Type: Poster Presentation

Strengthening national One Health disease surveillance with open-source EIDSS

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Background: Kazakhstan, Georgia, Azerbaijan, Armenia and Ukraine by 2005-2013 were running human, veterinary and vector disease surveillance on paper with rare application of software for selected vertical programs. This traditional method did not meet the modern requirements of information timeliness, data quality, data analysis and one-health integration of veterinary and human data.

Methods & Materials: Electronic Integrated Disease Surveillance System (EIDSS) is developed to address the shortcomings of the paper-based systems particularly in especially dangerous infections surveillance as well as all reportable diseases. Development is based on more than 100,000 man-hours of expertise from the Centers for Disease Control and Prevention (CDC) and other US and international organizations.

EIDSS provides support for desktop application, web application, Android app and mobile-phone web platforms. The Android and mobile-phone platforms are especially suited for low-resource environments where ongoing mobile network revolution provided connectivity to a significant part of a country recently (e.g. in Tanzania to 98% of district centers with significant growth in rural areas).

Starting in January 2014 EIDSS becomes open-source and freely available for use, modification and distribution under open-source license. The *eidss.codeplex.com* project will initially have about 50 core international participant community and is expected to expand.

Results: EIDSS is currently deployed and sustained at 436 sites with 780 workplaces in the Republics of Kazakhstan, Georgia, Azerbaijan, Ukraine and Armenia as a part of a program sponsored by the U.S. Defense Threat Reduction Agency (DTRA). Plans for expansion include additional 350+ sites with 500+ workplaces in Kazakhstan, Iraq and other countries. EIDSS has fully replaced paper disease reporting with electronic reporting in Azerbaijan and Georgia with the rest of the countries on the way for complete acceptance. Tens of thousands cases and aggregate counts are entered into the EIDSS systems across these countries.

Conclusion: Strengthening of national One Health disease surveillance system with EIDSS improves timeliness (few minutes to distribute notification), increases data collection quality through standardized formats, integrates exchange from district (or even hospital) to national level, and provides ability for integral data analysis.

Type: Poster Presentation

Training health workers for enhanced monkeypox surveillance, Democratic Republic of the Congo

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Background: Monkeypox (MPX) is an endemic disease of public health importance in the Democratic Republic of the Congo (DRC). In 2010, the DRC Ministry of Health joined with external partners to improve MPX surveillance in the Tshuapa Health District of DRC. A pivotal component of the program is training of health zone personnel in surveillance methods and patient care. In this report we evaluate outcomes of the training program.

Methods & Materials: In early February 2011 and again one year later, five representative health care workers from each of the 12 health zones in Tshuapa District attended a monkeypox surveillance training program. Health care worker knowledge of key concepts in the MPX training curriculum was assessed using an anonymous self-administered survey. Additionally, evaluators collected feedback about the capacity of participants to perform the surveillance tasks. Training impacts were determined by assessing various performance metrics for surveillance.

Results: Fifty-eight healthcare workers participated in the pre and post-knowledge evaluations. Correct trainee responses to questions about MPX symptoms and patient care increased significantly upon completion of training events. During the 12 months after the initial training, the proportion of suspected cases investigated increased significantly (from 6.7 to 37.3%), as compared to the 5 months prior. An improvement was also observed in the correct identification of vesicular fluid and lesion crusts (rather than blood) as preferred samples for laboratory testing. However, the proportion of reported cases that were ultimately confirmed remained unchanged, 20.1% (5/24) vs. 23.3% (60/257). When specifically asked how often the necessary PPE was available for collection of MPX samples, 47.7% responded 'sometimes' and 3.1% responded

'never', suggesting that lack of PPE is a notable barrier to the effective performance of monkeypox surveillance activities.

Conclusion: We have demonstrated that the MPX curriculum developed for this initiative was effective in transferring knowledge and was associated with improved detection of human MPX cases. Similar models for training local health care workers and the provision of simple investigation tools may be useful for improving surveillance and response to other infectious diseases of epidemic potential in resource-poor settings in line with the model outlined for IDSR in Africa.

Type: Poster Presentation

Etiology of influenza-like-illness in Mozambique: The first 9 Months of influenza virus surveillance

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Background: Although the lower respiratory infections are the most severe form of infection and cause millions deaths, the upper respiratory infections are the most frequent presentation of Acute Respiratory Infection-ARI, and virus infections have been shown to play a major role in ARI in developed and developing countries. Respiratory viruses traditionally associated with ARI include influenza-(FLU) A and B, respiratory syncytial virus-(RSV), parainfluenza-(PIV) types 1/2/3, adenovirus-(AdV), enterovirus-(EV), human metapneumovirus-(hMpV) and rhinovirus-(RhV). However, few studies on the occurrence of these specific viruses were generated in Sub-Sahara Africa, in particular Mozambique. Thus, the objective of this study was to evaluate the occurrence of respiratory viruses among influenza virus surveillance samples.

Methods & Materials: From February to November 2013, 96 nasopharingeal swabs (NFS) from inpatients and outpatients enrolled during influenza virus surveillance in three sentinel sites in Maputo-Mozambique were collected. All samples were tested for influenza virus using RT-PCR following the CDC procedures. Therefore, 28 positive or negative NFS to FLU-A virus were randomly selected and tested for the presence of other respiratory viruses by using a SARI-Multiplex-RT-PCR (Pretorius *et al.*, 2012). Moreover, case definition criteria for FLU infection such as fever and cough were analyzed.

Results: FLU-A was detected in 11 samples. A(H3) subtype was found in 45% (5/11) samples while the h1pdm09 was detected in 55% (6/11) samples. Among non-FLU-A viruses, RhV was the most frequent pathogen 59% (10/17) followed by PIV3 and AdV (3/17) each and EV (2/17). Co-detections of only two viruses were found being the RhV the common co-detected pathogen (5/6). FLU-A and RhV were mostly detected in samples from 20-55 years old patients while RhV was co-detected with EV in children less than a year. All 28 samples were negative to PIV1, PIV2, RSV, FLU-B and hMpV. All FLU-A (11/11) positive patients had reported cough while 91% (10/11) had reported fever and headache.

Conclusion: This is the first report of other respiratory viruses in Mozambican subjects after the emergence of the h1pdm09 virus. This study provides relevant data for better understanding the viral

ethiology of influenza like illness or severe acute respiratory infection during influenza surveillance.

Type: Poster Presentation

Malaria surveillance system evaluation, Oyo state, Nigeria 2012

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Background: Malaria constitutes a major public health problem in Africa, and Nigeria accounts for 25% of the burden of this infectious disease in Sub- Saharan Africa. Oyo state is holoendemic for malaria, and is the commonest reason for hospital outpatient attendance. The Integrated Disease Surveillance and Response (IDSR) was set up in 1998 to support concerted efforts towards priority disease prevention control and treatment. We assessed the relevance, and public health importance of the system in Oyo state, and evaluated its attributes and operations

Methods & Materials: Retrospective review of IDSR Malaria specific case summary data for January to December 2012 and descriptive analysis of cases was performed using Microsoft Excel. We conducted Key informant interviews with the program stakeholders (7 persons) and focused group discussions with the surveillance officers in the 33 Local Government areas (LGAs) in the state using self administered semi-structured questionnaires.

Results: The system provides information and data on disease trends, morbidity, mortality, and intervention coverage. Case definitions are well understood by participants, with willingness to continue in 25 out of 33 surveillance officers (76%) to sustain the system. Standardized data collection tools (stationery, paper and electronic based forms) are in place, and data communication is clear with feedback to surveillance units at all levels. The system was rated flexible in 5 out of 7 stakeholders (71%), as they believe it can accommodate the new changes in use and format. Data was essentially from public health facilities and excluded cases from tertiary and private health facilities and thus not representative. There was late reporting in 20 out of 33 LGAs (60%); and incomplete data in 195 out of 723 reporting facilities (27%), both parameters below the State's 80% target.