

HIV INFECTION IN THE REPUBLIC OF TATARSTAN AND IN THE RUSSIAN FEDERATION: EPIDEMIOLOGY AND PREVENTION

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Abstract: Over the past few decades, HIV infection has been a relevant strategic area of public health work. In addition to the risk groups, the epidemic process of HIV infection has involved the general population in recent years. The authors carried out an epidemiological analysis of the situation, dedicated to HIV infection in the Russian Federation, using the state reports of the Regional Office of the Federal Service for Supervision over Consumer Rights Protection and Human Welfare in the Republic of Tatarstan "On the State of Sanitary and Epidemiological Welfare of Population in the Republic of Tatarstan" and the Russian Federal Service for Surveillance on Consumer Rights Protection and Human Wellbeing "On the State of Sanitary and Epidemiological Welfare of Population in the Russian Federation".

Key words: HIV infection, epidemiology, infectious diseases, epidemic process, prevention.

1 Introduction

Infection, caused by HIV, (HIV infection) has been a relevant area of various researches (clinical, epidemiological, sociological, genetic, etc.) in medicine for many years [Novikova M.O. 2017, Epidemiological Characteristics of HIV Infection in the Republic of Mari EL / I.V. Petrov, M.O. Novikova, G.R. Khasanova et al. // 2017].

Special attention of doctors and scientists is given to a stigma in relation to patients with HIV-positive status, AIDS-marker diseases (opportunistic pathologies) and risk groups [Comparative Characteristic of Cases of Mycobacteriosis and Tuberculosis among HIV-Infected Patients / I.V.Petrov, M.O. Novikova, A.A. Almukhamedov et al. // 2017; Mycobacteriosis among Immunocompromised Patients (the Case of HIV Infection) / I.V. Petrov, T.Kh. Amirova, L.V. Petrova, E.V. Sevastyanova, F.S. Petrova, S.I. Rasskazova // 2019; The Problems of Epidemiology and Diagnosis of Mycobacteriosis among Immunocompromised Patients (the Case of HIV Infection) / I.V. Petrov, T.Kh. Amirova, L.V. Petrova, F.S. Petrova // 2016].

The medical and social portrait of a patient with HIV-positive status is changing. Thus, HIV infection shows a tendency to involve the general population in the epidemic process [Medical and social portrait of HIV infection in the Republic of Mari El / I.V. Petrov, M.O. Novikova, A.A. Almukhamedov, F.S. Petrova // 2017; Thiago Torres, Leonardo Bastos, Luciana Pereira Kamel, Daniel R.B. Bezerra and authors. 2020].

According to the official sources of the World Health Organization (WHO), there were about 37.9 million people with

HIV infection in the world at the end of 2018 [HIV/AIDS. Key facts. World Health Organization. Available at (February, 26 2020):<https://www.who.int/news-room/fact-sheets/detail/hiv-aids>]. Currently, the principle of "treatment = prevention" is actively used in the fight against HIV infection and its prevention. This allows to reduce the epidemiological risks of HIV infection spread among the population. So, as of June 2019, 24.5 million people in the world were receiving antiretroviral therapy (ART). There is evidence that the risk of virus transmission to an uninfected sexual partner is reduced by 96%, if a person with HIV-positive status adheres to an effective ART regimen [Catalani C., Philbrick W., Fraser H., Michael P. and Israelski DM. 2013; Peter Weis, George Schmidt and Kevin De Cock. 2008; Study highlights the need to strengthen sexual health services for PrEP Users. World Health Organization. Available at (February, 26 2020): <https://www.who.int/news-room/detail/11-12-2019-study-highlights-the-need-to-strengthen-sexual-health-services-for-prep-users>].

Over the past decade, WHO's recommendation on the use of pre-exposure prophylaxis (PrEP) for people with HIV-negative status, who are at a high risk of HIV infection, has become widely spread, as a part of an integrated approach to prevention. WHO has also extended these recommendations to HIV-negative women during pregnancy or lactation. More than 10 randomized controlled surveys are known, which have proven the effectiveness of PrEP in the reduction of HIV transmission among different groups of population, including discordant heterosexual couples (couples in which one partner is HIV-positive and the other is HIV-negative), men having sex with men (MSM), transgender women, high-risk heterosexual couples and injecting drug users (IDUs) [Patel P, Borkowf CB, Brooks JT, Lasry A, Lansky A, Mermin J. 2014].

A number of researchers indicate that in some countries, HIV infection has a large impact on medical, demographic and economic indicators. For example, in sub-Saharan Africa, at least 1 of every 20 adults has HIV-positive status, and they account for almost 71% of people living with HIV worldwide [Sarah Fidler, Timothy E.A. Peto, Philip Goulder and Christopher P. 2020].

The collection of these facts determined the relevance of given study and set the goal - to characterize the epidemiological process of HIV infection in the Republic of Tatarstan (RT) and the Russian Federation (RF), taking into account the correctness of preventive measures.

2 Methods

The authors used and analyzed the official data of state reports of the Regional Office of the Federal Service for Supervision over Consumer Rights Protection and Human Welfare in the Republic of Tatarstan (Tatarstan) (Regional Office of Rospotrebnadzor in the Republic of Tatarstan (Tatarstan)) "On the State of Sanitary and Epidemiological Welfare of Population in the Republic of Tatarstan" and the Russian Federal Service for Surveillance on Consumer Rights Protection and Human Wellbeing "On the State of Sanitary and Epidemiological Welfare of Population in the Russian Federation". The medical and social characteristics of the epidemic process of HIV infection in the Republic of Tatarstan (RT) were determined taking into account the form of federal state statistical observation No. 61 "Data on HIV Infection". The study included materials for the period 2014-2018. When processing the results, epidemiological methods and generally accepted variation statistics were used, taking into account the degree of results reliability and the compliance of epidemiological studies with the evidence-based medicine criteria.

3 Results

The epidemiological analysis of the situation, related to HIV infection in the Republic of Tatarstan and the Russian Federation for 2014-2018, allowed us to establish that the long-time average annual incidence rate in the Russian Federation is 1.9 times higher than in the Republic of Tatarstan (61.2 and 32.7 per 100

thousand population, respectively). The highest incidence rate in the Republic of Tatarstan for the studied period was in 2015 (35.5 per 100 thousand population), the lowest - in 2017 (31.01 per 100 thousand population). In the Russian Federation, the highest incidence rate for 2014-2018 was also established in 2015 (65.2 per 100 thousand population), the lowest - in 2014 (58.4 per 100 thousand population) (Table 1).

Table 1. The incidence rate of HIV infection in the Russian Federation and in the Republic of Tatarstan for 2014-2018, per 100 thousand population

Region/ country	2014	2015	2016	2017	2018	average multi-year level	increase/decrease, times
The Russian Federation	58.4	65.2	60.9	61.6	59.7	61.16	1.02
The Republic of Tatarstan	32.5	35.5	33.17	31.01	31.47	32.73	0.96

The incidence rate of HIV infection in the Russian Federation and in the Republic of Tatarstan does not demonstrate a visible increase. Also, in both compared territories, there was no significant trend towards an increase in the incidence rate of this

infection (in the Russian Federation $y = -0.1x + 61.46$; $R^2 = 0.0038$; in the Republic of Tatarstan $y = -0.655x + 34.695$; $R^2 = 0.3442$). However, this should not reduce the alertness for HIV infection (Figure 1).

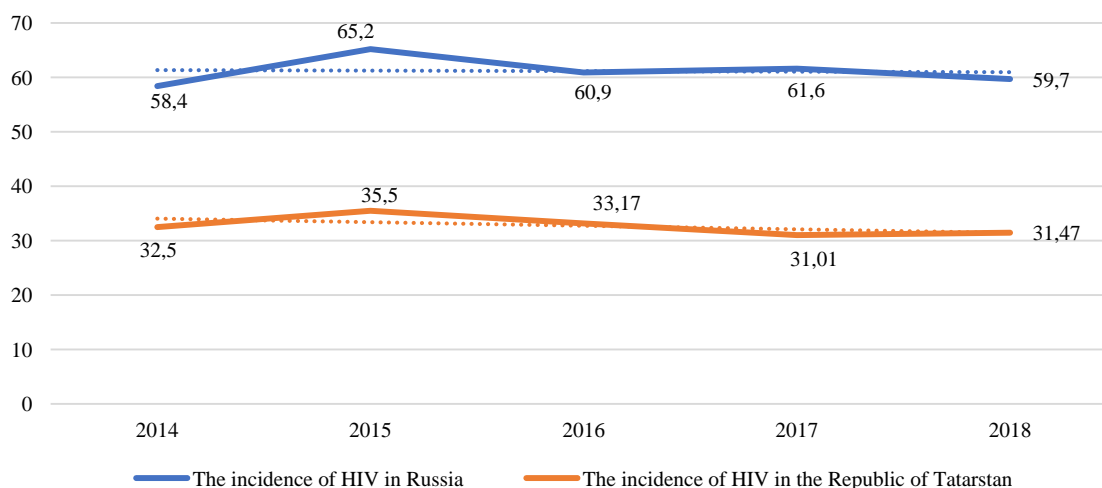


Fig.1. The trend of HIV infection incidence in the Russian Federation and in the Republic of Tatarstan for 2014-2018

During 2014-2018, there were no cases of HIV infection of patients when providing medical care in the Republic of Tatarstan.

It is worth noting, that for the studied period, there is a high coverage of dispensary observation of patients with HIV

infection in the Republic of Tatarstan. This indicates the coordinated work of medical organizations, which are responsible for regular medical checkup of patients in the field of HIV/AIDS prevention and control in the Republic of Tatarstan (Table 2).

Table 2. Coverage of dispensary observation of patients with HIV infection in the Republic of Tatarstan for 2014-2018, %

Year/ indicator	2014	2015	2016	2017	2018	Trend, %
The coverage of medical observation	89.2	89.6	90.1	90.15	90.7	+1.7%

HIV screening was conducted among the foreign citizens, residing in the Republic of Tatarstan. For the period 2014-2018, there was a decrease by 56.7% in the incidence of this infection among the examined people. So, according to the results of medical examinations, 22 foreign citizens, living with HIV, were registered in 2018 (58.1 per 100 thousand people surveyed). In

2017, 24 migrants with HIV-positive status were detected (60.6 per 100 thousand population), in 2016 - 34 people (90.9 per 100 thousand population), in 2015 - 37 migrants (95.0 per 100 thousand population), in 2014 - 20 people (134.7 per 100 thousand population). (Figure 2).

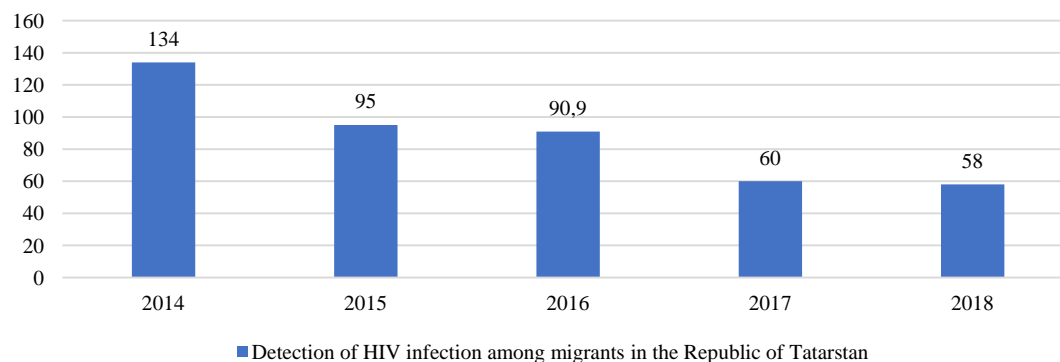


Fig. 2. Detection of HIV infection among foreign citizens, living in the Republic of Tatarstan, for the period 2014-2018, per 100 thousand population

According to the results of preventive work, related to the perinatal transmission of HIV infection in the Republic of Tatarstan, this indicator decreased by 30.8% (from 1.36% in 2014 to 0.94% in 2018). The result indicates the correct preventive measures (including timely prescription of ART to pregnant women and newborns, as well as the adherence to ART

in this cohort, provision of breast milk substitutes for children born to HIV-positive mothers), applied by the team of specialists of medical organizations, providing medical care to women with HIV infection and children born to HIV-positive mothers (Figure 3).

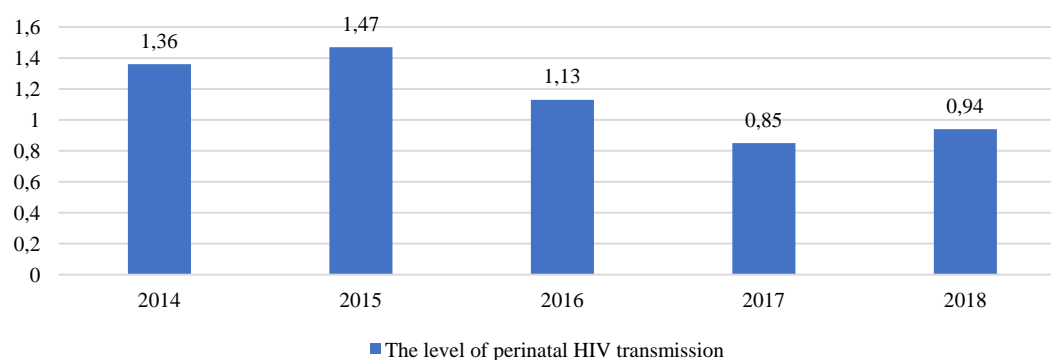


Fig.3 The level of perinatal HIV transmission in the Republic of Tatarstan for 2014-2018, %

The incidence in the Russian Federation does not demonstrate a significant increase over the study period. However, the prevalence of HIV infection increased by 38.7% (2014 - 494.6; 2018 - 686.2 per 100 thousand population) (Table 3).

Table 3. Prevalence of HIV infection in the Russian Federation for 2014-2018, per 100 thousand population

Year/ indicator	2014	2015	2016	2017	2018	trend, %
Prevalence	494.6	543.3	594.3	643	686.2	38.7%

The epidemic process of HIV infection in the Russian Federation has gone beyond the boundaries of the most vulnerable groups of population. Currently, it is actively spreading among the general population. In 2014-2018, the rate of patients infected by injection (injection drug users - IDU) decreased by 31.9% (2014

- 57.3%; 2018 - 39%). The number of patients, infected via homosexual route, increased by 50% (2014 - 1.2%; 2018 - 1.8%). The rate of patients, infected via heterosexual route, increased by 42.7% (2014 - 40.3%; 2018 - 57.5%) (Figure 4).

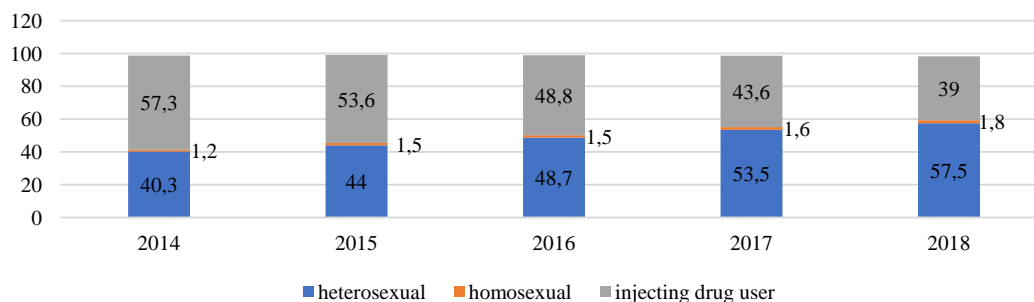


Fig. 4. The structure of patients with HIV infection, depending on the route of infection in the Russian Federation for 2014-2018, %

The epidemiological analysis of the structure of HIV patients by age cohorts in the Russian Federation led to the conclusion that in recent years HIV infection has been diagnosed in older age groups. For example, in 2001, 87% of HIV patients were in the age group of 15–29, and in 2018, 82% of patients were over 30 years old. It was defined, that in 2018, HIV infection was diagnosed in 30-50-year-old patients (about 70% of patients with HIV-positive status).

4 Conclusion

The study of the characteristics of HIV infection epidemiology in the Russian Federation and in the Republic of Tatarstan allowed us to draw the following conclusions:

1. The long-time average annual incidence in the Russian Federation is 1.9 times higher than in the Republic of Tatarstan (61.2 and 32.7 per 100 thousand population, respectively);
2. The increase in the number of patients with this nosology and significant trend in the increase of HIV infection incidence in the Russian Federation and in the Republic of Tatarstan were not revealed;
3. During 2014-2018, there were no cases of HIV infection associated with the provision of medical care in the Republic of Tatarstan;
4. For the studied period, the level of coverage of dispensary observation of patients with HIV infection in the Republic of Tatarstan remained high (about 90%). This allows to influence the epidemiological situation, related to HIV infection in the region;
5. Over the period 2014-2018, the level of perinatal transmission of HIV infection in the Republic of Tatarstan decreased by 30.8%;
6. The increase in the prevalence rate of HIV infection by 38.7% was detected in the territory of the Russian Federation;
7. The analysis of the routes of HIV infection in the Russian Federation led to the conclusion, that the epidemic process had involved the general population, in addition to three main risk groups (CSW, MSM, IDUs). This should be taken into account when planning preventive measures (programs, strategies, social marketing, etc.);
8. HIV infection in the Russian Federation for the analyzed period has been diagnosed in older age groups (30 years and above), that should also be taken into account when developing preventive measures.

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