATOR: Two weeks ago, Manjo went through a terrifying ordeal when he was quarantined with suspected Ebola. It turned out to be a false alarm and he returned to work. Now he's about to head to another contaminated village.

MANJO LAMIN: If I give up, it's like I'm putting more people at risk. They will transmit the disease to a lot of people, and many people will die. We'll not be able to control the situation.

NARRATOR: The surveillance team has only four vehicles to monitor the half million people living at the center of the outbreak. They meet up with the vehicle that's being used to transport Ebola victims. It's a hearse.

MANJO LAMIN: *[to hearse driver]* Brake! Brake! Turn. We're going to Pobengu.

It's the mortuary van, but because we are pressed for materials, we are using it as an ambulance. For today, we will call it an ambulance because we expect to put a live patient there.

NARRATOR: They're heading to a village where Ebola has already killed an old man. Everyone they encounter, even those who look healthy, could be infectious. The team used to wear protective clothing, but the suits terrified the villagers, who ran, hid and sometimes even attacked them. Manjo now relies on keeping his distance from everyone he meets.

MANJO LAMIN: *[subtitles]* My name is Manjo. And this is Ishata from the World Health Organization.

NARRATOR: A young woman is clearly unwell.

MANJO LAMIN: *[subtitles]* What's wrong with you?

NARRATOR: Kadiatu Jusu is 25 years old, the mother of four children.

ISHATA: *[subtitles]* Do you have fever? Temperature?

KADIATU JUSU: *[subtitles]* Yes, I have a temperature, diarrhea, and I'm vomiting.

NARRATOR: Her husband, Fallah, is a farmer. He's 35. It was his father who died two weeks ago. Ishata Conteh can see Kadiatu is almost certainly infected.

ISHATA: She actually fits into the case definition because she was the one taking care of the old man, feeding him, cleaning where the old man was vomiting. And there was direct physical contact.

MANJO LAMIN: *[subtitles]* I'm going to spray this area.

NARRATOR: Manjo disinfects Kadiatu's home with chlorine. Everything she touched could have been contaminated. Ishata notes the names of everyone who's been in close contact with Kadiatu. Her children and husband are at the top of the list.

ISHATA: All these 17 people here, if anyone gets fever or the cough or feels like they have malaria or pain all over their body, or vomits, or goes to the toilet a lot— any one of these symptoms, you must call us.

They are all like at risk. We need to monitor them for the next 21 days.

FALLAH JUSU: My father passed away. And she, too, is going with the same thing.

NARRATOR: Fallah can't risk touching his wife to say goodbye.

ISHATA: I just feel sorry because people are dying.

[on the phone] We are on our way with a patient, with a suspected case — well, it's a probable case, actually — to the center.

NARRATOR: They begin the two-hour journey to the Doctors Without Borders hospital. The local hospitals are barely functioning because so many doctors and nurses have died from Ebola.

ISHATA: *[at the hospital]* She has vomited, she said.

NARRATOR: The team at the hospital quickly begins to treat Kadiatu. Although there are no known cures for Ebola, sometimes the body can fight it off, especially if the victim can stay hydrated. A Canadian doctor, Tim Jagatic, passes anti-nausea drugs into the isolation ward.

Dr. TIM JAGATIC: We just gave her a medication to prevent the vomiting, and the RS solution just to rehydrate her, because she's losing a lot of fluid and electrolytes. Our job here is just to kind of keep the body at an optimal state of health so that the immune system can kind of do its work, find the virus, create the antibodies, kill off the virus. And we're just trying to clear the path for the immune system to get to that point.

NARRATOR: The van is disinfected, ready to pick up the next Ebola case on Manjo's list.

The hospital is busy through the night. The pain and the symptoms caused by Ebola mean its victims get little sleep.

Dr. TIM JAGATIC: You need a flashlight?

Some nights are different than others. It all depends. Last night was kind of quiet. The night before, we had one death.

NARRATOR: When the hospital was built four weeks earlier, 64 beds seemed more than enough. That's no longer the case.

Dr. TIM JAGATIC: Yeah, there's, like, an onslaught of patients. We're quickly filling up. We're getting a lot more patients coming in now.

ANJA WOLZ, Doctors Without Borders: This is another problem because one doctor was treating the patient as typhoid.

NARRATOR: Anja Wolz, from Germany, is the Doctors Without Borders emergency coordinator. She says the Sierra Leone government and the international community were slow to react to the virus when it initially appeared.

ANJA WOLZ: To be honest, I feel helpless and frustrated. I always think about my first day. One guy came to me and told me, like, "My brother died, my sister died, my wife died, my child died. Nobody came to disinfect the houses, and I got three body bags for four people. But I don't know how to use it." And I was thinking, "Oh [*expletive deleted*]. We are too late."

NARRATOR: An ambulance arrives, bringing a woman and her little girl. The mother has died on the journey. As the body is carried to the morgue, the girl cries out.

FATMATA: [*subtitles*] I'm feeling cold! Sir! I'm feeling cold!

NARRATOR: Her name is Fatmata. She's 7 years old. Her grandmother died of Ebola at home. As is customary in Sierra Leone, Fatmata touched her body at the funeral.

Sebastian has just been inside the wards to retrieve another body. He saw Fatmata.

SEBASTIAN STEIN: Another patient passed away on the floor right next to this poor little girl. So she's gone through a lot now. We come in dressed up like spacemen, and we can try and say nice things, but the fright and the terror of being alone as a child in a hospital, especially in these circumstances, it's just— it's too much for any small child.

NARRATOR: Later that day, Fatmata died.

Nearby, Kadiatu's symptoms are growing worse. And now the hearse that doubles as an ambulance has arrived with another case from her village. It's her husband, Fallah, whose father died in this hospital two weeks ago.

NURSE: *[subtitles]* When did you start feeling sick?

FALLAH JUSU: *[subtitles]* Actually, yesterday. My wife was sick, and they came for her.

NURSE: *[subtitles]* So how are you feeling?

FALLAH JUSU: *[subtitles]* I have a cough. And a headache also. I also feel pain in my back.

NARRATOR: He's left their four children in the village and joins his wife in the isolation ward.

NARRATOR: Manjo wants to talk to the couple. The fence keeps them six feet apart.

[subtitles]

MANJO LAMIN: Hello, Kadiatu. How are you feeling now?

KADIATU JUSU: Better, thank God.

MANJO LAMIN: A bit better since yesterday? I see you smiling.

Hey, Mr. Fallah Jusu! Do you have a message for your family?

FALLAH JUSU: Tell them to pray to God for us.

MANJO LAMIN: God will protect you, and we will try, too.

KADIATU JUSU: I'm sad because I left my children behind.

FALLAH JUSU: We believe that God will protect the children, and we hope they will not follow the same path as us.

SEBASTIAN STEIN: You found this body in the center of town?

MEN: Yes.

SEBASTIAN STEIN: In Kailahun?

MEN: Yes.

NARRATOR: A dead girl has just been brought to the field hospital.

SEBASTIAN STEIN: You came here and you spoke to the doctor?

MAN: Yes.

SEBASTIAN STEIN: But before?

NURSE: *[subtitles]* Before you called the doctor, who told the doctor about this case?

NARRATOR: But nobody knows who she is.

SEBASTIAN STEIN: Just hold on and I'll just try to figure out what's happened, OK? This guy can't explain properly where the body is coming from.

TEAM MEMBER: There's a body here?

SEBASTIAN STEIN: Yeah, it's a— it's pediatric body bag in there, so—

NARRATOR: Each new victim who arrives here has potentially infected more people. If they can't be traced, then the virus will continue to spread.

SEBASTIAN STEIN: We'll put the body in our mortuary here over the night until we can figure out what— who this is and why this body was brought like this.

So if you can spray the bag, and then we'll take it out and we'll put it in another bag.

I don't think you can get prepared for this. You have to just look at it as a job. It's—

NARRATOR: Manjo and his team head out to a remote village, where two more victims have recently died. They are now in pursuit of yet another infected man.

MANJO LAMIN: Hello! Come here!

NARRATOR: There's no sign of the infected man, and the villagers won't cooperate.

ISHATA: They're scared of us. Why?

MANJO LAMIN: Why are you afraid?

ISHATA: *[subtitles]* Come and talk to us. Aren't we human?

NARRATOR: Manjo says the villagers are afraid of going to the hospital, and they don't realize the infected man could spread the virus.

MANJO LAMIN: These are some of the challenges we get in the field. Some people are scared. Some people still feel if they go to the camp, something will happen to them.

NARRATOR: They have to give up and move on.

ISHATA: For all you know, maybe he is in there. They will hide them. You see when we came, they were running away.

NARRATOR: They later hear that the infected man has fled his village into neighboring Guinea, taking the virus with him.

One of the reasons the outbreak has persisted is that infected people travel freely across the borders between Sierra Leone, Liberia and Guinea. It's causing panic and unrest.

In nearby Kenema, the third largest town in Sierra Leone, rumors about the virus have brought people onto the streets. A story is going around that Ebola is a hoax, a trick devised by doctors to steal people's blood. The rioters are trying to break down the hospital gates and rescue the patients inside.

BYSTANDER: *[listening to radio] [subtitles]* They say this Ebola is a lie. It's not Ebola. They want people's blood. That's what they're saying.

NARRATOR: The police use tear gas and fire live bullets to disperse the rioters. But the rumors that Ebola is a hoax mean that more victims hide in their homes, infecting their families and neighbors.

NARRATOR: Back at the field hospital, it's Kadiatu's sixth night in isolation. She's still very sick, but she's more worried about her husband, Fallah.

KADIATU JUSU: *[subtitles]* I can still walk a bit, but he can't. When he tries to stand up, he falls over. I can get up, stand up a bit and walk around.

[subtitles]

NURSE: How are you feeling?

FALLAH JUSU: My body is weak.

NURSE: Your body is weak? Are you able to eat?

FALLAH JUSU: No, I can't.

NARRATOR: Fallah's battle with the virus is reaching a critical phase.

With both Fallah and Kadiatu in the hospital, Manjo returns to their village to check on their four sons.

MANJO LAMIN: *[subtitles]* Where are Fallah's children?

VILLAGER: *[subtitles]* Here they are.

NARRATOR: To everyone's relief, they are healthy. But they're missing their mom and dad.

MANJO LAMIN: *[subtitles]* Nobody is sick, right?

NARRATOR: They record a get well message.

MANJO LAMIN: *[subtitles]* How do you feel without your mom and dad?

ELDEST CHILD: *[subtitles]* I feel bad.

MANJO LAMIN: *[subtitles]* Why do you feel bad?

ELDEST CHILD: *[subtitles]* Because we don't get to see them.

MANJO LAMIN: I do not actually feel fine. They need care. I just hope their parents get well soon and join them.

NARRATOR: Manjo returns to the hospital with the children's message.

KADIATU JUSU: *[subtitles]* The eldest is named Sahr. Next to him is Tamba, and his brother, Fayia.

NARRATOR: Against the odds, Kadiatu is feeling better.

KADIATU JUSU: *[subtitles]* I'm getting back to my normal self. If only their father could be here, but he can't stand up. Maybe God will help him walk tomorrow. But he can't stand up.

MANJO LAMIN: *[subtitles]* Fallah is back. Oh, my God!

NARRATOR: Fallah been vomiting blood, but he wants to see the message from his children.

MANJO LAMIN: *[subtitles]* How are you feeling?

FALLAH JUSU: *[subtitles]* I'm vomiting.

MANJO LAMIN: *[subtitles]* You're vomiting?

Fallah is much more sick than Kadiatu. Anything he eats, he vomits.

NARRATOR: By August, the hospital is full. The dead are taken to a nearby clearing.

SEBASTIAN STEIN: It's really horrible, right? You're just walking, trying not to step on the graves, trying to show some respect. But at the same time, it's so un-ceremonial. And it is going to continue to grow, I'm afraid.

1st GRAVE DIGGER: I lost my brothers. I lost my sisters. I lost my best friends.

NARRATOR: The grave diggers are volunteers. They've each lost a number of loved ones.

2nd GRAVE DIGGER: Two.

3rd GRAVE DIGGER: My mother, my son and my father.

4th GRAVE DIGGER: Likewise myself, because he is my elder brother

5th GRAVE DIGGER: Five

6th GRAVE DIGGER: Three.

7th GRAVE DIGGER: Four good people. Four good people.

NARRATOR: Officially, this Ebola outbreak has claimed over 1,900 lives, but the real figure is believed to be higher and rising fast. The World Health Organization warns the virus could ultimately infect more than 20,000 people.

[The day after filming finished, Fallah died. Kadiatu has made a full recovery and is back with her children]

APPENDIX C: PARTICIPANT FEEDBACK SURVEY

Introduction

A major concern when designing any exercise or drill is determination of whether the exercise or drill is executed properly and valid in terms of testing specific objectives of emergency preparedness operational plans.

A properly designed and executed exercise will achieve the ultimate goal of any exercise or drill: the identification of not only best practices but also planning gaps in emergency operations plans.

By soliciting feedback from participants of the 2014 Maryland Regional Ebola TTX through the Participant Feedback Survey, the DHMH Office of Preparedness and Response attempted to assess exercise design and execution, exercise validity as well as its value to participants in enhancing emergency preparedness planning centered around medical materiel and countermeasure resources.

For meaningful survey results, three criteria must be met:

- The appropriate sample of respondents must complete the survey;
- The right questions must be asked to solicit the information desired;
- The questions must be worded properly to clearly reflect the information requested.

As part of the 2014 Maryland Regional Ebola Table Top Exercise (3 through 24 October 2014), all participants of record were asked to complete a participant feedback survey. The survey was designed and conducted using the Web based Survey Monkey survey tool. It consisted of 21 questions.

Three types of questions were used in the survey.

- Demographic multiple choice to identify information about respondents' background and participation during the exercise;
- Rating scale questions using a Level of Agreement Likert Scale to measure participant opinions about the exercise; and finally
- Open-ended comment essay questions providing the survey participants the opportunity to provide focused directed feedback.

The post-exercise participant survey was developed and presented to exercise participants in three sections:

- Participant Activity
- Value of the Exercise to Your Organization
- Assessment of Exercise Design and Conduct

The survey url/link was sent to a minimum 225 participants immediately following completion of exercise activities on September 25th 2013. One-hundred and eighteen responses have been received from participants for a 52% survey response rate.

The following sections provide survey results from the exercise participants' feedback survey.

Characterization of Post Exercise Survey Respondents

This survey section provides a characterization of the individuals completing the survey and focuses on identifying their respective:

- Maryland sub-state regional Ebola TTX in which they participated
- Participating organizations
- Their respective roles within their organization

Figure 1: Percentage of Survey Respondents by Maryland Sub-state Region

Percentage of Survey Respondents by Maryland Sub-state Region

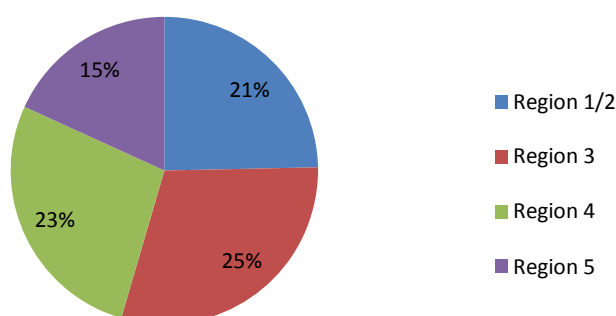


Figure 2: Percentage of Survey Respondents by Organization Participating in the Ebola Table Top Exercise

Percentage of Survey Respondents by Organization Participating in the Ebola TTX

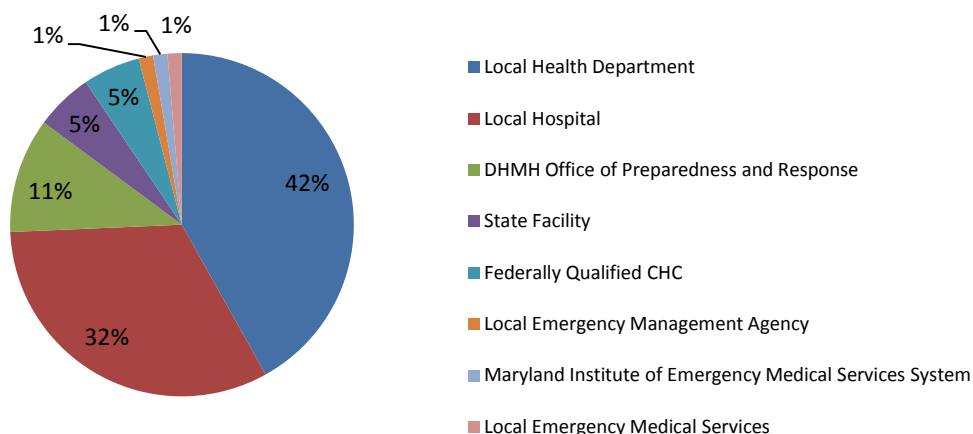
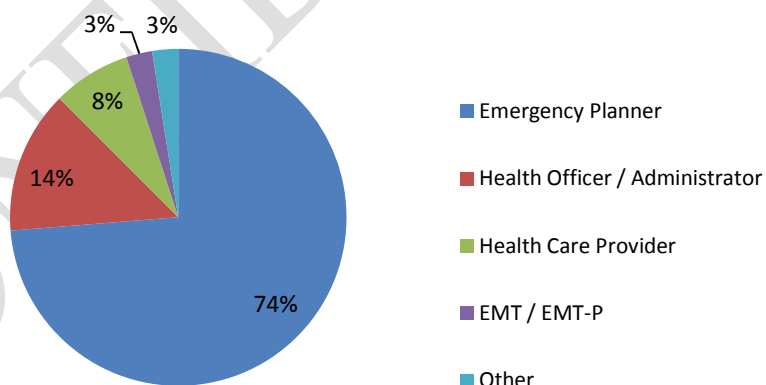


Figure 3: Percent of Survey Respondents by Their Roles within Their Respective Organization

Respondent Roles Within Their Respective Organizations



Assessment of Exercise Design and Conduct

This section of the survey was designed to provide feedback concerning exercise design and conduct. The following table provides a summary of exercise participant replies to questions related to exercise design and conduct. The percentage of exercise participants strongly agreeing and agreeing to the comments are as follows.

Table 1: Survey Results and Findings Concerning Conduct and Design of the Table Top Exercise

The exercise was well organized:	92%
The exercise was of high quality:	87%
Participation and interaction were encouraged:	100%

Value of the Exercise to Survey Respondents

Table 2: Value of the Exercise to Respondents and Their Organization

The exercise was relevant to my needs.	79%
The exercise helped me gain new information and skills.	90%
This experience has helped me to grow professionally.	77%
I would benefit from doing an exercise like this in the future.	85%

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Homeland Security Exercise and Evaluation Program (HSEEP)
After Action Report/Improvement Plan

2014 Maryland Regional Ebola TTX

Table 3: Exercise Participants' Positive Comments Concerning the 2014 Maryland Regional Ebola Table Top Exercises

Exercise Participants' Comments Concerning the 2014 Maryland Regional Ebola Table Top Exercises	
Positive Exercise Comments	<p>The TTX was a great experience from my perspective;</p> <p>It got all the necessary agencies talking.</p> <p>We had new representatives sitting at the table so an even greater range was established it was great to review the different sections of Planning, Logistics and Incident Command. While many of the facilities were familiar with these concepts - there were still several that were unsure.</p> <p>best practices as the outbreak unfolds-lessons learned</p> <p>Always --- group discussion leads to better thoughts than anyone working alone!</p> <p>Highlighted the need for close collaboration between public health and the health care system.</p> <p>Playing the role of IC</p> <p>Provided insight in the complex issues that have to be dealt with at the local, regional, state and federal levels.</p> <p>Provided good information about the outbreak in West Africa. information sharing</p> <p>Brought to light great information regarding how the disease is being handled in Africa.</p> <p>The case study based on the CNN report of on the ground activity made us think how we would function with the limited tools of communication, facilities, transportation etc</p> <p>Also identify gaps so that we can move toward ensuring we do not experience the same gaps</p> <p>It became apparent during the event that many facilities weren't as prepared as they thought they were - so this was a learning experience for them as well</p> <p>Watching the video was a strength because it gave perspective from someone other than the media. It showed the truth from those who actually are working with the virus</p> <p>It was very helpful when partners were able to discuss their questions and concerns.</p> <p>Discussion regarding protocols</p>

Table 4: Exercise Participants' Negative Comments Concerning the 2014 Maryland Regional Ebola Table Top Exercises

Exercise Participants' Comments Concerning the 2014 Maryland Regional Ebola Table Top Exercises	
Negative Exercise Comments	<p>Lack of understanding of comparability across the groups when they reported</p> <p>The program was long and could have been an all day table top.</p> <p>Was not pertinent to our area, still have no idea how to handle the situation</p> <p>In the beginning it was related to Africa. However, the group quickly turned it around to the states. Because of this it was difficult in the beginning to apply Incident Command.</p> <p>Would have preferred that everyone would be responding to the Ebola crisis using the same environment</p> <p>In retrospect I thought maybe it would have been a bit more helpful to gear it specifically towards a more plausible incident, such as an outbreak occurring in MD itself instead of Africa.</p> <p>Weakness was discussing how we would handle the situation in Africa, when we need to focus on planning and education here.</p> <p>Could have been focused more on the local environment, although it was somewhat helpful to understand the conditions in the home countries.</p> <p>It was excruciating frustrating and useless to us to use the scenario of an "African village" when it would have been far more appropriate and helpful to simply use a Maryland based context.</p> <p>More focus on the response locally rather than the tribe aspect.</p>

Survey Findings

Respondent Profile

Review of demographic data from the "Participant Activity" section of the survey supports the finding that the survey results collected reflect the correct sampling of exercise participants capable to comment on the validity and value of the exercise. An equal number of survey respondents were distributed across all Maryland sub-state regions (Figure 1).

In general, the majority of exercise participants completing the survey (Figure 2) represented either: local health departments, health care facilities (hospitals and state facilities) and state agencies; all key stakeholders in Maryland's planning, response and recovery from a public health emergency involving and emerging infectious disease (e.g. Ebola).

Furthermore, Figure 3 adds to the validity of the survey results in demonstrating that the majority of respondents were involved in roles as emergency planners (hospital, state facility or local health department). As such it is possible to infer that they would play a significant role in the Incident Command System within their respective organizations during disasters and emergencies.

Therefore, survey questions were answered by the most experienced knowledgeable and competent participants to provide insight into the quality of exercise design and conduct in addition to its emergency preparedness value.

Validity of Exercise Design and Conduct

Between 78 and 97% of the exercise participants agreed or strongly agreed that the exercise was: well run, well structured and organized, kept on target with useful information and the proper mix of participants (Table 1). One-hundred percent agreed that participation was encouraged.

These findings were also reflected in comments provided by the respondents as presented in Table 3 (Page 169).

Based upon these survey results, it is possible to conclude that the exercise was well designed, conducted and more importantly appropriately tested Maryland's regional Incident Management capabilities as well as ancillary capabilities discussed during the Ebola based TTX.

Value of the Exercise to Emergency Preparedness

Respondent replies presented in Table 2: Percentage Agreement or Disagreement for Survey Question 7,8 and 9 (Page 9) indicates that 84 to 89% of exercise participants felt that the 2014 Maryland Regional Ebola TTX was beneficial to their respective agencies and organizations. The emergency preparedness plans applied to the scenario/incident during the exercise adequately directed their responses.

Likewise the majority of exercise participants reported that the exercise resulted enhanced learning of new information and skills (90%) complementary to their professional development (77%).

The major impacts of the exercise were educational and relevant to the needs of the participants as they pertain to planning and responding to an emerging infectious disease public health incident.

Conclusion

In conclusion, the survey results support the validity of the exercise in its design and execution as a means to test the exercise objectives. More importantly, the survey findings also demonstrate the importance of the exercise in identification of best practices and planning gaps related to medical materiel and countermeasure resource management and distribution.

APPENDIX D: AFTER EXERCISE SWOT BASED DATA ANALYSIS

Introduction

The DHMH Office of Preparedness and Response has adopted, adapted and applied SWOT analysis for standardized reporting of identified best practices and as well as performance gaps in emergency preparedness plans that have been exercised and tested within Maryland.

This tool is based upon SWOT Analysis (see review below) protocol where Strengths, Weaknesses, Opportunities and Threats are identified along with corrective actions based upon the factors identified during the hot wash and exercise evaluation process. In addition, the SWOT format may serve as a good aid in directing the Hot Wash discussion following completion of play of an exercise or training event.

Comments, findings and other response related information obtained during both functional and table top exercises are categorized according to preparedness capability domains. They are further defined according to the PHEP and HPP capabilities; for example the capability domain of Incident Management with capabilities of Command and Control and Emergency Operations Coordination.

The data are then classified as a Strength, Weakness, Opportunity or Threat. Therefore, it is possible to write a comprehensive narrative of findings for each capability using the findings in the respective SWOT categories.

SWOT Introduction and Purpose

This document provides a short review of a strategic planning tool or technique and processes for the evaluation of an operational plan's value, effectiveness and benefit. The structured analysis and assessment of existing or proposed operational plans and project activities permits an opportunity to develop strong corrective actions including project management objectives and milestones to accomplish the desired end result.

The use of these tools can support development of project management plans for individual and or regional healthcare emergency preparedness planning and response.

Although there are many tools for plan or project evaluation, for the 2013 Maryland Statewide SNS Exercise, a SWOT format will be used to identify best practices and planning gaps as well as to develop corrective actions and mitigation steps to known threats.

SWOT Analysis: Identification of Strengths, Weaknesses, Opportunities and Threats to identify favorable and unfavorable factors as well as to identify and prioritize solutions to achieve the desired objective.

When applied, SWOT analysis permits an efficient, methodical and systematic method for operational plan improvements and determination of success. This strategic planning process is not to be confused with Project Management, where project management is defined as the process by which the project is to be successfully accomplished. This is done through the setting of project goals, milestones and objectives in the setting of a timeline until completion of the goal.

SWOT Analysis

To achieve our Goal and Objectives we will use the strategic planning tool known as a SWOT analysis.

It involves specifying the objective(s) of the project and identifying the internal and external factors that are favorable and unfavorable to achieving that objective(s). In the case of this exercise the distribution and receipt of medical resources, countermeasures and materiel.

SWOT Analysis System in Addressing Planning and Preparedness:

- “S” strengths:** *A listing or notation of the strengths of the system.
Attributes of the organization that are helpful to achieving the objective.*
- “W” weaknesses:** *What weaknesses in the system have been identified?
Attributes of the organization that are harmful to achieving the objective.*
- “O” opportunities:** *What opportunities exist to help achieve the strategic plan and goals?
External conditions that are helpful to achieving the objective.*
- “T” threats:** *What threats exist to prevent achievement of the stated goals?
External conditions that are harmful to achieving the objective*

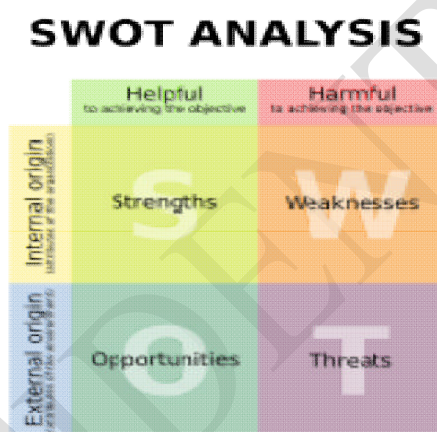
Identification of SWOTs is essential because subsequent steps in the process of emergency preparedness planning for achievement of the selected objective may be derived from the SWOTs analysis and assessment.

The SWOTs are used as inputs to the creative generation of possible strategies, by asking and answering each of the following four questions:

- How can we Use each Strength or do better?
- How can we Stop, improve, avoid or build upon each Weakness?
- How can we Exploit each Opportunity?
- How can we Defend against each Threat?

SWOT analysis may be used in any decision-making situation when a desired end-state (objective) has been defined. SWOT analysis may also be used in pre-crisis planning and preventive crisis management.

Figure 1: Traditional Business SWOT Paradigm



SWOT analysis is just one method of categorization.

It is prudent not to eliminate too quickly any candidate SWOT entry. The importance of individual SWOTs will be revealed by the value of the strategies it generates. A SWOT item that produces valuable strategies is important. A SWOT item that generates no strategies is not important.

One way of utilizing SWOT is *matching and converting*. Matching is used to find *competitive advantages* by matching the strengths to opportunities. Converting is to apply conversion strategies to convert weaknesses or threats into strengths or opportunities. If the threats or weaknesses cannot be converted an intervention or solution is to try *to minimize or avoid* them.

APPENDIX E: ACRONYMS

Table E.1: Acronyms

Acronym	Meaning
AAR	After Action Report
ASPR	HHS Office of the Assistant Secretary for Preparedness and Response
BOP	Maryland Board of Pharmacy
CDC	Centers for Disease Control and Prevention
DEOC	CDC Director's Emergency Operations Center
DHMH	Maryland Department of Health and Mental Hygiene
DHS	US Department of Homeland Security
DOC	Department Operations Center
DSNS	CDC Division of the Strategic National Stockpile
EEG	Exercise Evaluation Guide
EOC	Emergency Operations Center
ESAR-VHP	Emergency System for Advanced Registration of Volunteer Health Professionals
ESF 8	Emergency Support Function 8: Public Health and Medical
ESSENCE	Electronic Surveillance System for the Early Notification of Community-based Epidemics
FDA	US Food and Drug Administration
FOUO	For Official Use Only
HDOC	Health Department Operations Center
HHS	US Department of Health and Human Services
HPP	ASPR Hospital Preparedness Program Cooperative Agreement
HSEEP	Homeland Security Exercise and Evaluation Program
IC	Incident Command
ICS	Incident Command System
IP	Improvement Plan
LDH	Local Health Department
MERS	Middle Eastern Respiratory Syndrome
MERS-CoV	Middle Eastern Respiratory Syndrome Coronavirus
OP&R / OPR	Office of Preparedness and Response
PHEP	CDC Public Health Emergency Preparedness Cooperative Agreement
POC	Point of Contact
POD	Points of Distribution
RICA	
RMS	Responder Management System
RSS	SNS Receipt, Storage and Staging Site
SARS	Severe Acute Respiratory Syndrome
SETTS	
SOP	Standard Operation Procedure
SNS	Strategic National Stockpile
SWOT	Strength, Weakness, Opportunity and Threat Analysis
US	United States
WHO	World Health Organization