



## Results of Testing for Viral Hepatitis B and C in the Kyrgyz Republic, 2008 -2021

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### Abstract

**Introduction:** Testing and early detection of hepatitis B and C infection determine indications for the services of prevention and treatment and are a key component for effective response to the epidemic of these infections.

**The Aim of the Study:** Analysis of the state early detection of viral hepatitis B and C in Kyrgyzstan to develop a mass testing program as a stage towards eliminating the epidemic of blood-borne viral hepatitis in the country.

**Materials and Methods:** State Reporting Forms No. 1 "Report on infectious and parasitic disease" for 2008–2021 were reviewed. The data was processed by Epi Info 3.8.1

**Results:** The Kyrgyz Republic belongs to countries with high incidence of viral hepatitis B and C. The incidence of acute and chronic viral hepatitis B in 2021 amounted to 29.2 per 100,000 population, and hepatitis C -10.8. Based on the results of testing by some healthcare organizations, the hepatitis B virus infection of the population varies from 4.6% to 7.3% and hepatitis C - from 3.1% to 7.7%. Data of official statistics (Department of Disease Prevention and State Sanitary-Epidemiologic Surveillance and the Centre of Electronic Healthcare) on the prevalence of acute and chronic hepatitis B and C differ considerably. There is no information about the exact number of patients with all forms of hepatitis B and C, cirrhosis and liver cancer in their outcome.

**Conclusions:** To ensure the access of patients with chronic viral hepatitis and cirrhosis in their outcome to the services of diagnostics, highly effective methods of treatment and prevention it is needed to conduct a phased mass testing of the adult population for viral hepatitis B and C in order to determine the true number of such patients.

**Keywords:** Blood-Borne Viral Hepatitis, Viral Hepatitis B, Viral Hepatitis C, Diagnosis, Mass Testing, Prevention

### Introduction

The global Strategy of the health sector to Combat Viral Hepatitis in the WHO European Region provides for the elimination of viral hepatitis (VH) as a threat to public health by 2030 by establishing a diagnosis in 90% of those infected with hepatitis B virus and treating 80% of patients subject to therapy [WHO, 2018].

The incidence of acute and chronic viral hepatitis B in 2021 in the Kyrgyz Republic was 29.2 per 100,000 population, and hepatitis C-10.8; [5], which indicates that it belongs to countries with a high incidence of viral hepatitis (VH) [3.4.10]. The epidemiological Service registers an acute form of the disease in terms of its reversibility, chronic viral hepatitis B and C began to be registered only since 2010, and official statistics data (DSSSEN and RMIC) vary

significantly. There is no information in the country about the true number of patients with all forms of hemcontact viral hepatitis (HVH), cirrhosis and liver cancer in their outcome. At the same time, according to WHO, the estimated number of people over 15 years of age with anti-HCV alone in Kyrgyzstan is 1-6%, approximately 60,000-144,000 patients.

Testing and early detection of hepatitis B and C determine the indications for prevention and treatment services and are a key component of an effective response to the epidemic of these infections, receiving specialized care and treatment, can prevent or slow down progressive liver damage [2,7,11,12].

The purpose of this study is to analyze the state of early detection of viral hepatitis B and C in the Kyrgyz Republic to develop a mass testing program as a step towards the elimination of the HVH epidemic in the country.

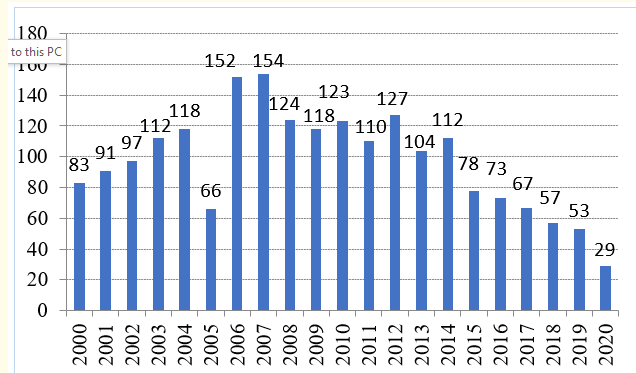
## Materials and Methods

The epidemiological situation of HVH in Kyrgyzstan was studied by analyzing the database of the state reporting form No. 1 «Report on infectious and parasitic diseases» of the Department of Disease Prevention and State Sanitary and Epidemiological Supervision of the Ministry of Health (DPZ and GSEN of the Ministry of Health) KR for the period 2008-2021 [5]. To study the dynamics of registration of newly detected chronic hepatitis B and C, data from the state reporting form No. 12 «Report on morbidity and preventive work, on treated cases of acute and chronic hepatitis B and C (HBV and HCV), accumulated by the Medical Information Center (RMIC) of the Ministry of Health of the Kyrgyz Republic, identified cases of HBV and HCV for the period 2008-2021. Republican AIDS and Blood centers, the Hepatological Center «CADMIR». The results of the study were processed using the statistical program Epi Info 3/8/1.

## Results and their Discussion

In the Kyrgyz Republic (KR), an extremely unfavorable situation for viral hepatitis (VH) persists. On average, up to 20 thousand people get sick with the acute form of VH every year, and in the years of recovery - up to 35 thousand (229.1 and 409.2 per 100,000), mainly due to hepatitis A [10]. According to the DPZ and GSEN data (DPZIGSEN. Department of prevention of diseases and state sanitary and epidemiological surveillance) in 2000-2020,

only  $102.8 \pm 11.3$  cases of acute hepatitis C (AHC) or 1,7-3,1-0,8 per 100 thousand population (Figure 1). Without taking into account the indicators of 2005 and 2020, when due to the troubles in the country and the COVID-19 pandemic, reliable accounting and registration of VH were violated, 29 cases of AHC were detected in 2020, and in 2021, 53 cases or 0.4 and 0.8 per 100,000 population, respectively.



**Figure 1:** Dynamics of the prevalence of acute hepatitis C (KR, 2000-2020 abs. number, data F-1 DPZ and GSEN).

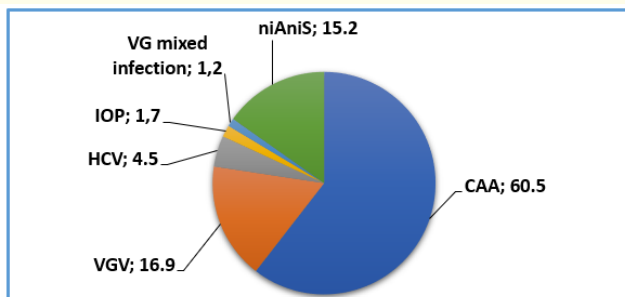
For comparison, the incidence rates in the Russian Federation are 22%, and in Georgia 148 times higher than in Kyrgyzstan, which is due to the good organization of work in these countries on early detection and effective treatment of hepatitis C [11]. At the same time, a steady decrease in the incidence of AHC in our country since 2015 is associated with the beginning of the use of direct antiviral drugs with 100% effectiveness in the treatment of chronic hepatitis C and a decrease in its role as a source of infection.

The study of the issue of early detection, accounting and registration of HVH in Kyrgyzstan revealed significant shortcomings. For the first time, the possibility of etiological diagnosis of HBV and HCV appeared in 2000 with the closure of the laboratory of enzyme immunoassay (ELISA), with the support of WHO, in the medical center «Preventive Medicine». Since 2003, the laboratories of the AIDS centers have been performing tests for HVH for a moderate fee.

The drawback in the work of these laboratories were: the lack of registration of the patient's passport data or the name of the medical clinic, an emergency notification of detected cases of hepatitis B or C was not sent to the DGSEN, as a result of which

patients were not taken into account. where the majority of the population applied to private laboratories, the result of the analysis was given to the patient, information about the detected cases of HVH was not received by either the clinics or the DGSEN, resulting in an absolute discrepancy between official statistics and the true incidence of hepatitis B and C.

So, there was a discrepancy in the data of the official statistics of the DPZ and GSEN of the Ministry of Health of the Kyrgyz Republic and sentinel surveillance (DEN). According to the form No. 1 "Report on infectious and parasitic morbidity" in the general structure of the prevalence of acute viral hepatitis, the extensive index of hepatitis B is 3.1%, hepatitis C is 1.3%, and according to the DEN -16.9% and 4.5%, respectively (Figure 2).



**Figure 2:** The share of acute hepatitis B and C in the total structure of acute viral hepatitis according to the data of the DEN RNPCCVI, NPO "PM", 2017.

- **HAV-60.5%:** Viral hepatitis A
- **HBV- 16.9%:** Viral hepatitis B
- **HCV-4.5%:** Viral hepatitis C
- **HDV-1.7%:** Viral hepatitis D
- **VH-mixed infection:** 1.2%
- **No-A no-C:** Hepatitis-15.2%

Sentinel surveillance (DEN) for HCV was carried out in 2015-2016 by the medical center «Preventive Medicine» in infectious hospitals in Bishkek (north), Jalal-Abad (south) and Naryn (highland region) by sampling the blood of every 5th patient with jaundice for markers of VH: A, B, C, D. 2860 blood samples were examined and the structure of VH in the republic was established.

Since 2016, for some unknown reason, all hemocontact chronic viral hepatitis (HCVH) began to be registered together, which made it difficult to establish the role and significance of each HVH in the development of cirrhosis, hepatocellular carcinoma (HCC) and death (Table 1). From table 1. It can be seen that the registration and registration of HVH every year they are improving, although they are still far from perfect.

According to the RMIC, in 2010-2018, HBV was detected in 360 children, and HCV-in 50 children.

Year	Acute Hepatitis C	Total chronic viral hepatitis C, according to the RMIC	Total chronic viral hepatitis, according to DPZ and GSEN	Carriage of the hepatitis C virus
2010	123	195	100	1661
2011	110	256	161	2180
2012	127	415	330	2522
2013	104	228	346	3020
2014	112	260	347	3023
2015	78	226	325	2778
2016	73	-	590	1917
2017	67	-	732	1262
2018	57	-	848	1062
2019	53	-	1034	1042
2020	29	856	2004	-
2021	53	663	2018	-
Bcero	986	1580	8835	15606

**Table 1:** Dynamics of registration of Acute Hepatitis C (AHC), chronic viral hepatitis C (CVHC) and "Hepatitis C virus carrier" according to the data of the RMIC of the Ministry of Health of the Kyrgyz Republic and DPZ and GSEN, 2010-2021.

Active detection-systematically, organized in a certain way and supported by appropriate means, based on laboratory examination of individuals for markers of HVH-mass screening has not been conducted in Kyrgyzstan, national protocols for mass testing of the population for infection with hemocontact hepatitis viruses (B and C) have not been developed.

At the same time, maybe not in compliance with all the rules of testing, a laboratory examination of medical workers who have contact with blood, pregnant women, patients, before surgery for HBV and HCV is carried out. So, in 2013-2017, only more than half of medical workers were examined annually at the HVH. Of these, markers of HCV and HBV were detected in  $2.98 \pm 0.4\%$  and  $3.62 \pm 0.5\%$ , respectively, but there is no information about their further examination and treatment (Table 2).

Year	Number of health workers to be tested	Of them tested for VH	Of these, positive for HBV	Of these, positive for HCV
2013	41825	21000 (50,1%)	661 (3,1%)	461 (2,2%)
2014	35776	21013 (58,7%)	681 (3,2%)	553 (2,6%)
2015	36955	19355 (52,4%)	842 (4,4%)	754 (3,9%)
2016	39338	22359 (56,8%)	744 (3,3%)	610 (2,7%)
2017	40833	21557 (52,7%)	879 (4,1%)	753 (3,5%)
			$3,62 \pm 0,5$	$2,98 \pm 0,4$

**Table 2:** Prevalence of HBV and HCV among medical workers in the Kyrgyz Republic 2013-2017.

Hepatological Center “CADMIR» in 2018. Conducted a charity event: 6496 patients hospitalized in non-infectious hospitals, including medical workers, as well as the population who responded to this action, were examined for free using the ELISA method (Table 3). The proportion of patients with positive tests for HBV and HCV was approximately the same, 7.3% and 7.7%,

respectively, but the largest the number of people with a positive test for hepatitis B was detected in the Jalal-Abad region (12.2%), which we see in practice by the treatment of patients from this area in the “CADMIR” HC. Moreover, the absolute majority of them suffer from hepatitis B with a delta agent in an advanced stage - cirrhosis.

Name of the healthcare facility	Total testing for VH	Of these, the positive on the HBV abs.number	%	Of these, positive for HCV abs.number	%
National Center of Oncology	1523	47	3,8	74	4,9
NC of Cardiology and Therapy	277	16	5,4	16	5,4
National Hospital	2177	69	3,2	168	7,7
Jalal-Abad Regional Hospital	1680	205	12,2	109	6,5
Naryn region	327	26	8,0	52	15,9
Hepatology Centre “CADMIR”	681	89	13,1	69	10,1
Osh City	100	8,0	8	6	6,0
Kara-Kulzha village, Osh. region	58	9	15,5	5	8,6
	6496	469 (7,3%)		499 (7,7%)	

**Table 3:** Screening of the population for infection with hepatitis B and C viruses, Hepatological Center «CADMIR», 2018, n = 6496.

In the National Hospital (3.2% and 7.7%), in the National Centers of Oncology (3.8% and 4.9%) and Cardiology (5.4%), patients from Bishkek and Chui region are mainly treated, therefore, the rates of infection with hepatitis B and C viruses were close to the national ones: 4.6% and 3.1%. (hepatitis B 1.6 times more sick than hepatitis C ) Only 327 people were examined in the Naryn region, the number of HCV infected turned out to be twice as much as with HCV (8% and 15.9%), which requires further study.

For 11 years (2008-2018), the Republican AIDS Center conducted examinations for hepatitis B and C markers in more than 1 million people. Hepatitis B in the country was detected in 4.6% (46,858 people); Hepatitis C-in 3.0% (30,885 people). In total, 77743 people were infected with HVH. The largest number of infected with HBsAg was found in Batken, Talas and Jalal-Abad regions (8.1%, 7.3% and 5.6%, respectively) and the city

of Bishkek (according to the Republican Blood Center) HBsAg-6.4% and hepatitis C - 3.7%.

At the same time, for the same period, according to official statistics (State Penitentiary Service of the Kyrgyz Republic), only 9660 patients with hepatitis B and C applied to state medical clinics in the republic! This is 10 times less than the detected HVH only in the laboratory of the RC "AIDS". And as you know, most of the country's population is examined in private laboratories.

According to WHO data (2017), 1911 people (13%) in the Kyrgyz Republic knew about their status as a patient with hepatitis B or C; with chronic viral hepatitis (CVH) - 0.51%.

Regions	Jalal-Abad			Talas			Naryn			Issyk-Kul			Batken		
	Year	In total	HBsAg + %	In total	HBsAg + %	In total	In total	HBsAg + %	In total	In total	HBsAg + %	In total	In total	HBsAg + %	
2008	8513	539	6,3	2384	173	7,3%	3850	170	4,4%	8594	272	3,2	6025	491	8,2
2009	9399	442	4,7	1768	129	7,3	3892	181	4,7	6785	231	3,4	10201	623	6,1
2010	11312	658	5,8	2694	206	7,6	5028	188	3,7	7411	225	3,0	9544	577	6,0
2011	14073	803	5,7	2291	197	8,6	5986	278	4,6	9571	255	3,4	10055	747	7,4
2012	15436	933	6,0	3669	274	7,5	7041	245	3,5	10473	225	2,1	11937	829	6,9
2013	17015	1099	6,5	3496	170	4,9	7776	281	3,6	10090	257	2,5	13208	899	6,8
2014	17762	1008	5,8	3634	306	8,4	7160	316	4,4	8756	309	3,5	11989	812	6,8
2015	17422	967	5,6	3070	341	11,1	7332	308	4,2	8348	285	3,4	12967	863	6,7
2016	17062	940	5,5	3219	238	7,4	7356	359	4,9	7027	211	3,0	12659	766	6,1
2017	17168	955	5,6	3838	235	6,1	7560	286	3,8	7278	242	3,3	12512	699	5,9
2018	18791	846	4,5	3639	189	5,2	8354	365	4,4	6657	191	2,9	12132	681	5,6
Total	163953	9190	5.6%	33702	2458	7.29%	71335	2719	3,8%	90990	2703	2,97%	123229	7987	8,14%

**Table 4:** Results of screening of the population of some regions of the Kyrgyz Republic for hepatitis B virus infection, 2008-2018, Republican AIDS Center, n = 483209.

## Conclusion

Thus, targeted testing for early detection of patients with acute and chronic hem contact viral hepatitis (B and C) is not carried out in the Kyrgyz Republic. The examination of VH infection by population circulation conducted by individual health organizations over the past 10 years does not reflect the true epidemiological situation of HVH in the country, there is no active identification of patients, the results of the survey are not analyzed. The registration and registration of hepatitis ViS is not carried out at the proper level.

There is an urgent need for mass testing of the population on HVH at the state level, to determine their true number, as a step towards eliminating the hepatitis B and C epidemic, to ensure access of patients to diagnostic services, highly effective methods of treatment and prevention.

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