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Research Article

IMPROVING THE SYSTEM OF EPIDEMIOLOGICAL SURVEILLANCE OF INFECTIOUS DISEASES IN UZBEKISTAN

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ABSTRACT

IS EMID is an information system created to automate the process of registration, accounting and response to identified cases of infectious morbidity, providing the Sanitary and Epidemiological Welfare and Public Health Service to carry out centralized control and monitoring of the epidemiological situation in a single organizational, legal, methodological and information space of the Service units, taking into account the forms of infectious morbidity and territorial affiliation.

In general, the introduction of IP into the practice of medical institutions and other authorized places will contribute to their effective management, timely identification and analysis of the situation of the necessary qualified medical care.

KEYWORDS

Epidemiological surveillance, as the main form of management activity of the sanitary and epidemiological service, is widely implemented in healthcare practice in most countries.

INTRODUCTION

The study and analysis of world experience in the field of building control and monitoring systems for epidemiological morbidity has shown that among foreign information systems there are solutions that partially satisfy the functional requirements for the IS EMID. The construction of a model of sanitary and epidemiological well-being of the population for each country is based primarily on its own legislative

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framework, modern scientific and methodological support, generally recognized requirements of international organizations such as the World Health Organization.

The tasks of preventing the occurrence and spread of dangerous infectious diseases that can cause mass outbreaks of infectious diseases and epidemics are usually assigned to the state sanitary and epidemiological service of the country. In this aspect, ensuring biological safety is determined by the state and preparedness of the state sanitary and epidemiological service system for the detection, localization and elimination of outbreaks of infections.

For effective timely development and implementation of measures to minimize the consequences, localization and elimination of outbreaks of infectious diseases, it is necessary to ensure maximum efficiency of sanitary and epidemiological investigations. In the context of a reduction in the number of sanitary and epidemiological institutions with an increase in the number of supervised facilities, the problems of personnel and logistical support actualize the task of introducing information technologies to support managerial decision-making.

Automated systems for monitoring the level and structure of various nosological forms of infectious diseases are widely used in Western Europe and the USA.

The most commonly used systems are Germ Alert, EIDSS, Germ Watcher, Gideon, RODS, EpidInfo. The analysis showed that the most effective in terms of the tasks being solved are the EIDSS, Gideon and EpidInfo systems, which are designed to monitor infectious morbidity and analyze the data obtained.

However, none of these systems provides automated collection, processing and analysis of primary information directly in the foci of mass infectious diseases, does not allow to establish the main determinants of the epidemic process and the order of interruption of the main ways and factors of transmission of infection in organized collectives. Problematic issues in the creation of such systems are: the need to create algorithms for processing the results of clinical examination, epidemiological history, as well as the formalization of a number of technological processes related to obtaining primary information about the disease from various sources.

These systems cannot be effectively used in other countries, since they are built taking into account the organizational structure of healthcare, accounting and reporting documentation, and the specifics of medical care for the population of specific countries.

So, for example, in the territory of the post-Soviet space, historically similar in functional content services for the prevention and control of infectious diseases have remained, guaranteeing comprehensive monitoring of the epidemic process and its determinants (screening) and clearly responding to all possible changes in its development (monitoring).

The main components of automated information support systems for decision-making support during sanitary and anti-epidemic (preventive) measures are subsystems for monitoring dangerous infectious diseases, data analysis of clinical and laboratory examination of patients, reference data. It is also required to be able to simulate epidemic scenarios depending on the agent of infection, preventive measures taken, and the potential for eliminating the source of infection.

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The basis of the functionality of many information systems for monitoring infectious morbidity is the collection of data on the state and trends of the epidemic process, the causes (biological factor) and conditions (social and natural factors) that support the epidemic process in a particular territory. Depending on the epidemiological characteristics of an infectious disease, the level of theoretical knowledge and practical capabilities, epidemiological, microbiological, immunological, zooentomological and socio-ecological monitoring are implemented.

Monitoring of the manifestations of the epidemic process involves monitoring the state and trends of the epidemic process: intensity, dynamics (long-term and annual) of morbidity, carrier, mortality, lethality, spatial characteristics, structure (age, social, environmental, clinical, etc.). Information is collected within the existing system of accounting and reporting on infectious diseases.

Data on morbidity, carrier, mortality and lethality are analyzed in relative terms (intensive – per 100,000 population, extensive - as a percentage). Monitoring of the dynamics of the epidemic process can be by years, months, weeks, days, depending on the epidemiological characteristics of the infection and the intensity of the EP. Morbidity is grouped according to the administrative-territorial principle, the radius of medical care, natural and geographical conditions and other signs, depending on the epidemiology of the infectious disease. Tracking the structure (distribution by age, social and occupational groups) in different infections has its own characteristics. Generally accepted grouping by age (up to 1 year, 1-2, 3-6, 7-14, adults), by social composition (organized and unorganized children under 3 years old, organized and unorganized children from 3 to 7 years old, schoolchildren, students of universities, technical schools). In addition, morbidity in risk groups determined for specific infections is taken into account. They also collect information about the etiological and clinical structure of diseases.

In the Russian Federation, in 2021, a program for the creation of a federal information system of sanitary and epidemiological information was approved.

The new platform will help to more quickly identify and track the spread of dangerous infections and take the necessary measures. The system will make it possible to predict the epidemiological situation "based on the use of statistical methods and mathematical models" developed by organizations subordinate to Rospotrebnadzor and will become part of the large-scale Sanitary Shield project. It is designed to preserve the health of citizens, protect people from possible epidemics.

The main functions of the IS EMID system

The system provides the implementation of the following functions:

- input, modification, storage and deletion of primary information about cases of infectious disease according to established forms;
- input, modification, storage and deletion of primary information on the patient's personal data;
- maintaining data on the epidemiological situation on the basis of unified reference books in accordance with the international classification of diseases;
- urgent notification of bodies and institutions related to the treatment and prevention of infectious and parasitic diseases;
- search, sorting and sampling of data on cases of infectious disease according to the specified query parameters;

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- processing of primary information and generation of reports on cases of infectious disease according to established forms;
- user registration in the system and access rights management;
- maintaining a history of user actions;
- entering, changing, storing and deleting reference information;
- entering, changing, storing, displaying and deleting cartographic information.

Fig.1. Data input and analysis scheme in the IS EMID

Stage	Subjects	Mechanism	Deadlines
Stage 1	District /City SES MI	Unconfirmed data on the case of an infectious disease (suspicion) are entered in the form 058 "Emergency notification" in the IS EMID	During 12 hours
Stage 2	System	An emergency notification is automatically registered in the journal of the district (city) Service in the form 060 "Journal of registration of infectious diseases".	During 12 hours
Stage 3	District /City SES	Opening of the epidemiological investigation card on Form 357 and appointment of a district epidemiologist	During 12 hours
Stage 4	District /City SES	Conducting an epidemiological investigation by a district epidemiologist	In accordance with the established procedure
Stage 5	District /City SES MI	Confirmed data on the case of an infectious disease (suspicion) are entered in the form 058 "Emergency notification" in the IS EMID	In accordance with the established procedure
Stage 6	District		

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	/City SES	Completion of the epidemiological investigation	In accordance with the established procedure
Stage 7	SES Ministry of Health	Monitoring of infectious and parasitic diseases, reporting forms (1-13)	By necessity

Information about the need for an epidemiological investigation is sent to the personal account of the epidemiologist in the System.

In order to inform the epidemiologist in a timely manner about the need for an epidemiological investigation, the System generates an appropriate notification, which is sent to the epidemiologist's e-mail. The epidemiologist begins to conduct an epidemiological investigation with filling in the data in the open card on form 357 received at the entrance of the patient's visit or the focus of infectious diseases.

During the epidemiological investigation, the System may receive new (additions) that are not subject to emergency notification forms on form 058. In this case, the Medical Statistician adds an emergency notification to the previously registered epidemiological investigation card, and, if necessary, with the possible assignment of an additional epidemiologist.

One of the conditions for closing the epidemiological investigation card of an infectious disease of a patient is the receipt by the System of a confirmed emergency notification form 058 about the presence or absence of an infectious disease in the patient.

The medical statistician adds a confirmed emergency notification form to the previously registered epidemiological investigation card, and, if necessary, assigns an additional epidemiologist to the epidemiological investigation.

In case of registration of an emergency notification with suspicion of a particularly dangerous infectious disease, the Chief Physician or his deputy, as well as the heads of the higher level of the Service, interested state executive authorities, regulatory and authorized bodies are necessarily informed about this fact of the epidemiological investigation.

Upon completion of the epidemiological investigation, the epidemiologist enters data on the results into the card on form 357 received during the investigation.

Analytical generalization of the epidemiological situation in the context of territories, regions and types of infectious diseases based on the information received is carried out without labor and time, and as a result of the generalization, it is possible to study in more detail the growth factor of a particular type of infectious disease.

When generating operational reports on Form 1 "Information on infectious morbidity", data on unconfirmed cases of emergency notifications are not used.

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As a result of the project, the Sanitary and Epidemiological Welfare and Public Health Service will receive:

- the ability to have online information about the course of rapid response to foci with infectious diseases;
- the possibility of monitoring the epidemiological situation and the dynamics of the activity of infectious diseases according to the selected criteria and territorial affiliation;
- the ability to generate reports within its competence and territorial affiliation.

The basis for accounting for infectious and parasitic diseases

in territorial services, there is an operational message by phone about the detection of an infectious or parasitic disease (suspicion), further confirmed by an emergency notification sent by a medical and preventive institution.

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