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Bio-Agro Defense Collaboration: The Need of Joint Leadership Education and Training of Strategic Analysts and Decision Makers

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Abstract

Bioweapons deliberately spread to humans and animals is one of the most complex and intersectoral CBRNE threats. It requires multi-sectoral collaboration between law enforcement, public and animal health and in severe cases civil-military collaboration. By building a collaborative management culture between these sectors, through joint education, training and exercise activities, better methods and tools will be obtained in order to reach interoperability and an integrated preparedness approach. Lessons learned and experiences from previous projects, courses, workshops, and simulation exercises require a rationale knowledge transfer. Horison scanning is one example of a method that can be recommended to educate strategic analysts jointly from various sectors and the "Decision Theater" is a dynamic and flexible tool that is useful to train decision makers to examine complex bio-agro defense and biosecurity problems.

Keywords: Agroterrorism; Bio-agro defense; Biosecurity; Civil-military collaboration; Decision theater; Horizon scanning; Multi-sectoral

Introduction

Today's and tomorrow's global threats are extremely complex and challenging and horizon scanning is one of many key methods for strategic planning to reduce these threats. Future threats are driven by global megatrends such as globalization, rapid urbanization, digitalization, technological innovation and climate changes [1]. These megatrends will influence infectious diseases that have disaster and crisis potential to cause negative economic, environmental and social impact, including human and animal suffering. The threats of infectious diseases can be naturally outbreaks, but also laboratory accidents and deliberate acts due to political instability and regions that are in post conflict or high insecurity conditions may lead to that pathogens may be used as biological weapons [2]. Most pathogens can be weaponised, i.e. to be used as deadly spray systems, missiles or bombs, but historical warfare studies have shown that very few pathogens have been weaponised [3]. In addition, historical studies on deliberate spread of pathogens related to bioterrorism and agroterrorism have also shown very few cases [4]. However, the success in countering biological weapons of mass destruction is recognized by what did not happen and how these weapons can be out of hands of terrorists and enemies [5].

Several international initiatives exists to prevent use of biological weapons and to reduce biological threats such as the Biological and Toxin Weapons Convention (BTWC), the G7 Global Partnership against the spread of biological weapons of mass destruction, the United Nations Office of Disarment Affairs (UNODA), and the Global Health Security Agenda (GHSA). However, even if there are many international initiatives there are many challenges related to both leadership issues and collaborative culture [6]. The interface between security and health requires that security and health works together and that professional for "One Health Security" adds another layer by connecting law enforcement, public health, animal health and plant health [7]. In addition, the recent and ongoing Ebola outbreak in western Africa has demonstrated the additional layer of collaboration, i.e. civil-military collaboration [8]. The importance of civil-military collaboration and defense management to handle an animal diseases crisis have been demonstrated during the Foot and Mouth Disease (FMD) outbreak in United Kingdom 2001 [9]. Besides outbreak situations funding of civil-military collaboration projects have led to new tools on how diagnostic results in the field can be quickly available for faster biosurveillance and situational awareness [10]. The preparedness to prevent, deliberate spread of pathogens in the food chain requires optimized methods, tools and multidisciplinary approaches to prevent and respond to these threats [11]. A rationale transfer of knowledge from previous projects and experiences are crucial in order to obtain a sustainable and improved collaborative bio-preparedness culture and to identify new methods and tools.

Building a Multi-sectoral Collaboration

The EU-funded project AniBioThreat (2010-2013; www.anibiothreat.com) is an example of a pilot project on bridging three disciplines: security, safety and research. These three disciplines, represented by law enforcement, animal and public health and academia, have various cultures in terms of sharing information and performance of work tasks. The project had a focus on bioterrorism threats to animals, feed and food. The pilot project was initiated to implement the EU CBRN action plan with the financial support from the Prevention of and Fight Against Crime Programme of the European Union, European Commission, and Directorate General Home Affairs.

The project has worked to bridge the gap between the various

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sectors through education, training, mobility programs, study visits, exercises and some published R&D activities [12]. The results from the AniBioThreat exercises concluded the need for sustainability to allow future collaboration between national animal health and law enforcement. The multi-sectoral capability that has been established is important to be maintained through continuously exercising between authorities and organizations involved. Following lessons learned and recommendations have been identified; (i) invest to ensure sustainable networks, experts, research and exercises, (ii) continue to develop and implement communication technologies, decision making tools and defined responsibilities, (iii) widen awareness trough outreach to other countries, sectors and disciplines, (iv) strengthen and develop the multi-sectoral approach, (v) facilitate multidisciplinary interaction between scientist and first responders, and (vi) foster a holistic mindset.

New Methods and Tools

Based on the outcome of the AniBioThreat the Institute for National Defence and Security Policy Studies, Swedish Defence University, arranged a multi-sectoral "Early Warning and Strategic Analysis" course for Swedish civil and military partners and strategic analysts in Stockholm 6-10th of October 2014 concerning methodologies applied to biodefense and biosecurity matters. The aim of the course was to improve a collaborative culture and provide the participants with tools, methods, and skills applicable to the 3 Dimensional Early Warning and Opportunity Model based on (i) rapid detection and rapid response (ii) persistent surveillance to known threats and (iii) horizon Scanning/strategic reconnaissance to evolving threats [13]. The course was developed based on workshops and activities that took place in AniBioThreat May 2013. The "Early Warning and Strategic Analysis Course" included education about various methods to evaluate potential mitigation options and strategies in dealing with future biosecurity uncertainties, such as the two-axis scenario method, the time-line indicator method, the driver constraints method, the expert brainstorming method and the horizon scanning method. The course was part of the Bio-Agro Defence Collaboration and Infrastructure Sharing project [14]. In addition, the course gave support to the development of a collaborative culture between the actors in the crisis management system. As a follow up to the course a horizon scanning workshop was conducted between experts from Swedish and US organizations in Washington DC 8th of December 2014. The horizon scanning workshop contained plenum presentation and group work activities. The workshop had a focus horizon scanning methodologies and experiences from law enforcement and animal health. The need for joint horizon scanning activates was identified in a previous workshop 31st of January 2014 that identified the foundation of multidisciplinary course for strategic analysts that was performed in Sweden 6-10th of October 2014 about early warning and strategic analysis. The results and lessons learned from this early warning and strategic analysis course was presented at the horizon scanning workshop 8th of December 2014. The horizon scanning workshop discussed the security domains combined with various biological threats. The workshop identified that in the next 5-10 years there will be shared biological and technological challenges that will affect risks to agriculture, food, and health (plants, animals, humans). Therefore there is a need to jointly explore potential future threats, as well as needed programmatic changes that occur now, to counter those threats. This can be done by designing crisis management training and exercises for strategic leaders [15].

Besides improved methods to train strategic analysts and decision makers modern and novel decision making tools are available. One example is the"Decision Theater", which is a powerful tool to visualize and bring clarity to complex problems [16]. The use of the Decision Theater has been applied to models simulating the countermeasures for a smallpox outbreak [17].

Conclusions

Lessons learned from outbreaks and previous projects have demonstrated the need for improved education, training and exercises for multidisciplinary biological and agricultural threats. New methods for early warning and strategic analysis combined with state-of-the-art tools, such as a "Decision Theater" can be recommended for bio-agro defense matters. Bringing transatlantic strategic analysts together has generated a deeper insight for strategic warning methodologies. Identified key trends will be clustered and will allow jointly education and training activities to monitor these trends. Improved methodologies for strategic analysts will foster a holistic mindset on various biological and agricultural threats.

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