

Electronic Integrated Disease Surveillance System (EIDSS)

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OBJECTIVE

This paper describes the Electronic Integrated Disease Surveillance System (EIDSS) being deployed in Uzbekistan, Kazakhstan, Georgia, and Azerbaijan under the Biological Threat Reduction Program (BTRP) as part of the Threat Agent Detection and Response (TADR) Network.

BACKGROUND

The TADR Network currently supports the U.S. Government's (USG) strategy for strengthening Biological Weapons Convention (BWC) compliance through focus on disease surveillance and investigations of suspicious outbreaks of disease in the Republics of Kazakhstan, Uzbekistan, Georgia and Azerbaijan. TADR is a comprehensive approach to achieving the USG's overall BWC compliance, and consists of several components.

EIDSS was developed as an integral part of the human and animal disease surveillance systems to strengthen and support monitoring and prevention of dangerous diseases by providing computerized capabilities to collect, store, analyze and rapidly disseminate disease surveillance data, both human and veterinary, throughout the surveillance system and to participating ministries and agencies.

EIDSS DESCRIPTION

EIDSS is based on a distributed data model with a hierarchical systems architecture consisting of four primary levels including from the top down the General Data Repository (GDR), Central Data Repository (CDR), Epidemiological Monitoring Stations (EMSs), Sentinel Sites (SS), TADR Response Vehicles (TRVs), and Mobile Outbreak Response Units (MORUs). The CDR, located at the Central Reference Laboratory (CRL) in each country where TADR is being implemented, will be the final data hosting place at the national level.

EIDSS is an electronic integrated disease surveillance system that integrates the case data collection, demographic information, geographical information, laboratory analysis, sample tracking, epidemiological analysis, clinical information (including disease specific clinical signs) and response measures into a cohesive information set that is continuously synchronized amongst all EIDSS sites within a country providing near real time information flow that can be then disseminated to the appropriate organizations in a timely manner. The information is securely stored and is available for historical data analysis.

The EIDSS system integrates human and veterinarian disease surveillance information, laboratory data management, mapping (Geographic Information System), statistics, and reporting information. In order to achieve these objectives, the EIDSS system incorporates high level of security and includes reliable data replication across multiple administrative levels, multi-language localization support, data validation and a unified data model. EIDSS is also designed with certain flexibility, allowing for expansion of the predefined list of especially dangerous diseases that are tracked by TADR with other reportable diseases.

The underlying communications and computer infrastructure supporting EIDSS is designed on the widely available and supported off-the-shelf Microsoft and HP components, which makes the systems maintenance and support effort cost effective, and allows future expansion of this system to additional sites. Virtual Private Network technology along with encryption, low bandwidth requirements and communications back-up technology allows the use of inexpensive land or radio links provided by existing service providers on EMS and CDR level and dial-up and General Packet Radio Service (GPRS) links on SS and TRV/MORU, providing low-cost secure and reliable communication between sites.

CONCLUSIONS

The EIDSS system is being successfully implemented within the Uzbekistan, Kazakhstan, Georgia and Azerbaijan. Other countries are expected to become part of the program and will receive EIDSS. The further implementation of the system requires continuous involvement of the participating institutes in the EIDSS iterative development in a transition to the full-scale operation of the system, and will require implementation of the regulatory basis through the legal support of the norms and regulations.

REFERENCES

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