



VHPB country meeting

Prevention and control of Viral Hepatitis in the Russian Federation: lessons learnt and the way forward

Moscow Hilton Leningradskaya Hotel

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Prepared by
Greet Hendrickx
VHPB Secretariat

Executive VHPB Secretariat, Vaccine and Infectious disease Institute, University of Antwerpen, Campus Drie Eiken, Universiteitsplein 1, BE-2610 Antwerpen, Belgium,
☎ +32 (0)3 265 26 64 @: Greet.Hendrickx@uantwerpen.be

Content

This pre-meeting document contains general background information on Romania and the current hepatitis situation. Furthermore a list of selected abstracts/ references from a Pubmed MEDLINE search on different search terms.

This document should guide you in the preparation of the meeting, it should not be considered as complete literature review, but hopefully it will give an overview of what has been published on the topics of the meeting

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1. General background

1.1 The Russian Federation – General information

(Source World factbook <https://www.cia.gov/library/publications/resources/the-world-factbook/geos/en.html>) and Wikipedia <http://en.wikipedia.org/wiki/>)



Russia , officially the **Russian Federation** (Russian: Российская Федерация, tr. Rossiyskaya Federatsiya), is a country in Eurasia. At 17,125,200 square kilometres (6,612,100 sq mi). Russia is the largest country in the world by area, covering more than one-eighth of the Earth's inhabited land area, and the ninth most populous, with over 144 million people as of December 2017, excluding Crimea. About 77% of the population live in the western, European part of the country. Russia's capital, Moscow, is the largest metropolitan area in Europe proper and one of the largest cities in the world; other major cities include Saint Petersburg, Novosibirsk, Yekaterinburg and Nizhny Novgorod.

Extending across the entirety of Northern Asia and much of Eastern Europe, Russia spans eleven time zones and incorporates a wide range of environments and landforms. From northwest to southeast, Russia shares land borders with Norway, Finland, Estonia, Latvia, Lithuania and Poland (both with Kaliningrad Oblast), Belarus, Ukraine, Georgia, Azerbaijan, Kazakhstan, China, Mongolia and North Korea. It shares maritime borders with Japan by the Sea of Okhotsk and the U.S. state of Alaska across the Bering Strait.

	Demographics data
Population	144,526,636 (feb 2018est.) without crimea
GDP (PPP) per capita	\$ 29,032 (2018 est.)
GDP	\$4.180 trillion (2018 est.)
Unemployment rate	5.5% (2017 est.)
Population growth	-0.08%% (2017 est.)
Birth rate:	11 births/1,000 population (2017 est.)
Death rate:	13.5 deaths/1,000 population (2017 est.)
Net migration rate	1.7 migrant(s)/1,000 population (2017 est.)

Health expenditures	7.1% of GDP (2014)
Physicians density:	3.98 physicians/1,000 population (2015)
Life expectancy at birth	total population: 71 years

Country Cooperation Strategy WHO Euro – Russian Federation

http://apps.who.int/iris/bitstream/handle/10665/179823/ccs_rus_en.PDF?sequence=1

Executive summary

This CCS is a joint product of WHO and the Ministry of Health of the Russian Federation, with aim to to define strategic collaboration by:

- » meeting needs for health and well-being, strengthening the health system of the Russian Federation and reinforcing health promotion and prevention with WHO's knowledge and technical expertise;
- » supporting the Ministry of Health of the Russian Federation in meeting its commitments to the policy framework of Health 2020;
- » cooperating with the Russian Federation as a donor country in the contexts of European and global health by supporting WHO's role and programmes; and
- » sharing examples and best practices in areas of health with neighbouring countries, the sub-region of eastern Europe and central Asia and the entire WHO European Region.



This is the first CCS for the Russian Federation and covers the period up to 2020.

It is aligned with national and European regional policy frameworks, in particular the State programme of the Russian Federation "Health care development" and the WHO European policy framework Health 2020.

The Strategic agenda of this CCS has four strategic priorities for collaboration, defined as:

1. Strengthening capacity for global and regional cooperation in health between the Russian Federation and WHO;
2. Creating a comprehensive environment of prevention and producing health through a life-course approach;
3. Improving health security through capacity-building, and;
4. Strengthening performance of the health system.

The Ministry of Health of the Russian Federation and WHO will work to achieving these strategic priorities within available resources and expertise by implementing mutually beneficial activities at global, regional and national levels, generating added value to each other's health agenda at all three levels.

1.2 Hepatitis in The Russian Federation

1.2.1 VHPB survey

VHPB survey on prevention and control of viral hepatitis in 53 European countries in 2014 – November 2014

(http://www.vhpb.org/files/html/Meetings_and_publications/Other_VHPB_documents/SURVEY2014.pdf)

PREVENTION AND CONTROL OF VIRAL HEPATITIS IN EUROPE IN 2014: THE CASE OF THE RUSSIAN FEDERATION

Country profile

- Population (in million) (year): 143,3 (2013)¹
- Gross national income per capita (int \$) (year): 23 200 (2013)²
- Most recent seroprevalence data:

	% HBsAg + (year)	% Anti-HCV + (year)
General population	2 % (2012) ³	4.1 % (2012) ³
Blood donors (first time)	0.1 % (2012) ³	0.6 % (2012) ³
Pregnant women	0.6 % (2012) ³	1.3 % (2012) ³
Risk groups		
Injecting drug users	34 % (2001-2002) ⁴	90 % (2009) ⁴
Men having sex with men	–	2.3 % (2004) ⁴
Sex workers	–	22 % (2009) ⁴

Screening

Obligatory for following groups:	Hep B	Hep C
Blood and organ donors	Yes (1990) ⁵	Yes (1994) ⁶
Pregnant women	Yes (1990) ⁵	Yes (2000) ⁶
Injecting drug users	Yes (1990) ⁵	Yes (2000) ⁶
STI clinic patients	Yes (1990) ⁵	Yes (2000) ⁶
Hemodialysis patients	Yes (1990) ⁵	Yes (2000) ⁶
Health care workers	Yes (1990) ⁵	Yes (2000) ⁶
Men having sex with men	No	No
Prison population	Yes (2005) ⁷	Yes (2005) ⁸
Migrants	No	No
Others	Yes (1990) ⁵	Yes (2000) ⁶

Hepatitis A	Universal	Risk group	Target	Screening
Universal	No			
Risk group	Yes	Health care workers, Employees of the food industry, Workers serving water and sewer facilities, equipment and networks, Persons traveling to countries where hepatitis A outbreaks are registered, Persons in effective disease area, People living in the territory with a high incidence of hepatitis A		2001 ongoing
Hepatitis B	Universal	Yes	Newborns, Children from 1 to 10 years and adults from 10 to 55	1990 ongoing, 2001 ongoing
Catch-up	No			
Risk group	Yes	Health care workers, medical students, patients receiving repeated blood transfusions, Hemodialysis patients, Family members of patients with chronic HepB and carriers of HBsAg, Injecting drug users		1990-2002

Treatment

National guidelines for clinicians available	
Hepatitis B ¹⁰	Yes (2014)
Hepatitis C ¹¹	Yes (2013)
Drugs available for hepatitis C treatment ⁹	
Ribavirin*	Yes
Pegylated interferon*	Yes
Interferon alpha*	Yes
Telaprevir	Yes
Boceprevir	Yes
Simeprevir	Yes
Sofosbuvir	No
Others: (specify)	No
Number of patients treated for hepatitis B	1816 (2012) ¹²
Number of patients treated for hepatitis C	32659 (2012) ¹³

* Included on the national essential medicines list or subsidized by the government

National plan

There is a written national strategy or plan that focusses primarily on the prevention and control of viral hepatitis and also integrates other diseases. It includes components for raising awareness, surveillance, vaccination, prevention in general, prevention of transmission via injecting drug use, prevention of transmission in health-care settings, treatment and care, and coinfection with HIV.¹⁴

Impact

Figure 1: Hepatitis B vaccination coverage¹⁵ and impact on acute hepatitis B incidence³

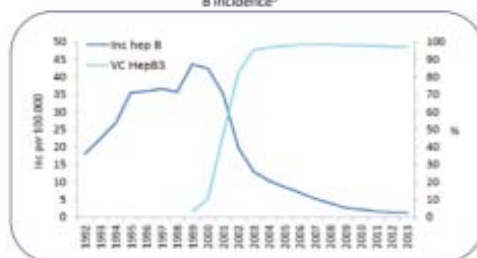
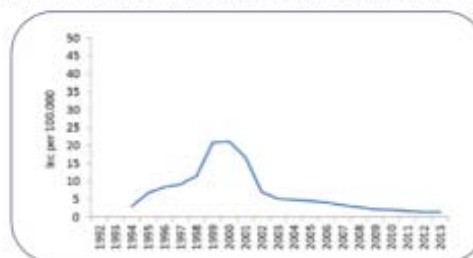


Figure 2: Introduction of activities and impact on acute hepatitis C incidence³



Specific issues and future challenges

In order to improve viral hepatitis B and C surveillance and continuity between screening programs and clinical care in 2012 was initiated the implementation of the national viral hepatitis registry.

National strategy for viral hepatitis requires major revision in respect of access to antiviral treatment.

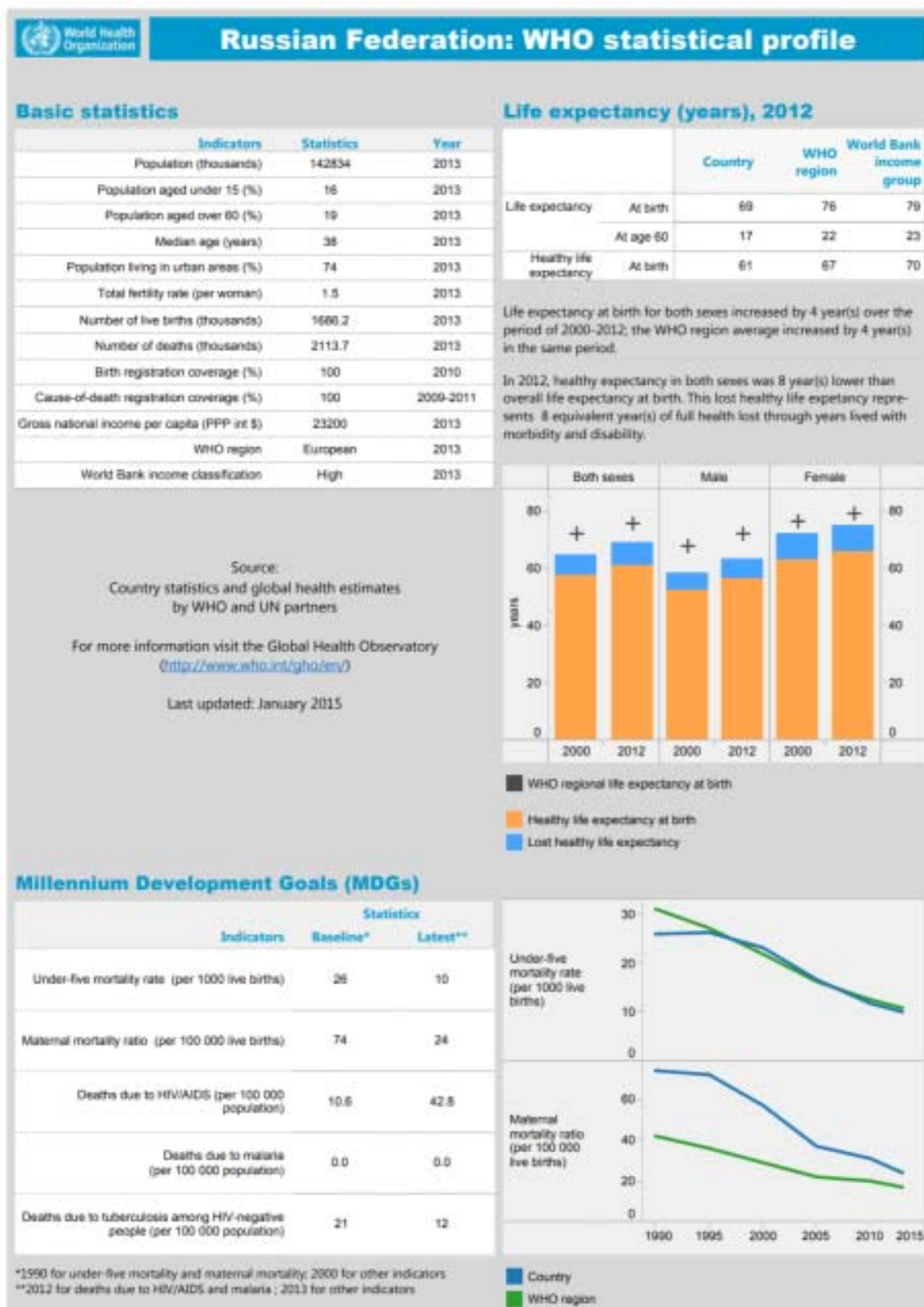


Country contact: Reference Center for Viral Hepatitis, Central Research Institute of Epidemiology, 3a, Novogireyevskaya str, Moscow, 111123, Russia; +7 (495) 974-9639, info@rcvh.ru

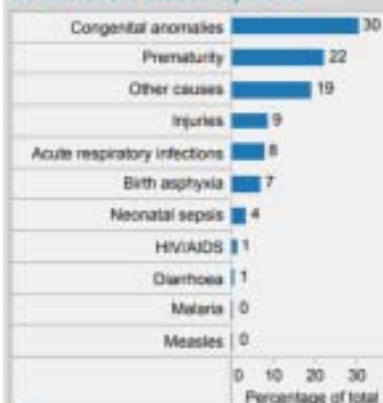


1.2.2 WHO data

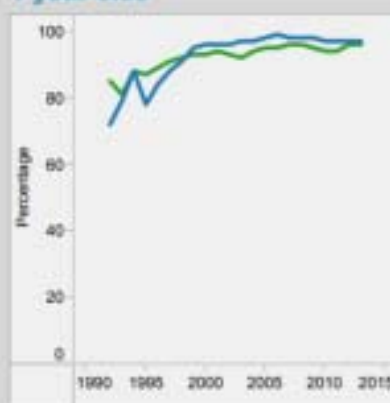
(source: <http://www.who.int/gho/countries/rou.pdf?ua=1>)



Distribution of causes of deaths in children under-5, 2013



DTP3 immunization among 1-year-olds



Children aged under-5 stunted

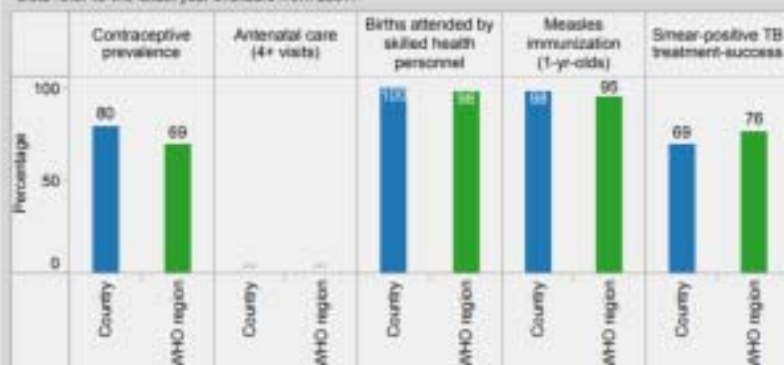


Country
WHO region

Source: Country statistics and global health estimates by WHO and UN partners
For more information visit the Global Health Observatory (<http://www.who.int/gho/en/>)
Last updated: January 2015

Utilisation of health services*

*Data refer to the latest year available from 2007.

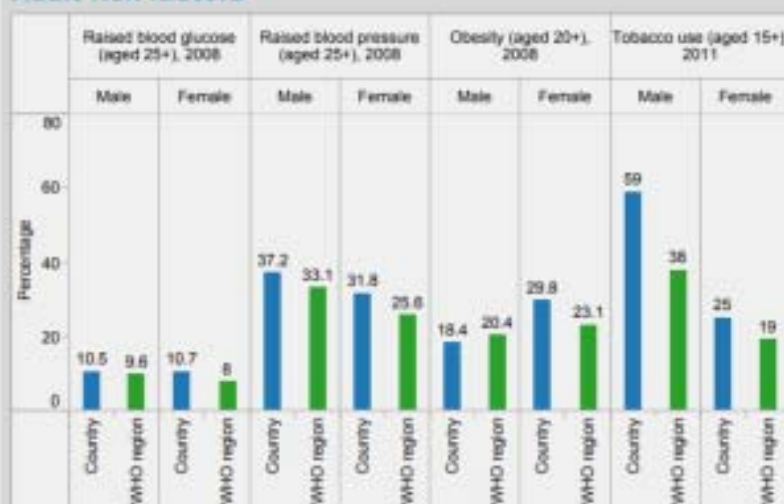


Per capita total expenditure on health

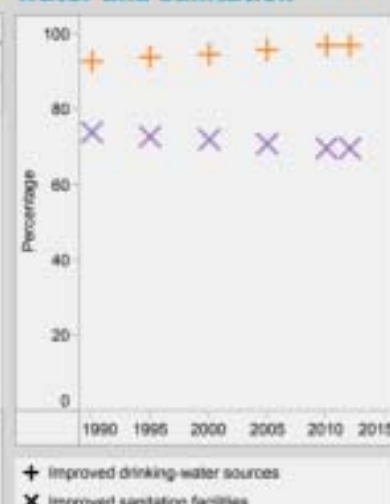


... Data not available or applicable

Adult risk factors



Population using improved water and sanitation



+ improved drinking-water sources
X improved sanitation facilities

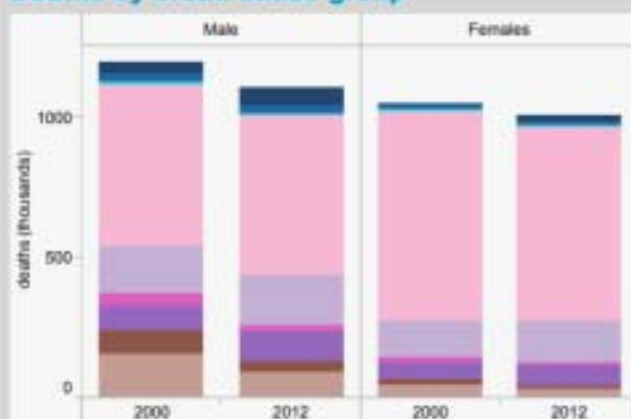
Top 10 causes of death

Ischaemic heart disease was the leading cause of death, killing 737.0 thousand people in 2012

	No of deaths (000s) 2012	Crude death rate 2000-2012	Change in rank 2000-2012
Ischaemic heart disease (35.1%)	737.0		
Stroke (21.3%)	447.5		
HIV/AIDS (2.9%)	61.2		
Trachea, bronchus, lung cancers (2.8%)	59.3		
Cirrhosis of the liver (2.4%)	50.9		
Colon and rectum cancers (2.2%)	45.4		
Stomach cancer (1.8%)	36.4		
Lower respiratory infections (1.6%)	34.3		
Chronic obstructive pulmonary disease (1.5%)	32.2		
Self-harm (1.5%)	32.0		

Rank ■ decreased ■ increased ■ no change

Deaths by broad cause group



Causes

- HIV, TB, malaria
- Acute respiratory infections
- Other infectious diseases
- Maternal, neonatal, nutritional
- Cardiovascular diseases and diabetes
- Cancers
- Chronic respiratory diseases
- Other NCDs
- Suicide, homicide and conflict
- Unintentional injuries

Burden of disease, 2012

Disability-adjusted life years (DALYs) are the sum of years of life lost due to premature mortality (YLL) and years of healthy life lost due to disability (YLD).

DALYs, YLL and YLD (thousands) by broad cause group



*Other noncommunicable diseases (NCDs) including non-malignant neoplasms; endocrine, blood and immune disorders; sense organ, digestive, genitourinary, and skin diseases; oral conditions; and congenital anomalies.

** Infectious diseases other than acute respiratory diseases, HIV, TB and malaria.

■ YLL ■ YLD

Probability of dying, 2012

Probability of dying between relevant exact ages, for a person experiencing the 2012 age-specific mortality risks throughout their life.

Before age 15, all causes	Male	6%
	Female	4%
Before age 70, all causes	Male	74%
	Female	40%
Between ages 15 and 49, from maternal causes	Female	0%
Between ages 30 and 70, from 4 major noncommunicable diseases (NCDs)*	Both sexes	30%

*Cancers, cardiovascular diseases, chronic respiratory diseases and diabetes

Source: Country statistics and global health estimates by WHO and UN partners
For more information visit the Global Health Observatory (http://www.who.int/gho/mortality/burden_disease/en/)
Last updated: January 2015

WHO CISID database info (<http://data.euro.who.int/cisid/?TabID=399572>)

Hepatitis A

6012 - Hepatitis A - Incidence (cases per 100 000 population)											
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Russian Federation	10.21	8.07	7.21	6.26							

6011 - Hepatitis A - Number of cases											
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Russian Federation	14648	11566	10313	8944							

Hepatitis B Incidence (cases per 100 000 population)

9009 - Hepatitis B - Incidence (cases per 100 000 population)											
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Russian Federation	5.24	4.01	2.68	2.21	1.71	1.42	1.34				

9008 - Hepatitis B - Number of cases											
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Russian Federation	7520	5741	3836	3157	2442	2023	1908				

Hepatitis C Incidence (Cases per 100 000 population)

6015 - Hepatitis C - Incidence (cases per 100 000 population)											
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Russian Federation	3.56	2.82	2.22	2.11							

6014 - Hepatitis C - Number of cases											
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Russian Federation	5100	4040	3183	3021							

Immunization coverage

Source: http://apps.who.int/immunization_monitoring/globalsummary/coverages?c=RUS

WHO vaccine-preventable diseases: monitoring system. 2018 global summary																			
Coverage time series for Russian Federation (the) (RUS)																			
Last updated 21-Sep-2018 (data as of 18-Sep-2018) Next overall update spring 2019																			
Vaccine	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999
BCG	95	96	96	96	96	96	95	96	96	96	97	97	97	96	97	96	96	96	95
DTP1	97	97	97	97	97	97	97	97	98	98	98	98	98	97	96	97	96	96	95
DTP3	97	97	97	97	97	97	97	97	98	98	98	98	98	97	96	97	96	96	95
DTP4	97	97	97	96	96	96	96	96	96	96	96	96	96	96	94	81	43	10	3
HepB3	97	97	97	97	97	97	97	97	98	98	98	98	97	96	94	81	43	10	3
HepB_BD	97	97	97	97	97	97	97	97	98	98	98	98	97	96	94	81	43	10	3
Hib3	97	97	97	97	97	97	97	97	98	98	98	98	97	96	94	81	43	10	3
MCV1	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	97	97	97	94
MCV2	97	97	97	97	97	97	97	98	97	97	97	97	97	97	96	93	88	86	84
PCV2	88	75	75	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
PCV3	70	35	35	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Pol3	96	97	97	97	98	98	98	98	98	98	98	98	98	98	97	97	97	97	94
RCV1	96	96	96	96	96	96	96	96	96	96	96	96	96	96	95	92	92	92	94
TT2+	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96

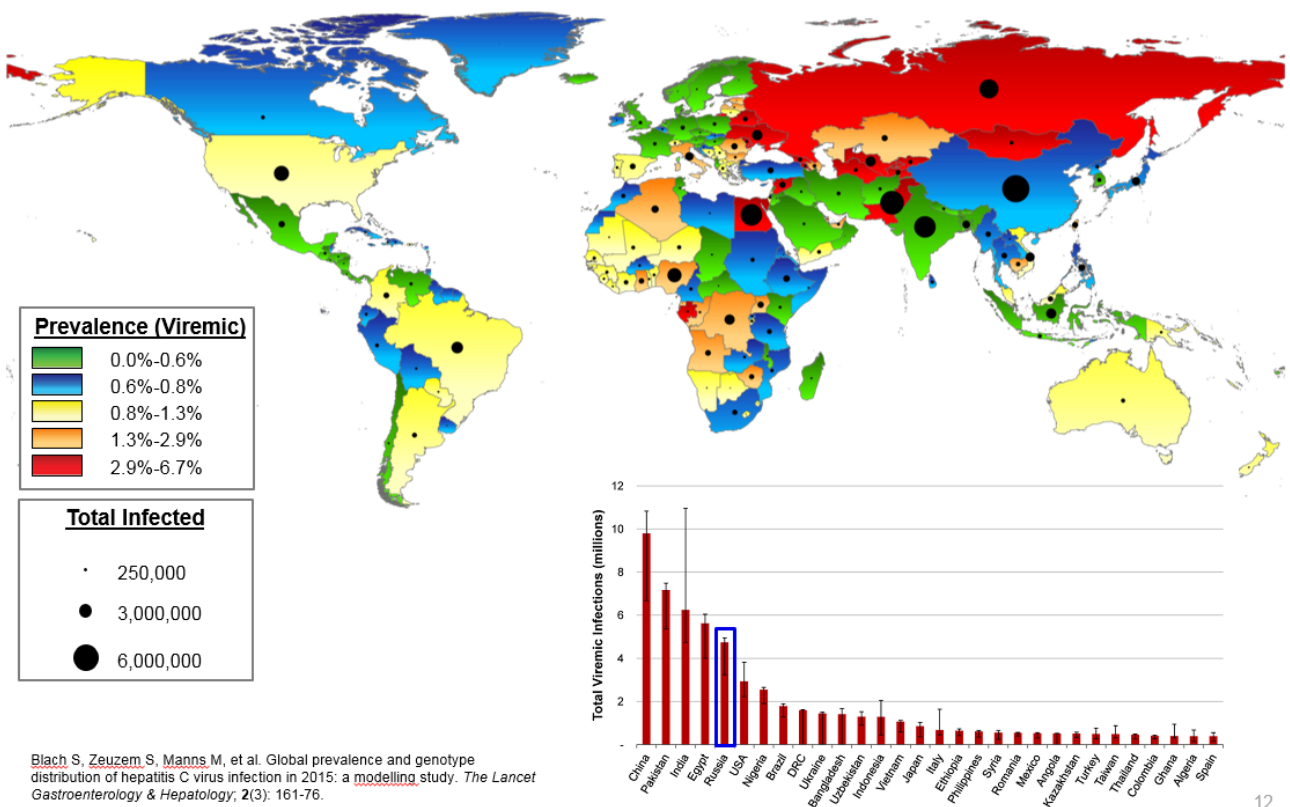
<http://apps.who.int/gho/data/node.main.A828?lang=en>

Hepatitis B (HepB3) immunization coverage am																	
Country	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001
Russian Federation	97	97	97	97	97	97	97	97	98	98	98	98	97	96	94	81	3

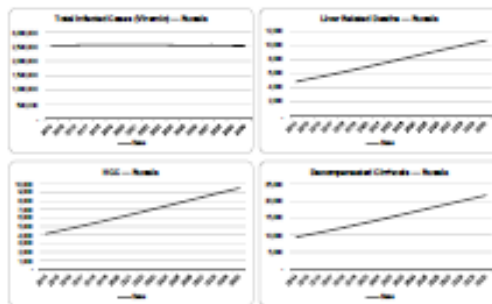
Hepatitis C

Information received from Homie Razavi

Current Disease Burden



In the absence of interventions, prevalence will remain steady while morbidity and mortality will more than double by 2030



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WHO Elimination Scenario (Low Prevalence)

- GHSS Targets:
 - 90% of Patients Diagnosed by 2030
 - 90% Reduction in new infections by 2030
 - 65% Reduction in liver related mortality by 2030

	2016	2017	2018	2019	2022	2025
Newly Diagnosed	50,000	50,000	80,000	70,000	70,000	70,000
Treated	12,000	12,000	25,000	80,000	150,000	210,000
New Infections	100,000	100,000	80,000	89,000	33,000	10,000
Fibrosis Stage	>= F1	>= F1	>= F0	>= F0	>= F0	>= F0
Treated Age	15-64	15-64	15-69	15-74	15-74	15-74
SVR	50%	50%	95%	95%	95%	95%

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With interventions, HCV morbidity and mortality can decrease by >65% by 2030 saving 45,800 lives and averting 18,000 HCC cases



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Estimated Disease Burden – Modeling Results

Prevalent Cases	2016	2030
Chronic Infections (viremic)	2,547,000	246,800
Liver Related Deaths	5,500	1,700
HCC	4,900	1,900
Decompensated cirrhosis	10,800	3,800

- Cases avoided

	Prevalence Cases Averted in 2030	Cumulative Incident Cases Averted 2016-2030
Cirrhosis	177,700	24,000
Decompensated Cirrhosis	18,000	24,900
HCC	7,600	32,300
Liver Related Deaths	45,800	

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Scenario 2 – High Prevalence Estimate

Base Scenario – Today's Treatment Paradigm Continues into the Future (High Prevalence)

- 12,000 patients per year continue to be treated

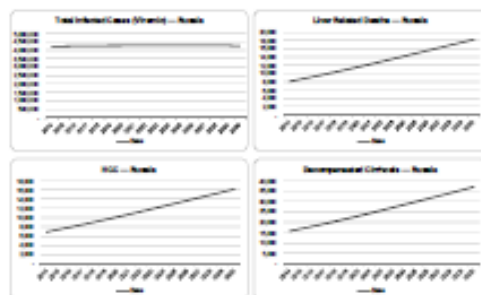
	2016	2017	2018	2019	2022	2025
Newly Diagnosed	50,000	50,000	50,000	50,000	50,000	50,000
Treated	12,000	12,000	12,000	12,000	12,000	12,000
New Infections	172,000	172,000	171,000	170,000	169,000	168,000
Fibrosis Stage	>= F1	>= F1	>= F1	>= F1	>= F1	>= F1
Treated Age	15-64	15-64	15-64	15-69	15-69	15-69
SVR	50%	50%	50%	50%	50%	50%

- Disease burden:

	2016
Chronic Infections (viremic)	4,225,000
Liver Related Deaths	9,200
HCC	8,000
Decompensated cirrhosis	18,000

16

In the absence of interventions, prevalence will remain steady while morbidity and mortality will more than double by 2030



21

WHO Elimination Scenario (High Prevalence)

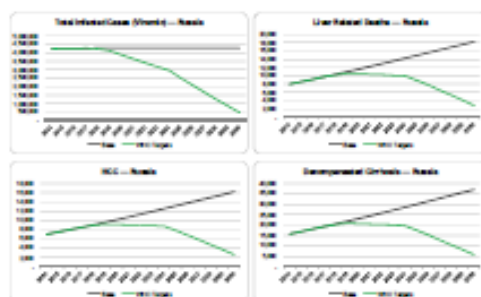
GHSS Targets:

- 90% of Patients Diagnosed by 2030
- 90% Reduction in new infections by 2030
- 65% Reduction in liver related mortality by 2030

	2016	2017	2018	2019	2020	2025
Newly Diagnosed	50,000	50,000	80,000	75,000	75,000	75,000
Treated	12,000	12,000	25,000	80,000	150,000	210,000
New Infections	100,000	100,000	80,000	69,000	33,900	16,500
Fibrosis Stage	>= F1	>= F1	>= F2	>= F2	>= F2	>= F2
Treated Age	15-64	15-64	15-69	15-74	15-74	15-74
SVR	50%	50%	90%	90%	90%	90%

22

With interventions, HCV morbidity and mortality can decrease by >85% by 2030 saving 77,000 lives and averting 13,000 HCC cases



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Estimated Disease Burden – Modeling Results

Prevalent Cases	2016	2030
Chronic Infections (Viremic)	4,325,500	446,800
Liver Related Deaths	9,200	2,800
HCC	8,000	2,800
Decompensated cirrhosis	18,000	6,000

Cases avoided

	Prevalence Cases Averted in 2030	Cumulative Incident Cases Averted 2016-2030
Cirrhosis	302,900	41,400
Decompensated Cirrhosis	31,200	41,000
HCC	13,600	52,900
Liver Related Deaths	77,600	

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2. Presentation related references

Pubmed MEDLINE search on {(Hepatitis) AND (Russia*) } in all [Abstract/title] and filter:'last 10 years' on was performed.

The references were manually sorted in the different subject in an EndNote database.

The references are listed by publication year (recent first).

2.1 Session 1 THE HEALTH CARE SYSTEM IN THE RUSSIAN FEDERATION

Session 1: THE HEALTH CARE SYSTEM IN THE RUSSIAN FEDERATION

09:20-09:35

The structure and priority directions of the health care system development in the Russian Federation.

Ekaterina Karakulina, *Department of the organization of medical care and sanatorium affairs, Ministry of Health of the Russian Federation, Moscow.*

Session 1: THE HEALTH CARE SYSTEM IN THE RUSSIAN FEDERATION

09:35-09:50

Organization of infectious disease service in the Russian Federation

Elena Malinnikova, Chief Specialist on infectious diseases of MoH, Moscow;

Vladimir Gorodin, Chief Specialist on Infectious Diseases in the Southern Federal district, Krasnodar.

Session 1: THE HEALTH CARE SYSTEM IN THE RUSSIAN FEDERATION

09:50-10:05

Development of the legal framework for viral hepatitis control in the Russian Federation

Natalia Kostenko, Department of Science, Innovative Development and Management of Medical and Biological Health Risks, Ministry of Health, Moscow.

Session 1: THE HEALTH CARE SYSTEM IN THE RUSSIAN FEDERATION

10:05-10:20	Challenges and prospects of the organization and financing of medical care. <i>Vitaly Omelyanovskiy, Center for Healthcare Quality Assessment and Control of the Russian Federation MoH, Moscow.</i>
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2.2 Session 2 SURVEILLANCE AND EPIDEMIOLOGY OF VIRAL HEPATITIS IN RUSSIA

Session 2: Surveillance and epidemiology of viral hepatitis in Russia

10:50-11:10	System of epidemiological surveillance for viral hepatitis in the Russian Federation. <i>Vladimir Chulanov, Central Research Institute of Epidemiology, Moscow.</i>
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Epidemiology

Baatarhhuu, O., Gerelchimeg, T., Munkh-Orshikh, D., Batsukh, B., Sarangua, G. and Amarsanaa, J. **"Epidemiology, Genotype Distribution, Prognosis, Control, and Management of Viral Hepatitis B, C, D, and Hepatocellular Carcinoma in Mongolia."** *Euroasian J Hepatogastroenterol* **2018** 8(1): 57-62.

Mongolia is located between Russia and China. The total population of Mongolia as of December 2017 is estimated to be 3.2 million people. According to our previous study results, the prevalence of HBV was 11.8%, and anti-HDV was detected in 4.8% among the HBsAg-positive subjects. Interestingly, most HCV infection is caused by genotype 1b. Among all HBV DNA-positive samples, 98.5% were classified into genotype D, and regarding HDV genotypes, all HDV RNA-positive samples, 100%, were classified into genotype I. The second study is the baseline survey of a Nationwide Cancer Cohort Study. Prevalence of HBsAg was 10.6%. Additionally, HCV infection was observed in 9.9%, and 0.8% were coinfecting with HBV and HCV among the general population aged from 10 to 64 years. The third study investigated the population-based prevalence of hepatitis B and C virus in apparently healthy population of Ulaanbaatar city, Mongolia. The anti-HCV prevalence was 9.0%. In addition, the prevalence of HBV was 8.0%. The fourth study is on the prevalence of HCV and coinfections among nurses in a tertiary hospital in Mongolia. The prevalence of HCV was 18.9%. Additionally, HBV infection was observed in 23.1%, and 1.2% were coinfecting with HCV and HBV. Mongolia has the highest HCC incidence in the world (78.1/100,000, 3.5* higher than China). As a result, the Mongolia government has launched The National Viral Hepatitis Program, which is a comprehensive program that involves all aspects from prevention to care and disease control to meet a reduction goal for morbidity and mortality due to HBV, HCV, and HDV. Consequently, access to antiviral therapies is now improving in Mongolia. How to cite this article: Baatarhhuu O, Gerelchimeg T, Munkh-Orshikh D, Batsukh B, Sarangua G, Amarsanaa J. Epidemiology, Genotype Distribution, Prognosis, Control, and Management of Viral Hepatitis B, C, D, and Hepatocellular Carcinoma in Mongolia. *Euroasian J Hepato-Gastroenterol* 2018;8(1):57-62.

Bailey, H., Turkova, A. and Thorne, C. **"Syphilis, hepatitis C and HIV in Eastern Europe."** *Curr Opin*

Infect Dis **2017** 30(1): 93-100.

PURPOSE OF REVIEW: Eastern Europe and Central Asia (EECA) has experienced large-scale epidemics of syphilis, hepatitis C virus (HCV) and HIV over the past few decades. Here, we review recent evidence on the epidemiology of and the response to these intersecting epidemics. RECENT FINDINGS: The HIV epidemic in EECA continues to expand, with new infections increasing by more than 50% between 2010 and 2015. HCV is now in the top 10 causes of death in EECA, with Russia accounting for more than half of the global burden of HCV infections, but access to direct-acting antivirals remains a major obstacle for control of the epidemic. Although syphilis incidence is generally declining, high prevalence is reported in key populations, particularly sex workers and people who inject drugs. Recent epidemiological studies have highlighted very high prevalence of HIV, syphilis and HCV in prison populations, alongside poor access to prevention and treatment. SUMMARY: Multiple factors are contributing to the ongoing and overlapping HIV, HCV and syphilis epidemics in EECA, including low coverage with antiretroviral therapy and insufficient scale of prevention services. Further research is required to estimate the burden of infections and identify effective prevention and treatment strategies in hard-to-reach key populations, particularly men who have sex with men.

Tsatsralt-Od, B. "**Viral Hepatitis in Mongolia: Past, Present, and Future.**" Euroasian J Hepatogastroenterol **2016** 6(1): 56-58.

Viral hepatitis is one of the major health concerns worldwide, particularly in Asian countries. Mongolia, which is located in northern Asia, between Russia and China, is confronting various infectious diseases, such as viral hepatitis and tuberculosis. As for healthy individuals in Mongolia, the reported prevalence of hepatitis B surface antigen (HBsAg) was 9 or 10% and the reported prevalence of anti-hepatitis C virus ranged from 11 to 25%. We reported a markedly high prevalence of hepatitis D virus RNA (83%) among apparently healthy individuals with HBsAg in Ulaanbaatar. Also due to lack of proper mechanisms to handle sewerage, disinfection, and lack of clean water supply across the country, hepatitis A is endemic in Mongolia. Moreover, Mongolia ranked in the high-prevalence zone for hepatitis B, D, and C. How to cite this article: Tsatsralt-Od B. Viral Hepatitis in Mongolia: Past, Present, and Future. Euroasian J Hepato-Gastroenterol 2016;6(1):56-58.

Tsatsralt Od, B. "**Epidemiology of Viral Hepatitis and Liver Diseases in Mongolia.**" Euroasian J Hepatogastroenterol **2015** 5(1): 37-39.

Mongolia which is located in Northern Asia between Russia and China is endowed with one of lowest population density in the world. Acute hepatitis due all types of hepatitis virus has been reported in Mongolia. Also, dual and triple hepatitis viruses, HBV, HDV and HCV are highly prevalent among patients with chronic liver disease living in Mongolia. Due to these facts, liver cancer is the leading cause of cancer mortality in Mongolia. The national immunization program including vaccination against hepatitis B was started in 1991 and screening of blood donations for HBsAg and anti-HCV was introduced in 1993 and 1997 respectively. The incidence of hepatitis viruses showing a downhill course in some parts of Mongolia, but comprehensive efforts are needed to control hepatitis viruses and containment of hepatitis related liver diseases and liver cancer in Mongolia. How to cite this article: Tsatsralt OB. Epidemiology of Viral Hepatitis and Liver Diseases in Mongolia. Euroasian J Hepato-Gastroenterol 2015;5(1):37-39.

Gerasimova, V. V., Maksimova, N. R., Levakoval, A., Zhebrun, A. B. and Mukomolov, S. L.

"EPIDEMIOLOGICAL FEATURES OF CHRONIC VIRUS HEPATITIS B AND C IN THE REPUBLIC SAKHA (YAKUTIA)." Wiad Lek **2015 68(4): 502-507.**

High disease burden of chronic virus hepatitis B and C of population in the Republic Sakha (Yakutia) is subject to referring it to endemic territories due to these infections. For a 15-year-old period the disease has been registered at higher rates in the Russian Federation.

Session 2: Surveillance and epidemiology of viral hepatitis in Russia

11:10-11:30 Hepatitis A and E: surveillance and epidemiological situation in the Russian Federation.

Mikhail Mikhailov, *Russian Medical Academy of Continuous Professional Education, Moscow.*

Hepatitis A

Volchkova, E., Umbetova, K., Belaia, O., Sviridova, M., Dmitrieva, L., Arutyunova, D., Chernishov, D. and Karan, L. "**Co-infection of dengue fever and hepatitis A in a Russian traveler.**" *IDCases* **2016** 5: 67-68.

We report a hepatitis A (HAV) and dengue virus (DENV) co-infection in Russian man who had been traveling to Dominican Republic. At admission to the hospital hemorrhagic and jaundice symptoms were observed in patient. PCR tests of blood serum and urine revealed RNA dengue virus type 3, HAV RNA, anti-HAV-IgM.

Dudarev, A. A., Dorofeyev, V. M., Dushkina, E. V., Alloyarov, P. R., Chupakhin, V. S., Sladkova, Y. N., Kolesnikova, T. A., Fridman, K. B., Nilsson, L. M. and Evengard, B. "**Food and water security issues in Russia III: food- and waterborne diseases in the Russian Arctic, Siberia and the Far East, 2000-2011.**" *Int J Circumpolar Health* **2013** 72: 21856.

BACKGROUND: The food- and waterborne disease situation in Russia requires special attention. Poor quality of centralized water supplies and sewage systems, biological and chemical contamination of drinking water, as well as contamination of food products, promote widespread infectious diseases, significantly exceeding nationwide rates in the population living in the two-thirds of Russian northern territories. OBJECTIVES: The general aim was to assess the levels of food- and waterborne diseases in selected regions of Russian Arctic, Siberia and the Far East (for the period 2000-2011), and to compare disease levels among regions and with national levels in Russia. STUDY DESIGN AND METHODS: This study is the first comparative assessment of the morbidity in these fields of the population of 18 selected regions of Russian Arctic, Siberia and the Far East, using official statistical sources. The incidences of infectious and parasitic food- and waterborne diseases among the general population (including indigenous peoples) have been analyzed in selected regions (per 100,000 of population, averaged for 2000-2011). RESULTS: Among compulsory registered infectious and parasitic diseases, there were high rates and widespread incidences in selected regions of shigellosis, yersiniosis, hepatitis A, tularaemia, giardiasis, enterobiasis, ascariasis, diphyllorhynchiasis, opisthorchiasis, echinococcosis and trichinellosis. CONCLUSION: Incidences of infectious and parasitic food- and waterborne diseases in the general population of selected regions of the Russian Arctic, Siberia and the Far East (2000-2011) are alarmingly high. Parallel solutions must be on the agenda, including improvement of sanitary conditions of cities and settlements in the regions, modernization of the water supply and of the sewage system. Provision and monitoring of the quality of the drinking water, a reform of the general healthcare system and the epidemiological surveillance (including gender-divided statistics), enhancement of laboratory diagnostics and the introduction of preventive actions are urgently needed.

Hepatitis E

Potemkin, I. A., Lopatukhina, M. A., Gadzhieva, O. A., Prokhorova, E. L., Diyarrassuba, A., Isaeva, O. A., Kozhanova, T. V., Ivanova, O. E., Silenova, O. V., Setdikova, N., et al. "**[Prevalence of hepatitis E markers**

in children]." *Zh Mikrobiol Epidemiol Immunobiol* **2015** (2): 38-46.

AIM: Frequency of detection determination for past and current hepatitis E virus (HEV) infection markers in children with immune suppression, as well as children with normal immune status. MATERIALS AND METHODS: The presence of HEV markers (anti-HEV IgG and IgM, HEV RNA) was studied in 609 sera samples of children with neurologic pathologies, 87 samples--from children with immune deficiencies, as well as 3122 samples from conditionally healthy children of 6 regions of Russia. The children were divided into 5 age groups. Anti-HEV IgG and IgM determination was carried out in EIA, HEV RNA--by RT-PCR. RESULTS: The frequency of detection of anamnestic anti-HEV IgG turned out to be significantly higher among immune-compromised. children compared with healthy children (5.7% against 1.4%, $p < 0.05$). Anti-HEV IgM, that testify to current or recent infection, were also detected significantly more frequently among children with immune-suppression (1.1-1.6%) compared with healthy children (0.25%, $p < 0.05$). HEV RNA was detected in 1 child with the absence of anti-HEV IgM and IgG. Nucleotide sequence analysis of HEV confirmed membership of this isolate in genotype 3, that is prevalent in non-endemic territories. CONCLUSION: The data obtained have demonstrated, that HEV-infection is prevalent among children in Russia and its course is, probably, asymptomatic in most cases. Immune suppression is a factor of increased risk of infection of children with HEV.

Voronina, O. L., Kunda, M. S., Gudov, V. P., Aksenova, E. I., Shilova, V. S., Yarosh, L. V., Elgort, D. A., Lunin, V. G. and Semenenko, T. A. "[Search for RNA of the hepatitis E virus autochthonous for Russia in the most likely infection sources]." *Mol Gen Mikrobiol Virusol* **2014** (3): 29-34.

The research carried out for 30 years from the moment of hepatitis E virus (HEV) discovery has proved the presence of the autochthonous HEV in non-endemic areas: Europe and Russia. Monitoring of the HEV antibodies (anti-HEV) among the Russian population has revealed regions with increased seroprevalence that testifies to high probability of local HEV infection in these areas. Contact with HEV can represent special danger for patients of the risk groups. In this work, the blood sera testing was carried out in order to assess the anti-HEV presence among these contingents (groups). Seropositive sera from the patients from the regions with high anti-HEV seroprevalence, risk groups patients, samples with high probability of HEV occurrence including the animals as possible reservoir, have been used for RNA extraction. The developed system of HEV RNA detection both in real-time RT-PCR and in a nested PCR variant has confirmed its sensitivity to the synthetic reference templates and positive control samples in commercial test system (Genesig, Great Britain). HEV RNA was absent in all tested samples. This indicates a low frequency of the autochthonous HEV carriage occurrence. Sampling enlargement to tens of thousands persons is necessary for significant HEV RNA detection.

Session 2: Surveillance and epidemiology of viral hepatitis in Russia

11:30-11:50

Hepatitis B: surveillance and epidemiological situation in the Russian Federation.

Elena Esaulenko, Pasteur Institute of Epidemiology and Microbiology, Saint Petersburg.

Hepatitis B

Balaeva, T., Grjibovski, A. M., Samodova, O., Sannikov, A. and Klouman, E. "[Seroprevalence of Markers of Hepatitis B Virus Infection, Associated Factors, and Vaccination Status in Young Adults in Arkhangelsk, Northwest Russia: A Population-Based Cross-Sectional Study.](#)" *Int J Environ Res Public Health* **2018** 15(9).

Russia had a high incidence of hepatitis B virus (HBV) infection before the vaccination campaigns of 1997, 2001, 2007, which targeted newborns, adolescents, and adults, respectively. The aim of our study was to assess the prevalence of serological markers of HBV

infection, associated factors, and vaccination status among young adults in Arkhangelsk, Northwest Russia. In this cross-sectional, population-based study, we used a quota sampling method to recruit 1243 adults aged 18(-)39 years. Participants completed a self-administrated questionnaire and were tested for hepatitis B markers. Associations between positivity for markers and selected sociodemographic and behavioral factors were studied by logistic regression. 10.9% of our participants were positive for at least one marker of hepatitis B, 1.2% were positive for HBsAg, and 42.1% were negative for all markers. In multivariable logistic regression analyses, age 30(-)34 years; lack of self-reported vaccination; and having ≥ 2 sexual partners in the last 6 months were associated with positivity for markers of hepatitis B. Hepatitis B vaccination was confirmed in 46.9% of participants. Although half of our study sample was vaccinated, four in 10 were still susceptible to infection and more than one participant in 100 showed evidence of an active infection.

Ozaras, R., Inanc Balkan, I., Yemisen, M. and Tabak, F. "[Epidemiology of HBV subgenotypes D.](#)" *Clin Res Hepatol Gastroenterol* **2015** 39(1): 28-37.

The natural history of hepatitis B virus infection is not uniform and affected from several factors including, HBV genotype. Genotype D is a widely distributed genotype. Among genotype D, several subgenotypes differentiate epidemiologically and probably clinically. D1 is predominant in Middle East and North Africa, and characterized by early HBeAg seroconversion and low viral load. D2 is seen in Albania, Turkey, Brazil, western India, Lebanon, and Serbia. D3 was reported from Serbia, western India, and Indonesia. It is a predominant subgenotype in injection drug use-related acute HBV infections in Europe and Canada. D4 is relatively rare and reported from Haiti, Russia and Baltic region, Brazil, Kenya, Morocco and Rwanda. Subgenotype D5 seems to be common in Eastern India. D6 has been reported as a rare subgenotype from Indonesia, Kenya, Russia and Baltic region. D7 is the main genotype in Morocco and Tunisia. D8 and D9 are recently described subgenotypes and reported from Niger and India, respectively. Subgenotypes of genotype D may have clinical and/or viral differences. More subgenotype studies are required to conclude on subgenotype and its clinical/viral characteristics.

Session 2: Surveillance and epidemiology of viral hepatitis in Russia

11:50-12:10	<p>Hepatitis D: surveillance and epidemiological situation in the Russian Federation.</p> <p><i>Olga Isayeva, I.I. Mechnikov Institute of vaccines and sera, Moscow.</i></p>
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Hepatitis D

Abdurakhmanov, D., Yesmembetov, K., Rozina, T., Nikulkina, E. and Tanaschuk, E. "[Liver-related mortality in hepatitis delta patients: Russian single centre experience.](#)" *Dig Liver Dis* **2018** 50(8): 867-868.

Kozhanova, T. V., Ilchenko, L. Y., Lopatuchina, M. A., Saryglar, A. A., Saryg-Chaa, O. N., Sonam-Baiyr, Y. D., Mongusch, M. K., Kyuregyan, K. K. and Mikhailov, M. I. "**[FAMILIAL CLUSTERS OF HEPATITIS DELTA IN ENDEMIC REGION (REPUBLIC TYVA)]**." *Eksp Klin Gastroenterol* **2015** (11): 15-22.

AIM: Clinical and virological characteristic of hepatitis delta familial clusters in region of Russia that is endemic for this infection (Republic Tuva). MATERIALS AND METHODS: Total 383 patients with HBV/HDV coinfection and their family members (3 generations) were followed. Serum samples for HDV and HBV markers testing were available for 42 patients from 18 families. HBsAg, anti-HBc, HBeAg, anti-HBe and anti-HDV were tested using commercial ELISA tests; HDV RNA and HBV DNA were tested using in house nested PCR tests. RESULTS: 30 family (63 people) clusters were identified, in which close living persons have been infected with HDV and HBV. The biological material for determining of HDV and HBV markers has been available from 18 families (42 people belonging to 1-3 generations (parents and children, husband and wife, brother and sister). The mean age was 35 +/- 14 years (10-58 years). Chronic hepatitis (CH) was in 30 (71.4%) patients, liver cirrhosis (LC)--in 10 (23.8%) and HCC was developed in 2 (4.8%) person on the background of long infections. The incidence of HBeAg was 14.3% (6/42),

HBV DNA--19% (8/42); HDV RNA--35.7% (15/42). In 2 cases (mother) replication markers of both viruses were found, it contributed to the increased risk of infection in children. So HDV RNA was detected in the blood serum of their daughters (15 and 17), that does not exclude the possibility of vertical transmission. An illustration describes four families. CONCLUSION: The epidemic process of delta infection in the Republic of Tyva is characterized by intrafamilial infection of HBV and HDV.

Kozhanova, T. V., Il'chenko, L. and Mikhailov, M. I. "[Viral hepatitis delta. Is there the delta infection problem in the Russian Federation?]." *Eksp Klin Gastroenterol* 2014 (12): 4-12.

Hepatitis delta (HD) is characterized by rapid progression to fibrosis, and development of hepatocellular carcinoma, and a high mortality rate. The article presents data on the epidemiology, diagnosis, treatment of HD. The views of the epidemiological, clinical and virological characteristics of HD-infection among population of the Russian Federation (RF) are limited due to absence of official HD registration and detection of antibodies to the HD virus (anti-HDV) in HBsAg-positive individuals. However, some areas of the country are characterized by a high HDV circulation (Republic Tyva (RT) - 46,5%, Republic Sakha (Yakutia) - 12,5%) according to our studies conducted in 6 regions of Russia. Clinical-epidemiological situation of HDV infection in RT can be considered as a model to create a program of optimize diagnosis, prevention and treatment of HDV-infection in the Russian Federation.

Session 2: Surveillance and epidemiology of viral hepatitis in Russia

12:10-12:30

Hepatitis C: surveillance and epidemiological situation in the Russian Federation.

Nikolay Pimenov, Central Research Institute of Epidemiology, Moscow..

Hepatitis C

Barkhash, A. V., Kochneva, G. V., Chub, E. V. and Romaschenko, A. G. "[Single nucleotide polymorphism rs1800872 in the promoter region of the IL10 gene is associated with predisposition to chronic hepatitis C in Russian population.](#)" *Microbes Infect* 2018 20(3): 212-216.

Previously, we studied an association of two IL28B gene single nucleotide polymorphisms (SNPs) and three IL10 gene SNPs with predisposition to tick-borne encephalitis in a Russian population. In this study, a possible involvement of these SNPs in the development of predisposition to chronic hepatitis C (caused by structurally similar, related virus from the Flaviviridae family) was investigated in the same population. Only the IL10 promoter rs1800872 SNP was associated with predisposition to chronic hepatitis C. This SNP seems to be a common genetic marker of predisposition to two diseases caused by hepatitis C and tick-borne encephalitis viruses in Russian population.

Manuylov, V. A., Chub, E. V., Kichatova, V. S., Soboleva, N. V., Isaeva, O. V., Zamyatnin, A. A., Jr. and [Netesov, S. V.](#) "[Hepatitis C virus subtype 3a was introduced in the USSR in the early 1980s.](#)" *J Gen Virol* 2017 98(8): 2079-2087.

A total of 2120 nucleotide sequences of the NS5b region of HCV subtype 3a were analysed, including 310 strains derived from former republics of the USSR (Azerbaijan, Estonia, Lithuania, Russia, Tajikistan and Uzbekistan). Among the viral isolates collected from former regions of the Soviet Union, 294 strains formed 3 sustained phylogenetic clusters, with each having a common origin. Phylodynamic analysis demonstrated that the most recent common ancestors of the current strains inside the three clusters were introduced into the USSR population in 1981+/-1, 1984+/-2 and 1985+/-2, respectively (the confidence intervals were calculated using Student's t-distribution, P<0.05). The time estimation obtained for HCV subtype 3a correlated well with the historical and epidemiological context of this period, and in particular with the start of widespread injection drug use in the USSR in the first half of the 1980s.

Zhebrun, A. B. and Kalinina, O. V. "[VIRAL HEPATITIS C: EVOLUTION OF THE EPIDEMIOLOGIC

PROCESS, EVOLUTION OF THE VIRUS]. *Zh Mikrobiol Epidemiol Immunobiol* **2016** (1): 102-112.

Periodization of the evolution of epidemic process of hepatitis C is given based on the results of phylodynamic, phylogeographic, historic and demographic studies: invasion of the virus into European and North-American population in 1700-1850; primary activation of the epidemic process in the years of the World War 1; expansive growth of prevalence in 40--60s of the 20th century due to mass parenteral interventions; new rise due to heroine drug abuse in 60--80s of the 20th century; manifold reduction of incidence of acute hepatitis C in industrial countries for the last 10-15 years as a result of general medical measures of prevention of hemocontact infections. A problem of possibility of hepatitis C management and necessity of evaluation of effectiveness of existing prophylaxis measures involving quantitative analytical methods of epidemiology is discussed. Data from phylogenetic studies on stages of hepatitis C virus evolution (HCV) are provided: division of its root genetic lineage with homologous hepaciviruses of animals 985--2013 years ago; division of HCV into genotypes 500--2000 years ago; division of genotypes into subtypes 70--300 years ago. Contribution of mutations and genetic recombinations into HCV evolution is discussed. Genotyping is stated as an inefficient approach for determination of pathogenicity determinants, immune evasion, non-responsiveness to therapy, as well as search for predictors of infection outcome. A necessity of genomic approach for these aims is justified, as well as for risk monitoring, ensuing from continuing evolution and biodiversity of HCV and other hepaciviruses.

Savilov, E. D., Malov, S. I., Malov, I. V., Gantulga, D., Miroshnichenko, I. A., Erdenebayar, N., Orlova, L. S., Nyamadawa, P. and Dulguun, B. "**[EPIDEMIOLOGIC MANIFESTATIONS OF VIRAL HEPATITIS C IN REPRESENTATIVES OF CAUCASIAN AND MONGOLOID RACES].**" *Zh Mikrobiol Epidemiol Immunobiol* **2016** (1): 9-17.

AIM: Present comparative epidemiologic characteristics of viral hepatitis C in Mongolia and Irkutsk Region taking into account racial origin of the studied populations. MATERIALS AND METHODS: The studies were carried out in 2009-014 on the territory of Irkutsk Region in Mongolia. Prevalence of viral hepatitis based on serological monitoring, virus RNA detection, risk factors, change in structure of circulating genotypes, hepatocellular carcinoma morbidity were studied. RESULTS: Epidemiologic manifestations of viral hepatitis C in Mongolia, in contrast to Irkutsk Region, are characterized by, a wider prevalence of the disease, predominance of the fraction of seropositive individuals in age category of above 50 years and predominance of genotype 1 virus in circulation. In recent years an evolution of diversity of circulating virus genotypes, took place towards a reduction of the fraction of genotype in Mongolia and Russia due to increase of the fraction of genotype-3. Expressed differences in average-annual values of hepatocellular carcinoma morbidity were detected, that were more than 10 times higher among Mongoloids compared with Caucasians. CONCLUSION: Pronounced differences were detected in manifestations of epidemic process of viral hepatitis C in Mongolia and Asian part of Russia, represented by Eastern Siberia, that are associated with ethnic, social and, cultural living conditions of the indigenous population.

Petruzziello, A., Marigliano, S., Loquercio, G. and Cacciapuoti, C. "**Hepatitis C virus (HCV) genotypes distribution: an epidemiological up-date in Europe.**" *Infect Agent Cancer* **2016** 11: 53.

Hepatitis C virus (HCV) infection is a major public health burden in Europe, causing an increasing level of liver-related morbidity and mortality, characterized by several regional variations in the genotypes distribution. A comprehensive review of the literature from 2000 to 2015 was used to gather country-specific data on prevalence and genotype distribution of HCV infection in 33 European countries (about 80 % of the European population), grouped in three geographical areas (Western, Eastern and Central Europe), as defined by the Global Burden of Diseases project (GBD). The estimated prevalence of HCV in Europe is 1.7 % showing a decrease than previously reported (- 0.6 %) and accounting over 13 million of estimated cases. The lowest prevalence (0.9 %) is reported from Western Europe (except for some rural areas of Southern Italy and Greece) and the highest (3.1 %) from Central Europe, especially Romania and Russia. The average HCV viraemic rate is 72.4 %, with a population of almost 10 million of HCV RNA positive patients. Genotype distribution does not show high variability among the three macro-areas studied, ranging between 70.0 % (Central Europe), 68.1 % (Eastern Europe) and 55.1 % (Western Europe) for genotype 1, 29.0 % (Western Europe), 26.6 % (Eastern Europe)

and 21.0 % (Central Europe) for genotype 3. Genotype 2 seems, instead, to have a major prevalence in the Western Europe (8.9 %), if compared to Eastern (4.3 %) or Central (3.2 %), whereas genotype 4 is present especially in Central and Western area (4.9 % and 5.8 %, respectively). Despite the eradication of transmission by blood products, HCV infection continues to be one of the leading blood-borne infections in Europe. The aim of this review is, therefore, to provide an update on the epidemiology of HCV infection across Europe, and to foster the discussion about eventual potential strategies to eradicate it.

Mukomolov, S., Trifonova, G., Levakova, I., Bolsun, D. and Krivanogova, E. "[Hepatitis C in the Russian Federation: challenges and future directions.](#)" *Hepat Med* **2016** 8: 51-60.

Hepatitis C virus (HCV) infection is one of the most prevalent health problems in the world. Official registration of HCV infections in the Russian Federation started in 1994. Two clinical forms of infection - acute and chronic hepatitis C - are registered separately. Moreover, the HCV national surveillance system also includes reports from laboratories on results from testing approximately 20 population risk groups for antibodies to HCV; approximately 15-16 million tests are performed annually. Modern epidemiological features of HCV infection in the Russian Federation are characterized by low incidence of the acute form of infection (acute HCV; one to two per 100,000) and a dramatic increase in chronic HCV (CHCV) cases. In 2013, the average nationwide rate of newly detected CHCV cases was 39.3/100,000. In the same year, the prevalence of CHCV demonstrating an accumulation of chronically infected patients in the country was much higher - 335.8/100,000. Four risk groups were identified as greatly affected by HCV, which were demonstrated by a high prevalence of antibodies to HCV: newborns from chronically infected women, persons from correctional facilities, patients with chronic liver diseases, and clients from clinics for sexually transmitted disease patients and drug users. It was found that several HCV genotypes circulated in different regions of the country; HCV1b had a prevalence of 55%-80% in almost every part of the country. However, in St Petersburg during the final decade of the last century and from 2001-2005, HCV3a subtype expanded circulation among young people due to increased intravenous drug addiction. Intravenous drug users were the major cause of a higher registration of double infection, with two different virus subtypes, and the appearance in Russia of new recombinant virus RF_2k/1b. It can be concluded that CHCV infection should be a focus of the health care system in Russia because serious epidemics of liver cirrhosis and hepatocellular carcinoma will be seen in the near future that will require urgent preventive and therapeutic measures.

Saraswat, V., Norris, S., de Knecht, R. J., Sanchez Avila, J. F., Sonderup, M., Zuckerman, E., Arkkila, P., Stedman, C., Acharya, S., Aho, I., et al. "[Historical epidemiology of hepatitis C virus \(HCV\) in select countries - volume 2.](#)" *J Viral Hepat* **2015** 22 Suppl 1: 6-25.

Chronic hepatitis C virus (HCV) infection is a leading cause of liver related morbidity and mortality. In many countries, there is a lack of comprehensive epidemiological data that are crucial in implementing disease control measures as new treatment options become available. Published literature, unpublished data and expert consensus were used to determine key parameters, including prevalence, viremia, genotype and the number of patients diagnosed and treated. In this study of 15 countries, viremic prevalence ranged from 0.13% in the Netherlands to 2.91% in Russia. The largest viremic populations were in India (8 666 000 cases) and Russia (4 162 000 cases). In most countries, males had a higher rate of infections, likely due to higher rates of injection drug use (IDU). Estimates characterizing the infected population are critical to focus screening and treatment efforts as new therapeutic options become available.

Chulanov, V. P., Pimenov, N. N., Mamonova, N. A., Sagalova, O. I., Shestakova, I. V. and Pokrovsky, V. I. "[\[Chronic hepatitis C in Russia: current challenges and prospects\]](#)" *Ter Arkh* **2015** 87(11): 5-10.

This paper evaluates the impact of different medical care strategies for chronic hepatitis C patients in relation to its prevalence, frequency of adverse outcomes and mortality rate.

Session 2: Current hepatitis situation STATE OF THE ART

12:30-12:50

WHO guidelines on surveillance for viral hepatitis.

Antons Mozalevskis, WHO Regional Office for Europe,
Copenhagen, Denmark.

WHO-recommended surveillance standard of acute viral hepatitis(http://www.who.int/immunization/monitoring_surveillance/burden/vpd/surveillance_type/passive/hepatitis_standards/en/)



http://apps.who.int/iris/bitstream/handle/10665/204501/9789241549547_eng.pdf?sequence=1

2.3 Session 3 EPIDEMIOLOGY AND DISEASE BURDEN OF VIRAL HEPATITIS IN THE REGIONS OF THE RUSSIAN FEDERATION

Russian regions

Session 3: EPIDEMIOLOGY AND DISEASE BURDEN OF VIRAL HEPATITIS IN THE REGIONS OF THE RUSSIAN FEDERATION

14:00-14:10 Epidemiology and burden of viral hepatitis in the Chelyabinsk Region.
Olga Sagalova, *Chief specialist on infectious diseases of the Chelyabinsk Region MoH, Chelyabinsk*



Session 3: EPIDEMIOLOGY AND DISEASE BURDEN OF VIRAL HEPATITIS IN THE REGIONS OF THE RUSSIAN FEDERATION

14:10-14:20 Epidemiology and burden of viral hepatitis in Krasnodar Region.
Viktoria Bakhtina, *Specialized clinical infectious diseases hospital of Krasnodar Region MoH, Krasnodar.*



Maksyutov, R. A., Gavrilova, E. V., Maksyutov, A. Z. and Kanev, A. N. "[Genotyping of hepatitis B and C virus Russian isolates for reference serum panel construction](#)." *J Med Virol* **2015** 87(7): 1192-1198.

Approximately 2% and 5% of the world human population is estimated to be infected with HCV and HBV, respectively. Reference panels of HCV and HBV serum samples with defined genotypes and serotypes is necessary for monitoring of the specificity and sensitivity of diagnostic test kits. The aim of this study was to determine genotypes/serotypes of HBV and HCV circulating in Russia in order to construct a panel of reference sera containing these HCV genotypes and HBV serotypes. A total of 343 HBsAg-positive and 207 anti-HCV positive serum samples were collected from patients with HBV and HCV infection from different cities between years 2002 and 2010 in St. Petersburg, **Krasnodar**, Nizhny Novgorod, Novosibirsk, Barnaul, Gorno-Altaysk, and Khabarovsk. HBV DNA was found in 76.4% of HBsAg positive samples by PCR for the S gene and HCV RNA was found in 71.5, 70.0, and 64.7% of anti-HCV positive samples in the 5'UTR, Core, and NS5B regions, respectively. The prevalence and proportion of HBV genotype/serotype associations were as follows: A/adw2, 2.1%; D/ayw2, 54.0%; D/ayw3, 43.1%; D/adw2, 0.7%. A new combination of genotype D and adw2 serotype was discovered. The distribution of HCV genotypes was the following: 43.6%, b; 3.8%, 2a; and

52.6%, 3a. Russian National reference panels of HBV and HCV lyophilized sera were developed to monitor specificity and sensitivity of approved kits and for the certification of newly developed assays.

Session 3: EPIDEMIOLOGY AND DISEASE BURDEN OF VIRAL HEPATITIS IN THE REGIONS OF THE RUSSIAN FEDERATION

14:20-14:30 Epidemiology and burden of viral hepatitis in the Far Eastern
Federal District.
*Anna Simakova, The Far Eastern State Medical University,
Vladivostok.*



Session 3: EPIDEMIOLOGY AND DISEASE BURDEN OF VIRAL HEPATITIS IN THE REGIONS OF THE RUSSIAN FEDERATION

14:30-14:40 Epidemiology and burden of viral hepatitis in the Republic of
Sakha (Yakutia).
*Snezhana Sleptsova, M.K.Amosov North-Eastern Federal
University, Yakutsk.*



Sleptsova, S. S., Semenova, V. K., Dyatchkovskaya, P. S. and Nikitina, S. G. **"BREADTH SPREADING OF VIRAL HEPATITIS MARKERS IN THE RISK GROUPS IN THE REPUBLIC OF SAKHA (YAKUTIA)."** *Wiad Lek* **2015** 68(4): 476-479.

INTRODUCTION: Republic of Sakha (Yakutia) is a hyperendemic region of Russian Federation for spreading of parenteral viral hepatitis B, C and D. In risk groups of these diseases are firstly medical personnel, who contacting with infection carriers including latent infections family and members of families of chronic viral hepatitis carriers. AIM: To reveal the breadth of spreading of viral hepatitis markers in the risk groups. MATERIALS AND METHODS: The level of HBV- and HC- infection were determined in medical staff of large multi specialty hospital and family members of people with viral hepatitis B and C. Epidemiological, clinical, serological and molecular biology methods of viral hepatitis diagnostics were applied in this study. RESULTS: Results of this study showed that the staff at surgery and hematology departments and all nursing staff belong to the high-risk of HBV-infection groups. Therefore, they are a priority for

active immunization. Attention is paid on the fact that infectivity of medical staff is not equally distributed in dependence on type of department and position of medical staff. Rate HBV-marker detecting in "family hearths" was dependent on degree of interrelationship with infection source. According received information, in families of patient with chronic hepatitis B spreading of infection was higher (77.6%) then in families of patients with acute hepatitis B (39.7%). At primary examination of families an anti-HCV was detected in 9.3 +/- 1.8% cases, i.e. the spreading of HCV was at low-activity. CONCLUSIONS: Results of our study on spreading of hepatitis B and C in Yakutia showed the high rate of appearance of HCV and HBV markers in the risk groups.

Sleptsova, S. S. and Borisova, N. V. **"THE ROLE OF VIRAL HEPATITIS IN THE MECHANISM OF LIVER CANCER FORMATION AMONG THE FAR NORTH INDIGENOUS INHABITANTS."** *Wiad Lek* 2015 68(4): 464-468.

INTRODUCTION: Yakutia is a region of high prevalence of viral hepatitis B, C and D. The rating and ranking of risk factors for the formation of cirrhosis and primary liver cancer in patients with chronic viral hepatitis (CVH) B, C and D in the Republic of Sakha (Yakutia) (RS(Y)), it is a serious medical problem. AIM: Studying of the main reasons for the progression of chronic viral hepatitis B, C and D to cirrhosis and liver cancer in the Far North. MATERIALS AND METHODS: Materials of official statistics of the Territorial Rosпотребнадзор and official registration of the Ministry of Health of RS (Y); serological and molecular biological research methods to the studying of HCV genotype B, C, D. RESULTS: On the basis of long-term morbidity of chronic viral hepatitis B, C and D and their outcomes in Yakutia defined a role in the progression to cirrhosis and primary liver cancer, ethnicity and genotype of HBV and HDV. Established fact of viral replication in cirrhosis and primary liver cancer under adverse social and environmental factors, genetically determined increased concentration of acetaldehyde due to impaired activity of alcohol dehydrogenases (ADH) and aldehyde dehydrogenases (ALDH) at the indigenous inhabitants of the republic proves the need for targeted therapy of complex events. CONCLUSIONS: The regions of Yakutia are the most affected by the virus of hepatitis B, C and D with progressive course of the disease to cirrhosis and cirrhosis liver cancer, defined by genotype hepatitis B & D, in which significantly usually occurs primary liver cancer, also noted that the combined mixed-replicating virus hepatitis is a risk factor for primary liver cancer.

Sleptsova, S., Duglas, N. and Shek, L. **"CLINICAL CASE OF CONDUCTING PREGNANCY AND CHILDBIRTH AT THE WOMAN WITH CHRONIC VIRAL HEPATITIS B IN THE REPLICATIVE FORM."** *Wiad Lek* 2015 68(4): 591-595.

INTRODUCTION: Because of a wide circulation of the hepatitis B (HB) among persons of young age, so-called vertical transmission of a virus from mother to the child is of particular importance. Relevance of this problem of HB increases in connection with a set of ways of infection, failures are more often observed at infection by natural ways: sexual and from mother to a fetus that demands development of effective measures of prevention of transfer from mother to a fetus. AIM: To develop algorithm of maintaining pregnant women with the chronic hepatitis B (HBV) for prevention of perinatal transfer of a HBV infection in the Republic of Sakha (Yakutia) (RS (Y)). MATERIALS AND METHODS: Materials of official statistics of Territorial administration of Rosпотребнадзор of RS (Y) are studied, incidence of chronic viral hepatitis B, C and D in RS (Y) from 2003-2013 was analyzed. Clinical, laboratory and tool, serological, molecular and biological methods of research were carried out. RESULTS: The high incidence of CHV, considerable frequency of detectability of markers of a HB infection at pregnant women, feasibility of a vertical way of a transmission of infection cause interest of doctors of different specialties in this problem. In this scientific publication we analyzed an example of maintaining the pregnant woman, woman in childbirth period with chronic viral hepatitis B, with long "experience" of an illness, with existence of replication of HBV-DNA. CONCLUSIONS: To decrease the risk of perinatal transfer of a HBV infection it is recommended a quantitative PCR-research among pregnant women with HBsAg which will provide decrease in transmission frequency of HB by carrying out in need of antiviral therapy to the woman and the individualized schedule of vaccinal prevention with introduction of specific immunoglobulin to the newborn.

Gerasimova, V. V., Maksimova, N. R., Levakoval, A., Zhebrun, A. B. and Mukomolov, S. L.

"EPIDEMIOLOGICAL FEATURES OF CHRONIC VIRUS HEPATITIS B AND C IN THE REPUBLIC SAKHA (YAKUTIA)." *Wiad Lek* 2015 68(4): 502-507.

High disease burden of chronic virus hepatitis B and C of population in the Republic Sakha (Yakutia) is subject to referring it to endemic territories due to these infections. For a 15-year-old period the disease has been registered at higher rates in the Russian Federation.

Dmitrieva, T. G., Munkhalova, Y. A., Argunova, E. F., Alexeyeva, S. N., Egorova, V. B. and Alexeeva, N. N.

"THE PREVALENCE OF CHRONIC VIRAL HEPATITIS IN CHILDREN AND ADOLESCENTS IN YAKUTIA." *Wiad Lek* 2015 68(4): 553-556.

UNLABELLED: Chronic hepatitis in children represents a serious health and social problem. Under the conditions of the high prevalence of viral hepatitis in Yakutia epidemiological process has a number of peculiarities. In children chronic hepatitis often occurs with minor clinical manifestations, which complicate diagnosis. The study of the epidemiological, clinical and laboratory data is an important task. The aim of the study was to investigate the epidemiological characteristics of chronic hepatitis in children and adolescents living in hyper-endemic region. MATERIALS AND METHODS: The study included 1568 patients' data, registered in the dispensary with a diagnosis of chronic hepatitis in the period from 2000 to 2012. Epidemiological history data of 304 patients with chronic hepatitis were analyzed. The data from official statistics were used for epidemiological analysis. Processing of clinical and laboratory studies was performed using the statistical package IBM SPSS STATISTICS 19. RESULT: CH epidemiological features were identified, including the prevalence of HBV-infection in etiological structure, the high incidence of the disease among the indigenous population, a high risk of intra-familial infection with hepatitis B virus, high frequency of perinatal infection with hepatitis C virus. It was proposed to maximize screening tests for markers of viral hepatitis and to improve quality control of vaccination. CONCLUSIONS: The epidemic process of viral hepatitis in children and adolescents in Yakutia is characterized by domination of HBV-infection in the structure of chronic hepatitis. The predominance of the indigenous nationalities among patients with chronic hepatitis B and the leading role of family contact in the routes structure of infection transmission indicates the importance of ethnic and social factors in contraction of the disease.

Kozhanova, T. V., Il'chenko, L. and Mikhailov, M. I. **"[Viral hepatitis delta. Is there the delta infection problem in the Russian Federation?]." *Eksp Klin Gastroenterol* 2014 (12): 4-12.**

Hepatitis delta (HD) is characterized by rapid progression to fibrosis, and development of hepatocellular carcinoma, and a high mortality rate. The article presents data on the epidemiology, diagnosis, treatment of HD. The views of the epidemiological, clinical and virological characteristics of HD-infection among population of the Russian Federation (RF) are limited due to absence of official HD registration and detection of antibodies to the HD virus (anti-HDV) in HBsAg-positive individuals. However, some areas of the country are characterized by a high HDV circulation (Republic Tyva (RT) - 46,5%, Republic Sakha (Yakutia) - 12,5%) according to our studies conducted in 6 regions of Russia. Clinical-epidemiological situation of HDV infection in RT can be considered as a model to create a program of optimize diagnosis, prevention and treatment of HDV-infection in the Russian Federation.

Session 3: EPIDEMIOLOGY AND DISEASE BURDEN OF VIRAL HEPATITIS
IN THE REGIONS OF THE RUSSIAN FEDERATION

14:40-14:50 Epidemiology and burden of viral hepatitis in the North Caucasus
Federal District.
*Marina Ivanova, AIDS and Infectious Diseases Center of the
Kabardino-Balkaria
Republic MoH, Nalchik.*



Session 3: EPIDEMIOLOGY AND DISEASE BURDEN OF VIRAL HEPATITIS
IN THE REGIONS OF THE RUSSIAN FEDERATION

14:50-15:00 Epidemiology and burden of viral hepatitis in Chukotka
Autonomous District.
Alexey Krapivkin, Chukotka District Hospital, Anadyr.



Session 3: **EPIDEMIOLOGY AND DISEASE BURDEN OF VIRAL HEPATITIS**
IN THE REGIONS OF THE RUSSIAN FEDERATION STATE OF THE ART

15:00-15:20

Optimization of screening strategies for viral hepatitis.

John Ward, *Centers for Disease Control and Prevention, Atlanta, USA.*



Why should people born from 1945-1965 get tested for hepatitis C?

People born from 1945–1965, sometimes referred to as baby boomers, are 5 times more likely to have hepatitis C than other adults. Hepatitis C can lead to liver damage, cirrhosis, and even liver cancer. Most people with hepatitis C do not know they are infected. Since many people can live with hepatitis C for decades without symptoms or feeling sick, testing is critical so those who are infected can get treated and cured.

While anyone can get hepatitis C, 3 in 4 people with hepatitis C were born from 1945–1965.

What should baby boomers know about hepatitis C?

Hepatitis C is a liver disease that results from infection with the hepatitis C virus. Some people who get infected are able to clear, or get rid of, the hepatitis C virus, but most people who get infected develop a chronic, or long-term, infection. Over time, chronic hepatitis C can cause serious health problems. In fact, hepatitis C is a leading cause of liver cancer and the leading cause of liver transplants. Treatments are now available that can cure hepatitis C.



CDC recommends that everyone born from 1945–1965 get tested for hepatitis C.

Why do people born from 1945-1965 have such high rates of hepatitis C?

The reason that people born from 1945–1965 have high rates of hepatitis C is not completely understood. Most baby boomers are believed to have become infected in the 1960s through the 1980s when transmission of hepatitis C was highest.

Hepatitis C is primarily spread through contact with blood from an infected person. Baby boomers could have gotten infected from medical equipment or procedures before universal precautions and infection control procedures were adopted. Others could have gotten infected from contaminated blood and blood products before widespread screening virtually eliminated the virus from the blood supply by 1992. Sharing needles or equipment used to prepare or inject drugs, even if only once in the past, could spread hepatitis C. Still, many people do not know how or when they were infected.



U.S. Department of
Health and Human Services
Centers for Disease
Control and Prevention

Continued on next page

Getting tested for hepatitis C

The only way to know if you have hepatitis C is to get tested. A blood test, called a hepatitis C antibody test, can tell if a person has ever been infected with the hepatitis C virus. This test looks for antibodies to the hepatitis C virus. Antibodies are chemicals released into the bloodstream when someone gets infected.

When getting tested for hepatitis C, ask when and how test results will be shared. There are two possible antibody test results:

- **Non-reactive, or a negative**, means that a person does not have hepatitis C. However, if a person has been recently exposed to the hepatitis C virus, he or she will need to be tested again.
- **Reactive, or a positive**, means that hepatitis C antibodies were found in the blood and a person has been infected with the hepatitis C virus at some point in time. A reactive antibody test **does not** necessarily mean a person has hepatitis C. Once someone has been infected, they will always have antibodies in their blood. This is true if even if they have cleared the hepatitis C virus.

A reactive antibody test requires an additional, follow-up test to determine if a person is currently infected with hepatitis C.



For more information

Talk to a health professional, call the health department, or visit www.cdc.gov/knowmorehepatitis.

Screening and case finding in the Russian Federation

Belopolskaya, M., Avrutin, V., Firsov, S. and Yakovlev, A. "HBsAg level and hepatitis B viral load correlation with focus on pregnancy." *Ann Gastroenterol* **2015** 28(3): 379-384.

BACKGROUND: Viral load measurement is necessary to estimate mother-to-child transmission risk for women with chronic hepatitis B (CHB), however, it is expensive. The present study aimed to investigate the relationship between HBsAg and hepatitis B virus (HBV) DNA levels, and to determine potential applications of HBsAg level monitoring for estimating viral load. METHODS: 85 patients with CHB (31 pregnant women, 26 non-pregnant women, 28 men) were included in the study. HBV DNA level was measured by real-time PCR, and HBsAg level by chemiluminescent immunoassay method. Dependency between viral load and HBsAg level was determined by Spearman correlation coefficient rho. RESULTS: The correlation between HBsAg and HBV DNA levels was significant for all patients [$\rho=0.3762$ ($P<0.0005$; $n=85$)]. In the group of pregnant women, a low (unmeasurable) HBV DNA level led to a decrease in the Spearman coefficient rho. In almost all cases a low level of the HBsAg corresponded to a low HBV DNA level. Only 2 patients had a low level of HBsAg and a relatively high viral load. By contrast, a high HBsAg level was observed in patients both with high and low viral load. CONCLUSIONS: Correlation between HBsAg and HBV DNA levels is significant. In most cases, a low level of HBsAg indicates a low HBV DNA level, whereas a high HBsAg level does not always correspond to a high viral load. The measurement of HBV DNA level is necessary for pregnant women with a high HBsAg level.

Diagnositica

Leblebicioglu, H., Arends, J. E., Ozaras, R., Corti, G., Santos, L., Boesecke, C., Ustianowski, A., Duberg, A. S., Ruta, S., Salkic, N. N., et al. "Availability of hepatitis C diagnostics and therapeutics in European and Eurasia countries." *Antiviral Res* **2018** 150: 9-14.

BACKGROUND: Treatment with direct acting antiviral agents (DAAs) has provided sustained virological response rates in >95% of patients with chronic hepatitis C virus (HCV) infection. However treatment is costly and market access, reimbursement and governmental restrictions differ among countries. We aimed to analyze these differences among European and Eurasian countries. METHODS: A survey including 20-item questionnaire was sent to experts in viral hepatitis. Countries were evaluated according to their income categories by the World Bank stratification. RESULTS: Experts from 26 countries responded to the survey. As of May 2016, HCV prevalence was reported as low ($\leq 1\%$) in Croatia, Czech Republic, Denmark, France, Germany, Hungary, the Netherlands, Portugal, Slovenia, Spain, Sweden, UK; intermediate (1-4%) in Azerbaijan, Bosnia and Herzegovina, Italy, Kosovo, Greece, Kazakhstan, Romania, Russia, Serbia and high in Georgia (6.7%). All countries had national guidelines except Albania, Kosovo, Serbia, Tunisia, and UK. Transient elastography was available in all countries, but reimbursed in 61%. HCV-RNA was reimbursed in 81%. PegIFN/RBV was reimbursed in 54% of the countries. No DAAs were available in four countries: Kazakhstan, Kosovo, Serbia, and Tunisia. In others, at least one DAA combination with either PegIFN/RBV or another DAA was available. In Germany and the Netherlands all DAAs were reimbursed without restrictions: Sofosbuvir and sofosbuvir/ledipasvir were free of charge in Georgia. CONCLUSION: Prevalence of HCV is relatively higher in lower-middle and upper-middle income countries. DAAs are not available or reimbursed in many Eurasia and European countries. Effective screening and access to care are essential for reducing liver-related morbidity and mortality.

Tiittala, P., Ristola, M., Liitsola, K., Ollgren, J., Koponen, P., Surcel, H. M., Hiltunen-Back, E., Davidkin, I. and Kivela, P. "Missed hepatitis b/c or syphilis diagnosis among Kurdish, Russian, and Somali origin migrants in Finland: linking a population-based survey to the national infectious disease register." *BMC Infect Dis* **2018** 18(1): 137.

BACKGROUND: Migrants are considered a key population at risk for sexually transmitted and blood-borne diseases in Europe. Prevalence data to support the design of infectious diseases screening protocols are scarce. We aimed to estimate the prevalence of hepatitis B and C, human immunodeficiency virus (HIV) infection and syphilis in specific migrant groups in Finland and to assess risk factors for missed diagnosis. METHODS: A random sample of 3000 Kurdish,

Russian, or Somali origin migrants in Finland was invited to a migrant population-based health interview and examination survey during 2010-2012. Participants in the health examination were offered screening for hepatitis B and C, HIV and syphilis. Notification prevalence in the National Infectious Diseases Register (NIDR) was compared between participants and non-participants to assess non-participation. Missed diagnosis was defined as test-positive case in the survey without previous notification in NIDR. Inverse probability weighting was used to correct for non-participation. RESULTS: Altogether 1000 migrants were screened for infectious diseases. No difference in the notification prevalence among participants and non-participants was observed. Seroprevalence of hepatitis B surface antigen (HBsAg) was 2.3%, hepatitis C antibodies 1.7%, and Treponema pallidum antibodies 1.3%. No cases of HIV were identified. Of all test-positive cases, 61% (34/56) had no previous notification in NIDR. 48% of HBsAg, 62.5% of anti-HCV and 84.6% of anti-Trpa positive cases had been missed. Among the Somali population (n = 261), prevalence of missed hepatitis B diagnosis was 3.0%. Of the 324 Russian migrants, 3.0% had not been previously diagnosed with hepatitis C and 2.4% had a missed syphilis diagnosis. In multivariable regression model missed diagnosis was associated with migrant origin, living alone, poor self-perceived health, daily smoking, and previous diagnosis of another blood-borne infection. CONCLUSIONS: More than half of chronic hepatitis and syphilis diagnoses had been missed among migrants in Finland. Undiagnosed hepatitis B among Somali migrants implies post-migration transmission that could be prevented by enhanced screening and vaccinations. Rate of missed diagnoses among Russian migrants supports implementation of targeted hepatitis and syphilis screening upon arrival and also in later health care contacts. Coverage and up-take of current screening among migrants should be evaluated.

Poltavchenko, A. G., Nechitaylo, O. V., Filatov, P. V., Ersh, A. V. and Gureyev, V. N. "[Multiplex method for initial complex testing of antibodies to blood transmitted diseases agents.](#)" *J Virol Methods* **2016** 236: 231-236.

Initial screening of donors and population at high risk of infection with blood transmitted diseases involves a number of analyses using monospesific diagnostic systems, and therefore is expensive labor- and time-consuming process. The goal of this work is to construct a multiplex test enabling to carry out rapid initial complex testing at a low price. The paper describes a kit making it possible to detect simultaneously antibodies to six agents of the most significant blood transmitted diseases: HIV virus, hepatitis B and C viruses, cytomegalovirus, T. pallidum and T. gondii in blood products. The kit comprises multiplex dot-immunoassay based on plane protein arrays (immune chips) using colloidal gold conjugates and silver development. It provides an opportunity to carry out complex analysis within 70min at room temperature, and there is no need of well-qualified personnel. We compared laboratory findings of the kit with monospecific kits for ELISA produced by two Russian commercial companies. Dot-assay results correlate well with data obtained using commercial kits for ELISA. Furthermore, multiplex analysis is quicker and cheaper in comparison with ELISA and can be carried out in non-laboratory conditions. The kit for multiplex dot-immunoassay of antibodies to blood transmitted agents can significantly simplify initial complex testing.

2.4 Session 4 PREVENTION OF VIRAL HEPATITIS. VIRAL HEPATITIS IN RISK GROUPS.

Prevention

Session 4: PREVENTION OF VIRAL HEPATITIS. VIRAL HEPATITIS IN RISK GROUPS.

15:50-16:05 Hepatitis B vaccination program in the Russian Federation: achievements and prospects.
Setlana Kovarova, Central Research Institute of Epidemiology, Moscow.

Balaeva, T., Grijbovski, A. M., Samodova, O., Sannikov, A. and Klouman, E. "[Seroprevalence of Markers of Hepatitis B Virus Infection, Associated Factors, and Vaccination Status in Young Adults in Arkhangelsk, Northwest Russia: A Population-Based Cross-Sectional Study.](#)" *Int J Environ Res Public Health* **2018** 15(9).

Russia had a high incidence of hepatitis B virus (HBV) infection before the vaccination campaigns of 1997, 2001, 2007, which targeted newborns, adolescents, and adults, respectively. The aim of our study was to assess the prevalence of serological markers of HBV infection, associated factors, and vaccination status among young adults in Arkhangelsk, Northwest Russia. In this cross-sectional, population-based study, we used a quota sampling method to recruit 1243 adults aged 18(-)39 years. Participants completed a self-administrated questionnaire and were tested for hepatitis B markers. Associations between positivity for markers and selected sociodemographic and behavioral factors were studied by logistic regression. 10.9% of our participants were positive for at least one marker of hepatitis B, 1.2% were positive for HBsAg, and 42.1% were negative for all markers. In multivariable logistic regression analyses, age 30(-)34 years; lack of self-reported vaccination; and having ≥ 2 sexual partners in the last 6 months were associated with positivity for markers of hepatitis B. Hepatitis B vaccination was confirmed in 46.9% of participants. Although half of our study sample was vaccinated, four in 10 were still susceptible to infection and more than one participant in 100 showed evidence of an active infection.

Klushkina, V. V., Kyuregyan, K. K., Kozhanova, T. V., Popova, O. E., Dubrovina, P. G., Isaeva, O. V., Gordeychuk, I. V. and Mikhailov, M. I. "[Impact of Universal Hepatitis B Vaccination on Prevalence, Infection-Associated Morbidity and Mortality, and Circulation of Immune Escape Variants in Russia.](#)" *PLoS One* **2016** 11(6): e0157161.

METHODS: 6,217 sera samples collected from volunteers in six epidemiologically different regions of Russia were tested for serological and molecular markers of HBV infection. A mathematical model developed by the U.S. Centers for Disease Control and Prevention was used to estimate the effect of vaccination and birth dose coverage on the incidence of HB and adverse outcomes of infection. **RESULTS:** Prevalence of HBsAg in the study population varied from 1.2% to 8.2%; anti-HBc detection rates were 13.0-46.2%. HBsAg detection rates in epidemiologically significant cohorts were 0.6-10.5% in women of childbearing age; 0-2.4% in children ≤ 5 years old; 1.9-8.1% in adults ≥ 30 years old. Mathematical modeling demonstrated that the current 96.1-99.6% level of birth dose coverage increased the effectiveness of vaccination 10-21 times compared to 50% and 0% birth dose coverage scenarios. HBV DNA was detected in 63 sera samples. The frequency of amino acid substitutions in HBsAg was 38% (24/63). Only in 3% (2/63) the mutations were within the a-determinant of HBsAg (M133T and G145S, one case each). None of the identified mutations eluded HBsAg detection, since all these samples tested positive for HBsAg by commercial ELISA. **CONCLUSION:** Despite a significant decline in acute HB incidence after the introduction of universal vaccination, many undiagnosed potential sources of infection remain. Low prevalence of HBV immune escape variants is a favorable predictor of vaccine effectiveness in

the future.

Feldblyum, I. V., Nikolaeva, A. M., Pavroz, K. A., Danilina, T. V., Sosnina, O. Y., Vyaznikova, T. V., Ershov, A. E., Trofimov, D. M. and Polushkina, A. V. "[**SAFETY AND IMMUNOGENICITY OF A NATIONAL COMBINED VACCINE AGAINST PERTUSSIS, DIPHTHERIA, TETANUS, HEPATITIS B AND Hib-INFECTION, CONTAINING ACELLULAR PERTUSSIS COMPONENT, DURING IMMUNIZATION OF ADULTS**]." *Zh Mikrobiol Epidemiol Immunobiol* **2016** (1): 46-51.

AIM: Study safety, reactogenicity and immunologic effectiveness of a national combined vaccine against diphtheria, pertussis (acellular component), tetanus, hepatitis B and Hib-infection during immunization of volunteers aged 18-60 years. MATERIALS AND METHODS: The study was carried out in accordance with ethical standards and requirements, regulated by Helsinki declaration and Good clinical practice (ICHGCP). In a simple non-randomized clinical trial 20 adult volunteers took part, the mean age of those was 46.9 years. RESULTS: Registered: post-vaccination reactions (both local and systemic) were mild and of moderate degree of severity, stopped independently after 2-3 days without administration of drug treatment. Postvaccinal complications were not noted. Parameters of general and biochemical analysis of blood, urine, IgE content in dynamics of immunization were within normal limits. A single administration of aAPDT--HepB+Hib to individuals aged 18-60 years resulted in development of antibodies against all the components of the preparation. Seroconversion factor fluctuated from 6.9 to 53.5: CONCLUSION: The results obtained allow to recommend the vaccine for evaluation of its safety, reactogenicity, immunologic and prophylaxis effectiveness in randomized clinical observation trials in children.

Onishchenko, G. G., Ezhlova, E. B. and Mel'nikova, A. A. "[**Actual problems of vaccine prophylaxis in the Russian Federation**]." *Zh Mikrobiol Epidemiol Immunobiol* **2014** (1): 9-19.

The WHO within the framework of extended immunization program assumes a significant increase of the number of vaccine controlled infections by 2020 - 2025 to 27 - 37 including protection from diseases of parasitic etiology. Russia contributes to the international efforts of the WHO to control infections with vaccine prophylaxis. The national calendar of prophylaxis vaccinations currently provides vaccination against 11 infections--tuberculosis, hepatitis B, poliomyelitis, pertussis, diphtheria, tetanus, measles, rubella, epidemic parotitis, influenza, haemophilus type B infection. Significant progress in reduction of infectious morbidity controlled by means of specific prophylaxis has been made in the country.

Session 4: PREVENTION OF VIRAL HEPATITIS. VIRAL HEPATITIS IN RISK GROUPS.

16:05-16:20

Control of hepatitis A through routine vaccination of children: experience of the Tyva Republic.

Anna Saryglar, Chief specialist on infectious diseases of the Tyva Republic, Kyzyl

Ozawa, S., Privor-Dumm, L. A., Nanni, A., Durden, E., Maiese, B. A., Nwankwo, C. U., Brodovicz, K. G., Acosta, C. J. and Foley, K. A. "[Evidence-to-policy gap on hepatitis A vaccine adoption in 6 countries: Literature vs. policymakers' beliefs.](#)" *Vaccine* **2014** 32(32): 4089-4096.

BACKGROUND: National vaccine adoption decisions may be better understood by linking multiple data sources. When examining countries' decisions to adopt the hepatitis A vaccine, applying multiple research methods can facilitate assessments of gaps between evidence and policy. We conducted a literature review on hepatitis A and stakeholder interviews about decisions to adopt the vaccine in six countries (Chile, India, South Korea, Mexico, Russia, and Taiwan). METHODS: A systematic literature review was conducted across five literature databases. The review identified and abstracted 340 articles, supplemented by internet search. In addition, we interviewed 62 experts and opinion leaders on hepatitis A and/or vaccines. Data from the two sources were analyzed to identify gaps around epidemiologic data, economic

data, and barriers/facilitators of hepatitis A vaccine adoption. RESULTS: Epidemiologic data gaps were found in Chile and Russia, where stakeholders believed data to be more solid than the literature documented. Economic data on hepatitis A was found to be weak across all countries despite stakeholders' agreement on its importance. Barriers and facilitators of vaccine adoption such as political will, prioritization among vaccines, and global or local recommendations were discussed more by stakeholders than the literature. Stakeholders in India and Mexico were not concerned with the lack of data, despite growing recognition in the literature of the epidemiological transition and threat of outbreaks. CONCLUSIONS: Triangulation of results from two methods captured a richer story behind vaccine adoption decisions for hepatitis A. The discrepancy between policymakers' beliefs and existing data suggest a decline in priority of hepatitis A or weak investment in data collection. Filling the confirmed data gaps in seroprevalence or economic data is important to help guide policy decisions. Greater communication of the risk of hepatitis A and the benefits of the vaccine may help countries undergoing the epidemiologic transition.

Session 4: PREVENTION OF VIRAL HEPATITIS. VIRAL HEPATITIS IN RISK GROUPS.

16:20-16:35 The risk of transmission of viral hepatitis in health care settings.
***Tatiana Semenenko, Arpik Asratyan, Gamaleya National
 Research Center for Epidemiology and Microbiology, Moscow***

Mukomolov, S. L. and Levakova, I. A. "[Vaccination against hepatitis A among occupational risk groups]." *Med Tr Prom Ekol* 2014 (10): 11-15.

The study was aimed to evaluate vaccine prevention of hepatitis A in occupational risk groups in Russian Federation over 2011-2013. Epidemiologic analysis method was used. Data array for the analysis included information about 1,162,619 individuals vaccinated against hepatitis A throughout the country. Findings are that during the studied period a total of 470,278 adults over 18 years were vaccinated (i.e., 0.4% of all population of this age). Among occupational risk groups subjected to anti-hepatitis A vaccination within immunization calendar on epidemic indications, major (29%) share was presented by catering enterprises workers and individuals engaged into food trade and supply. Other occupational risk groups (workers maintaining water supply systems and sewerage system, medical staff, preschool institution teachers, etc) demonstrated significantly lower levels of being vaccinated. Vaccination against hepatitis A in occupational risk groups should be in a focus of prophylactic measures, as will help to control over hepatitis A spread.

Session 4: PREVENTION OF VIRAL HEPATITIS. VIRAL HEPATITIS IN RISK GROUPS.

16:35-16:50 Viral hepatitis B and C among PWID.
***Ekaterina Zinger, Charitable Foundation "Humanitarian Action",
 Saint Petersburg.***

Risk groups

PWID (People Who Inject Drugs)

Tsui, J. I., Ko, S. C., Krupitsky, E., Lioznov, D., Chaisson, C. E., Gnatienco, N. and Samet, J. H. "[Insights on the Russian HCV Care Cascade: Minimal HCV Treatment for HIV/HCV Co-infected PWID in St. Petersburg.](#)" *Hepatol Med Policy* 2016 1.

BACKGROUND: The human immunodeficiency virus (HIV) epidemic in Russia, driven by injection drug use, has seen a steady rise in the past two decades. Hepatitis C virus (HCV) infection is highly prevalent in people who inject drugs (PWID). The study aimed to describe

the current frequency of HCV testing and treatment among HIV-infected PWID in St. Petersburg, Russia. METHODS: This study examined baseline data from the "Linking Infectious and Narcology Care" (LINC) and "Russia Alcohol Research Collaboration on HIV/AIDS" (Russia ARCH) studies. Participants included in this analysis were HIV-infected with a history of injection drug use. Descriptive statistics were performed to assess frequency of HCV testing and treatment. RESULTS: Participants (n=349 [LINC], 207 [Russia ARCH]) had a mean age of 33.8 years (IQR: 31-37) in LINC and 33.0 (IQR: 30-36) in Russia ARCH; 26.6% (LINC) and 29.0% (Russia ARCH) were female; 100% were Caucasian. Nearly all participants had been tested for HCV (98.9% in LINC, 97.1% in Russia ARCH). Almost all reported being diagnosed HCV positive (98.9% in LINC, 97.1% in Russia ARCH). Only 2.3% of LINC and 5.0% of Russia ARCH participants reported ever receiving HCV treatment. CONCLUSIONS: Among these cohorts of HIV-infected PWID in St. Petersburg, Russia, as of 2015 nearly all reported being tested for HCV and testing positive, while only 3.3% received any HCV treatment. In this new era of effective HCV pharmacotherapy, an enormous chasm in the HCV treatment cascade in Russia exists providing substantial opportunities for curing HCV in HIV-infected Russians with a history of injection drug use.

Heimer, R., Lyubimova, A., Barbour, R. and Levina, O. S. "[Emergence of methadone as a street drug in St. Petersburg, Russia.](#)" *Int J Drug Policy* **2016** 27: 97-104.

BACKGROUND: The syndemic of opioid addiction, HIV, hepatitis, tuberculosis, imprisonment, and overdose in Russia has been worsened by the illegality of opioid substitution therapy. As part of on-going serial studies, we sought to explore the influence of opioid availability on aspects of the syndemic as it has affected the city of St. Petersburg. METHODS: We employed a sequential approach in which quantitative data collection and statistical analysis were followed by a qualitative phase. Quantitative data were obtained in 2013-2014 from a respondent-driven sample (RDS) of people who inject drugs (PWID). Individuals recruited by RDS were tested for antibodies to HIV and interviewed about drug use and injection practices, sociodemographics, health status, and access to medical care. Subsequently, we collected in-depth qualitative data on methadone use, knowledge, and market availability from PWID recruited at nine different locations within St. Petersburg. RESULTS: Analysis of interview data from the sample revealed the percentage of PWID injecting methadone in the 30 days prior to interview increased from 3.6% in 2010 to 53.3% in 2012-2013. Injection of only methadone, as compared to injecting only heroin or both drugs, was associated with less frequent injection and reduced HIV-related injected risk, especially a lower rate of injecting with a previously used syringe. In-depth questioning of methadone injectors corroborated the finding from serial quantitative surveys of PWID that methadone's black market availability is a recent phenomenon. Spatial analysis revealed widespread methadone availability but no concentration in any specific districts of the city. CONCLUSION: Despite the prohibition of substitution therapy and demonization of methadone, the drug has emerged to rival heroin as the most commonly available opioid in St. Petersburg. Ironically, its use is associated with reduced injection-related HIV risk even when its use is illegal.

Brown, J. L., DiClemente, R. J., Sales, J. M., Rose, E. S., Safonova, P., Levina, O. S., Belyakov, N. and Rassokhin, V. V. "[Substance Use Patterns of HIV-Infected Russian Women with and Without Hepatitis C Virus Co-infection.](#)" *AIDS Behav* **2016** 20(10): 2398-2407.

Individuals with HIV and hepatitis C virus (HCV) co-infection may experience substance use related health complications. This study characterized substance use patterns between HIV/HCV co-infected and HIV mono-infected Russian women. HIV-infected women (N = 247; M age = 30.0) in St. Petersburg, Russia, completed a survey assessing substance use, problematic substance use, and the co-occurrence of substance use and sexual behaviors. Covariate adjusted logistic and linear regression analyses indicated that HIV/HCV co-infected participants (57.1 %) reported more lifetime drug use (e.g., heroin: AOR: 13.2, 95 % CI 4.9, 35.3, $p < .001$), problem drinking (beta = 1.2, $p = .05$), substance use problems (beta = 1.3, $p = .009$), and increased likelihood of past injection drug use (AOR: 26.4, 95 % CI 8.5, 81.9, $p < .001$) relative to HIV mono-infected individuals. HIV/HCV co-infection was prevalent and associated with increased substance use and problematic drug use. Findings highlight the need for ongoing substance use and HIV/HCV risk behavior assessment and treatment among HIV/HCV

co-infected Russian women.

Luhmann, N., Champagnat, J., Golovin, S., Maistat, L., Agustian, E., Inaridze, I., Myint, W. M., Butsashvili, M. and Bouscaillou, J. ["Access to hepatitis C treatment for people who inject drugs in low and middle income settings: Evidence from 5 countries in Eastern Europe and Asia."](#) *Int J Drug Policy* **2015** 26(11): 1081-1087.

BACKGROUND: People who inject drugs (PWID) are disproportionately affected by the hepatitis C (HCV) epidemic. Of the estimated 16 million PWID worldwide, approximately 8 million live with chronic HCV, and around 26% and 23% of the global HCV infections among PWID occur in East/Southeast Asia and Eastern Europe respectively. Globally, few PWID have access to treatment for HCV. **METHODS:** We conducted a systematic literature review and internet survey in 2014 to document the burden of disease, access to diagnosis and treatment and the existence of national policy and treatment guidelines for HCV. We included Georgia, Russia, Ukraine, Myanmar and Indonesia as countries with injection drug use epidemics. **FINDINGS:** HCV antibody prevalence among the general population ranged from 0.80% in Indonesia to 5% in Georgia, and among PWID from 48.1% in Myanmar to 92% in Georgia. PWID carried a significant burden of disease, ranging from 2.7% in Indonesia to 40.4% in Russia. Yearly treatment uptake was under 1% for the general population and PWID in all countries. Diagnostic tools and disease staging investigations as well as pegylated interferon/ribavirin treatment were available at a range of prices. Despite policy and treatment protocols for HCV in the majority of countries, strategies focusing on PWID were largely absent. **CONCLUSION:** PWID are a priority group for treatment, and access to treatment should be based on sound national policy, accessible public treatment programmes and functional surveillance systems.

Azbel, L., Wickersham, J. A., Wegman, M. P., Polonsky, M., Suleymanov, M., Ismayilov, R., Dvoryak, S., Rotberga, S. and Altice, F. L. ["Burden of substance use disorders, mental illness, and correlates of infectious diseases among soon-to-be released prisoners in Azerbaijan."](#) *Drug Alcohol Depend* **2015** 151: 68-75.

BACKGROUND: Despite low HIV prevalence in the South Caucasus region, transmission is volatile. Little data are available from this region about addiction and infectious diseases among prisoners who transition back to communities. **METHODS:** A nation-wide randomly sampled biobehavioral health survey was conducted in 13 non-specialty Azerbaijani prisons among soon-to-be-released prisoners. After informed consent, participants underwent standardized health assessment surveys and testing for HIV, hepatitis B and C, and syphilis. **RESULTS:** Of the 510 participants (mean age = 38.2 years), 11.4% were female, and 31.9% reported pre-incarceration drug injection, primarily of heroin. Prevalence of HCV (38.2%), HIV (3.7%), syphilis (3.7%), and HBV (2.7%) was high. Among the 19 HIV-infected inmates, 14 (73.7%) were aware of their HIV status, 12 (63.2%) were receiving antiretroviral therapy (ART), and 5 (26.3%) had CD4 < 350 cells/mL (4 of these were on ART). While drug injection was the most significant independent correlate of HCV (AOR = 12.9; p = 0.001) and a significant correlate of HIV (AOR = 8.2; p = 0.001), both unprotected sex (AOR = 3.31; p = 0.049) and working in Russia/Ukraine (AOR = 4.58; p = 0.008) were also correlated with HIV. **CONCLUSION:** HIV and HCV epidemics are concentrated among people who inject drugs (PWIDs) in Azerbaijan, and magnified among prisoners. A transitioning HIV epidemic is emerging from migration from high endemic countries and heterosexual risk. The high diagnostic rate and ART coverage among Azerbaijani prisoners provides new evidence that HIV treatment as prevention in former Soviet Union (FSU) countries is attainable, and provides new insights for HCV diagnosis and treatment as new medications become available. Within prison evidence-based addiction treatments with linkage to community care are urgently needed.

Heimer, R., Eritsyan, K., Barbour, R. and Levina, O. S. ["Hepatitis C virus seroprevalence among people who inject drugs and factors associated with infection in eight Russian cities."](#) *BMC Infect Dis* **2014** 14 Suppl 6: S12.

BACKGROUND: Behavioural surveillance among people who inject drugs (PWID) and testing for hepatitis C virus (HCV) and HIV is needed to understand the scope of both epidemics in at-risk populations and to suggest steps to improve their health. **METHODS:** PWID were recruited

using respondent-driven sampling (RDS) in eight Russian cities. A standardized survey was administered to collect sociodemographic and behavioral information. Blood specimens were obtained for serological testing for HCV and HIV-1. Data across the eight sites were pooled to identify individual-, network-, and city-level factors associated with positive HCV serostatus. RESULTS: Among 2,596 PWID participating in the study, 1,837 tested positive for HCV (71%). The sample was 73% male and the mean age was 28. Very few PWID reported regular contact with harm reduction programs. Factors associated with testing positive for HCV were longer duration of injection drug use, testing positive for HIV-1, sharing non-syringe injection paraphernalia and water for rinsing syringes, and larger social network size. Factors negatively associated with HCV-positive serostatus were injecting with a used syringe and two city-level factors: longer mean RDS recruitment chain in a city and higher levels of injecting stimulants. CONCLUSIONS: HCV prevalence in all eight Russian cities is at the higher end of the range of HCV prevalence among PWID in Europe, which provides evidence that more resources, better prevention programs, and accelerated treatment targeting PWID are needed to control the HCV epidemic.

Hammett, T. M., Phan, S., Gaggin, J., Case, P., Zaller, N., Lutnick, A., Kral, A. H., Fedorova, E. V., Heimer, R., Small, W., et al. "[Pharmacies as providers of expanded health services for people who inject drugs: a review of laws, policies, and barriers in six countries.](#)" *BMC Health Serv Res* **2014** 14: 261.

BACKGROUND: People who inject drugs (PWID) are underserved by health providers but pharmacies may be their most accessible care settings. METHODS: Studies in the U.S., Russia, Vietnam, China, Canada and Mexico employed a three-level (macro-, meso-, and micro-) model to assess feasibility of expanded pharmacy services for PWID. Studies employed qualitative and quantitative interviews, review of legal and policy documents, and information on the knowledge, attitudes, and practices of key stakeholders. RESULTS: Studies produced a mixed assessment of feasibility. Provision of information and referrals by pharmacies is permissible in all study sites and sale and safe disposal of needles/syringes by pharmacies is legal in almost all sites, although needle/syringe sales face challenges related to attitudes and practices of pharmacists, police, and other actors. Pharmacy provision of HIV testing, hepatitis vaccination, opioid substitution treatment, provision of naloxone for drug overdose, and abscess treatment, face more serious legal and policy barriers. DISCUSSION: Challenges to expanded services for drug users in pharmacies exist at all three levels, especially the macro-level characterized by legal barriers and persistent stigmatization of PWID. Where deficiencies in laws, policies, and community attitudes block implementation, stakeholders should advocate for needed legal and policy changes and work to address community stigma and resistance. Laws and policies are only as good as their implementation, so attention is also needed to meso- and micro- levels. Policies, attitudes, and practices of police departments and pharmacy chains as well as knowledge, attitudes, and practices of individual PWID, individual pharmacies, and police officers should support rather than undermine positive laws and expanded services. Despite the challenges, pharmacies remain potentially important venues for delivering health services to PWID.

Degenhardt, L., Whiteford, H. A., Ferrari, A. J., Baxter, A. J., Charlson, F. J., Hall, W. D., Freedman, G., Burstein, R., Johns, N., Engell, R. E., et al. "[Global burden of disease attributable to illicit drug use and dependence: findings from the Global Burden of Disease Study 2010.](#)" *Lancet* **2013** 382(9904): 1564-1574.

BACKGROUND: No systematic attempts have been made to estimate the global and regional prevalence of amphetamine, cannabis, cocaine, and opioid dependence, and quantify their burden. We aimed to assess the prevalence and burden of drug dependence, as measured in years of life lived with disability (YLDs), years of life lost (YLLs), and disability-adjusted life years (DALYs). METHODS: We conducted systematic reviews of the epidemiology of drug dependence, and analysed results with Global Burden of Diseases, Injuries, and Risk Factors Study 2010 (GBD 2010) Bayesian meta-regression technique (DisMod-MR) to estimate population-level prevalence of dependence and use. GBD 2010 calculated new disability weights by use of representative community surveys and an internet-based survey. We combined estimates of dependence with disability weights to calculate prevalent YLDs, YLLs, and DALYs, and estimated YLDs, YLLs, and DALYs attributable to drug use as a risk factor for

other health outcomes. FINDINGS: Illicit drug dependence directly accounted for 20.0 million DALYs (95% UI 15.3-25.4 million) in 2010, accounting for 0.8% (0.6-1.0) of global all-cause DALYs. Worldwide, more people were dependent on opioids and amphetamines than other drugs. Opioid dependence was the largest contributor to the direct burden of DALYs (9.2 million, 95% UI 7.1-11.4). The proportion of all-cause DALYs attributed to drug dependence was 20 times higher in some regions than others, with an increased proportion of burden in countries with the highest incomes. Injecting drug use as a risk factor for HIV accounted for 2.1 million DALYs (95% UI 1.1-3.6 million) and as a risk factor for hepatitis C accounted for 502,000 DALYs (286,000-891,000). Suicide as a risk of amphetamine dependence accounted for 854,000 DALYs (291,000-1,791,000), as a risk of opioid dependence for 671,000 DALYs (329,000-1,730,000), and as a risk of cocaine dependence for 324,000 DALYs (109,000-682,000). Countries with the highest rate of burden (>650 DALYs per 100,000 population) included the USA, UK, Russia, and Australia. INTERPRETATION: Illicit drug use is an important contributor to the global burden of disease. Efficient strategies to reduce disease burden of opioid dependence and injecting drug use, such as delivery of opioid substitution treatment and needle and syringe programmes, are needed to reduce this burden at a population scale. FUNDING: Australian National Health and Medical Research Council, Australian Government Department of Health and Ageing, Bill & Melinda Gates Foundation.

Cepeda, J. A., Niccolai, L. M., Eritsyan, K., Heimer, R. and Levina, O. "[Moderate/heavy alcohol use and HCV infection among injection drug users in two Russian cities.](#)" *Drug Alcohol Depend* **2013** 132(3): 571-579.

BACKGROUND: In Russia, injection drug use and transmission of blood-borne pathogens such as human immunodeficiency virus (HIV) and hepatitis C virus (HCV) are inextricably linked, however the burden of alcohol use remains unexplored among injection drug users (IDUs). METHODS: Individuals who were 18 years of age and older and had injected drugs in the previous 30 days were recruited in the cities of Novosibirsk and Ivanovo by respondent driven sampling. Consenting individuals were administered a quantitative survey instrument and provided blood samples for serological testing. RESULTS: In Novosibirsk and Ivanovo, 29% and 35% of respondents were categorized as moderate/heavy drinkers, respectively. Individuals reported problems related to alcohol use that affected their physical health (23%), family (55%), and induced financial hardships (43%). In the multivariate analysis, we found that methamphetamine injection in the past 12 months was a strong and significant correlate of moderate/heavy drinking in Novosibirsk (aOR=5.63 95% CI: [1.01-31.47]) and Ivanovo (aOR=3.81 95% CI: [2.20-6.62]). There was poor agreement between self-reported HCV status and HCV test results (kappa=-0.05 and 0.26 in Novosibirsk and Ivanovo, respectively). IDUs who correctly knew their HCV seropositive status in Novosibirsk and IDUs who correctly knew their HCV seronegative status in Ivanovo were significantly more likely to be moderate/heavy drinkers. CONCLUSION: Alcohol use is problematic among IDUs who are at high risk for HCV. Future interventions should target IDUs who are moderate/heavy drinkers in order to prevent liver complications resulting from HCV infection.

[Risk groups – Blood donors](#)

Ignatova, E. N., Tupoleva, T. A., Ovchinnikova, E. N., Romanova, T. Y., Yaroslavtseva, N. G., Filatov, F. P., Troitskaya, V. V., Kuzmina, L. A., Parovichnikova, E. N., Gaponova, T. V., et al. "[Impact of current approaches to laboratory screening of donated blood and its components on hepatitis B virus infection in patients with blood system diseases](#)." *Ter Arkh* **2017** 89(11): 27-34.

AIM: To evaluate the detection rate of markers for hepatitis B virus (HBV) in the blood samples taken from patients with blood system diseases, by applying the current approaches to examining donated blood and its components for markers of viral infections. MATERIAL AND METHODS: The investigation included blood samples from patients with blood system diseases (n=364) and donors (n=5,011). The results of laboratory screening of donated blood samples (n=13,081) were retrospectively analyzed. Commercial kits of reagents were used for immunochemical assay and polymerase chain reaction. RESULTS: Patients with blood system diseases were recorded to have markers of active HBV infection in 12.6% of cases, anti-HBc in

31.3%, and anti-HBs in 37.6%. A retrospective analysis of the results of screening donated blood samples showed the presence of markers for active HBV infection in 0.28% of cases. A prospective examination of blood donors revealed markers of HBV infection in 4.83% of cases, including those of active forms in 0.54% and anti-HBc in 4.79%. The markers of active HBV infection in donors were only anti-HBc IgM in 0.42% of cases. The blood samples from donors with an anti-HBs titer of >200 mIU/ml contained anti-HBc IgM in 10.5%. **CONCLUSION:** In the last 5-7 years, the detection rate of markers of HBV infection in the blood samples of patients with blood system diseases have remained at a high level. Screening for decreed markers fails to identify people with inapparent infections among the donors. Even high anti-HBs concentrations in the donated blood may be a risk for HBV transmission by transfusion to a recipient.

Tashtemirov, K., Imangazinov, S., Tashtemirova, O. and Egoshin, V. "[**DONATION AND SOME PROBLEMS OF DEFECT OF DONOR'S BLOOD**]." *Georgian Med News* **2016** (261): 80-88.

There was analyzed the prevalence of transfusion-transmissible infections among blood donors and its components by examining the monitoring of donor withdrawal to donations, the absolute structure of defect in the Blood Center of Pavlodar region (BCPR) of the Republic of Kazakhstan. The results quality was ensured by the compliance of the rules and conditions of the analytical and post analytical stages of the internal quality control. It is shown that the need to improve the work of a single donor's information center (EDITS), because Only 11.6% of potential donors excluded from donation on the first-aid control stage, which increases the risk of transfusion-transmissible infections. The absolute blood defect during the study period increased in 3.9 times mainly due the transfusion-transmissible infections (47.6%), while a large share of both primary and repeated laboratory monitoring have made hepatitis B (64.1%) and C (86.5%). The share of unpaid donors (92.4%) of the total number of absolute defect is higher than paid donors (7.6%). Antibodies HCV, HBSAg, Luis 10 times more frequently detected in primary donors than repeated.

Gubanova, M. N., Madzaev, S. R. and Zhiburt, E. B. "[**Prevalence and incidence of the infections among blood donors in Russia**]." *Vopr Virusol* **2015** 60(6): 29-31.

The prevalence and incidence of the infections among Russian blood donors in 2010-2012 was determined. The estimated residual risk of the transfusion infection was as follows: for HIV - 16.2, HCV - 33.7; HBV - 97.1 per 1 million donations. In the information system of the blood service AIST data should be divided based on the positive results of screening and confirmatory tests for markers of the infection. High risk of the transfusion infection with HIV, hepatitis B and C stimulates the active implementation of the measures for increasing the safety of blood: the selection of donors, increasing the sensitivity of infections screening methods, inactivation of pathogens in blood components, and transfusion management appointment at the clinic.

Risk groups – others

Mamedov, M., Mamedova, T., Rahimzadeh, S. and Rahimov, A. "[**HEPATITIS C INFECTION SPECIFIC MARKERS AMONG PATIENTS WITH BREAST CANCER IN AZERBAIJAN**]." *Georgian Med News* **2017** (270): 55-58.

The article presents results of comparative investigation of blood serum in 2682 breast cancer (BC) patients and 3323 healthy persons. At the onset of the study, all the specimens were tested for serum antibodies to hepatitis C virus (HCV). At the later stage, the serum specimens containing the antibodies were examined for detecting RNA GCV. Based on the obtained study results the authors concluded that BC patients can be considered as a high risk group for parenteral contamination with HCV. In addition, the authors have determined that HCV-infection course among BC patients is characterized by a low rate of recovery accompanied with spontaneous virus elimination and a high level of <viral load>.

Altice, F. L., Azbel, L., Stone, J., Brooks-Pollock, E., Smyrnov, P., Dvoriak, S., Taxman, F. S., El-Bassel, N., Martin, N. K., Booth, R., et al. "*The perfect storm: incarceration and the high-risk environment*"

perpetuating transmission of HIV, hepatitis C virus, and tuberculosis in Eastern Europe and Central Asia. *Lancet* **2016** 388(10050): 1228-1248.

Despite global reductions in HIV incidence and mortality, the 15 UNAIDS-designated countries of Eastern Europe and Central Asia (EECA) that gained independence from the Soviet Union in 1991 constitute the only region where both continue to rise. HIV transmission in EECA is fuelled primarily by injection of opioids, with harsh criminalisation of drug use that has resulted in extraordinarily high levels of incarceration. Consequently, people who inject drugs, including those with HIV, hepatitis C virus, and tuberculosis, are concentrated within prisons. Evidence-based primary and secondary prevention of HIV using opioid agonist therapies such as methadone and buprenorphine is available in prisons in only a handful of EECA countries (methadone or buprenorphine in five countries and needle and syringe programmes in three countries), with none of them meeting recommended coverage levels. Similarly, antiretroviral therapy coverage, especially among people who inject drugs, is markedly under-scaled. Russia completely bans opioid agonist therapies and does not support needle and syringe programmes-with neither available in prisons-despite the country's high incarceration rate and having the largest burden of people with HIV who inject drugs in the region. Mathematical modelling for Ukraine suggests that high levels of incarceration in EECA countries facilitate HIV transmission among people who inject drugs, with 28-55% of all new HIV infections over the next 15 years predicted to be attributable to heightened HIV transmission risk among currently or previously incarcerated people who inject drugs. Scaling up of opioid agonist therapies within prisons and maintaining treatment after release would yield the greatest HIV transmission reduction in people who inject drugs. Additional analyses also suggest that at least 6% of all incident tuberculosis cases, and 75% of incident tuberculosis cases in people who inject drugs are due to incarceration. Interventions that reduce incarceration itself and effectively intervene with prisoners to screen, diagnose, and treat addiction and HIV, hepatitis C virus, and tuberculosis are urgently needed to stem the multiple overlapping epidemics concentrated in prisons.

Sleptsova, S., Duglas, N. and Shek, L. **"CLINICAL CASE OF CONDUCTING PREGNANCY AND CHILDBIRTH AT THE WOMAN WITH CHRONIC VIRAL HEPATITIS B IN THE REPLICATIVE FORM."** *Wiad Lek* **2015** 68(4): 591-595.

INTRODUCTION: Because of a wide circulation of the hepatitis B (HB) among persons of young age, so-called vertical transmission of a virus from mother to the child is of particular importance. Relevance of this problem of HB increases in connection with a set of ways of infection, failures are more often observed at infection by natural ways: sexual and from mother to a fetus that demands development of effective measures of prevention of transfer from mother to a fetus. AIM: To develop algorithm of maintaining pregnant women with the chronic hepatitis B (HBV) for prevention of perinatal transfer of a HBV infection in the Republic of Sakha (Yakutia) (RS (Y)). MATERIALS AND METHODS: Materials of official statistics of Territorial administration of Rospotrebnadzor of RS (Y) are studied, incidence of chronic viral hepatitis B, C and D in RS (Y) from 2003-2013 was analyzed. Clinical, laboratory and tool, serological, molecular and biological methods of research were carried out. RESULTS: The high incidence of CHV, considerable frequency of detectability of markers of a HB infection at pregnant women, feasibility of a vertical way of a transmission of infection cause interest of doctors of different specialties in this problem. In this scientific publication we analyzed an example of maintaining the pregnant woman, woman in childbirth period with chronic viral hepatitis B, with long "experience" of an illness, with existence of replication of HBV-DNA. CONCLUSIONS: To decrease the risk of perinatal transfer of a HBV infection it is recommended a quantitative PCR-research among pregnant women with HBsAg which will provide decrease in transmission frequency of HB by carrying out in need of antiviral therapy to the woman and the individualized schedule of vaccinal prevention with introduction of specific immunoglobulin to the newborn.

Co-infection

Sarsekeyeva, N., Kosherova, B. and Azizov, I. **"Comparative assessment of liver fibrosis in patients with HIV/chronic hepatitis C co-infection in different ethnic groups."** *J Infect Dev Ctries* **2016**

10(10): 1099-1107.

INTRODUCTION: In recent years, the frequency of human immunodeficiency virus (HIV) and hepatitis C (HCV) co-infection has increased, which is due to their common routes of transmission. HIV/chronic HCV co-infection aggravates the development of fibrosis and increases the risk of cirrhosis. The aim of the study was to evaluate the results of liver elastometry in patients of different ethnic groups with HIV/chronic HCV co-infection. **METHODOLOGY:** The study involved 49 Kazakh and 46 Russian patients with HIV/chronic HCV co-infection. The stage of liver fibrosis was assessed by the results of indirect ultrasonic liver elastometry according to the METAVIR scale using FibroScan 502. As an indirect marker of liver fibrosis, level of alanine aminotransferase and aspartate aminotransferase, as well as platelet counts, were determined. **RESULTS:** Analysis of the results with the evaluation of the dynamics of fibrotic process in 36 months revealed a prevalence of patients with advanced liver fibrosis (F3, F4) among Kazakh compared with Russian patients, accompanied by a significant increase of liver elasticity indices in Kazakhs and Russians ($p < 0.05$). Significant differences in the indices of transaminases in the patients with later stages of liver fibrosis (F3, F4) were found ($p < 0.05$). **CONCLUSIONS:** The study of patients with HIV/chronic HCV co-infection revealed differences in the progression of liver fibrosis depending on ethnicity. Results of elastometry and indirect markers of liver fibrosis were used in the comprehensive assessment at different stages of liver fibrosis.

Kadochnikov, D. S. and Minaeva, P. V. "[Forensic medical assessment of the cases of HIV infection and hemocontact viral hepatitis B and C during the period from 2011 till 2015 in different subjects of the Russian Federation](#)." *Sud Med Ekspert* **2016** 59(4): 4-9.

The annually increasing number of the patients presenting with HIV infection and hemocontact viral hepatitis is naturally accompanied by the growing number of deaths from these infectious pathologies. The objective of the present study was to analyze the results of forensic medical expertises of the cases of HIV infection and hemocontact viral hepatitis B and C during the period from 2011 till 2015 in different subjects of the Russian Federation. The data obtained confirm the tendency toward the further rise in the frequency of such cases in the practical work of forensic medical experts. Moreover, they indicate the necessity of registration of such cases in state forensic medical expertise organizations and open up the prospects for the development of the common approaches to the solution of the existing problems including the evaluation of the degree of the harm to human health.

Turkova, A., Giacomet, V., Goetghebuer, T., Miloenko, M., Nicolini, L. A., Noguera-Julian, A., Rojo, P., Volokha, A., Indolfi, G., Giaquinto, C., et al. "**HCV treatment in children and young adults with HIV/HCV co-infection in Europe.**" *J Virus Erad* **2015** 1(3): 179-184.

OBJECTIVES: To describe use of treatment for chronic hepatitis C virus (HCV) infection in HIV/HCV co-infected children and young people living in Europe and to evaluate treatment outcomes. **METHODS:** HCV treatment data on children and young people aged <25 years with HIV/HCV co-infection were collected in a cohort collaboration of 11 European paediatric HIV cohorts. Factors associated with receipt of HCV treatment and with sustained virological response 24 weeks after treatment completion (SVR24) were explored. **RESULTS:** Of 229 HIV/HCV co-infected patients, 22% had a history of AIDS and of 55 who were treated for HCV, 47 (85%) were receiving combined antiretroviral therapy. The overall HCV treatment rate was 24% ($n=55$) but it varied substantially between countries, with the highest rate being in Russia at 61% (30/49). Other factors associated with treatment receipt were older age [adjusted odds ratio (AOR) 5.24, 95% confidence interval (CI) 1.9-14.4, for 18-24-year-olds vs 11-17-year-olds, $P=0.001$] and advanced fibrosis (AOR 5.5, 95% CI 1.3-23.7; for ≥ 9.6 vs < 7.2 kPa, $P=0.02$). Of 50 patients with known treatment outcomes, 50% attained SVR24. Of these, 16 (80%) had genotype (GT) 2,3 and 8 (29%) had GT 1,4 ($P<0.001$). After adjusting for genotype (GT 1,4 vs GT 2,3), females ($P=0.003$), patients with non-vertical HCV acquisition ($P=0.002$) and those with shorter duration of HCV ($P=0.009$) were more likely to have successful treatment outcomes. **CONCLUSION:** Only half of the HIV/HCV co-infected youth achieved an HCV cure. HCV treatment success appears to be lower in the context of HIV co-infection than in HCV mono-infection, underscoring the urgent need to speed up approvals of new direct-acting antiviral combinations in children.

Heimer, R., Levina, O. S., Osipenko, V., Ruiz, M. S., Sergeyev, B., Sirotkin, A. V. and Vyshemirskaya, I. **"Impact of incarceration experiences on reported HIV status and associated risk behaviours and disease comorbidities."** *Eur J Public Health* **2015** 25(6): 1089-1094.

BACKGROUND: The Russian human immunodeficiency virus (HIV) epidemic among people who inject drugs (PWID) originated in Kaliningrad, but research into risk behaviours among PWID has been lacking. The potential for heterosexual spread has not been analysed. **METHODS:** A sample of PWID was accrued using two methods. A questionnaire was administered to assess HIV-related risk behaviours for parenteral and sexual transmission, sociodemographic factors, HIV knowledge and attitudes about sexual risks. Data were analysed focusing on the role of imprisonment, factors associated with awareness of being HIV infected and condom use. **RESULTS:** More than a quarter of the sample reported having been diagnosed with HIV infection, with higher prevalence among women and those with a history of incarceration. More than half reported having been diagnosed with hepatitis C virus infection. Those reporting being HIV positive were less likely to distribute used syringes to other PWID and more likely to have used a condom the last time they had sex. A history of incarceration was associated with higher rates of receptive syringe sharing among those not having ever received an HIV-positive diagnosis and a lower likelihood of believing that condoms are needed when having sex with a casual partner. **CONCLUSION:** Although extensive HIV testing has alerted many PWID to their HIV-positive status, which is associated with less distributive syringe sharing and higher likelihood of condom use, substantial risk for parenteral and especially sexual HIV transmission remains. More active prevention programs will be required to control the heterosexual spread of HIV.

Session 4: PREVENTION OF VIRAL HEPATITIS. VIRAL HEPATITIS IN RISK GROUPS.
STATE OF THE ART

16:50-17:20

Current strategies of hepatitis A vaccination.

*Daniel Shouval, Hadassah Hebrew University Hospital,
Jerusalem, Israel.*

References provide by the speaker

Shouval, D. "[Immunization against Hepatitis A](#)." Cold Spring Harb Perspect Med **2018**.

Worldwide, there are multiple formaldehyde-inactivated and at least two live attenuated hepatitis A vaccines now in clinical use. The impressive immunogenicity of inactivated vaccines is reflected in rapid seroconversion rates, enabling both preexposure and postexposure prophylaxis. Universal childhood vaccination programs targeting young children have led to significant drops in the incidence of hepatitis A both in toddlers and in susceptible nonimmune adults in regions with intermediate endemicity for hepatitis A. Although the safety of inactivated vaccines is well established, further studies are needed concerning the implications of fecal virus shedding by recipients of attenuated vaccines, as well as the long-term persistence of immune memory in children receiving novel immunization schedules consisting of single doses of inactivated vaccines.

Stuurman, A. L., Marano, C., Bunge, E. M., De Moerlooze, L. and Shouval, D. "[Impact of universal mass vaccination with monovalent inactivated hepatitis A vaccines - A systematic review](#)." Hum Vaccin Immunother **2017** 13(3): 724-736.

The WHO recommends integration of universal mass vaccination (UMV) against hepatitis A virus (HAV) in national immunization schedules for children aged ≥ 1 year, if justified on the basis of acute HAV incidence, declining endemicity from high to intermediate and cost-effectiveness. This recommendation has been implemented in several countries. Our aim was to assess the impact of UMV using monovalent inactivated hepatitis A vaccines on incidence and persistence of anti-HAV (IgG) antibodies in pediatric populations. We conducted a systematic review of literature published between 2000 and 2015 in PubMed, Cochrane Library, LILACS, IBECs identifying a total of 27 studies (Argentina, Belgium, China, Greece, Israel, Panama, the United States and Uruguay). All except one study showed a marked decline in the incidence of hepatitis A post introduction of UMV. The incidence in non-vaccinated age groups decreased as well, suggesting herd immunity but also rising susceptibility. Long-term anti-HAV antibody persistence was documented up to 17 y after a 2-dose primary vaccination. In conclusion, introduction of UMV in countries with intermediate endemicity for HAV infection led to a considerable decrease in the incidence of hepatitis A in vaccinated and in non-vaccinated age groups alike.

Vizzotti, C., Gonzalez, J., Gentile, A., Rearte, A., Ramonet, M., Canero-Velasco, M. C., Perez Carrega, M. E., Uruena, A. and Diosque, M. "[Impact of the single-dose immunization strategy against hepatitis A in Argentina](#)." Pediatr Infect Dis J **2014** 33(1): 84-88.

BACKGROUND: After a country wide outbreak occurred during 2003-2004, 1 dose of hepatitis A vaccine was introduced into Argentinian regular immunization schedule for all children aged 12 months in June 2005. The aim of this study was to assess the impact of this novel intervention. METHODS: A longitudinal analysis was done of hepatitis A virus (HAV) infection rates reported to the National Epidemiological Surveillance System from 2000 to 2011. Occurrence of fulminant hepatic failure (FHF) and liver transplantation cases up to 2011 were also assessed. Incidence rates and clinical impact were compared between pre- and postvaccination periods (2000-2002 vs. 2006-2011). Notification rates were also compared by age groups and geographical regions. RESULTS: Since 2006, an abrupt decline was observed in

HAV infection rates, as well as in FHF and liver transplantation cases. The mean incidence rate of 7.9/100,000 in the postvaccination period represents a reduction of 88.1% ($P < 0.001$) when compared with the prevaccination period. Neither FHF nor liver transplantation due to HAV infection were observed since March 2007. Decline in incidence rates was evident in all geographical regions and all age groups but was higher in the prevaccination most affected areas and in young children. Although an absolute decrease was observed for cases and rates in all age groups, since 2006, a higher proportion of cases was observed in people >14 years of age. CONCLUSIONS: The single-dose vaccination strategy has been highly effective for controlling HAV infection in all age groups till now in Argentina. Long-term surveillance will be critical to document the sustained success of this unique intervention.

Cui, F., Liang, X., Wang, F., Zheng, H., Hutin, Y. J. and Yang, W. "[Development, production, and postmarketing surveillance of hepatitis A vaccines in China.](#)" *J Epidemiol* **2014** 24(3): 169-

177.Chinese Center for Disease Control and Prevention.

China has long experience using live attenuated and inactivated vaccines against hepatitis A virus (HAV) infection. We summarize this experience and provide recent data on adverse events after immunization (AEFIs) with hepatitis A vaccines in China. We reviewed the published literature (in Chinese and English) and the published Chinese regulatory documents on hepatitis A vaccine development, production, and postmarketing surveillance of AEFI. We described the safety, immunogenicity, and efficacy of hepatitis A vaccines and horizontal transmission of live HAV vaccine in China. In clinical trials, live HAV vaccine was associated with fever (0.4%-5% of vaccinees), rash (0%-1.1%), and elevated alanine aminotransferase (0.015%). Inactivated HAV vaccine was associated with fever (1%-8%), but no serious AEFIs were reported. Live HAV vaccine had seroconversion rates of 83% to 91%, while inactivated HAV vaccine had seroconversion rates of 95% to 100%. Community trials showed efficacy rates of 90% to 95% for live HAV and 95% to 100% for inactivated HAV vaccine. Postmarketing surveillance showed that HAV vaccination resulted in an AEFI incidence rate of 34 per million vaccinees, which accounted for 0.7% of adverse events reported to the China AEFI monitoring system. There was no difference in AEFI rates between live and inactivated HAV vaccines. Live and inactivated HAV vaccines manufactured in China were immunogenic, effective, and safe. Live HAV vaccine had substantial horizontal transmission due to vaccine virus shedding; thus, further monitoring of the safety of virus shedding is warranted.

Lemon, S. M., Ott, J. J., Van Damme, P. and Shouval, D. "[Type A viral hepatitis: A summary and update on the molecular virology, epidemiology, pathogenesis and prevention.](#)" *J Hepatol* **2017**.

Although epidemic jaundice was well known to physicians of antiquity, it is only in recent years that medical science has begun to unravel the origins of hepatitis A virus (HAV) and the unique pathobiology underlying acute hepatitis A in humans. Improvements in sanitation and the successful development of highly efficacious vaccines have markedly reduced the worldwide prevalence and incidence of this enterically-transmitted infection over the past quarter century, yet the virus persists in vulnerable populations and remains a common cause of food-borne disease outbreaks in economically-advantaged societies. Reductions in the prevalence of HAV have led to increases in the median age at which infection occurs, often resulting in more severe disease in affected persons and paradoxical increases in disease burden in some developing nations. Here, we summarize recent advances in the molecular virology of HAV, an atypical member of the Picornaviridae family, survey what is known of the pathogenesis of hepatitis A in humans and the host-pathogen interactions that typify the infection, and review medical and public health aspects of immunisation and disease prevention.

Advisory Committee on Immunization, P., Fiore, A. E., Wasley, A. and Bell, B. P. "[Prevention of hepatitis A through active or passive immunization: recommendations of the Advisory Committee on Immunization Practices \(ACIP\).](#)" *MMWR Recomm Rep* **2006** 55(RR-7): 1-23.

Routine vaccination of children is an effective way to reduce hepatitis A incidence in the United States. Since licensure of hepatitis A vaccine during 1995-1996, the hepatitis A childhood immunization strategy has been implemented incrementally, starting with the recommendation of the Advisory Committee on Immunization Practices (ACIP) in 1996 to vaccinate children living in communities with the highest disease rates and continuing in 1999 with ACIP's recommendations for vaccination of children living in states, counties, and

communities with consistently elevated hepatitis A rates. These updated recommendations represent the final step in the childhood hepatitis A immunization strategy, routine hepatitis A vaccination of children nationwide. Implementation of these recommendations will reinforce existing vaccination programs, extend the benefits associated with hepatitis A vaccination to the rest of the country, and create the foundation for eventual consideration of elimination of indigenous hepatitis A virus transmission. This report updates ACIP's 1999 recommendations concerning the prevention of hepatitis A through immunization (CDC. Prevention of hepatitis A through active or passive immunization: recommendations of the Advisory Committee on Immunization Practices [ACIP]. MMWR 1999;48[No. RR-12]:1-37) and includes 1) new data on the epidemiology of hepatitis A in the era of hepatitis A vaccination of children in selected U.S. areas, 2) results of analyses of the economics of nationwide routine vaccination of children, and 3) recommendations for the routine vaccination of children in the United States. Previous recommendations for vaccination of persons in groups at increased risk for hepatitis A or its adverse consequences and recommendations regarding the use of immune globulin for protection against hepatitis A are unchanged from the 1999 recommendations.

**Session 4: PREVENTION OF VIRAL HEPATITIS. VIRAL HEPATITIS IN RISK GROUPS.
STATE OF THE ART**

17:20-17:40 Hepatitis B vaccination worldwide: lessons learnt and the way forward.
Pierre Van Damme, Vaccine and Infectious Diseases Institute, Antwerp University, Antwerp, Belgium.

Whitford, K., Liu, B., Micallef, J., Yin, J. K., Macartney, K., Van Damme, P. and Kaldor, J. M. "[Long-term impact of infant immunization on hepatitis B prevalence: a systematic review and meta-analysis.](#)" *Bull World Health Organ* **2018** 96(7): 484-497.

Objective: To conduct a systematic review and meta-analysis of the long-term impact of infant vaccination on the prevalence of hepatitis B virus (HBV) infection at the population level.
Methods: We searched online databases for articles reporting comparisons between population cohorts aged ≥ 15 years who were exposed or unexposed to infant HBV immunization programmes. We categorized programmes as universal or targeted to infants whose mothers were positive for hepatitis B surface antigen (HBsAg). We included studies reporting prevalence of hepatitis B core antibody (HBcAb), HBsAg, or both. We evaluated the quality of the study methods and estimated the relative reduction in the prevalence of infection. Findings: Of 26 studies that met the inclusion criteria, most were from China (20 studies). The prevalence of HBV infection in unvaccinated and universally vaccinated cohorts ranged from 0.6% (116 of 20 305 people) to 16.3% (60/367) and from 0.3% (1/300) to 8.5% (73/857), respectively. Comparing cohorts with universal vaccination to those without vaccination, relative prevalences were 0.24 (95% confidence interval, CI: 0.16-0.35) for HBsAg and 0.23 (95% CI: 0.17-0.32) for HBcAb. For populations with targeted vaccination, relative prevalences were 0.32 (95% CI: 0.24-0.43) and 0.33 (95% CI: 0.23-0.45), respectively.
Conclusion: The residual burden of infection in cohorts offered vaccination suggests that longer-term evaluations of vaccination coverage, timeliness and other aspects of programme quality are needed. As HBV-vaccinated infant cohorts reach adulthood, ongoing analysis of prevalence in adolescents and young adults will ensure that elimination efforts are on track.

Van Damme, P. "[Long-term Protection After Hepatitis B Vaccine.](#)" *J Infect Dis* **2016** 214(1): 1-3.

Meireles, L. C., Marinho, R. T. and Van Damme, P. "[Three decades of hepatitis B control with vaccination.](#)" *World J Hepatol* **2015** 7(18): 2127-2132.

Hepatitis B virus (HBV) continues to represent a major health problem and can lead to acute liver failure, acute hepatitis, chronic carriership, chronic hepatitis of HBV, liver cirrhosis, liver cancer, liver transplantation and death. There is a marked difference in the geographic distribution of carriers. More than 240 million people worldwide are chronic HBV carriers.

Mother-to-child transmission remains the most important mechanism of infection in countries with a high prevalence of HBV. Percutaneous/parenteral transmission and unsafe sexual practices are important mode of spread transmission of HBV in other countries. Vaccination against HBV is the gold measure for primary prevention and control of the disease. Currently, 179 countries have added HBV vaccination to their routine vaccination programs with great results. Neonatal immunization with HBV vaccine has been one of the most highly effective measures in public health and the first anti-cancer program to be launched. In this paper we review the achievements for the last three decades.

Lernout, T., Hendrickx, G., Vorsters, A., Mosina, L., Emiroglu, N. and Van Damme, P. "[A cohesive European policy for hepatitis B vaccination, are we there yet?](#)" *Clin Microbiol Infect* **2014** 20 Suppl 5: 19-24.

Despite the availability of safe and effective hepatitis B virus (HBV) vaccines for more than 30 years, the burden of hepatitis B disease is still substantial. In 1992, the WHO recommended the inclusion of HBV vaccination in all national vaccination programmes. As of 2012, 47 of the 53 European countries (89%) had implemented a universal hepatitis B vaccination programme. The most recent countries to follow the recommendation were Ireland (in 2008) and the Netherlands (in 2011). Still, six countries (Denmark, Finland, Iceland, Norway, Sweden and the UK) adopt risk-group-targeted vaccination only, instead of adding a universal vaccination programme. However, changing demography, increasing immigration and the current vaccine costs make the cost-benefit ratios in these remaining low endemicity countries strongly in favour of universal HBV vaccination. Global efforts, including a cohesive European vaccination policy, are essential to control and prevent hepatitis B.

FitzSimons, D., Hendrickx, G., Vorsters, A. and Van Damme, P. "[Hepatitis B vaccination: a completed schedule enough to control HBV lifelong? Milan, Italy, 17-18 November 2011.](#)" *Vaccine* **2013** 31(4): 584-590.

The Viral Hepatitis Prevention Board (VHPB) organized an international meeting in Milan in November 2011 on the question of whether completing a course of hepatitis B vaccination confers lifelong protection against hepatitis B virus infection and its complications. Presentations covered vaccine efficacy including factors influencing long-term protection; breakthrough infections; the immunological effect of natural boosting; the effectiveness of universal hepatitis B vaccination in different countries, and issues relating to national, regional and global policies on booster vaccination. Findings from four continents were presented at the meeting, with data now extending to follow-up for nearly 30 years after full primary vaccination. The results reported add to the extensive and growing body of knowledge, demonstrating that in spite of subsequent decline and ultimate loss of detectable serum anti-HBs, a full primary course of hepatitis B vaccine confers complete protection against acute clinical disease and chronic hepatitis B infection for long periods of time. Our understanding of the role and functions of T and B cells in protective immunity deepens, although the picture is still complex. A framework for future work in several areas emerged from the meeting, including monitoring and surveillance of vaccination programmes, breakthrough infections, hepatitis B in immigrant populations, and vaccine-escape viral mutants. One further concrete recommendation is the setting up of a working group to standardize definitions on terms such as "immunity", "protection", "immune memory", "non-responders", "long-term", "anamnestic response", "breakthrough" and "vaccine failure".

Van Damme, P., Leuridan, E., Hendrickx, G., Vorsters, A., Theeten, H., Leino, T., Salminen, M. and Kuusi, M. "[Should Europe have a universal hepatitis B vaccination programme?](#)" *BMJ* **2013** 347: f4057.

Hendrickx, G., Vorsters, A. and Van Damme, P. "[Advances in hepatitis immunization \(A, B, E\): public health policy and novel vaccine delivery.](#)" *Curr Opin Infect Dis* **2012** 25(5): 578-583.

PURPOSE OF REVIEW: This review offers an update on hepatitis A, B and E vaccines based on relevant literature published in 2011-2012. Hepatitis A and B vaccines have been commercially available for years; however, the development of the hepatitis E vaccine is still facing some challenges. RECENT FINDINGS: Current scientific evidence shows that both hepatitis A and B vaccines confer long-term protection. These data supported the updated recommendations

from the WHO on hepatitis A and B vaccines and the respective booster policy. In addition, a single-dose hepatitis A vaccination programme may be an option for some intermediate endemic countries, as far as the epidemiological situation is further monitored. Recent data illustrate the co-administration of hepatitis A with infant vaccines, as well as the interchangeability with other hepatitis A vaccines. Two genetically engineered hepatitis E vaccines are currently in development, showing more than 95% protective efficacy. SUMMARY: Follow-up of vaccinated individuals confirms the long-term protection offered by the hepatitis A as well as hepatitis B vaccines. Data confirm the safety and immunogenicity profile of both vaccines, also when used in patient groups. The first data on the hepatitis E vaccine look promising, but questions on cross-protection, long-term efficacy and safety and immunogenicity in pregnant women and children less than 2 years remain unanswered.

Romano, L., Paladini, S., Van Damme, P. and Zanetti, A. R. "[The worldwide impact of vaccination on the control and protection of viral hepatitis B.](#)" *Dig Liver Dis* **2011** 43 Suppl 1: S2-7.

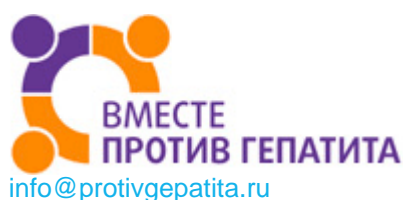
Viral hepatitis B is a leading cause of acute and chronic liver disease worldwide, including cirrhosis and hepatocellular carcinoma. Vaccination is the most effective measure for controlling and preventing hepatitis B and its severe long-term sequelae. According to the World Health Organization (WHO), by the end of 2008 177 countries had introduced hepatitis B vaccination into their national routine neonatal, infant and/or adolescent immunisation programmes, and Italy was one of the first countries to implement a universal strategy of hepatitis B vaccination. The implementation of such vaccination programmes has globally resulted in a marked decrease in disease burden, in the carrier rate and in hepatitis B-related morbidity and mortality. Despite this success, work remains to be done to fully achieve the WHO goal of control of hepatitis B and HBV-related diseases on a global scale.

Van Damme, P., Zanetti, A. R., Shouval, D. and Van Herck, K. "[Strategies for global prevention of hepatitis B virus infection.](#)" *Adv Exp Med Biol* **2010** 659: 175-188.

2.5 Session 5 THE ROLE OF CIVIL SOCIETY IN THE RESPONSE TO VIRAL HEPATITIS IN RUSSIA

Session 5 : THE ROLE OF CIVIL SOCIETY IN THE RESPONSE TO VIRAL HEPATITIS IN RUSSIA

17:50-18:05	<p>Health care for viral hepatitis in Russia from the patients' perspective.</p> <p>Nikita Kovalenko, <i>Interregional non-government patient advocacy organization "United against hepatitis", Moscow.</i></p>
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United against Hepatitis

Contact details

<http://protivgepatita.ru/>

u-a-h@mail.ru

T: +7 903 7434 723

Session 5 : THE ROLE OF CIVIL SOCIETY IN THE RESPONSE TO VIRAL HEPATITIS IN RUSSIA STATE

18:05-18:20	<p>Improving access to antiviral treatment: experience and prospects.</p> <p>Sergey Golovin, <i>The International Treatment Preparedness Coalition: Eastern Europe and Central Asia, Moscow</i></p>
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<http://itpcglobal.org/contact/>

2.6 Session 6 WHO GLOBAL HEALTH SECTOR STRATEGY AND EUROPEAN PLAN OF ACTION ON VIRAL HEPATITIS. TREATMENT OF VIRAL HEPATITIS

Chulanov, V. P., Zueva, A. P., Kostyushev, D. S., Brezgin, S. A., Volchkova, E. V. and Maleyev, V. V. ["\[Hepatitis C can be cured: will hepatitis B become next?\]."](#) *Ter Arkh* **2017** 89(11): 4-13.

Chronic hepatitis B (CHB) and C (CHC) are one of the leading causes of cirrhosis and liver cancer with over a million of people dying annually from their consequences. In Russia CHB and CHC morbidity and related mortality show an upward trend. As a result of recent breakthroughs in antiviral therapeutics CHC became a curable disease. Modern therapeutics effectively suppress viral replication in CHB patients, but withdrawal of antivirals usually results in disease relapse. Loss of HBsAg required for the so called 'functional cure' is a very rare event. Moreover, 'complete cure' when the virus is entirely eliminated from the body is not possible due to a persistent form of covalently closed circular DNA (cccDNA) of hepatitis B virus (HBV) in hepatocytes refractory to modern antivirals. Today, there is a plethora of new promising medications being at different stages of development that target different steps of viral life cycle, including inhibitors of interaction between HBV and its entry receptor NTCP, inhibitors of HBV cccDNA, inhibitors of nucleocapsid assembly, technologies of genome editing (TALENs, CRISPR/Cas etc) and RNA-interference. In addition to direct acting antivirals, there is a number of approaches aimed at enhancement of the innate and adaptive immune responses. In experimental conditions, some of these approaches or their combinations help to achieve functional cure. However, complete elimination of the virus is possible only using technologies of genome editing, capable of specific cccDNA degradation. Nuclease systems are currently at their early stages of development, and there is a long way to prove their efficacy and safety. Nevertheless, highly promising results of the recent years leave no doubt that CRISPR/Cas systems and similar technologies can become the basis of CHB therapy.

Tkachenko, L. I., Maleev, V. V., Sannikova, I. V. and Titorenko, M. V. ["\[Use of a regional registry of chronic hepatitis patients to optimize antiviral therapy\]."](#) *Ter Arkh* **2015** 87(8): 58-66.

AIM: To determine the general characteristics of patients with chronic viral hepatitis C (CVHC) from the data of a registry of patients with viral hepatitis (VH) in the Stavropol Territory and to estimate possible predictors for the inefficiency of antiviral therapy (AVT) for treatment optimization. SUBJECTS AND METHODS: The results of examining and treating patients with CVHC were retrospectively analyzed from the data of the registry of HV patients in the Stavropol Territory in 2008-2013. RESULTS: The chronic hepatitis registry includes 1811 patients with CVHC; out of them there are 64% who have its virus genotype 1. According to the registry, there is cirrhosis in 244 (13.5%) patients, fibrosis (METAVIR F2-F3 in 724 (39.97%), and fibrosis (METAVIR F0-F1) in the remaining 843. Carbohydrate and fat metabolic disturbances (obesity, insulin resistance (IR), and diabetes mellitus (DM)) have been found in 615 (34%) patients; every three patients have gastrointestinal diseases and comorbidity is absent in 24% of the patients. The results of AVT were analyzed in 493 patients with CHC virus genotype 1. The analysis showed the most important predictors for the inefficiency of AVT; these included HOMA-IR >2, the presence of IR (HOMA-IR >2.77), and type 2 DM, as well as patient age over 45 years, male sex, a viral load of $\geq 6 \log_{10}$ IU/ml, and liver fibrosis (METAVIR \geq F3). CONCLUSION: The analysis of VH morbidity in the Stavropol Territory, the making of a registry of patients with chronic VH, its columns of IR, body mass index, virologic response changes during therapy could clarify the actual need in AVT and improve activities in the prophylactic medical examination and treatment optimization in this patient group in the areas of this region.

Chulanov, V. P., Pimenov, N. N., Mamonova, N. A., Sagalova, O. I., Shestakova, I. V. and Pokrovsky, V. I. ["\[Chronic hepatitis C in Russia: current challenges and prospects\]."](#) *Ter Arkh* **2015** 87(11): 5-10.

This paper evaluates the impact of different medical care strategies for chronic hepatitis C patients in relation to its prevalence, frequency of adverse outcomes and mortality rate.

Ozawa, S., Privor-Dumm, L. A., Nanni, A., Durden, E., Maiese, B. A., Nwankwo, C. U., Brodovicz, K. G.,

Acosta, C. J. and Foley, K. A. "[Evidence-to-policy gap on hepatitis A vaccine adoption in 6 countries: Literature vs. policymakers' beliefs.](#)" *Vaccine* **2014** 32(32): 4089-4096.

BACKGROUND: National vaccine adoption decisions may be better understood by linking multiple data sources. When examining countries' decisions to adopt the hepatitis A vaccine, applying multiple research methods can facilitate assessments of gaps between evidence and policy. We conducted a literature review on hepatitis A and stakeholder interviews about decisions to adopt the vaccine in six countries (Chile, India, South Korea, Mexico, Russia, and Taiwan). METHODS: A systematic literature review was conducted across five literature databases. The review identified and abstracted 340 articles, supplemented by internet search. In addition, we interviewed 62 experts and opinion leaders on hepatitis A and/or vaccines. Data from the two sources were analyzed to identify gaps around epidemiologic data, economic data, and barriers/facilitators of hepatitis A vaccine adoption. RESULTS: Epidemiologic data gaps were found in Chile and Russia, where stakeholders believed data to be more solid than the literature documented. Economic data on hepatitis A was found to be weak across all countries despite stakeholders' agreement on its importance. Barriers and facilitators of vaccine adoption such as political will, prioritization among vaccines, and global or local recommendations were discussed more by stakeholders than the literature. Stakeholders in India and Mexico were not concerned with the lack of data, despite growing recognition in the literature of the epidemiological transition and threat of outbreaks. CONCLUSIONS: Triangulation of results from two methods captured a richer story behind vaccine adoption decisions for hepatitis A. The discrepancy between policymakers' beliefs and existing data suggest a decline in priority of hepatitis A or weak investment in data collection. Filling the confirmed data gaps in seroprevalence or economic data is important to help guide policy decisions. Greater communication of the risk of hepatitis A and the benefits of the vaccine may help countries undergoing the epidemiologic transition.

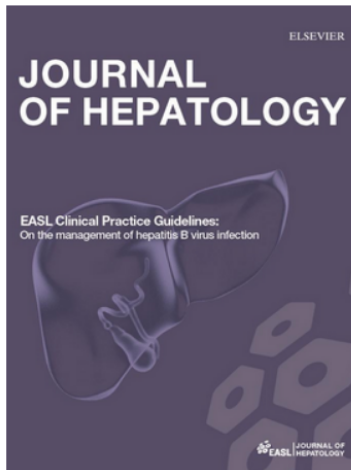
Iushchuk, N. D., Znoiko, O. O., Dudina, K. R. and Belyi, P. A. "[\[The problem of viral hepatitis C in the Russian Federation\].](#)" *Ter Arkh* **2014** 86(10): 77-81.

The incidence of chronic viral hepatitis (CVH) has increased 2.2-fold in the Russian Federation over the past decade. This increase is mainly determined by an almost threefold rise in the incidence of chronic hepatitis C (CHC): from 12.9 in 1999 to 39.1 per 100,000 population in 2012. The calculated data of hepatitis C burden in the Russian Federation show that in 2010 the total medical and social losses and expenses associated with hepatitis C and its implications were 48.47 billion rubles or 0.108% of the gross domestic product, the direct medical costs were 17.1 billion (35.28%) rubles, GDP losses were 26.05 billion (53.75%) rubles, and the disability payments were 5.32 billion (10.97%) rubles. The patients (mean age 45 years) with liver cirrhosis (LC) were 15.2% in the structure of the CHC patients (mean age 37 years) admitted to Moscow infectious diseases hospitals in 2010. Analysis of the regional registers of the Russian Federation, the proportion of patients with LC among those with CHC was 18%. The existing forms for recording morbidity and mortality from poor CHC outcomes cannot significantly estimate the true disease stage distribution of patients and hepatitis C-associated disability and mortality rates. In this connection, it is necessary to introduce a federal register and to change recording forms for patients with viral hepatitis. Standard interferon, pegylated interferon alpha 2a and pegylated alpha 2b, and the HCV protease inhibitors telaprevir, boceprevir, and simeprevir have been registered for the treatment of hepatitis C in the Russian Federation.

09:00-09:15

International and Russian guidelines on treatment of hepatitis B and D.

Dzhamal Abdurakhmanov, I.M.Sechenov First Moscow State Medical University, Moscow.



EASL 2017 CLINICAL PRACTICE GUIDELINES ON THE MANAGEMENT OF HEPATITIS B VIRUS INFECTION

Hepatitis B virus (HBV) infection remains a global public health problem with changing epidemiology due to several factors including vaccination policies and migration. This Clinical Practice Guideline presents updated recommendations for the optimal management of HBV infection. Chronic HBV infection can be classified into five phases: (I) HBeAg-positive chronic infection, (II) HBeAg-positive chronic hepatitis, (III) HBeAg-negative chronic infection, (IV) HBeAg-negative chronic hepatitis and (V) HBsAg-negative phase.

<http://www.easl.eu/research/our-contributions/clinical-practice-guidelines/detail/easl-2017-clinical-practice-guidelines-on-the-management-of-hepatitis-b-virus-infection>

Treatment Hepatitis B

Burnevich, E., Moiseev, S. and Mukhin, N. "[Letter: cure of chronic hepatitis B and D after 12 years of treatment with low-dose standard interferon alfa-2b](#)." *Aliment Pharmacol Ther* **2016** 44(6): 649-650.

Abdurakhmanov, D. T. and Otrashkevskaya, A. V. "[[Entecavir in the treatment of chronic hepatitis B: multicenter randomized trials and real clinical practice](#)]." *Ter Arkh* **2014** 86(11): 100-104.

The goal of treatment for chronic hepatitis B (CHB) is now to improve quality of life and to prevent the poor outcomes of the disease rather than to eliminate the virus from the body. This goal may be achieved via the long-term maintenance of aviremia. According to the International and Russian clinical guidelines, entecavir is the first-line drug of choice to treat patients with CHB. For almost 10 years of world clinical practice there has been evidence that entecavir has a high efficacy and a favorable safety profile in a number of randomized clinical trials and in real medical practice worldwide, in Russia in particular. For instance, the BRAVR (Baraclude Russian Analysis of Virological Response) trial of 147 CHB patients from 10 Russian cities indicated that the rate of aviremia was 85.8% (n=147), 89.9% (n=138), 89.4% (n=97), and 93.5% (n=81) at 1, 2, 3, and 4 years, respectively. In addition to its virological, immunological, and biochemical efficacies, entecavir also proved to be effective in achieving the regression of histological changes and in preventing the decompensation of cirrhosis and the development of carcinoma. The given data permit the use of entecavir for the long-term therapy of CHB with confidence.

09:15-09:30

EASL guidelines on treatment of hepatitis C through the prism of Russian realities.

Sergey Batskikh, A.S. Loginov Moscow Clinical Scientific Center;
Central Research Institute of Epidemiology, Moscow.



EASL RECOMMENDATIONS ON TREATMENT OF HEPATITIS C 2018

Hepatitis C virus (HCV) infection is a major cause of chronic liver disease, with approximately 71 million chronically infected individuals worldwide. Clinical care for patients with HCV-related liver disease has advanced considerably thanks to an enhanced understanding of the pathophysiology of the disease, and because of developments in diagnostic procedures and improvements in therapy and prevention. These European Association for the Study of the Liver Recommendations on Treatment of Hepatitis C describe the optimal management of patients with acute and chronic HCV infections in 2018 and onwards.

<http://www.easl.eu/research/our-contributions/clinical-practice-guidelines/detail/easl-recommendations-on-treatment-of-hepatitis-c-2018>

Treatment hepatitis C

Wei, L., Wang, F. S., Zhang, M. X., Jia, J. D., Yakovlev, A. A., Xie, W., Burnevich, E., Niu, J. Q., Jung, Y. J., Jiang, X. J., et al. "[Daclatasvir plus asunaprevir in treatment-naïve patients with hepatitis C virus genotype 1b infection](#)." *World J Gastroenterol* **2018** 24(12): 1361-1372.

AIM: To assess daclatasvir plus asunaprevir (DUAL) in treatment-naïve patients from mainland China, Russia and South Korea with hepatitis C virus (HCV) genotype 1b infection. **METHODS:** Patients were randomly assigned (3:1) to receive 24 wk of treatment with DUAL (daclatasvir 60 mg once daily and asunaprevir 100 mg twice daily) beginning on day 1 of the treatment period (immediate treatment arm) or following 12 wk of matching placebo (placebo-deferred treatment arm). The primary endpoint was a comparison of sustained virologic response at posttreatment week 12 (SVR12) compared with the historical SVR rate for peg-interferon plus ribavirin (70%) among patients in the immediate treatment arm. The first 12 wk of the study were blinded. Safety was assessed in DUAL-treated patients compared with placebo patients during the first 12 wk (double-blind phase), and during 24 wk of DUAL in both arms combined. **RESULTS:** In total, 207 patients were randomly assigned to immediate (n = 155) or placebo-deferred (n = 52) treatment. Most patients were Asian (86%), female (59%) and aged < 65 years (90%). Among them, 13% had cirrhosis, 32% had IL28B non-CC genotypes and 53% had baseline HCV RNA levels of ≥ 6 million IU/mL. Among patients in the immediate treatment arm, SVR12 was achieved by 92% (95% confidence interval: 87.2-96.0), which was significantly higher than the historical comparator rate (70%). SVR12 was largely unaffected by cirrhosis (89%), age ≥ 65 years (92%), male sex (90%), baseline HCV RNA ≥ 6 million (89%) or IL28B non-CC genotypes (96%), although SVR12 was higher among patients without (96%) than among those with (53%) baseline NS5A resistance-associated polymorphisms (at L31 or Y93H). During the double-blind phase, aminotransferase elevations were more common among placebo recipients than among patients receiving DUAL. During 24 wk of DUAL therapy (combined arms), the most common adverse events ($\geq 10\%$) were elevated alanine aminotransferase and upper respiratory tract infection; emergent grade 3-4 laboratory

abnormalities were infrequently observed, and all grade 3-4 aminotransferase abnormalities (alanine aminotransferase, n = 9; aspartate transaminase, n = 6) reversed within 8-11 d. Two patients discontinued DUAL treatment; one due to aminotransferase elevations, nausea, and jaundice and the other due to a fatal adverse event unrelated to treatment. There were no treatment-related deaths. CONCLUSION: DUAL was well-tolerated during this phase 3 study, and SVR12 with DUAL treatment (92%) exceeded the historical SVR rate for peg-interferon plus ribavirin of 70%.

Leblebicioglu, H., Arends, J. E., Ozaras, R., Corti, G., Santos, L., Boesecke, C., Ustianowski, A., Duberg, A. S., Ruta, S., Salkic, N. N., et al. "[Availability of hepatitis C diagnostics and therapeutics in European and Eurasia countries.](#)" *Antiviral Res* **2018** 150: 9-14.

BACKGROUND: Treatment with direct acting antiviral agents (DAAs) has provided sustained virological response rates in >95% of patients with chronic hepatitis C virus (HCV) infection. However treatment is costly and market access, reimbursement and governmental restrictions differ among countries. We aimed to analyze these differences among European and Eurasian countries. METHODS: A survey including 20-item questionnaire was sent to experts in viral hepatitis. Countries were evaluated according to their income categories by the World Bank stratification. RESULTS: Experts from 26 countries responded to the survey. As of May 2016, HCV prevalence was reported as low ($\leq 1\%$) in Croatia, Czech Republic, Denmark, France, Germany, Hungary, the Netherlands, Portugal, Slovenia, Spain, Sweden, UK; intermediate (1-4%) in Azerbaijan, Bosnia and Herzegovina, Italy, Kosovo, Greece, Kazakhstan, Romania, Russia, Serbia and high in Georgia (6.7%). All countries had national guidelines except Albania, Kosovo, Serbia, Tunisia, and UK. Transient elastography was available in all countries, but reimbursed in 61%. HCV-RNA was reimbursed in 81%. PegIFN/RBV was reimbursed in 54% of the countries. No DAAs were available in four countries: Kazakhstan, Kosovo, Serbia, and Tunisia. In others, at least one DAA combination with either PegIFN/RBV or another DAA was available. In Germany and the Netherlands all DAAs were reimbursed without restrictions: Sofosbuvir and sofosbuvir/ledipasvir were free of charge in Georgia. CONCLUSION: Prevalence of HCV is relatively higher in lower-middle and upper-middle income countries. DAAs are not available or reimbursed in many Eurasia and European countries. Effective screening and access to care are essential for reducing liver-related morbidity and mortality.

Isakov, V., Paduta, D., Viani, R. M., Enejosa, J. V., Pasechnikov, V., Znoyko, O., Ogurtsov, P., Bogomolov, P. O., Maevskaia, M. V., Chen, X., et al. "[Ombitasvir/paritaprevir/ritonavir+dasabuvir+ribavirin for chronic hepatitis C virus genotype 1b-infected cirrhotics \(TURQUOISE-IV\).](#)" *Eur J Gastroenterol Hepatol* **2018** 30(9): 1073-1076.

OBJECTIVE: An estimated 336 per 100 000 people in Russia are infected with hepatitis C virus, including up to 75% with genotype (GT) 1b. In the TURQUOISE-II/-III trials, a 12-week regimen of the direct-acting antiviral agents ombitasvir (OBV), paritaprevir (PTV), ritonavir, and dasabuvir (DSV) in GT1b-infected patients with compensated cirrhosis resulted in 12-week sustained virologic response (SVR) rates of 100%. PATIENTS AND METHODS: In TURQUOISE-IV, GT1b-infected patients (n=36) from Russia and Belarus with compensated cirrhosis, who were treatment naive or previously treated with pegylated interferon/ribavirin (RBV), received OBV/PTV/ritonavir+DSV+RBV for 12 weeks. The primary efficacy end point was SVR at 12 weeks. Safety assessments included adverse event (AE) monitoring and laboratory testing. RESULTS: At baseline, patients had Child-Pugh scores of 5 (92%) or 6 (8%). Overall, 69% were treatment experienced (44% prior null responders, 32% relapsers, and 16% partial responders). All patients achieved SVR at 12 weeks (36/36; 100%). No patient experienced a serious AE or discontinued treatment prematurely. Treatment-emergent AEs possibly related to study drugs occurring in greater than or equal to 10% of patients were asthenia (19%), anemia (14%), cough (14%), and headache (11%); most events were mild in severity. Clinically significant laboratory abnormalities were infrequent. CONCLUSION: In Russian and Belarusian patients with hepatitis C GT1b infection and compensated cirrhosis, 100% achieved SVR at 12 weeks after 12 weeks' treatment with OBV/PTV/ritonavir+DSV+RBV. The treatment was well tolerated.

George, J., Burnevich, E., Sheen, I. S., Heo, J., Kinh, N. V., Tanwandee, T., Cheng, P. N., Kim, D. Y., Tak, W. Y., Kizhlo, S., et al. "[Elbasvir/grazoprevir in Asia-Pacific/Russian participants with chronic hepatitis](#)

C virus genotype 1, 4, or 6 infection." *Hepatol Commun* **2018** 2(5): 595-606.

The prevalence of hepatitis C virus (HCV) infection in Asian countries is high. This study assessed the efficacy and safety of elbasvir/grazoprevir (EBR/GZR) in participants with HCV infection from Asia-Pacific countries and Russia. In this phase 3, randomized, placebo-controlled, double-blind study, treatment-naïve participants with HCV genotype (GT) 1, 4, or 6 infection were randomized to EBR 50 mg/GZR 100 mg (immediate-treatment group [ITG]) or placebo (deferred-treatment group [DTG]) once daily for 12 weeks (Protocol PN-5172-067, NCT02251990). The primary efficacy variable was a nonrandomized comparison of sustained virologic response at 12 weeks after the end of therapy (SVR12) for the ITG with a historical control. The primary safety outcome was a randomized comparison between the ITG and DTG. Three hundred thirty-seven participants were randomized to the ITG (n = 251) or DTG (n = 86); 199 (59.2%) participants were Asian, and 250 (74.4%) had HCV GT1b infection. Overall, 232/250 (92.8%) participants in the ITG achieved SVR12 (97.5% confidence interval, 89.1, 96.5). Of the 18 participants who failed to attain SVR12, 1 was lost to follow-up and 17 had virologic failure, 13 of whom had HCV GT6 infection. The incidence of adverse events was similar between participants receiving EBR/GZR and placebo (50.8% versus 51.2%; difference, -0.3%; 95% confidence interval, -12.3, 11.9). Conclusion: EBR/GZR for 12 weeks provides an effective and well-tolerated regimen for chronic HCV GT1 infection in treatment-naïve people from Asia-Pacific countries and Russia, particularly for the large population with GT1b infection. EBR/GZR is not recommended for the treatment of individuals with HCV GT6 infection. (*Hepatology Communications* 2018;2:595-606).

Kao, J. H., Yu, M. L., Peng, C. Y., Heo, J., Chu, C. J., Chang, T. T., Lee, Y. J., Hu, T. H., Yoon, K. T., Paik, S. W., et al. "**Daclatasvir/asunaprevir/beclabuvir, all-oral, fixed-dose combination for patients with chronic hepatitis C virus genotype 1.**" *J Gastroenterol Hepatol* **2017** 32(12): 1998-2005.

BACKGROUND AND AIM: This multinational (Taiwan, South Korea, Russia) phase 3 study evaluated the all-oral, ribavirin-free, fixed-dose combination (DCV-TRIO) of daclatasvir (NS5A inhibitor) 30 mg, asunaprevir (NS3 inhibitor) 200 mg, and beclabuvir (NS5B inhibitor) 75 mg, in patients with chronic hepatitis C virus genotype-1 infection, with or without compensated cirrhosis. METHODS: UNITY-4 (NCT02170727) was an open-label, two-cohort study in which 169 patients, treatment-naïve (n = 138) or treatment-experienced (n = 31), received twice-daily DCV-TRIO for 12 weeks with 24 weeks of post-treatment follow-up. The primary efficacy end point was sustained virologic response at post-treatment week 12 (SVR12) in treatment-naïve patients. RESULTS: Eighty-eight (52%) patients were men, 81 (48%) Taiwanese, 78 (46%) Korean, and 10 (6%) Russian; 23 (14%) had compensated cirrhosis, and 52 (31%) were IL28B (rs1297860) non-CC genotype. Baseline resistance-associated NS5A polymorphisms (L31 and/or Y93) were detected in 25/165 (15%) patients with available genotype-1 sequencing data. SVR12 was achieved by 98.6% (136/138; 95% confidence interval: 94.9-99.8%) of treatment-naïve and 100% (31/31; 95% confidence interval: 88.8-100%) of treatment-experienced patients. Both virologic failures were found to be infected with hepatitis C virus genotype-6g; 100% SVR12 was observed for genotype-1a (n = 8) and genotype-1b (n = 157). Two patients experienced serious adverse events. Eight (5%) patients experienced reversible grade 3/4 alanine aminotransferase or aspartate aminotransferase elevations, leading to discontinuation in four (2%); all achieved SVR12. There were no grade 3/4 total bilirubin increases and no deaths. CONCLUSIONS: Twelve weeks of DCV-TRIO was well tolerated and provided 100% SVR12 in treatment-naïve and treatment-experienced patients with genotype-1 infection, with or without cirrhosis, including those with baseline NS5A-L31 or NS5A-Y93 resistance-associated substitutions.

Znoyko, O. O., Klimova, E. A., Maevskaya, M. V., Shuldyakov capital A, C., Linkova, Y. N. and Morozova, M. A. "**[Possibilities of using cepeginterferon alpha-2b in double (cepeginterferon alfa-2b and ribavirin) and triple (simeprevir, cepeginterferon alpha-2b, and ribavirin) antiviral therapy regimens for chronic hepatitis C. A review of clinical trials and experience of everyday clinical practice].**" *Ter Arkh* **2016** 88(11): 156-162.

Since the incidence of chronic hepatitis C (CHC) increases steadily, the priority of national health care is to provide antiviral therapy (AVT) for the maximum number of patients infected with hepatitis C virus (HCV). The regimens including pegylated interferons (PEG-IFN) are still in

demand in the Russian Federation. A number of clinical trials have been conducted to evaluate the efficacy and safety of cepeginterferon alpha-2b (cePEG-IFN alpha-2b), an original PEG-IFN-alpha developed in the Russian Federation. Their results have shown that cePEG-IFN alpha-2b in the two-component AVT regimen has at least no less clinical efficacy than PEG-IFN alpha-2b and PEG-IFN alpha-2a in HCV monoinfected and HCV/HIV co-infected patients. The pooled analysis of data has indicated that the use of cePEG-IFN alpha-b in combination with ribavirin allows an average of 80% of the patients with HCV genotypes 2 and 3 and 62% of those with HCV genotype 1 to achieve a sustained virological response (SVR). In clinical practice when the two-component AVT regimen (cePEG-IFN alpha-b and ribavirin) was used in patients with early-stage CHC and mild fibrosis, SVR was recorded in 90.7% of the patients with HCV genotype 2/3 and in 75% of those with HCV genotype 1. The experience in using cePEG-IFN alpha-2b as a component of the three-component AVT regimen (simeprevir, cePEG IFN alfa-2b, and ribavirin) has been published. The observational program mainly covered young patients with mild or moderate fibrosis. SVR was observed in 94% of the patients. Another paper describes the experience with the triple AVT therapy (simeprevir, cePEG-IFN alfa-2b, and ribavirin) in 22 patients, the majority of whom had advanced fibrosis. SVR was recorded in 71.4% of those who had completed treatment. Thus, an individual approach and assessment of predictive response factors to two- or three-component AVT regimens including cePEG-IFN alpha 2b can achieve successful treatment outcomes in most patients with CHC, which is, in some cases, more economically sound than interferon-free regimens used as first-line therapy.

Isakov, V., Zhdanov, K., Kersey, K., Svarovskaia, E., Massetto, B., Zhu, Y., Knox, S. J., Bakulin, I. and Chulanov, V. "[Efficacy of sofosbuvir plus ribavirin in treatment-naïve patients with genotype-1 and -3 HCV infection: results from a Russian Phase IIIb study.](#)" *Antivir Ther* **2016** 21(8): 671-678.

BACKGROUND: In this Phase IIIb study, we evaluated the efficacy and safety of the oral nucleotide analogue inhibitor sofosbuvir plus ribavirin, with special attention given to viral resistance, in Russian patients with HCV genotype-1 or -3. METHODS: Treatment-naïve patients with and without compensated cirrhosis were randomized (1:1) to receive 16 or 24 weeks of once-daily sofosbuvir 400 mg plus twice-daily oral ribavirin 1,000 or 1,200 mg/day. The primary efficacy end point was the proportion of patients with sustained viral response 12 weeks after the end of treatment (SVR12). Viral resistance testing was performed by deep sequencing on all baseline samples and for patients who experienced virological failure. RESULTS: SVR12 rates for patients with genotype-1 HCV were 50% and 76% for those in the 16-week and 24-week groups, respectively, and for patients with genotype-3 HCV, SVR12 rates were 87% and 90% for patients in the 16-week and 24-weeks groups, respectively. Genotype-1 patients with the L159F resistance-associated variant who received 16 weeks of treatment had lower SVR12 rates than those without, but in patients who received 24 weeks of treatment, response rates were similar in those with and without L159F (80% versus 74%). Sofosbuvir plus ribavirin was well tolerated with no deaths, adverse event-related study drug discontinuations, or grade 3 or 4 adverse events, and few grade 3 or 4 laboratory abnormalities. CONCLUSIONS: Sofosbuvir plus ribavirin for 16 or 24 weeks was associated with a high SVR rate in patients with HCV genotype-3. Among HCV genotype-1b patients, the presence of the L159F variant at baseline was associated with a lower SVR rate in those treated for 16 weeks but not in those treated for 24 weeks. Sofosbuvir plus ribavirin was safe and well tolerated regardless of treatment duration. Clinicaltrials.gov number NCT01896193.

Isakov, V., Nikitin, I., Chulanov, V., Ogurtsov, P., Lukyanova, E., Long, J., Wahl, J. and Helmond, F. A. "[Boceprevir plus peginterferon/ribavirin for treatment of chronic hepatitis C in Russia.](#)" *World J Hepatol* **2016** 8(6): 331-339.

AIM: To evaluate addition of boceprevir to peginterferon/ribavirin (PR) in Russian patients with chronic hepatitis C virus (HCV). METHODS: Treatment-naïve (TN) and treatment-experienced (TE) patients (who had failed prior treatment with PR for ≥ 12 wk) with chronic HCV genotype 1 infection were enrolled in this placebo-controlled, double-blind study. All patients initially received PR for 4 wk. Patients randomized to control treatment then received PR for an additional 44 wk. TN patients randomized to triple therapy received boceprevir (800 mg three times daily) plus PR for 24 wk and then further therapy according to treatment week 8 (TW8) HCV RNA levels. TE patients received boceprevir plus PR for 32 wk and then further therapy

according to TW8 HCV RNA levels. Treatment was discontinued for TN patients with detectable HCV RNA at TW24 and TE patients with detectable HCV RNA at TW12 because of futility. The primary efficacy end point was sustained virologic response (SVR) defined as undetectable HCV RNA 24 wk after completing all study therapy. RESULTS: SVR was 74.8% in the boceprevir plus PR arm compared with 46.2% in the control arm, with a stratification-adjusted treatment difference of 29.2% (95%CI: 16.4-41.5; $P < 0.0001$). Rates of SVR were higher in the boceprevir arm in both TN and TE patient groups (TN 78.4% vs 56.3%; TE 69.4% vs 30.0%). Within TE patients, the rates of SVR were higher with boceprevir plus PR compared with PR, regardless of treatment failure type (null responder, partial responder, and relapser). Most patients receiving boceprevir plus PR in both TN (86%) and TE (71%) populations were eligible for reduced treatment duration. Anemia was increased in patients receiving boceprevir plus PR vs PR alone (47.2% vs 24.4%); there was a corresponding increase in ribavirin dose reduction and erythropoietin use. Among patients receiving boceprevir plus PR, SVR rates were similar in patients with anemia (< 10 g/dL) and those without anemia (71.2% vs 77.4%). CONCLUSION: Regulatory approval has been obtained for boceprevir plus PR in Russian patients with HCV genotype 1 infection based on the results of this study.

Pyadushkina, E., Avxentyeva, M., Omelyanovsky, V. V., Treur, M. and Westerhout, K. Y. "[Cost-Effectiveness Analysis Of Antiviral Pharmacotherapies For Treatment Of Chronic Hepatitis C Virus Infection In Russia](#)." *Value Health* **2014** 17(7): A366-367.

Burnevich, E. Z. and Tikhonova, N. "[\[Ways of improving adherence on telaprevir-based therapy in patients with chronic HCV infection\]](#)." *Eksp Klin Gastroenterol* **2014** (3): 94-98.

AIM: To present the ways of improving adherence on telaprevir-based therapy in patients with chronic HCV infection. BACKGROUND: Telaprevir is a direct antiviral agent, registered in Russian Federation as a treatment for chronic hepatitis C genotype 1 patients in combination with pegylated interferon and ribavirin (PR). Phase III clinical trials showed a significant improvement in efficacy when adding telaprevir to pegylated interferon and ribavirin compare to the dual PR treatment along. Standard telaprevir regiment 750 mg 3 times per day is associated with difficulties in keeping adherence to the treatment. Here we present the results of administering telaprevir 1125 mg twice daily. CONCLUSION: Telaprevir-based 1125 mg twice daily regimen in combination with PR is comparable with telaprevir 750 mg every 8 hours treatment if looking at rates of SVR, relapse incidence, virological insufficiency, pharmacokinetics, safety, also taking in consideration higher treatment adherence even in HCV cirrhotic patients.

Burnevich, E. Z. "[\[Simeprevir in combination with pegylated interferon-alpha and ribavirin in the treatment of naive patients with genotype 1 chronic hepatitis C\]](#)." *Ter Arkh* **2014** 86(11): 105-114.

Triple therapy with pegylated interferon-alpha, ribavirin, and simeprevir is now optimal among the antiviral treatment options available in the Russian Federation for patients with chronic hepatitis C (CHC), including in the compensated stage of liver cirrhosis. The optimality of this combination is determined by its high efficacy--the given combination of antiviral agents allows one to predict that more than 90% of naive patients with CHC will achieve a sustained virological response as 97-99% of the Russian population patients is infected with hepatitis C virus subgenotype 1b. The second important aspect that can recognize the triple therapy incorporating simeprevir to be most rational now is its safety similar to that of double therapy with pegylated interferon-alpha and ribavirin. In addition, the absolute advantages of the triple therapy including simeprevir are shorter treatment duration (for a total of 24 weeks) for all naive patients with CHC, including those in the compensated stage of cirrhosis, and simeprevir taken as one capsule once daily.

Session 6 : WHO GLOBAL HEALTH SECTOR STRATEGY AND EUROPEAN PLAN OF ACTION ON VIRAL HEPATITIS. TREATMENT OF VIRAL HEPATITIS

09:30-09:45

Socio-economic burden and access to treatment of chronic hepatitis C in the Russian Federation.

Olga Znoyko, A.I. Yevdokimov Moscow State University of Medicine and Dentistry, Moscow.

Iushchuk, N. D., Znoiko, O. O., Dudina, K. R. and Belyi, P. A. "[\[The problem of viral hepatitis C in the Russian Federation\]](#)." *Ter Arkh* **2014** 86(10): 77-81.

The incidence of chronic viral hepatitis (CVH) has increased 2.2-fold in the Russian Federation over the past decade. This increase is mainly determined by an almost threefold rise in the incidence of chronic hepatitis C (CHC): from 12.9 in 1999 to 39.1 per 100,000 population in 2012. The calculated data of hepatitis C burden in the Russian Federation show that in 2010 the total medical and social losses and expenses associated with hepatitis C and its implications were 48.47 billion rubles or 0.108% of the gross domestic product, the direct medical costs were 17.1 billion (35.28%) rubles, GDP losses were 26.05 billion (53.75%) rubles, and the disability payments were 5.32 billion (10.97%) rubles. The patients (mean age 45 years) with liver cirrhosis (LC) were 15.2% in the structure of the CHC patients (mean age 37 years) admitted to Moscow infectious diseases hospitals in 2010. Analysis of the regional registers of the Russian Federation, the proportion of patients with LC among those with CHC was 18%. The existing forms for recording morbidity and mortality from poor CHC outcomes cannot significantly estimate the true disease stage distribution of patients and hepatitis C-associated disability and mortality rates. In this connection, it is necessary to introduce a federal register and to change recording forms for patients with viral hepatitis. Standard interferon, pegylated interferon alpha 2a and pegylated alpha 2b, and the HCV protease inhibitors telaprevir, boceprevir, and simeprevir have been registered for the treatment of hepatitis C in the Russian Federation.

Pyadushkina, E. V., Avxentyeva, M. V., Omelyanovsky, V. V. and Khachatryan, G. R. "**[CLINICAL AND ECONOMIC ANALYSIS OF ALTERNATIVE SCHEMES OF ANTIVIRAL THERAPY OF CHRONIC HEPATITIS C GENOTYPE 1 IN PATIENTS WHO DID NOT ANSWER TO THE PRIOR THERAPY, IN THE RUSSIAN FEDERATION]**." *Eksp Klin Gastroenterol* **2015** (3): 55-65.

We conducted clinical and economic analysis of the protease inhibitor simeprevir versus currently available in Russia protease inhibitors (boceprevir and telaprevir) in combination with pegylated interferon and ribavirin and dual therapy with pegylated interferon and ribavirin in patients with chronic hepatitis C genotype 1 without polymorphism Q80K, who had not responded to previous treatment. Global cost-effectiveness model was adapted to the Russian health care system. We calculated differences in direct medical costs between the antiviral therapy schemes, treatment of long-term complications of chronic hepatitis C and the costs of achieving sustained virological response (SVR) to treatment. The incremental cost-effectiveness ratio - additional cost per life year saved was calculated as well. Available published data and the tariffs of the Russian healthcare system were used for the calculations. Simeprevir was shown to be more effective than dual therapy with acceptable additional costs and more effective than boceprevir and telaprevir in the number of life years saved being less costly therapy option.

Session 6 : WHO GLOBAL HEALTH SECTOR STRATEGY AND EUROPEAN PLAN OF ACTION ON VIRAL HEPATITIS. TREATMENT OF VIRAL HEPATITIS

09:45-10:00	<p>The system of drug supply of patients with viral hepatitis in the Russian Federation: how to make treatment more accessible?</p> <p>Elena Maksimkina, <i>Department of drug supply and regulation of medical products handling, Ministry of Health, Moscow.</i></p>
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Session 6 : WHO GLOBAL HEALTH SECTOR STRATEGY AND EUROPEAN PLAN OF ACTION ON VIRAL HEPATITIS. TREATMENT OF VIRAL HEPATITIS

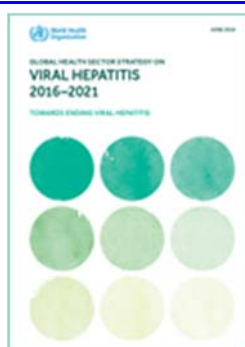
10:00-10:15	<p>Economic aspects of the organization of medical care in infectious diseases.</p> <p>Inna Zheleznyakova, <i>Center for Healthcare Quality Assessment and Control of the Russian Federation MoH, Moscow.</i></p>
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Session 6 : WHO GLOBAL HEALTH SECTOR STRATEGY AND EUROPEAN PLAN OF ACTION ON VIRAL HEPATITIS. TREATMENT OF VIRAL HEPATITIS – STATE OF ART

10:15-10:35	<p>WHO Global Strategy and the European action plan on viral hepatitis elimination. WHO guidelines for treatment of chronic hepatitis B and C.</p> <p>Antons Mozalevskis, WHO Regional Office for Europe, Copenhagen, Denmark.</p>
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WHO Elimination Goals

[Global health sector strategy on viral hepatitis 2016-2021](#)



This is the first global health sector strategy on viral hepatitis, a strategy that contributes to the achievement of the 2030 Agenda for Sustainable Development.

It covers the first six years of the post-2015 health agenda, 2016–2021, building on the Prevention and Control of Viral Hepatitis Infection: Framework for Global Action, and on two resolutions on viral hepatitis adopted by the World Health Assembly in 2010 and in 2014.

The strategy addresses all five hepatitis viruses (hepatitis A, B, C, D and E), with a particular focus on hepatitis B and C, owing to the relative public health burden they represent.

[Global hepatitis Report 2017](#)



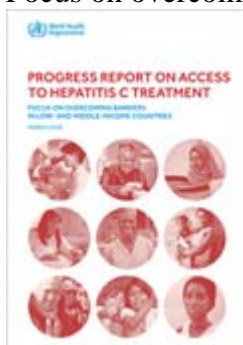
In May 2016, the World Health Assembly endorsed the *Global Health Sector Strategy (GHSS) on viral hepatitis 2016–2021*. The GHSS calls for the elimination of viral hepatitis as a public health threat by 2030 (reducing new infections by 90% and mortality by 65%).

This WHO *Global hepatitis report* describes, for the first time, the global and regional estimates on viral hepatitis in 2015, setting the baseline for tracking progress in implementing the new global strategy.

The report focuses on hepatitis B and C, which are responsible for 96% of all hepatitis mortality. It presents data along the five strategic directions (strategic information, interventions, equity, financing and innovation) – key pillars of the GHSS to facilitate monitoring of progress in countries, regions and globally, and to measure the impact of interventions on reducing new infections and saving lives between 2015 and 2030.

[Progress report on access to hepatitis C treatment](#)

Focus on overcoming barriers in low- and middle-income countries



Increased access to highly effective direct-acting antivirals (DAAs) for the treatment of infection with the hepatitis C virus (HCV) is revolutionizing the prospect of ending HCV epidemics. Globally, the number of people who initiated DAA-based treatment for HCV rose between 2015 and 2016, from approximately 1 million to 1.5 million.

This report updates the first edition, published in 2016, and reviews the progress countries have made in expanding access to life-saving DAAs. The report reviews the main challenges countries face and describes recent developments in relation to five key factors that determine access to DAA medicines: affordability, quality assurance, regulatory approval, government commitment and financing. It highlights key areas for action by ministries of health and other government decision-makers, pharmaceutical manufacturers and technical partners.

[Action plan for the health sector response to viral hepatitis in the WHO European Region \(2017\)](#)



This first Action plan for viral hepatitis in the WHO European Region adapts the Global Health Sector Strategy on Viral Hepatitis, 2016–2021 to the context of the European Region.

The plan was developed through a participatory process, finalized and endorsed at the 66th session of the WHO Regional Committee for Europe, along with resolution EUR/RC66/R10. While the Action plan addresses all five hepatitis viruses, its major focus is on hepatitis B and C, given the high public health burden they represent in the Region.

The goal of the Action plan is elimination of viral hepatitis as a public health threat in the WHO European Region by 2030 through the reduction of transmission, morbidity and mortality due to viral hepatitis and its complications, and by ensuring equitable access to comprehensive prevention, recommended testing, care and treatment services for all.

[Fact sheets on sustainable developments goals: health target, Viral hepatitis](#)



The facts sheets on the SDG health targets present key facts and figures, ongoing commitments, guidance on action, and indicators to monitor progress – in the context of the WHO European Region. They also provide specific highlights on how WHO/Europe supports its Member States in achieving these targets, and cover key SDG aspects such as equity, partnerships and intersectoral collaboration

3. Other references related to Russia and Hepatitis

Chronic viral hepatitis

Strizhakov, L. A., Karpov, S. Y., Fomin, V. V., Lopatkina, T. N., Tanashchuk, E. L. and Taranova, M. V.

"[Myocardial injury associated with chronic hepatitis C: Clinical types and pathogenetic components]." *Ter Arkh* 2016 88(4): 105-111.

Heart injury is one of the extrahepatic manifestations of chronic hepatitis C (CHC). The paper gives Russian and foreign authors' data on a relationship between CHC and myocardial injury. It discusses different pathogenetic components (the direct effect of the virus, immunological components), through which hepatitis C virus can induce myocarditis and cardiomyopathies in patients with CHC.

Dudanova, O. P., Shubina, M. E., Belavina, I. A., Elpaeva, E. A., Pisareva, M. M., Grudinina, M. P. and Kiselev, O. I. **"CHRONIC HEPATITIS WITH DOUBLE B/C INFECTION: VIROLOGICAL, CLINICAL, MORPHOLOGICAL CHARACTERISTICS."** *Klin Med (Mosk)* 2016 94(4): 289-294.

AIM: To estimate the virological and clinical characteristics of chronic viral hepatitis (CVH) with double B/C infection. MATERIALS AND METHODS: We examined 282 patients with CVH. Genomes of hepatitis B virus (HBV) and hepatitis C virus (HCV) were studied by PCR in blood and liver (AmpliSens HBV and Amplisens HCV Russia), nuclear proteins (HBcorAg HBV and NS3 HCV) were determined by immunohistochemical method (Novocastra, UK), HBV genome was sequenced by the Sanger method using ABI prism BigDye Terminator v3.1 kits and ABIPRISM 3100 analyzer (Applied Biosystems, USA). Indices of histological activity (HAI), fibrosis, and portal vein (PV) congestion index (CI) were calculated by formula $CI = SBB/LB \cdot V$ where S is P V cross section area in cm^2 and LB V - linear blood flow velocity in cm/s (Vivid Pro- 7 apparatus, USA). RESULTS: CVH with double B/C infection was diagnosed in 85 (30.1%) patients including 44.7% with viral genomes and proteins in the liver; 42.4% with HCV viremia, and 12.9% with HBV/HCV viremia. Maximum CVH activity was documented in patients with latent HBV/HCV viremia (ALT 157.2 ± 59.2 U/l, HAI 11.6 ± 1.3 , fibrosis 2.8 ± 0.7 , CI 0.059 ± 0.005); it was minimal in patients without viremia (ALT 76.25 ± 63.0 U/l, HAI 6.7 ± 0.6 , fibrosis 1.7 ± 0.5 , CI 0.042 ± 0.001 ; $p < 0.05$). Patients with latent HBV infection had precore/ore and pres/s mutations in HBV genome and cytoplasmic localization of HBcorAg. CONCLUSION: Double B/C infection was diagnosed in 30.1% of the patients with CVH dominated by HCV. Patients with latent HBV had precore/ore and pres/s mutations. The highest intensity of hepatic cellular inflammation, fibrosis, and PV congestion was associated with HBV/HCV viremia and the lowest with intrahepatic localization of both viruses.

Volynets, G. V., Potapov, A. S. and Skvortsova, T. A. **"[Chronic hepatitis C in children: problems and prospects]." *Vestn Ross Akad Med Nauk* 2014 (11-12): 46-53.**

The analysis of a problem state of chronic hepatitis C in children was conducted. Data on primary incidence of chronic hepatitis C at the children's population as on the territory of the Russian Federation, and abroad are submitted. Problems of diagnosis of a HCV infection are studied. The survey analysis of risk of contamination is carried out, possible ways of transfer are highlighted, features of a course of a HCV infection in children are shown, synchronising frequency of a process is displayed. The problem is analysed now, and further prospects in treatment of chronic viral hepatitis C in children are estimated.

4. Speakers information

List of publications achieved via speaker's form, when this form was not available a Pubmed MEDLINE search was performed on Name of the speaker in [Author]-field. If more than 10 references were available only the most recent articles are shown.

ELENA MALINNIKOVA,

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Central Research Institute of Epidemiology, Moscow
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Chief specialist on infectious diseases of the Chelyabinsk Region MoH, Chelyabinsk
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VIKTORIA BAKHTINA

Specialized clinical infectious diseases hospital of Krasnodar Region MoH, Krasnodar

ANNA SIMAKOVA

The Far Eastern State Medical University, Vladivostok.

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SNEZHANA SLEPTSOVA

M.K.Amosov North-Eastern Federal University, Yakutsk.

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MARINA IVANOVA,

AIDS and Infectious Diseases Center of the Kabardino-Balkaria Republic MoH, Nalchik..

ALEXEY KRAPIVKIN

Chukotka District Hospital, Anadyr..

JOHN WARD,

Centers for Disease Control and Prevention, Atlanta, USA..

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ANNA SARYGLAR Chief specialist on infectious diseases of the Tyva Republic, Kyzyl.
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ARPIK ASRATYAN, *Gamaleya National Research Center for Epidemiology and Microbiology, Moscow*

EKATERINA ZINGER

Charitable Foundation "Humanitarian Action", Saint Petersburg..

DANIEL SHOUVAL

Hadassah Hebrew University Hospital, Jerusalem, Israel..

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NIKITA KOVALENKO

Interregional non-government patient advocacy organization “United against hepatitis”, Moscow.

SERGEY GOLOVIN

The International Treatment Preparedness Coalition: Eastern Europe and Central Asia, Moscow.

DZHAMAL ABDURAKHMANOV

I.M.Sechenov First Moscow State Medical University, Moscow.

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SERGEY BATSIKIH

A.S. Loginov Moscow Clinical Scientific Center; Central Research Institute of Epidemiology, Moscow.

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A.I. Yevdokimov Moscow State University of Medicine and Dentistry, Moscow..

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ELENA MAKSIMKINA

Department of drug supply and regulation of medical products handling, Ministry of Health, Moscow.

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INNA ZHELEZNYAKOVA

Center for Healthcare Quality Assessment and Control of the Russian Federation MoH, Moscow.

DAVID FITZSIMONS

Rappoteur.

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