

ANALYSIS AND EVALUATION OF THE HIV EPIDEMIC SPREAD DYNAMICS IN THE KYRGYZ REPUBLIC TERRITORY

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Abstract

The purpose of this study is to analyze the long-term dynamics of the development of the HIV infection epidemic process on the territory of the Kyrgyz Republic (KR) for the period from 2000 to 2021 years. Methods: Epidemiological, statistical and analytical research methods were used. Results: Two periods have been established: the initial period and the period of intensive spread of the HIV epidemic. As the epidemic process intensifies, there is an increase in the sexual factor of infection from 11.4% in 2001 to 71.4% in 2021 and a decrease in the number of parenteral infection factors in injecting drug use from 88.6% to 4.4%, an increase in the proportion of HIV-infected women from 8.2% to 39.0%, respectively. Conclusion: On the territory of the Kyrgyz Republic, there is an active involvement of various population groups in the epidemic process of HIV infection with multiple risk factors for infection.

Keywords: HIV Infection, Prevalence, Epidemic Process, Risk Factors, Ways of Infection.

INTRODUCTION

Globally, the spread of HIV infection continues and, according to UNAIDS, by the beginning of 2022 year, the number of people living with HIV/AIDS worldwide amounted to 37.7 (30.2-45.1) million people, the number of new HIV infections in 2021 amounted to 1.5 million (1.0-2.0 million people) [1].

It is known, since the beginning of the HIV epidemic in many countries of the world, there have been significant changes in both the nature and scale of the epidemic [2-5]. HIV infection epidemic process characterized by the beginning of epidemic transition from the high-risk population to the general population, predominance of infection sexual route,

involvement of female population in the epidemic process, an increase in the risk of perinatal transmission of HIV infection, and as a result, an increase in the number of HIV-infected children [6-10]. The epidemiological situation of HIV infection in the Kyrgyz Republic, as well as throughout the world, continues to become more complicated [11, 12]. Currently, the republic has not carried out an analysis and assessment of the current trends in the epidemic process of HIV infection for correction and development of preventive and anti-epidemic measures, which determines the relevance of the research topic.

The purpose of this study was to analyze the long-term dynamics of the HIV infection epidemic process development on the territory of the Kyrgyz Republic (KR) for the period from 2000 to 2021 years.

MATERIALS AND RESEARCH METHODS

Materials of this study were official statistical data on the HIV-infected people registration cases among various contingents of the Kyrgyz Republic population (form No. 4a "On registration of HIV infection", websites of the Republican Center (RC) "AIDS" of the Kyrgyz Republic Ministry of Health on infections in the Kyrgyz Republic, statistical information of the population, Kyrgyz Republic National Committee of Statistics (Kyrgyz Republic Demographic Yearbook) for the period from 2000 to 2021 years.

For this study period, the retrospective and prospective methods epidemiological analysis morbidity data on the population of the Kyrgyz Republic was used. The characteristics of the HIV infection epidemic process for 1996 to 2021 years in the Kyrgyz Republic were studied. For quantitative assessment, indicators were used that characterize the incidence of HIV infection, the prevalence of HIV among the male and female population, among different age groups, as well as distribution indicators by risk factors. Indicators calculation carried out by conventional methods. The processing and analysis of obtained materials carried out on a computer using the Epi-Info programs.

RESULTS AND DISCUSSIONS

On the republic territory, an epidemiological situation of HIV infection remains tense. According to the Republican AIDS Center, as of June 1, 2022, 11552 cases of HIV infection were registered in the Kyrgyz Republic, of which 10894 (94.3%) were among the citizens of Kyrgyzstan and 658 (5.7%) were from the republics of far and near abroad [10].

A retrospective epidemiological analysis showed that for 1996 to 2000 years in the country, 14 cases of HIV infection detected among citizens. Since 2001, there has been a sharp increase in the HIV epidemic. Thus, in 2001 year, 134 cases again detected among citizens of the Kyrgyz Republic, which is 9.5 times higher than the number of cases registered for the entire previous period of the epidemic. This is due to the outbreak of HIV infection among injecting drug users (IDUs), who accounted for 95.9% of the number of people living with HIV registered in 2001 [11].

Figure 1 shows the dynamics of HIV cases registration among Kyrgyz Republic population for 2001 to 2021 years (per 100 thousand population).

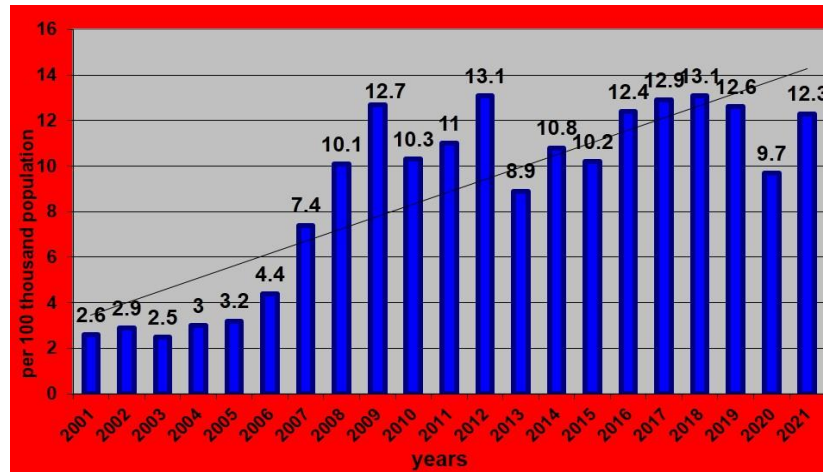


Figure 1: Dynamics of HIV infection cases registration among population in the Kyrgyz Republic for 2001 to 2020 years (per 100 thousand population)

From the figure 1 it is shown that from 2001 to 2021 years the HIV infection incidence increased from 2.6 ± 0.07 to 12.3 ± 0.49 cases per 100000 population. The incidence rate of HIV infection remained practically at the same level during 2002 to 2004 years, then the rise in infection begins, which amounted to 3.2 ± 0.25 in 2005 and 4.4 ± 0.29 in 2006 years [9]. Since 2007, a new stage in the HIV infection epidemic process development has been observed. The incidence of HIV infection increased from $7.4 + 0.37$ per 100000 population in 2007 to $12.7 + 0.49$ in 2009 years. In 2010 and 2011. In 2010 and 2011 years there is a decrease in the incidence rate to $10.3 + 0.44$ and $11.0 + 0.45$, and in 2012 this value raised again to $13.1 + 0.49$ per 100000 population. For 2013 to 2015 years the incidence rate is slightly reduced and amounted to $8.9 + 0.4$, $10.8 + 0.43$ and $10.2 + 0.42$, respectively. Starting from 2016, this indicator again reliably begins to increase and amounted to $12.4 + 0.45$ in 2016, in 2017 year for $12.9 + 0.46$, in 2018 for $13.1 + 0.46$, and in 2019 years for $12.6 + 0.44$ [9]. However, in 2020, the incidence rate is significantly reduced and amounted to $9.7 + 0.42$ per 100 thousand of the population.

In the dynamics of HIV cases registration in the country, two periods can be noted: the initial period (from 2001 to 2007) and the period of intensive spread of the HIV epidemic (from 2008 to 2021 years) [9, 11]. The alignment of the long-term dynamics of the incidence of HIV infection for 2000-2021 years using the least squares technique showed the continuing increase in HIV infection of the country's population in modern conditions.

A retrospective analysis showed that from 2001 to 2006 years the beginning of HIV epidemic in large regions of the country was observed as Bishkek, Osh and Chui regions. The epidemic process was characterized by distribution mainly among IDUs (76.8%) and males aged from 20 to 39 years old (79.2%) [9].

Since 2007, there has been a period of intensification of the HIV epidemic among various population groups with different routes of infection. During this period, all other regions of the country are involved in the epidemic process, there is an increase in the HIV infection incidence among women, especially of reproductive age (from 27.6% in 2007 to 39.0% in 2021 year), cases of HIV infection among children by both vertical and parenteral routes of infection (from 1.1% to 13.1%), there is an increase in sexual transmission of HIV (from 28.1% to 71.4%) [9, 12]. Over the observation period from 1996 to 2021 years, all 9 administrative regions of the republic were involved in the epidemic process of HIV infection with different activity and intensity. The highest prevalence of HIV infection is observed among the population of the cities. Osh (390.3 + 11.2), Bishkek (232.2 + 4.2) and Chui region (311.5 + 5.5), with the national average of 159.6 + 1.5 per 100 thousand population [9]. In other regions of the republic, this indicator ranged from 49.4 + 2.8 in Batken and to 120.4 + 8.4 in Osh region.

The distribution of HIV infection registered cases by regions in the republic shows that the largest number detected in Osh region and Osh city (30.0%), then in Chui region (30.0%) and Bishkek city (20.0%).

An epidemiological analysis of the HIV-infected citizens' age aspect in the Kyrgyz Republic was carried out. It has been established that in our republic the age group from 30 to 39 years old (33.3%) prevails in the structure of HIV infected people; the age group from 20 to 29 years old (26.9%) is in second place, followed by the age group from 40 to 49 years old (19.7%). Table 1 shows the age structure of HIV-infected people during the study period of the epidemic.

Table 1: Age structure of HIV-infected people in different periods of the epidemic in the Kyrgyz Republic (in %)

Age group in years	Total in %	Proportion of infected people in % from the total number of HIV infections	
		2001 to 2007 years	2008 to 2021 years
0-14	9.6	1.1 ±0.96	11.1 ±0.33
15-19	1.9	2.6 ±0.36	1.0 ±0.10
20-29	27.8	44.4 ±1.36	29.0 ±0.47
30-39	36.5	39.2 ±1.33	37.5 ±0.51
40-49	19.5	10.1±0.82	17.2 ±0.39
50 and older	7.2	2.6±0.43	4.2 ±0.21
Total	100	100	100

From the Table 1 it is shown that in the first period of the epidemic in the structure of HIV-infected people there were age groups from 20 to 29 years and 30 to 39 years (44.4 ± 1.36% and 39.2 ± 1.33 % from the total number of cases HIV infections, respectively. The high prevalence of HIV infection among people aged from 20 to 39 can be explained by the fact that HIV infection occurred mainly through the parenteral route among drug users. 14 years 11.1 ± 0.33%, which is associated with mass infection of them with HIV in

medical institutions in the south of the republic, as well as the birth of children from HIV-positive mothers [12].

Data on the sex distribution of HIV infection showed that females were much less likely to be involved in the epidemic process [9]. As of January 1, 2022, from the total number of HIV-infected people, there were 6665 men (63.3%) and 3870 women (36.17%).

Modern features of the HIV infection spread were manifested by an increase in the number of infected women. The ratio of men to women in the initial period from 2001 to 2007 was 2.9 : 1, and during the period of active spread of the epidemic (from 2008 to 2021 year) was 1.5 : 1 [11,13]. In the sex structure, the proportion of HIV-infected women increased from 8.2% in 2001 to 39.0% in 2021, with a maximum in 2013 and 2015 to 51.1% and 49.2% respectively.

The structure of HIV infection factors for the study period are presented in Table 2.

Table 2: Structure of infection factors among population of HIV-infected people as of January 1, 2021 (in %)

No	HIV infection factors	Total cases	Share in % to total number
1.	Parenteral for injection drug use	3754	35.6 ±0.51
2.	Sexual way	5165	49.0 ±0.53
3.	Parenteral artificial (medical manipulations)	401	3.8 ±0.20
4.	Vertical (from mother to child)	287	2.7 ±0.17
5.	Sexual way – homosexual	351	3.3±0.17
6.	Indefinite way	577	5.5 ±0.22
	Total	10515	100

From table 2 it follows that in the structure of HIV infection factors, sexual route of transmission is leading, which amounted to 49.0 ± 0.53% in the republic, the parenteral route of infection during injecting drug use is noted in 35.6 ± 0.51% of cases, then nosocomial infections were 3.8±0.20%. The vertical route of transmission from an HIV-infected mother was noted in 2.7 ± 0.17% of cases, and unidentified route of infection was identified in 5.5 ± 0.22% of cases.

On the whole, there has been a redistribution of the main factors of HIV infection in the republic. An increase in the sexual factor of infection from 11.4% in 2003 was noted. to 71.4% in 2021 At the same time, there is a decrease in the number of parenteral infection factor in the use of injecting drugs from 88.6% to 4.4%, respectively. However, the parenteral route of HIV infection remains as dominant risk factor for HIV infection. Since 2011 year, 351 homosexually infected people (3.3%) have begun to register HIV in republic, which indicates the onset of an epidemic in this population group [9, 11].

In general, the factors of HIV infection in 577 (5.5%) people in the republic were not identified. These are people who were tested for HIV anonymously, people who changed their place of residence without waiting for the laboratory results, as well as those people who hide name of the true risk factors for infection [9].

It should be noted that one of the main driving factors of the HIV epidemic is the spread and growth of intravenous drug use among young people, who are characterized by a high risk of HIV infection. In Kyrgyzstan, namely in the southern regions, in the Chui region and in the city of Bishkek, one of the main drug trafficking routes from Afghanistan to the CIS and further to Eastern Europe passes, which contributes to the spread of drug sedimentation in these regions [11]. A significant role in the growth of the HIV infection spread was realized by such factors as the low level of population sexual education, growth of unemployment, internal and external migration.

It is believed that the level of prevalence (affection) of the population with HIV infection is an important indicator for characterizing the epidemic process. We have determined the prevalence of HIV infection among the Kyrgyz Republic population in terms of working age (from 15 to 64 years). It has been established that by 2021, the HIV prevalence rate in the republic was 0.14%, including 0.18% among men, 0.1% among women, and 0.03% among children under 15 years old [9, 10]. This indicator was 0.38% in Osh city, 0.29% in Chui region, and 0.17% in Bishkek. Below the republican incidence rate were in Batken region 0.04%, Jalal-Abad region 0.08%, Issyk-Kul region 0.06%, Osh region 0.11%, Talas region 0.05% and Naryn region 0.06%.

CONCLUSION

1. In the dynamics of HIV cases registration in the country, two periods have been distinguished: the initial period associated with the spread among injecting drug users, and the second period of the intensive spread of the HIV epidemic. The second period is characterized by a predominant distribution by the parenteral route during injecting drug use, followed by an increase in the importance of sexual route, in which the number of HIV-infected women increases, followed by an increase in the vertical transmission of HIV infection in children.
2. As of 01.01.2022, the highest prevalence of HIV infection was observed in Osh (390.3 + 11.2), Bishkek (232.2 + 4.2) and Chui region (311.5 + 5.5), with the national average of 159.6 + 1.5 per 100 thousand population. In other regions of the republic, this indicator ranged from 49.4 + 2.8 in Batken to 120.4 + 8.4 in Osh region.
3. In the structure of HIV infection risk factors, sexual (49.0%) and parenteral routes of infection (with injecting drug use) predominate, which is 35.6%, men predominate in the gender structure (the ratio of men to women was 1.7:1), however, as the epidemic progressed, the proportion of women living with HIV increased from 8.2% in 2001 to 39.0% in 2021 year. In the age structure of HIV-infected people, the leading place is occupied by young people aged from 20 to 39 years (66.5%). These factors determine the main driving factors of HIV infection epidemic process in the Kyrgyz Republic.
4. On the Kyrgyz Republic territory, there is an active involvement of various groups of the population in the epidemic process of HIV infection with multiple risk factors for infection.

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