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Game Overview

From 17-18 September 2019, the Uniformed Services University of the Health Sciences (USUHS) - National Center for Disaster Medicine and Public Health (NCDMPH) and the United States Naval War College (NWC) conducted a game at Johns Hopkins University's Applied Physics Lab (JHU-APL) in Laurel, Maryland. Titled "Urban Outbreak 2019," this two-day, three-move analytic game was internally developed by the NWC's Humanitarian Response Program (HRP) and emerged as an output from their 2018 Civilian-Military Humanitarian Response Workshop.

This event was executed in partnership with faculty from USUHS-NCDMPH and JHU-APL. The game focused on the challenges and opportunities for organizations responding to a rapidly spreading infectious disease in a notional, dense, coastal, urban environment of 21 million people. Over 50 highly experienced players participated in this game, including real-world experts from international militaries and government agencies, public health and medical responders, humanitarian nongovernmental and intergovernmental organizations, and private sector health, security and shipping industries.

The game's thematic focus and design resulted from discussions between leading civilian, military and academic participants focused on urbanization trends and pandemic threats during the 2018 Civilian-Military Humanitarian Response Workshop hosted at Brown University in Providence, RI. Following the 2014 response to the Ebola outbreak in West Africa and monitoring its 2018 spread in the Democratic Republic of the Congo, collaborating experts identified the importance of garnering a better understanding of the wide variety of operational and coordination challenges they may encounter during a response to a rapidly-spreading pathogenic threat in a densely-populated urban environment. A series of follow-on conversations between the NWC, USUHS-NCDMPH, and JHU-APL further refined the objectives for this game.

Urban Outbreak was designed to further three key objectives:

- Identify priorities for organizations involved in such a response as well as their associated strengths and weaknesses;
- Identify civilian and military agency coordination and communication challenges and opportunities for preparedness and response; and
- Develop a set of questions, derived from player activities and observations made during the exercise, to inform a research and training agenda.

With these objectives in place, the game was designed to replicate the geography, infrastructure and demography of an extremely dense mega-city, including myriad social, political, economic, cultural, and security complexities that compound this particular problem set. The pathogen was designed to result in an outbreak of an (otherwise treatable) disease in dense urban environment that could be realistically declared a Public Health Emergency of International Concern (PHEIC) and prompt a robust international humanitarian response.

Urban Outbreak 2019 was not designed to simulate an actual response or test current coordination structures. Instead, the game was created to elicit information from, and promote interaction between, expert practitioners with the unique experience to inform each other about the realities of a humanitarian response within this operational environment. The game was systematically designed to

gather key information from all participants at critical phases of the outbreak. Significant areas of inquiry for participants included:

- The actions or activities they prioritized as most essential for an effective response;
- The external stakeholders they prioritized as most essential to successfully complete their priority activities;
- Their confidence in their ability to actually complete their own priority activities with the support of the stakeholders they deemed essential;
- The amount of access they needed to successfully coordinate with particular stakeholders;
- The perceived importance of their organization's efforts towards the overall response;
- The types of formal coordination systems they would use within their response;
- And which participants or participant groups best aligned with their response approach or priorities at each phase of the response.

Initial Findings: Pre-Analytic Elements Observed During Game Execution

- Move data captured a wide range of confidence from players about their organizations' ability to engage in their priority activities and the value of those activities to the overall response effort.
- Players clearly struggled with the ambiguity associated with host government authorities and the majority expressed a consistent desire for a central entity to coordinate a multilateral response.
- Many cells emphasized the need for strong relationships with local and international media and communication stakeholders for a variety of reasons, including: public health education, risk communication, fundraising, rumor control, safety, improving perception of aid workers, and building political will within the United States.
- While it was difficult for many players focused on the national authorities, there was general agreement that local government and other local authorities remain primary stakeholders for a successful response. This commonly held assertion did not seem to change USG role players' practice of prioritizing coordination with national agencies and officials at the expense of local authorities.
- There were five interrelated outlawed gangs in the scenario. Each was unique and held some form of control over a geographic area and large population. Every breakout cell independently discussed if and how to engage the gangs. There was general agreement that they were important to the response and local gangs were noted as a viable stakeholder for the majority of groups, but for different reasons. There was a predominant theme among many USG role players that gangs could be a source of "intelligence." Most other game players from different sectors had very different perspectives on engaging with gangs.
- Players representing NGOs expressed a noticeably higher tolerance for operational risk to their own personnel than their military counterparts.
- Private sector emphasized the need for creating robust and reliable supply chains to establish a continuous stream of supplies as a means of addressing the outbreak. They also felt dependent on military and local law enforcement services for the security of essential infrastructure.
- Deliberation concerning the scope and role of the military response remained a predominant theme throughout the entire event. Unlike other groups who may have considered their response in relation to the military, NGO players were noticeably less interested in military activities than

other participants and remained focused on the demands of their own specialized response activities.

- While a de facto quarantine emerged within the game as the outbreak expanded, there was general agreement that though this might be a political reality, it would likely only accelerate the spread of the disease (from a medical perspective) and increase violence and insecurity.
- A dominant sentiment among some key groups was that the infection was the only thing many responders were there to address and, regardless of the fragility of the city/country, as the number of infected people decreases, "development" organizations should take over.
- Formulating a coherent post-military strategy was very challenging for both civilian and military players as discussion of transition and handoff of responsibilities led to numerous examples of historical failures and organizational differences.

Participants

The Urban Outbreak game brought together 50 highly skilled professionals with substantial tactical and operational-level experience in humanitarian response to participate in a two-day game focused on a high-risk scenario for a multinational emergency response. The game began with 30 male and 20 female role players distributed to five different sector-specific cells. Each of the following sectors was represented by approximately ten players: US and International Military (Alpha Cell), Humanitarian NGOs (Bravo Cell), US Government (Charlie Cell), International Organizations/Agencies (Delta Cell), and the Private Sector (Echo Cell). Players averaged nearly 13 years of service in government, military, agency, NGO, or private sector entities. When queried about their operational-level involvement in humanitarian response to natural disasters, complex emergencies, and catastrophic medical events, players self-reported an average of ten years of experience in such settings. The mean age of participants in this game was approximately 46.

Scenario

To foster an environment for dynamic game play which avoids the potential for players becoming mired in real-world geopolitics, Urban Outbreak is set in the notional, coastal city of Olympia, which is located on the southwestern edge in the sovereign nation of Olympus. With a population of approximately 21 million, the city of Olympia possesses the highest levels of income inequality in the world. Approximately 60% of its inhabitants live in informal settlements and slums, and only three percent of the population has access to public water facilities. The preponderance of the population receives its health care through informal medical providers, many of whom lack professional credentials, university-level medical training, or hospital-grade supplies or equipment.

There is rampant illegal dumping of refuse including medical waste and high rates of interpersonal crime in many areas that are not policed. Olympia has one of the highest rates of kidnapping for ransom in the world. Outlawed gangs are active in informal settlements/slums and have de facto or local government sanctioned control over some of the densest areas in Olympia. The local and national police have taken a heavy-handed approach to gangs and crime in some of these areas so extrajudicial killings by police and gangs are not uncommon.

Within this challenging context, the first move of the game introduced the outbreak of a pathogen that was originally identified in rodents but is later spread by person-to-person contact. This infectious agent

initially causes fever, cough, headache, fatigue, and general malaise; progressively worsening to include bloody sputum production, respiratory distress syndrome, respiratory failure, and death within six days. Although injectable antibiotics could be used to treat this pathogen, they were not readily available in the densely populated environment of Olympia.

The first move of the game focused on initial planning and response to the pathogen outbreak, which was declared a Public Health Emergency of International Concern by the World Health Organization and resulted in the requests for support from international militaries. The second move emphasized the difficulties found in coordinating and delivering an effective response when faced with exponential growth of the infection, civil unrest, a breakdown of formal governance and public health systems, misinformation, and medical resource scarcity. The third move presented players with a break in the spread of the disease - prior to international militaries transitioning out of their supporting roles - but introduced all of the factors that would be present in a mega-city following a large-scale disaster. Players could freely interpret this as a momentary lull in the outbreak or explore viable options for transition from crisis response and a return to (a perceived) steady state.

Gameplay

Olympia itself is an exhaustively researched and designed city and players had access to detailed information in the 34-page "Olympia Factbook" covering everything from maternal mortality and water quality to transportation statistics and gang affiliations. Players were advised to find the information that would be most relevant to their particular area of decision making within the response.

The scenario was designed to raise multiple competing issues for players focused on different aspects of the response at different times. Similar to an actual disaster response, the wealth and detail of information available to players was designed to force specialized decision-making along with time and priority management. There were no constraints put on players' moves other than the request that they commit to up to three priority activities and up to five essential stakeholders (external to their organization) per activity. Players were instructed to respond in any way they deemed most effective for the response and act in a realistic manner for the organizations they represented in the game.

After each of the three moves within the scenario was briefed to the players, they went to their facilitated breakout cells to enter their personal move data and discuss their actions. As cell participants presented and discussed priority activities and key stakeholders with each other, each cell was forced to further prioritize their numerous key stakeholders down to the five most essential in a vote. Players were then asked to outbrief the results of their cell's vote and preceding discussion in plenary for all participants.

In the first round, breakout cells alpha through echo began as a monoculture of role players from that particular sector. Following the cell outbriefs at the end of the first and second moves, players were prompted to actively choose any cell they preferred for their next move if they determined a different cell better aligned with their priority activities. Players were required to give a rationale as to why they believed joining a particular cell was advantageous to their response. All individualized demographic, pre-and-post move data, votes, and cell selection rationales were captured via internal survey instruments on JHU-APL terminals. All discussion in breakout cells and plenaries were closely documented by dedicated ethnographers.

Analytic Methodology

Using an analytic gaming approach to capture data from a diverse group of organizations and interests, the game sought to identify issues in coordination, communication, and challenges across entities engaged in humanitarian response. Moreover, bounded within a universal notional scenario, participants were afforded the opportunity to honestly and openly discuss their primary activities and key stakeholders in a non-attribution environment.

Urban Outbreak employed an inductive, qualitative research design, using a mixed-methods approach. Data were collected using both externally and internally validated survey instruments to capture individual player insights and a common ethnographic process to capture cell-based and group plenary discussions. Game data includes approximately 168 pages of ethnographer notes focused on discussions within the five player cells and collective three group plenary sessions. In addition, the findings of 9 cell-based surveys and three move visualizations were included in the datasets for post-game analysis.

Text-based products were coded using a list of nine words identified during the literature review portion of this project and termed selective codes. The nine words included the following: coordination, communication, priorities, challenges, opportunities, prepare, response, strength, and weakness.

Using a grounded induction analytic tool termed *MAXQDATA Analytics Pro* (Version 12), the final post-game report (anticipated for release in 2020) will include the examination of data related to these terms in context, allowing the NWC to connect with perspectives identified by the game's players, and produce broader, serendipitous insights valuable for both follow-on research and timely and accurate inputs to curriculum.

Way Ahead

From October 2019 through April 2020, faculty from the NWC's HRP will closely examine nearly 168 pages of ethnographer's notes, 26 pages of spreadsheet-borne data from individual player surveys, and three cell-based stakeholder visualizations. These datasets will be analyzed to identify common insights identified by the players, noteworthy outlier remarks, and emerging themes useful for further research inquiry and NWC curriculum development.

After anonymizing the totality of data collected during the game, it will be shared with participants and their respective organizations in order to stimulate further research, analysis and publication. Post-game surveys have already resulted in the identification of expert working groups comprised of diverse civilian and military stakeholders interested in original research and dissemination of game findings.

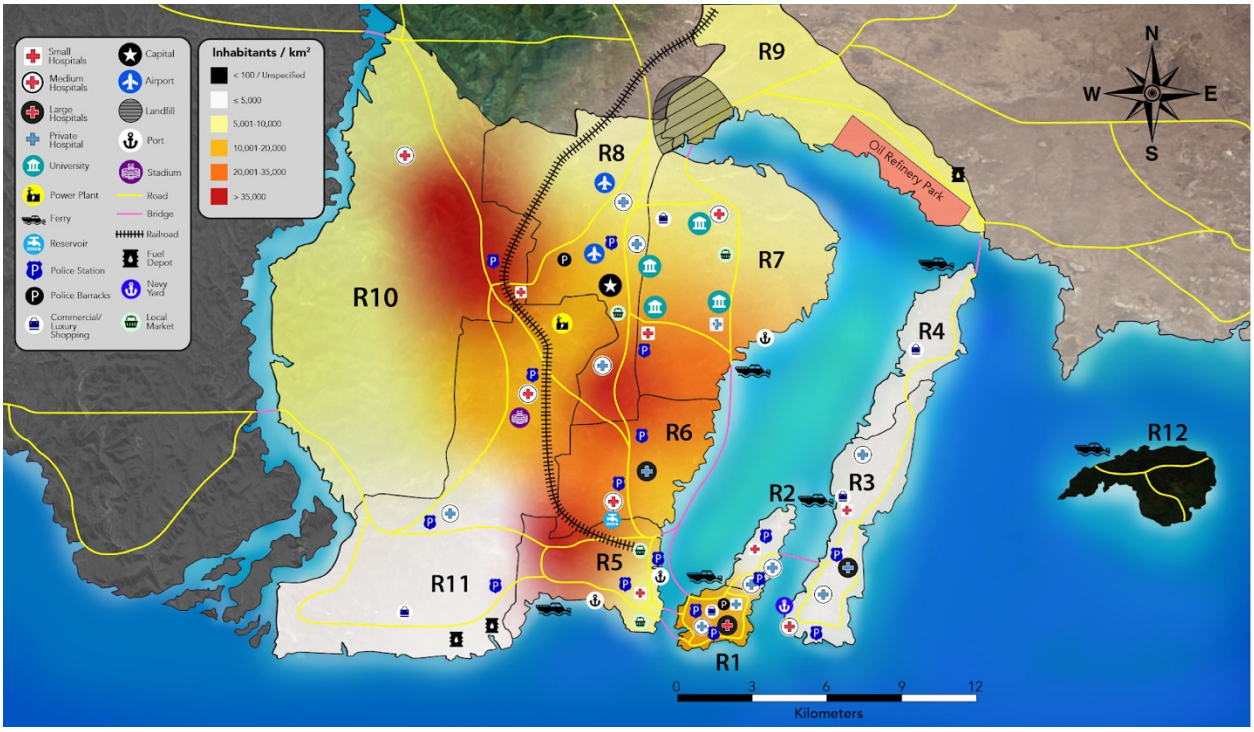
The game will now serve as the touchstone product for follow-on simulations involving natural disasters and complex emergencies, and will be used as a catalyst for future engagements with academicians, students, and practitioners.

Robust analytic findings will be provided in the final game report, which is anticipated for release in 2020. However, initial assessment of this project emphasizes the essentiality of bringing together diverse stakeholders focused on cross cutting issues like the Urban Outbreak scenario. Such efforts are necessary to develop new solutions and foster greater awareness of the barriers to effective coordination in response to emergent humanitarian crises.

The key analytic findings and areas for further inquiry will be presented at the NWC-Brown University Civilian-Military Humanitarian Response Workshop (25-27 March 2020) in Providence, Rhode Island.

Appendix

I. Density and Infrastructure Map of Notional City of Olympia



II. Urban Outbreak 2019 Epidemic Curve