

## PLENARY SESSION IV: MILITARY THREAT: EMERGING AND RE-EMERGING INFECTIOUS DISEASES

### PL11 RESURGENCE OF MIXED DENGUE VIRUS INFECTION

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Dengue is re-emerging as one of the most important public health problems with an estimated 50 million cases occurring per annum. Dengue is now endemic in most parts of India. The proper and timely diagnosis of the disease is complicated due to co-circulation of cross-reacting antibodies of other flaviviruses. Since there is no immunoprophylactic or specific antiviral therapy available, the timely and rapid diagnosis plays a vital role in patient management and implementation of control measures. The serosurveillance of a total number of 174 clinical samples collected during a recent dengue outbreak in Delhi during post-monsoon period from Sept to Nov 2008 was carried out for presence of antibodies using the in-house dengue ELISA kit. The overall seropositivity was found to be 68% and the antibody profile revealed 6% IgM, 40% IgG and 22% - IgM & IgG antibodies indicating that most of the patients have carryover antibodies from past infection. Further analysis of these samples by RT-PCR of viral genome, indicated 14% positivity confirming the lower percentage of incidence of dengue infection this year. The serotyping of the RT-PCR positive samples by Multiplex and Nested PCR revealed the presence of mixed serotypes (DEN-2 & 3). This trend of resurgence of mixed infection indicates that dengue virus has established the endemicity in Delhi, which is a point of major concern for public health authorities thereby demanding implementation of strict control measures for the control of future epidemics.

### PL12 THE EMERGENT SMALLPOX THREAT AND FORCE PROTECTION

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Terrorists have announced their desire to use biological weapons. Indeed, effective use of disease would set in motion political, economic, and health consequences so severe as it challenges government's ability to maintain our security. Perhaps the worst possible biological attack would involve smallpox. That danger increases enormously if smallpox can be created de novo from widely available materials. If so, then the main hurdle to smallpox terrorism – getting the agent – would be lowered substantially. Can this most feared virus – smallpox – be de novo synthesized? What is the timeframe? While answers to these questions are unclear, the infirmity of security policies and national preparedness plans to meet dangers associated with intentionally inflicted smallpox is absolutely clear. Because of the widely held perception that smallpox's unavailability is the best line of defense, the correlation between the imminence of de novo synthesis of smallpox and the urgency of prevention policies has not yet been adequately explored. A first issue concerns the development, stockpiling, and delivery of medical countermeasures to military personnel and disaster responders. In the light of such developments, what should be the focus of policies to prevent those risks from materializing? What are the conditions and requirements of implementing those policies? How do we implement biological preparedness? A second issue concerns implementation of measures for rapid and effective response through improved disease surveillance, early warning, and medical counter-measure delivery to limit disease consequences. What multinational processes can be equitably established to promote early detection through bio-surveillance and sensing capabilities? How can coordination be optimized among public health personnel and law enforcers investigating the attack

PL13

## EMERGING INFECTIOUS DISEASES SURVEILLANCE IN MILITARY MEDICINE

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Emerging infectious diseases (EIDs) like SARS and novel influenza viruses continuously threaten global public health and thus international security. EIDs arise from all regions of the world, including developed and developing countries. Among the populations most at risk for emerging infections are military personnel, due to crowding, mixing of diverse groups, frequent deployments to remote and dangerous locations, and less access to advanced diagnostics. To counter this continuous threat from EIDs, the US military was tasked with developing a global system for detecting, responding to, and mitigating these infectious threats. In 1997, the DoD-Global Emerging Infection Surveillance and Response System (DoD-GEIS) was established, and capitalized on a global network of 5 DoD research laboratories in the tropics and military treatment facilities around the world. This disease surveillance system focuses on 5 areas, including influenza and other respiratory infections, febrile and vector-borne infections like malaria and dengue, anti-microbial resistant organisms, diarrheal diseases, and sexually transmitted infections. Coordination is achieved through central management of the system within the Armed Forces Health Surveillance Center, which standardizes reporting requirements and is responsible for providing timely and actionable data for force health protection and global public health. This system has been very successful in the first 12 years, including the detection of numerous emerging pathogens such as H5N1 avian influenza, novel hemorrhagic fever viruses and the current swine origin influenza virus (SOIV) H1N1 that is spreading globally. Additionally, GEIS has sponsored the development of innovative electronic disease surveillance tools, annual influenza vaccine effectiveness evaluations, and efforts to standardize malaria resistance methodology, among many other endeavors. This talk will describe the current GEIS network and detail some of the recent accomplishments.

