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Accuracy of EIDSS Software Prognosis on CCHF Natural Foci Activity in Kazakhstan

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Objective

Evaluation of accuracy of the population epidemic risks prognosis for 2013 in the natural foci of Crimean-Congo Hemorrhagic Fever (CCHF) in the Republic of Kazakhstan with application of Electronic Integrated Disease Surveillance System (EIDSS) version 4.

Introduction

Active CCHF natural foci were reported in 3 southern regions of Kazakhstan. The CCHF virus reservoir and vectors are ixodic ticks. 3-12 human CCHF cases occur per year; infection occurs through tick bites and CCHF patient blood contact. Prediction of the CCHF epidemiological situation is extremely difficult due to a variety of natural and social factors that directly or indirectly influence development of CCHF outbreaks. Kazakhstan has conducted research of EIDSS software application for processing an array of epidemiological data and situation prediction in certain regions of Kazakhstan [1].

Methods

EIDSS version 4 [2,3] is designed to collect and process epidemiological, clinical and laboratory information on infectious diseases of humans, animals and natural vectors of dangerous pathogens. EIDSS in Kazakhstan is installed at 146 sites of the Ministry of Agriculture, and 8 sites of the Ministry of Health. In 2012, the EIDSS database was loaded with 3 groups of indicators for the 2007-2011 period: population counts by districts; tick infection rate; CCHF human incidence rate. A multivariate epidemiological analysis was conducted in the EIDSS program to reveal areas with the most CCHF risk. The information was grouped into 3 outbreak prognosis risk levels (high, medium and low) for all 25 CCHF endemic districts of Kazakhstan. This prognosis for 2013 was provided to the public health service of Kazakhstan to plan activities.

Actual information on CCHF foci situation was received for the 1st half of 2013: details on the number of people who had sought health care in relation to tick bites, tick infection rate figures and 3 human cases. The major criterion for the evaluation of the prognosis was the actual number of tick bite complaints.

Results

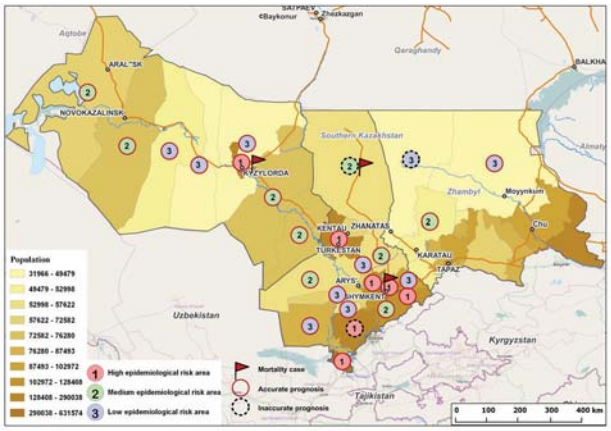
It was determined that the 2013 prognosis [1] with the high outbreak risk estimate for 9 districts of 3 regions of Kazakhstan proved to be accurate for 8 districts (88.9%). Moreover, in 2 high outbreak risk districts 2 out of 3 CCHF human cases were registered. The prognosis for the districts with medium and low outbreak risk proved to be accurate in 13 of 16 CCHF endemic districts (81.3%).

The received information is statistically reliable (statistical significance is 0.95) and confirms that EIDSS software provides a reliable prognosis of CCHF epidemic threats for specific districts, and can be used for management decision-making. Proposed method requires the following four indicators grouped by CCHF endemic districts (for no less than 5-year period):

1) Population counts in CCHF endemic districts
2) Tick infection rate (proportion of seropositive samples for CCHF to the total number of tested laboratory samples)
3) CCHF people incidence per 10,000 persons
4) Number of people with tick bite complaints in medical institutions

Conclusions

EIDSS with Natural Infection Vectors and Analysis, Visualization and Reporting modules can be used to analyze and predict threats of epidemic outbreaks in CCHF natural foci, and serve as a decision-making basis for the management. The software is easy to use, accessible, and can become the main working tool for the field epidemiologists of Kazakhstan.



Keywords

CCHF; Prognosis method; EIDSS

References

1. Kazakov S, et. al EIDSS Application for CCHF Foci Activity Epi-Analysis and Prediction in Kazakhstan // ojphi.org 5(1):e199, 2013
2. Burdakov A, et. al One Health Surveillance with Electronic Integrated Disease Surveillance System // ojphi.org * 5(1):e199, 2013
3. Burdakov A, et. al Transforming national human and veterinary disease surveillance systems from paper into integrated electronic form in the FSU countries // ICID 15, 2012, Bangkok, Thailand

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