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EPIDEMIOLOGICAL CHARACTERISTICS OF HIV INFECTION IN THE REPUBLIC OF MARI EL

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Abstract

This paper deals with the analysis of the incidence of the disease caused by the human immunodeficiency virus (HIV infection), the dynamics of the incidence of this nosology have been traced, and the HIV-incidence of the population of the Republic of Mari El (RME) has been characterized in comparison with this indicator in the Russian Federation (RF). HIV is a socially significant disease, tends to increase in cases both in the RME and in the Russian Federation. This issue is a matter of concern and has been under consideration at the state level. In 2016, the Government of the Russian Federation approved the State Strategy for Counteracting the Spread of HIV Infection in Russia for the period to 2020 and further prospects. Implementation of this strategy requires a detailed approach, taking into account modern technologies, the capabilities of which should be used in an accurate and step-by-step manner. The study analyzed the epidemiological maps of the patients of the state budgetary institution of the Republic of Mari El "Republican Center for the Prevention and Control of AIDS and Infectious Diseases" (SBI RME RCPC AIDS and ID), calculated the incidence and prevalence of the population of the Republic using statistical methods (calculations of relative and average values, building of dynamic series and estimation of statistically significant differences), used graphical-analytical methods and a retrospective epidemiologic analysis. According to the results of the study for the period 2007-2016, an increase in the incidence of 2.2 times was revealed in the RME. The cumulative number of HIV-positive patients in the RME during the study period increased 3.3 times. The prevalence index in 2016 in the RME is 1.7 times lower than the Russian average. The results of the study will help to conduct a comprehensive epidemiological diagnosis of the situation of HIV incidence in the RME, including mathematical simulation of the prognosis of the HIV incidence and prevalence of the population, which will allow diversifying approach to creating a "single preventive space" on the territory of the republic.

Keywords: *HIV infection, preventive space, epidemiological analysis, incidence*

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INTRODUCTION:

Analysis of the epidemiological situation of HIV infection allows us to determine further steps to control this socially significant disease, which manifests itself as a threat to the country's stable economic development [0- 0]. At present, HIV infection should be considered as a multifactorial medical and social process that has certain epidemiological, socioeconomic and demographic consequences for our society, the need for analysis of which is reflected in the system of the second generation of epidemiological surveillance of HIV infection [0-0]. The economic significance of HIV infection and its complications in 2016 in the Russian Federation (RF) was 10,762,502.8 thousand rubles, and in the Republic of Mari El (RME) -14,774.60 thousand rubles [0,0].

Hygienic education remains one of the most effective tools in the prevention of this infection, and for the organization of targeted preventive work both among vulnerable cohorts of the population (male homosexuals, injecting drug users, commercial sex workers) and the population as a whole, there is a need to conduct an epidemiological analysis with the definition of constructive features of HIV infection in a particular area [0-0].

The identified problems require an epidemiological analysis to improve the effectiveness of managerial decisions when determining the directions of preventive programs in the territory of the Republic of Mari El (RME).

MATERIALS AND METHODS:

In this study, we used anamnestic data from epidemiological charts (form No. 357/U) of patients with HIV infection and form No. 60/u ("Infectious Disease Register") of SBI RME RCPC AIDS and ID for the period 2007-2016. In analyzing morbidity, incidence and prevalence of HIV infection among population, the variation statistics methods were used (calculations of relative and average rates of incidence and prevalence of HIV infection with analysis of dynamic series and evaluation of statistically significant differences), graphic-analytical methods, and retrospective and operative epidemiological analyzes.

RESULTS AND DISCUSSION:

For the period 2007-2016 among the population of the RME, the number of newly registered cases of HIV infection has increased 2.2 times according to emergency notification data (form No. 60/u "Infectious Disease Register").

If in 2007 63 cases were registered with an incidence rate of 8.9 per 100 thousand populations, then in 2017 - 127 newly identified by emergency notification, with an incidence rate of 19.6 per 100 thousand populations in the reporting year. In the Russian Federation, the incidence of HIV infection over the period 2007-2016 doubled (from 34.7 to 70.6 per 100,000 people, respectively).

When analyzing the incidence rate for the period 2007-2016, the RME has a tendency to grow (approximation equation y=x+7.36; reliability R^2=0.7751). In Russia there is a similar situation, characterized by a tendency towards an increase in the incidence of HIV infection (y=3.617x+31.427; R^2=0.9703). The average annual incidence in the Russian Federation (51.32 per 100,000 population) is 3.9 times higher than in the RME (12.86 per 100,000 population).

The results obtained indicate an unfavorable epidemiological situation for HIV infection in the RME, provided that there was a small coverage of HIV testing by the end of 2016 in the republic (11.5% of the population) relative to the rate in the Volga Federal District (20.0%) and the average Russian indicator (21%) [0].

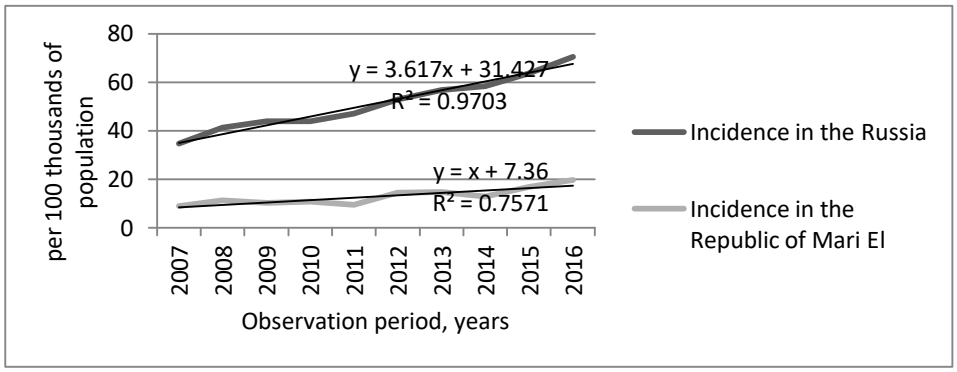

Fig 1: Incidence of HIV infection in the Republic of Mari El over the period 2007-2016, per 100 thousand population

The cumulative number of HIV-positive patients in the RME increased 3.3 times in 2016 (2,161) compared with 2007 (649 people); the rates of damage were 91.8 and 334.1 per 100 thousand populations, respectively. The rate of prevalence in the RME in 2016 is 1.7 times lower than the average Russian (594.3 per 100 thousand population). The Republican (and the average Russian ($y=34.755+230.7$; $R^2=0.9933$) indices of incidence tend to increase during the period 2007-2016 ($y=25.832+41.673$; $R^2=0.9445$ and $y=34.755+230.7$; $R^2=0.9933$, respectively) (Table 1, Fig.2).

Table 1: Absolute and relative indicators of population affliction in the Republic of Mari El for 2006-2017

Year	Prevalence	
	Cumulative number of HIV-positive patients	Prevalence per 100 thousand population
2007	649	91.8
2008	729	103.7
2009	838	119.7
2010	944	135.2
2011	1050	151.2
2012	1211	174.9
2013	1431	207.3
2014	1638	237.8
2015	1941	282.4
2016	2161	334.1

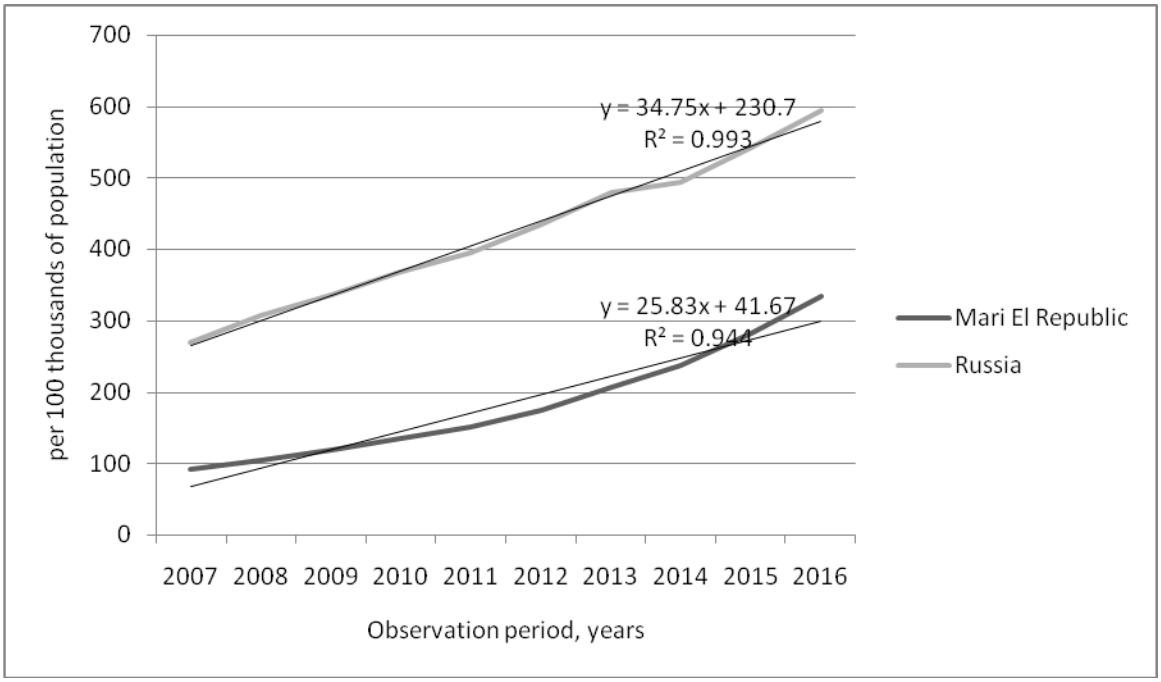

Fig. 2: The comparative dynamics of prevalence of HIV-infection in the population of the Republic of Mari El and Russia for the period 2007-2016 (per 100 thousands of people)

SUMMARY:
For the period 2007-2016 in the RME, the incidence rate increased 2.2 times. The cumulative number of HIV-positive patients in the country increased 3.3 times over the period under study. The incidence rate of HIV infection in the RME in 2016 is 3.6 times, and the incidence rate - 1.7 times lower than the average Russian. Nevertheless, the situation with HIV infection in the RME is still strained due to the growth in incidence and prevalence in the geometric progression, which requires the adoption of immediate management decisions aimed at preventing the disease. It is necessary to increase the coverage of testing of the population of the republic, and also to expand the horizons of prevention, incl. through hygienic education.
In order to determine the direction and mechanisms for implementing targeted prevention programs on the territory of the RME, a comprehensive analysis of each HIV case is needed, taking into account gender and age, social status, and the model of sexual behavior [0]. Further work is planned to identify these key markers in order to create a single preventive space in the RME, which, in our opinion, will allow us to approach the problem of combating HIV infection more effectively not only at the national, but also at the Russian level [0,0,0].

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