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Structure of Epidemiological Surveillance System of Shigellosis in Armenia

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Introduction

Public health surveillance is the ongoing, systematic collection, analysis, interpretation, and dissemination of data regarding a health-related event for use in public health action to reduce morbidity and mortality and to improve health [1,8,9]. Public health surveillance activities are generally authorized by legislators and carried out by public health officials. Public health surveillance systems have been developed to address a range of public health needs. In addition, public health information systems have been defined to include a variety of data sources essential to public health action and are often used for surveillance [10].

In United States of America National Shigella surveillance data are collected through passive surveillance of laboratory-confirmed human Shigella infections. Clinical diagnostic laboratories submit Shigella isolates to state and territorial public health laboratories, where they are confirmed, speciated, and subtyped. Unusual or untypable isolates are forwarded to the National Shigella Reference Laboratory in the Enteric Diseases Laboratory Branch (EDLB) at the Centers for Disease Control and Prevention (CDC); results are reported back to public health laboratories. State and territorial public health laboratories report Shigella infections electronically to CDC through a variety of mechanisms. Data are collected into the Laboratory-based Enteric Disease Surveillance (LEDS) system. The Division of Foodborne, Waterborne, and Environmental Diseases (DFWED) in the National Center for Emerging and Zoonotic Infectious Diseases maintains national Shigella surveillance in LEDS. The annual summaries of these data are the national source of species and subtype information for Shigella [11].

Surveillance of shigellosis started as part of the Enteric Diseases Surveillance System in 1992 in Armenia. Over the years the shigellosis surveillance has experienced a number of structural changes calling for a description of its current capacity.

The aim of the study is to describe the epidemiological surveillance system of shigellosis in Armenia, particularly its structure and ease of operation.

Material and Methods

The legal framework governing the epidemiological surveillance of shigellosis has been studied, as well as type of data necessary to establish the occurrence of the health-related event, type of other data on cases, organizations involved in receiving case reports, methods of collecting the data and types of reporting sources.

Results and Discussions

The epidemiological surveillance of shigellosis is carried out by the National Center of Disease Control and Prevention (NCDC) of the Ministry of Health of Armenia, as well as by all stakeholders [2]. The NCDC consist of central apparatus (national level), Reference Laboratory Center and 11 branches at marz level, *i.e.* one branch in each marz [12].

In Armenia, shigellosis is subject to passive comprehensive populationbased surveillance at the both marz and national levels [2]. When 3 cases (in rural areas, 5 in urban areas) epidemiologically linked are detected, an active epidemiological investigation is initiated [6].

To provide administrative statistical reporting of infectious diseases, shigellosis is subject to state statistics and reporting on the basis of the «Procedure for state statistics and reporting of infectious diseases» [4].

All health care providers, including emergency medical services, should urgently report any suspected shigellosis case to the NCDC, via Electronic Integrated Disease Surveillance System (EIDSS) or paper-fond, by sending an "urgent report" card in accordance with the emergency communication format approved by the order of the Minister of Health [3]. The "urgent report" card includes demographic and clinical data of patients. The **shigellosis case definition** is established by the joint decree of the Minister of Health, Minister of Emergency Situations, Minister of Agriculture, Minister of Nature Protection and Chairman of State Nuclear Security Committee as follows:

Suspected - a case corresponding to clinical description

Probable - which is epidemiologically linked to a confirmed case

Confirmed - laboratory confirmed case [7].

As soon as urgent report is received, NCDC branch epidemiologist that conducts investigation:

- 1. Contacts the patient (even if pre-diagnosed, no matter inpatient or outpatient) by phone or directly, to find out the place, time, causes, as well as type and quality of specimen taken for laboratory examination,
- 2. Contacts healthcare provider and relatives of the patient, in case other data needed,
- 3. Discusses clinical description of the patient, course and possible outcome, acquires the history of the disease with the treating doctor, collects anamnesis of the patient.

Based on the obtained data a decision is made whether to carry out further investigation to understand mode of transmission, origin, source, foci borders, cause-and-effect link, as well as to find contacts. Of note, an epidemiological investigation is compulsory at foci when:

- 1. The patient attends kindergarten
- 2. The patient is a child under 2 years old
- 3. The occupational activity of the identified patient or co-living is related to the of food and water production, preservation, transportation and sale processes, children upbringing and education, public utilities and household services. All the foci with 2 or more cases (recorded at the same time or repeated cases) are also subject to epidemiological surveillance.

Epidemiological investigation includes foci screening, information gathering through interviews with patients and contacts, document review, and laboratory investigation. Preliminary and final epidemiologic diagnosis is made during the investigation, based on which the localization and elimination measures of the foci are developed. The type and volume of laboratory investigation needed in the foci is determined by the epidemiologist conducting the investigation based on the situation and requirements set out in the legal acts (see Figure).



Fig. The type of laboratory investigation in the foci

Patients' laboratory tests are carried out by the healthcare provider (or by NCDC if there is no laboratory available), and environmental and contacts'

laboratory investigations – by NCDC. In NCDC, classical microbiology and PCR are used to detect shigella from environmental and biomass samples [5].

If 3 cases epidemiologically linked in rural areas or 5 in urban areas are detected, the NCDC branch (marz level) urgently report the cases to the national level as a suspicion of an outbreak. At regional or national levels, rapid response is implemented through rapid response teams in accordance with the requirements of applicable legal acts, and on the basis of the outbreak specificity and recognized "Public Health Emergency of International Concern", the information shall be submitted to the World Health Organization within the framework of the implementation of the International Health Regulations. Ministry of Health and NCDC cooperates with all stakeholder agencies when both separate cases and outbreaks are recorded [6].

All collected information is analyzed at the marz and national levels on a monthly, quarterly, semi-annual and annual basis. Based on the results, analyzes and reports on sanitary-epidemic situation of the republic are compiled, which are presented to all stakeholders as well as published on the official websites (www.moh.am, www.ncdc.am, www.nih.am, www.armstat.am and etc.).

Precisely, information about cases of shigellosis is used for the purpose of:

- Epidemiological observation: continuous and systematic collection, analysis, assessment, mapping, forecasting of data on shigellosis and the reasons and conditions for its dissemination,
- Planning, organizing, implementing and evaluation comprehensive measures to prevention, reduction the spread or exclusion of shigellosis,
- Developing recommendations for ensuring the sanitary and epidemiological safety of the population, the prevention of shigellosis in "real time",
- Providing administrative statistical reporting,
- Coordinating population health information and ensuring data on shigellosis,
- Conducting applied-scientific research,
- Developing and implement targeted shigella control and prevention programs,
- Monitoring and evaluation the public health, as well as to risk management, evaluation and mitigation [3].

Medical professionals maintain confidentiality of case and personal information according to Armenia Law on «Personal Data Protection» and NCDC specialists in accordance with the Armenia Law on «Personal Data Protection» and ISO 27001 standard.

The epidemiological surveillance system of shigellosis is simple. Since the standard case definitions and standard reporting forms have been established, the cases of shigellosis are reported with «urgent report» cards, which 60

include demographic and clinical data. The reporting units are well defined as all healthcare providers and they should share the information about cases with NCDC. Healthcare workers immediately report any suspected case, and also update regularly as more information like lab results is available, by sending an "urgent report" card via Electronic Integrated Disease Surveillance System (EIDSS) or paper-based. According to obtained data a decision to carry out investigation in the foci is made. The epidemiological investigation in the foci is carried out by epidemiologists of branches of NCDC. All collected information on cases is recorded and analyzed at marz and national levels on a monthly, quarterly, semi-annual and annual basis. Findings are disseminated among all stakeholders through official reporting forms, as well as specific analyses and reports on sanitary-epidemic situation, and also published on the official MoH websites.

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Структура системы эпидемиологического надзора за шигеллезом в Армении

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Представлены результаты изучения системы эпидемиологического надзора за шигеллезом в Армении. Проведен анализ правового поля, в том числе исследован вид данных, необходимых для характеристики случая болезни. Изучены также методы сбора данных и способы их передачи.

Հայաստանում շիգելոզի համաձարակաբանական հսկողության համակարգի կառուցվածքը

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Ներկայացված են Հայաստանում շիգելոզի համաձարակաբանական հսկողության համակարգի ուսումնասիրության արդյունքները։ Իրականացվել է ՀՀ օրենսդրական դաշտի վերլուծություն, այդ թվում՝ ուսումնասիրվել է տվյալների տեսակը, ինչն անհրաժեշտ է դեպքի բնորոշման համար։ Ուսումնասիրվել են նաև տվյալների հավաքագրման մեթոդները և հաղորդման եղանակները։

References

- 1. Buehler JW. Surveillance. In: Rothman KJ, Greenland S. Modern epidemiology, 2nd ed. Philadelphia, PA: Lippencott-Raven, 1998.
- 2. Decree of the Minister of Health of the RA of April 9, 2013, No. 14-N.
- 3. Decree of the Minister of Health of the RA of December 17, 2010, No. 35-N.
- 4. Decree of the Minister of Health of the RA of November 27, 2015, No. 3385-N.
- 5. Decree of the Minister of Health of the RA of October 5, 2017, No. 2873-A.
- 6. Decree of the Minister of Health of the RA of October 28, 2016, No. 3254-A.
- 7. Joint decree of the Minister of Health of the RA of December 26, 2011, No. 31-N, Minister of Emergency Situations of the RA of January 11, 2012, No. 02-N, Minister of Agriculture of the RA of December 30, 2011, No. 258-N, Minister of Nature Protection of the RA of December 29, 2011, No. 301-N, and Chairman of State Nuclear Security Committee of the RA of December 27, 2011, No. 325-N.
- 8. Teutsch SM, Thacker SB. Planning a public health surveillance system. Epidemiological Bulletin: Pan American Health Organization, 1995,16:1-6.
- 9. Thacker SB. Historical development. In: Teutsch SM, Churchill RE, eds. Principles and practice of public health surveillance, 2nd ed. New York, NY: Oxford University Press, 2000.
- Thacker SB, Stroup DF. Future directions for comprehensive public health surveillance and health information systems in the United States, Am J Epidemiol., 1994,140:383-97.
- 11. https://www.cdc.gov/nationalsurveillance/shigella-surveillance.html#:~:text =National%20Shigella%20surveillance%20data%20are,confirmed%2C%20speciated%2C%20and%20subtyped.
- 12. https://ncdc.am/