



Shifting the Paradigm toward Maritime Human (Health) Security Training Against Infectious Disease Threats

Dr. J. Fish¹

ARTICLE INFO

Article history:

Received 22 March 2020;
in revised form 30 March 2020;
accepted 8 April 2020.

Keywords:

Infectious Disease Prevention Training,
Bioweapon, Human Health Security,
Maritime, Pandemic .

ABSTRACT

Over the past decade, pioneering research has been conducted in the field of Maritime Human (Health) Security Awareness. The purpose was to gain an understanding of the current preparedness of mariner's abilities to identify an intentional infectious disease delivery system using maritime modality as a primary means of entry into any global seaport. The goal would be to initiate a pandemic. International maritime trade is built upon certified, licensed mariners being trained in the Standards of Training, Certification, and Watchkeeping (STCW) international guidelines. The STCW concepts of preparing mariners for vessel operations, which is a Vessel Centric System (VCS), instead of a Human-Centric System (HCS), that places human needs at the center of education. Personal safety and social responsibility were the focus of this research to determine if HCS training currently exist and if that training is static rather than dynamic. Daniel Stufflebeam's (CIPP) model was the framework for the program evaluation. The maritime industry no longer has the luxury of remaining naive toward Human (health) security due to enhanced DNA manipulation, synthetic biology, lower cost, and easy access to information. Human (Health) Security Awareness training that would allow them to identify infectious diseases as threats to humans, economies and societal norms.

© SEECMAR | All rights reserved

1. Introduction.

Between 2012 and 2019, scientific research was conducted to evaluate young mariners' current level of knowledge of maritime terrorism threats and to gain a deeper understanding of current STCW training ideology in terms of mariner's safety and social responsibility. The purpose of this program evaluation was to focus on the STCW A-VI/1-4 training requirements to the goal was to determine if the original intent of ensuring mariner safety to include health in addition to mariner's responsibility to 'do no harm' to the public is currently being met. This research focused on a human bioweapon delivery system existing to deliver a pandemic to any nation-state using maritime modality as an entry point. The objective was to identify gaps in training methodologies while capturing the current knowledge of modern maritime health security awareness threats.

Personnel safety and social responsibility are traditionally taught from a standardized occupational viewpoint, which comes from what this researcher terms a Vessel Centric System (VCS) ideology rather than a Human Centric System (HCS). Human-Centric Systems place human and societal training needs at the center of maritime academic institutional occupational requirements. Historically, VCS is the center of all maritime training institutions allowing for all global mariners to meet the demands of the vessel needs first, while personnel and global public societies' safety are considered a collateral educational and duty component. Public health and security traditionally remain separate lanes in terms of training, threat understanding, preparedness, response, and containment. However, the maritime industry could be in a unique position to enhance the chance of early awareness, identification, and containment of innovative human (health) security threats, if the current ideology can be shifted from a sole focus of VCS toward an inclusive HCS training mindset. This shift would benefit society on a global scale.

¹Capella University. (+1) 301-787-5926. E-mail Address: Fish.EarlyID@proton.com.

2. Methodology.

Daniel Stufflebeam's CIPP model was implemented for this program evaluation. The primary goal of this model is not to prove but to improve (Stufflebeam, 1966). Due to the limitations of this program evaluation (e.g., personnel, cost, and time), the scope was confined to personal safety and social responsibility STCW training requirements. These limitations result in a streamlined CIPP program evaluation within a modern maritime academic setting. The CIPP model promotes a thorough analysis of the program curriculum components while allowing the collection of data through various measurable collective qualitative tools. CIPP methodology has four sections that consist of the context, input, process, and product phases. The analysis results helped to determine if the program was serving its original purpose of ensuring personal safety and social responsibility in today's modern emerging human (health) security threat environment.

In addition to the CIPP framework, the chaos theory was used to lay the foundation for the importance of any changes between the initial conditions of a bioweapon's primary host carrier to a secondary host. These changes would result in a different set of dynamic conditions. The expanded exposure of the bioweapon in various hosts ensures that the chances of predictability by medical professionals have limited accuracy. This time difference enhances the probability of successful containment. Ideally, bioweapons that spread using respiratory routes should be contained immediately to stop further contamination. The reality, however, is that the early phase of identification is unlikely, due to limited mariner training, equipment, and lack of awareness or consideration for these conditions. This program evaluation set out to gain a clearer understanding of how much if any, human (health) security awareness regarding infectious diseases is currently considered or addressed through the curriculum or vessel security exercises.

This program evaluation consisted of discussing current operating practices to identify opportunities that could enable a basic understanding of human (health) security threats. Identifying the mariner as the lowest common denominator for the global maritime sector was vital in working toward designing a training curriculum solution. The VCS training system historically is the central focus for curriculum development rather than an HCS solution. Traditionally, public health and security coursework are taught entirely independently of one another, leaving a gap in the curriculum where health concerns cross over into national security concerns. Enormous leaps in technology no longer allow us the privilege of ignoring infectious diseases as a significant national security concern.

3. Instrumentation.

The identified stakeholders for this program evaluation included the maritime students, maritime academic, administrative professionals, and professors in addition to maritime operational trainers. Emphasis was placed on a relaxed environment as students can often feel guarded in a natural training environment; they are typically graded. A primary focus was ensuring

that the operational trainers and professors were experienced in an institutional setting as well as have operational experience. The student participants were limited in their exposure to operational time to capture their knowledge of the current threat environment.

4. Data Collection.

During the past six years, this learner has conducted empirical research about current maritime training practices of STCW in addition to joining, attending, and collating data within the field of terrorism and biological agents, known and described as Category A threats (CDC, 2017). This practitioner has over fifteen years of federal, FBI, and USCG counterterrorism experience, with half of those years, served in the maritime field. This practitioner's role was to define the goals and implement the four components of the CIPP methodology. This methodology included context, input, process, and product data collection and observation during training conducted at sea. The analysis of each of the four CIPP phases was conducted for their impact or lack of impact on the issue of personal safety and social responsibility regarding current knowledge human (health) security awareness.

The combination of experience and this program evaluation allowed for bringing together a tremendously rich field of data for analysis. Theorists such as John Dewey (1910), brought scientific support to the practitioner's positionality. The student participants were considered outsiders due to a lack of operational sea experience. The students had minimal understanding of the academic requirements for STCW certification and non-certification career fields. Students' outsider positionality allowed knowledge to be transferred from one to another while limiting the questionable validity, as validity is often necessary for mutual collaboration to be successful (Mertens & Wilson, 2012). The commonality of interest, such as seamanship experience, creates a mutual bond, which can assist an outsider as being viewed as an insider. Commonality provides a link that works toward establishing camaraderie. The four-phase approach is discussed as individual subcomponents of the CIPP methodology. This breakdown allows for a deeper understanding of the data collection process.

4.1. Context.

The first phase (context) in the CIPP methodology consisted of interviews with maritime students in their freshman or sophomore academic years. The context phase allowed the researcher to assess the student's perspective of need, problems, and opportunities that could assist the decision-makers in determining any changes or necessary additions to the current instructional program.

Program evaluation goals identified by the researcher included gaining an understanding of the IMO original intent for personal safety and social responsibility and gaining an understanding of if that intent was being met in modern-day training curriculum. The second identified program evaluation goal was to gain an in-depth understanding of the original maritime

training paradigm based strictly on the vessel needs (VCS) versus the consideration of a shift toward a new paradigm based on human needs (HCS) with a focus on human (health) security awareness designed to prevent a GCBR event. An in-depth analysis of these two goals has assisted in the determination of the response to the research questions.

4.2. *Input.*

The second phase (input) was implemented by bringing together a focus group of stakeholders from the maritime domain with years of operational and/or higher institutional, educational experience to consider alternative approaches to the current academic instructional platform. Additionally, the discussion during the focus group was open to consideration of various ideologies, participant characteristics, changes in curriculum, staffing, or changes in budget needs if the time allotted for the inclusion of the topic's discussion.

4.3. *Process.*

The third phase which focused on processes, gathered information using three subcomponent measurement sets that included direct observation while onboard an active training vessel at sea, conducting a student focus group while at sea, and a written trainer questionnaire during the performance of their duties. This hands-on research allowed the researcher to monitor, document, assess, and report on a variety of systems encountered by mariners operating in their natural environment along with the execution of the current training curriculum. Direct observation, a focus group session, and the questionnaire acted as rich sources of data to place into NVivo 12 for a variety of analyses to be performed.

4.4. *Product.*

The fourth phase (product) consisted of an in-depth analysis of all the data gathered using NVivo 12 software to determine the answer to three identified product components. The first review considers to what extent does the program successfully address the fundamental assessed need for personal and social responsibility of mariners, the second review gauges the success of determining the need to shift the paradigm from a VCS paradigm toward the inclusion of an HCS paradigm on a long-term basis, and the third review looks at the research findings to determine if the results can be used as an educational goal for all maritime academic institutions on a global scale. These components in conjunction with the research findings of the research questions comprise a final product report that was provided to the leadership and management participants for review and operational change consideration.

4.5. *Research Questions.*

To understand this complex maritime program evaluation, the researcher contemplated questions at various levels to gain an in-depth understanding of how the STCW international training requirements for personal safety and social responsibility prepare students for modern threats. The strategic program evaluation level consisted of the following three research questions:

- To what extent are the objectives of personal safety and social responsibilities for STCW-basic training currently being met?
- In what ways do current training activities contribute to, or detract from a knowledge base to meet today's human (health) security threat environment?
- To what extent are the current activities of the current program consistent with the intended outcome for ensuring personal safety and social responsibility?

4.6. *Context Interview.*

The context data that was collected from the maritime academic students was designed to gain an in-depth understanding of their current knowledge base of human (health) security awareness during the early phase of their academic training thus establishing the context of where the students are in their individual and collective knowledge base at the time of the program evaluation. Examining context for causal processes is a way to open the black box of causality that quantitative studies may leave closed because they rely heavily on statistical analyses (Maxwell, 2012b)

The pros of the student context interview open-ended questions were that they allowed for each participant to discuss their current exposure to current events combined with in some cases limited emotional experiences from actual sea time. This combination allowed for richly detailed responses. Each participant showed creativity and self-expression while revealing their thinking process. Because the process flow of thought was unhindered, each participant felt comfortable which allowed for responses that were not anticipated. The cons noted were that each participant had different degrees of exposure to actual maritime experience, social events, and curriculum.

An additional unexpected con that was discovered was that not all students seeking maritime careers at maritime academic institutions require licensure. These same students' career functionalities can and often do play a significant role in various types of emergencies under the emergency management curriculum. For the researcher to ensure a thorough understanding of where today's maritime students stand regarding modern threats, preparedness, and general knowledge or lack thereof of human (health) security awareness, students that were not seeking licensure were not excluded from participation in the context interview phase. The only participant exclusion was that the student had not taken the Vessel Personal Designated Security Duties (VPDSD) course.

4.7. *Leadership Focus Group.*

The leadership input focus group data was collected to assist the program evaluator in gaining insight into the current practices and training curriculum content being taught to young mariners in modern-day maritime institutions. These participants were provided eight open-ended leadership questions, which emphasized gaining in-depth knowledge of where leadership currently stood regarding knowledge of human (health)

awareness, social responsibility, personal safety, and human acting as a self-infected bioweapon on board a vessel.

The pros of the input leadership focus group consisted of the ability to gather free-flowing ideas from various perspectives. Since many of the leadership groups were current professors in the maritime field, it allowed for current insight into the current instructional curriculum along with the intent behind specific coursework.

The cons of the input leadership focus group were that various ranks in the institutional hierarchical management structure were present. When higher-ranking managers are present, it can often lead to another participant being hesitant to respond with their real thoughts or feelings out of concern of being judged or being disagreeable. In this instance, the input leadership focus group did not appear to hold back on their various perspectives as different views and opinions discussed throughout the two-hour timeframe.

4.8. Subcomponent Process Phases.

The process phase consisted of three subcomponents, each with their pros and cons identified and reviewed independently.

4.9. Direct Non-Participant Observation Conducted at Sea.

The direct observation phase was considerate and conscientious while acknowledging that the descriptive stage was separate from the interpretation and judgment of observations. This method allowed the researcher to capture events as they occurred without judgment. The pros of direct observation included mariners' interactions with various systems and individuals happening in real-time. The direct observation allowed for direct insight into human reactions and response in real-time from unexpected and unanticipated encounters within the natural vessel and operational environmental systems. The capture of this data was crucial to capture if accuracy in the evaluation was to be reflected.

The cons of direct observation are that while a fly on the wall is an approach that was implemented in this program evaluation historically students have long experienced an educational culture in which they have been graded and judged. According to (Hauer, 2016) students can perceive all direct observation as a high stakes activity rather than one intended to support their learning. However, it is this researcher's belief that due to the insider-outsider participant approach, the student's focus remained on their task at hand. There were no exceptions in this sample.

4.10. The Final Product Interview.

The final product interview consisted of attempting to reschedule the same management and leadership members that had been participants in the input phase focus group. The pros were that a positive response from all participants. There were no cons noted during this phase. One of the original participants was not able to be in attendance for the final product interview, which was the only exception.

5. Data Validity.

Proximal similarity helps to improve external validity when data can show similarities between the participants and the unexamined groups. An example of this research would be maritime participants that major in engineering at an academic institution public or private, domestic or abroad must meet the minimum standards of STCW to become credentialed. Implementation and compliance of these international training standards represent an important role that the IMO has engaged in intensively over decades (Basaran, 2016). However, due to many differences in nation-states capability, financial support, education, and practical implementation how well these standards are understood remains questionable. Because there is a mandatory international training baseline for all STCW credentialing this lends credence toward more proximal similarity rather than less when considering time, places and people. There are varying degrees of less similarity when considering any additional training provided by each independent institution above and beyond the STCW baseline training requirements.

6. Findings.

Due to many initially identified themes produced within the context and input phase, a reduction process was implemented using a weighted software system. Any context frequency responses that were expressed twenty or more times by research participants were kept and coded. Context content with a weight of under twenty references were ruled out. The following thirteen identified themes are listed with their weighted context references being reflected the served as thematic headers.

6.1. Identified Themes.

- Identified needs that work toward HCS training (61 context references)
- Proactive Training (54 context references)
- External Terrorism Threat (External of Vessel) (40 context references)
- Social Responsibility Training (40 context references)
- Awareness identified as a training need (36 context references)
- Human-Centric System Threats (HCS) (35 context references)
- VCS Training Recognition (26 context references)
- Human (Health) Security Awareness Training (26 context references)
- Global HCS Perspective (24 context references)
- Internal Terrorism Threats (Onboard Vessel) (21 context references)

- Internal Threat (besides terrorism) (21 context references)
- Outbreaks (20 context references)
- Humans as Threats (20 context references)

During this data analysis, the researcher set out to identify if the modern-day maritime curriculum varied from the century's old VCS training approach of the needs of the vessel ahead of the human needs. If a variation was recognized as an HCS approach, that data was coded and appropriately assigned under the preidentified theme.

6.2. Test Pilot Recommendation's.

Eleven test pilot (TP) nodes were identified. These test pilots should be considered by both academic institutions and government agencies that have responsibility for training modern-day mariners. The eleven identified pilot tests include:

- No focus on human as (weapons) acting as a threat.
- Evacuation and escape routes (SOPS) and practice.
- The threat to one is a threat to all-stronger social responsibility training.
- Training is needed on how to respond on a vessel to a health threat.
- The understanding of each individuals social responsibility on a global scale regarding health security awareness is vital to global commerce.
- Call to be informed on health issues on ports of call.
- Mariners need to be trained equally on human (security) issues and not by function requirement.
- Human (health) security awareness should not be overlooked regarding personal safety.
- Terrorists look for new, less apparent approaches to deliver fear and global economic loss as well as for political gain.
- Medical briefings (MB) are a minimal cost point (MCP) identified for initial human (health) security awareness launch consideration; thus, the following equation is correct.
- The lack of mental health issues in regards to security threats are tremendous.

Each of these pilot opportunities lays out a newly identified chance for any maritime institution or private training institution to create a test pilot training curriculum based on an HCS approach. Heavy emphasis is placed on inclusion rather than a change in culture to represent the shift from VCS to HCS training dynamics on a global scale. These test pilot opportunities were presented and discussed with the selected research site management team.

6.3. Current High-Risk Areas.

The following list consists of sixteen areas identified during the analysis phase of the program evaluation. It is highly recommended to understand how current VCS training curriculum currently increases risk due to the lack of HCS inclusion consideration in current training systems:

1. Innovating training is often kept at bay due to cost concerns, which result in a cost factor, becoming a threat.
2. Terrorists depend on a lack of awareness of human (health) security within the maritime field.
3. Lack of preparation is their opportunity.
4. Multitasking promotes stress, which can lower the immune system and divide attention into separate tasks equally important.
5. Current training focuses on prostitution and alcohol consumption for personal safety and social responsibility, which is a limited and narrow focus.
6. The over fixation on technology rather than human health often limits vision to other problematic threats.
7. In VCS, training vessels are the primary focus, while humans are not seen as the priority.
8. Overload of focus on vessels could have an effect on mental status during the extended duration of operations.
9. VCS training is machine-oriented rather than the human condition even regarding threats.
10. Threats such as piracy remain VCS focused rather than on personal safety first.
11. Current training has not kept up with the rapidly evolving threat from technical, medical changes such as CRISPER and ease of accessibility at a lower cost on a global scale.
12. VCS training limits social responsibility and personnel safety training to mariners seeking licensure, not the student population as a whole.
13. Limiting the minimal HCS training being conducted to specific groups of mariners increases the risk of lack of awareness of human (health) security awareness only due to the choice of functionality within the maritime domain industry.
14. Some research participants believed they should be trained only in their area of functionality, which results in problematic ideology.
15. Global shipping is the primary modality of global commerce, and an infected vessel with no plan would have a significant effect on world trade due to downtime and social media awareness.
16. Unclean vessels and air transport systems will enhance the spread of disease. Navigation and watch standing officers not adhering to training enhance the threat conditions to human (health) security concerns.

6.4. Non-Participant Direct Observation at Sea Findings.

The goal of the direct observation was to take notes on the various systems the students encounter such as environmental (other humans, hot or cold environments, close quarters, etc.),

human systems (emotions, interactions with others, etc.), mechanical (vessel, time), and behavioral systems (interactions) to collect data on possible opportunities to identify ways to identify a self-infected carrier that may not have been previously evident. Additionally, capturing the natural interactions between systems allows for analyses of identified concerns or possible opportunities that may serve to enhance a contagion spread.

The direct observation findings were categorized into two primary sections titled systems and opportunities. Under each section, strengths and weaknesses were identified after thoroughly reading the translated audio direct observational notes recorded at sea into word documents.

These strengths and weaknesses can be used by private or public institutions to include public administrations that write maritime training regulations or institutional policies. These strengths and weaknesses are broad and can be applied as a general guideline review questions for any current training curriculum delivering the maritime curriculum.

6.5. Strengths.

- Communication Systems: Ship phone provides direct communication; however, a containment and disembarkation plan of a deadly threat is vital.
- Sanitation practice is in place.
- Operational Systems: Ventilation varies from ship to ship.
- Administrative Systems: Recognizing what we do not have in place.

6.6. Weaknesses.

Commercial application: Delay in satellite communication (email) via the day or two, enhancing exposure time-delaying advanced treatment.

- Response System: Commercial Application: Limits on Helo response extend seclusion and response time.
- Behavioral System: Seclusion & confinement lower morale, higher stress, and an increase in fear in confined areas of vessel.
- No plans or exercises in place on how to handle a highly deadly infectious diseases on board an active working vessel.

The systems and opportunities analysis included categories that cover how the old VCS approach would play a substantial role in young mariners' workloads today. Historically, mariners have always carried heavy-duty loads and multitasking requirements with little or no second thoughts on the matter. Today, however, younger mariners see heavy workloads as heightening stress levels, which can increase stress which in turn can cause lower immune systems. Additionally, modern-day mental health issues are a more significant concern for younger mariners than older mariner's ideology consists of getting the job done no matter what other conditions exist.

The locations of commercial vessels also play a role in emergency response capabilities should a highly infectious disease be identified onboard a vessel. Traditional helicopter response has range limits should an immediate evacuation be necessary to save a life. Telephone communication between ship to shore is often the primary lifeline between limited medically trained personnel and an actual medical facility. E-mail communications that depend upon satellite operations can be delayed by a day or two, which can serve as critical moments during medical emergencies where time is of the essence.

6.7. Trainer Questionnaire at Sea.

These themes were used as the primary headers for the trainer questionnaire findings. The five newly identified themes are listed in no specific order.

- Social Responsibility "Do No Harm" prevention of spread of infectious diseases.
- Exercises conducted at sea focusing on Abnormal Health Conditions.
- Identified Training Needs
- Recommendations.

6.8. Social Responsibility "Do No Harm".

- Current Level of Knowledge: STCW -basic introductory.
- Starts and stays at entry level-needs enforcement throughout all levels.
- Increased emphasis should be placed on non-compliance.
- Should be taught on Ship & Shoreside.
- Health Brief should be provided to all crew before entering the port.
- All crew should have an understanding of how a disease can spread between the crew and port of call.

6.9. Prevention of Spread of Infection.

- Avoid physical contact between crew shoreside public-animals.
- Measures to include personnel hygiene-cleaning gally equipment-cookware-proper water temperature-ship ventilation air filters & ductwork-mess hall-steward dept-lounges disinfected.
- Emphasis is placed on washing hands & not touching animals shoreside.
- Hand disinfectant used -use of the microbial air filters-VCS approach to spread prevention.

6.10. Historical Data on Exercises Conducted at Sea Referencing Large Scale Abnormal Health Conditions.

- Trainers have never seen or conducted an exercise at sea that demonstrates how to respond to abnormal health conditions of shipmates aboard the vessel while underway.
- Human Health Security Awareness training is a very low priority.
- Primary Mission is to get into port on time with cargo intact.
- The probability of vessel being quarantined is very low.
- Human Health Security is discussed in very basic or generic terms.

6.11. Newly Identified Training Needs.

- What to look for regarding infectious diseases (signs or symptoms) in conjunction with abnormal behavior.
- Knowledge of how to report, respond and contain a highly infectious exposure.
- A better understanding of ease and routes of disease transmission using maritime means.
- Expand knowledge to include a global health security perspective.
- Training should be expanded to "Big Picture" Global Effect should failure to identify and contain occur.

6.12. Research Recommendations.

- Training to understand Human (Health) Threats against infectious diseases intentional or nonintentional.
- Basic Level- 4-8 hour course for all ship personnel.
- Advanced Level- Additional Course 4-8 hours case study approach with consequences for noncompliance.
- Basic & Advanced courses should be taught at sea.
- Recommendation for training on health threats and how transmitted before visiting specific ports.

Each of the headers highlights issues that should be considered and thought through by any private or public academic institution interested in shifting the paradigm to include human (health) security awareness of human bioweapon delivery systems in addition to a basic knowledge of highly contagious infectious diseases into their program curriculum.

6.13. Student Focus Group at Sea.

The third and final component of the process research phase conducted at sea was the student focus group. The student focus group consisted of nine volunteer students. The student focus group consisted of a semi-structured focus group, where they responded to eight predetermined questions. These questions were designed to gain an understanding of current knowledge levels on human (health) security, social responsibility, and personal safety in the early stages of their maritime education.

These students were in the early entry phase of their maritime academic career. Capturing this data at this early stage of their academic career allowed for a fresh perspective from their usual daily understanding of current events. This timing also allowed the researcher to gain an understanding of their vision along with what they expect from an academic institution in terms of preparation to deal with future maritime threats. Various students added additional commentary as the audio recording device was passed between each student.

Common themes were identified through common context terminology and used as headers.

6.14. Identified Themes.

- Physical breakdown of systems onboard a vessel with an identified infected individual.
- Shipping mission.
- Reaching "Critical Mass" quickly in operations continuation.
- Self Preservation.
- The mariner is the first stopgap.

6.15. Physical Breakdown of Systems Onboard a Contaminated Vessel.

- Crew stress
- Fear
- Anger
- Failure to eat
- Low immune systems
- An extended time of exposure equals broken down mentality
- Weak mentality plus fear could equal "Snap" in the mindset of crew
- Must work as a team to survive

6.16. *Effects on Humans and Mission.*

- Loss of life
- Financial loss
- Pressure remains to deliver cargo on time ahead of crew and public safety
- The pressure to deliver cargo enables the spread of infection
- The spread of infection increases the risk of pandemic

6.17. *Quickly Reaching Critical Mass.*

- Average Crew 10-201 Sick Crew = 10% 2 Sick Crew = 20%
- A vessels confined space equals cross -contamination across one can have a quick impact on job function (Nav Officers).
- 3 or 4 infected crew in the same job function would reach critical mass for vessel operations within days.
- Concerns include segregated living quarters by class.

6.18. *Identified Factors of Self Preservation.*

- Cross-contamination when feeding infected individual.
- The risk is too high to take care of the sick individual as the risk of infecting others grows.
- Majority of participants believe that sick individual should be quarantined rather than the vessel and the entire crew.
- Avoid infected individual all together.
- Never thought of this possibility occurring before so unsure of what to do

6.19. *First Stop Gap in Maritime Pandemic Transmission.*

- Mariner will most likely be first to encounter a human host bioweapon delivery threat on board a vessel.
- Human (Health) Security issues should be taught as part of See Something Say Something initiative on a global scale.
- Procedures-plans & practice on how to handle such an event are identified to include in curriculum and training exercises while at sea.
- Proactive measures could prevent a lot of uncertainty while reducing fear from operating in unknown conditions and rumors.
- The primary goal should be to have a plan and practice it often.

It was clear from this focus group that mental health issues were a priority concern, especially when small space confinement of a vessel was added to the equation. Currently, STCW does not address mental health issues as either a social responsibility or from a personal safety perspective. Mental health concerns reflect the student's modern-day current events exposure, such as multiple mass shootings that have occurred within the United States.

Fear of the unknown from the possibilities of what may happen should a deadly infectious disease be brought aboard a vessel is another factor that falls under the concern of mental stability. Ultimately this mental pressure can enhance stress and the physical breakdown of the body's immunity system. The combined pressure of stress and unknown fear can create the byproduct of anger, which can become a threat to the individual and public society. These failures underline the fact that the STCW does not meet the standard of addressing personal safety nor mariner's social responsibility to protect the public by doing no harm. Because cargo and container vessels operations typically are maintained with a crew of under thirty individuals, critical operational mass can be reached very quickly should key personnel is infected. While a chain of command is in place, there are only single-digit numbers of personnel for replacements of any one given job functionality. It is typical of vessel operations for crew members of the same job function to socialize and work with the same group. There is function stratification, therefore should the contamination affect one, there is a high risk of reach critical mass very quickly. A non-operational vessel could represent a massive loss of revenue from a corporate perspective, gain global press attention, and deliver a significant blow to the port of the intended call.

Summary.

The final analysis resulted in the identification of critical points, identified needs, and inclusion recommendation in addition to changes to be considered by both private and public sectors that plan to develop and/or train future global mariners.

Critical Points To Help Prevent Future Pandemics.

Every mariner needs to go through the Human (Health) Security Awareness training.

- People are always afraid of what they do not understand.
- The vessel-operating capacity will be degraded very quickly once contagiousness infectious disease is brought on board (Reaching Critical Operational Mass).
- Relative risks such as intentional infectious diseases being delivered by maritime modality should not be overlooked.
- Lack of awareness of Human (Health) Security is just another example of the maritime industry being behind itself.

- High risk of a multitude of ramifications to the shipping industry if not addressed. Removing an infected individual from contaminated vessels does not immediately remove contagion.
- Once the contaminated vessel has downtime, it is an additional concern.
- Unknown infectious contagion can quickly result in cross-vessel-cross port contamination.
- Press (Media) public relations can result in a reduced image if the affected entity has no plan.
- Adding Human (Health) Security would be a call for a shift toward cultural inclusion.
- Lack of awareness on the commercial side of the industry regarding Human (Health) Security.
- Stress / frequent change of environments equals a higher risk of lower immunity.
- Awareness is the first step to early identification of the problem and quicker containment on board an operating vessel.
- Maritime industry needs a call for best Human (Health) Security practices.
- The maritime industry, institutions (private and public) have a high risk of liability (if no plan is in place).
- Multiple port visits increase pandemic risk if the threat goes unidentified.
- High financial global impact if not identified and contained quickly.
- An increase in technological capability increases the risk of threat.
- Vessel laundry is critical to consider when reviewing spread routes.
- An unknown percentage of global removal of mariners from any vessel with a contagious disease (focus on the container, cargo, and non-passenger vessels).
- Some replacement personnel on board vessel for continuousness of operations is minimal.
- Vessel nor company can afford to be dead in the water for any given amount of time.
- Violent regimes take advantage of whatever tools they have for leverage in violence and threats for destruction.
- There will be panic without a plan! How scary is it that we are not thinking or preparing for this type of action at all?

- An unknown intentional infectious disease threat onboard vessel is like a moving time bomb. Infectious disease threat reaches all the way home to the family.
- Collateral damage could be unlimited (lives, global commerce, social fear).

Needs to Shift the Training Paradigm toward Maritime Human (Health) Security.

- Standard Operating Procedures (SOP's) for identifying and reacting to a known infectious disease carrier.
- Have a protocols along with a communications plan and appropriate equipment to address onboard contagions.
- Develop drills for containment and evacuation until professional help arrives.
- Design Human (Health) Security modules for intentional and nonintentional contagious disease interactions.
- Everyone should be trained in signs and symptoms of various infectious diseases and abnormal behavioral displays.
- Evaluate mitigation measures to be put into place.
- PPEs are not standard issue when dealing with agriculture products.

Zoonotic considerations should be inclusive in a Human (Health) Security course.

Inclusion Recommendations and Change Considerations.

The inclusion of Human (Health) Security awareness may fit into the Vessel Security for Persons in Designated Security duties or the Vessel Security Officer training course as an add-on. **Risk:** Not all mariners positions require a license. Total inclusion of training will most likely require an independent course. These change considerations are recommended for inclusion into any current curriculum.

- The inclusion of human health as a security concern for global mariners (Cultural integration rather than change).
- Reduction of fear through preparation -planning and execution exercises.
- Implement leadership training on how to handle a crisis.
- Develop best practices.
- The non-inoculation cultural environment should be taken into consideration during preparation and planning.

References.

Basaran, I., 2016. IMO's contribution to international law regulating maritime security. *Journal of Maritime Law and Commerce* , 45(4), pp. 101-117.

Control, C. f. D., 2017. Center for Disease Control. [Online] Available at: <http://www.cdc.gov/quarantine/qas-frn-travel-restriction.html>[Accessed May 2017].

Maxwell, J., 2012b. A Realist Approach for Qualitative Re-

search. Oaks, CA: Sage.

Mertens, D.M. & Wilson, A.T. , 2012. Program evaluation theory and practice: A comprehensive guide. New York, NY: Guilfor Press .

Stufflebeam, D., 1966. A depth study of the evaluation requirement under Title 1. *Theory into Practice* , 5(3), pp. 121-133.