Journal of Bioterrorism & Biodefense
ISSN: 2157-2526

Leon, J Bioterror Biodef 2016, 7:2
DOI: 10.4172/2157-2526.1000143

Short Communication Open Access

Biosurveillance Threats and the Opportunity to Develop a Safer World

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Biological events that have caused significant mass morbidity, mortality and fear are well chronicled in human history [1]. They range from the Antonine Plague (similar to smallpox), which caused a death toll of 30% of the population, to the Plague of Justinian and the Black Death, which resulted in mortality estimates of as high as 70% of the population. Biological disasters have also occurred in modern times. Such disasters include: Severe Acute Respiratory Syndrome (SARS) in 2002 and 2003; influenza in the 20th century; Ebola Viral Disease in West Africa in 2014 [1].

The term "bio surveillance" has become the umbrella term for a more comprehensive approach to bioterrorism and biological events [2]. From this point of view recent events have to be analyzed where hundreds of thousands of people seeking refuge from conflict in Iraq and Syria have streamed into Europe. Are these governments ready to monitor the epidemiologic status on their borders? In this question an emphasis is put on the point of entry (the border crossing) when potential biological threats could infiltrate.

An additional source of "bio surveillance" threats is human migration. Such events could be massive immigration, religious pilgrimage, or even large scale sporting events and business/personal air travel, which could endanger regions that had not been at risk previously. The rapid spread of pandemic infections has led to the development of numerous devices to detect infected persons, especially at border checkpoints [3]. Emerging technologies from a combination of miniaturization technologies (such as "lab on a chip") and data from numerous fields are leading to noninvasive, effective, automated, portable, low cost, more efficient and rapid biochemical analyses which must be adopted to adapt to every potential biological threat to society.

The question is not whether other pandemic bio surveillance events will return, but rather when and where they will occur.

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Received January 28, 2016; **Accepted** April 06, 2016; **Published** April 12, 2016

Citation: Leon B (2016) Biosurveillance Threats and the Opportunity to Develop a Safer World. J Bioterror Biodef 7: 143. doi: 10.4172/2157-2526.1000143