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

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VHPB country meeting Prevention and control of Viral Hepatitis in the Russian Federation: lessons learnt and the way forward Moscow Hilton Leningradskaya Hotel
25-26 October 2018

Assessment of the Socio-Economic Burden of Hepatitis C in the Russian Federation.

Оценка социально-экономического бремени гепатита С в Российской Федерации

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Abstract

In a cross-sectional study the economic burden of hepatitis C in the Russian Federation as of 2010 was estimated based on 555 009 patients with chronic hepatitis C (CHC), who were officially registered by the end of 2010. Total medical costs and social losses in 2010 prices amounted to 48.47 billion rubles or 0.108% of the gross domestic product (GDP). Losses of GDP by itself amounted to 26.05 billion rubles. Total medical costs related to the treatment of hepatitis C and its complications amounted to 17.1 billion rubles. Total budget costs (direct medical costs and disability payments) constituted 22.41 (46.25%) billion rubles. A major part of the costs and losses were due to hepatitis C complications (decompensated liver cirrhosis (LC), hepatocellular carcinoma (HCC), liver transplantation), which could have been prevented by timely initiated antiviral therapy. Taking into account patients with hepatitis C, who are singled out from HCV carriers after in-depth examination (1 466 072 patients), the burden of the hepatitis C could reach 162.41 billion rubles in total in 2010. It is expected that in the coming decade an increase of the burden of hepatitis C will be observed. Absence of surveillance system of hepatitis C prevalence, its outcomes, and LC and HCC mortality related to the disease, impedes the evaluation of the epidemiological situation and prevents the development of well-grounded and efficient medical care programs for patients with CHC.

The burden assessment was performed taking into account economic and statistical indicators as of 2010, average prices for medicines and tariffs for medical services, as well as macroeconomic indicators

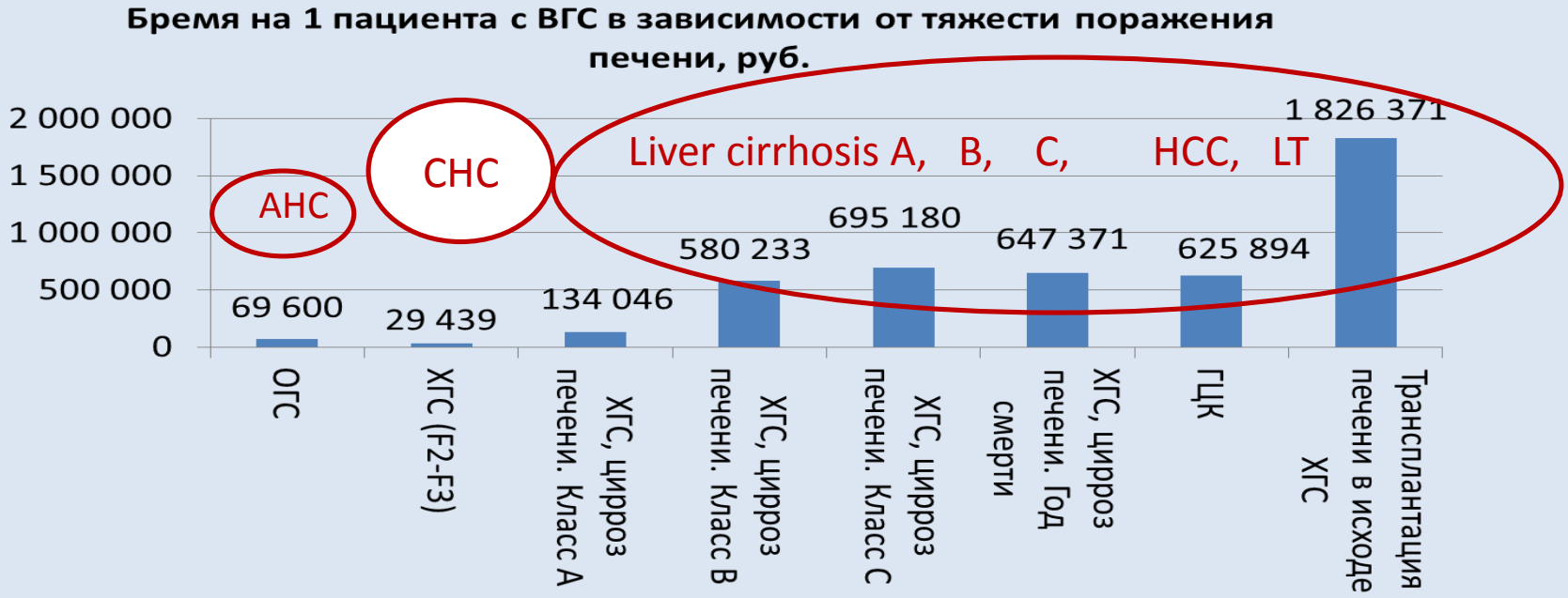
In the absence of official statistics data, sample studies and expert assessments were used

In assessing social costs and losses used the method of human capital ("human capital approach") - takes into account all GDP losses during the absence of a person in the workplace

N.D. Yuschuk, O.O. Znoyko, N.A. Yakushechkina et al. *Epidemiology & Vaccinal Prevention* № 2 (69)/2013

ASSESSING HEPATITIS C BURDEN IN RUSSIA
in 2010 based on 500 000 patients with CHC, scientific data on the natural course of CHC and expert assessments

Categories Категории	Стоимость, млрд. руб. Cost, billion rubles	Proportion % Доля, %
Burden of Hepatitis C Бремя ВГС	**48,47**	**100,00%**
Direct medical costs Прямые мед. затраты	**17,10**	**35,28%**
Disability payments Выплаты по инвалидности	**5,32**	**10,97%**
GDP losses Потери ВВП	**26,05**	**53,75%**

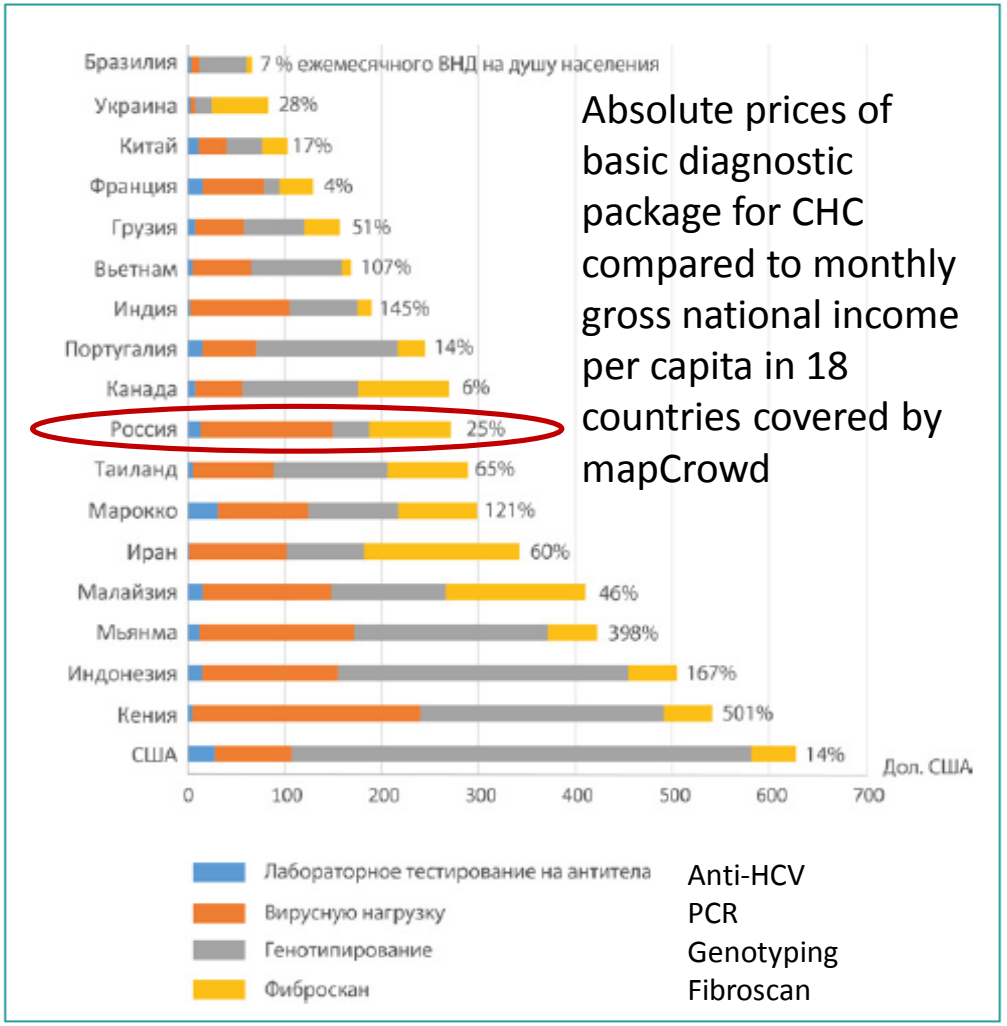


N.D. Yuschuk, O.O. Znoyko, N.A. Yakushechkina et al. ... Ющук Н.Д., Знойко О.О., Якушечкина Н.А. с соавт. 2013 г.

Limited access to chronic hepatitis correct diagnosis is associated with its high cost compared to household income

Burden of direct medical costs associated with hepatitis C, due not only to the cost of antiviral therapy, but also the high cost of the main diagnostic package for the identification of the " patient portrait»

Рис. 2. Абсолютные цены на основной диагностический пакет для ВГС в сравнении с месячным ВНД на душу населения в 18 странах, охватываемых mapCrowd



Absolute prices of basic diagnostic package for CHC compared to monthly gross national income per capita in 18 countries covered by mapCrowd

Anti-HCV
PCR
Genotyping
Fibroscan

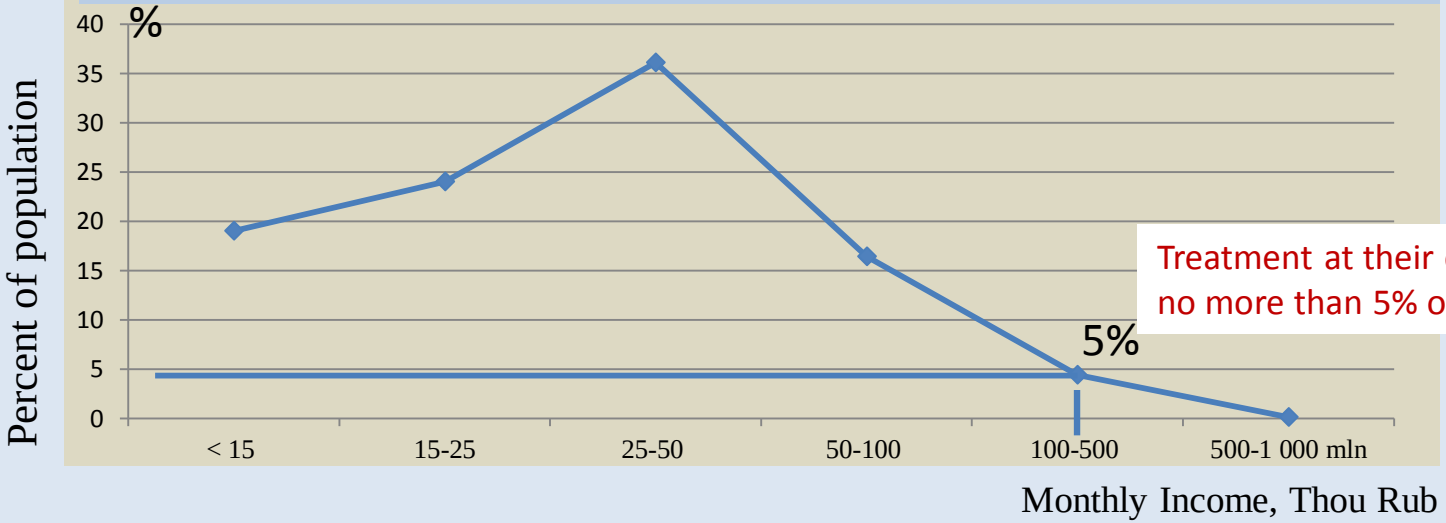
mapCrowd — онлайн-краудсорсинговая платформа, созданная организациями Médecins du Monde (MdM) и Treatment Action Group (TAG) — разработана для содействия сбору и распространению актуальной информации о ВГС. Платформа содержит данные, предоставленные активистами борьбы с ВГС со всего мира, а также современную научную и организационную информацию.
Собранные mapCrowd данные доступны бесплатно на сайте mapCrowd.org;

Access to treatment of chronic hepatitis C in Russia…..

…… is still limited, as the cost of treatment ranges from **120 thousand rubles to 1 million rubles.** Thus, treatment at their own expense can afford no more than 5% of the population, taking into account the fact that 77% of wages goes to pay for services and the purchase of necessary goods…

Share of cash income of the population used to buy goods and pay for services in January-may 2013-2018, %

Distribution of the number of employees by the size of the accrued salary . Just by surveyed kinds of economic activities. Распределение численности работников по размерам начисленной заработной платы . Всего по обследуемым видам экономической деятельности



Monthly monitoring of the socio-economic situation and well-being of the population: 2015-June 2018 .

Russian Academy of national economy and public service under the President of the Russian Federation; ed.T. M. Maleva. 2018.

Treatment at their own expense can afford no more than 5% of the population

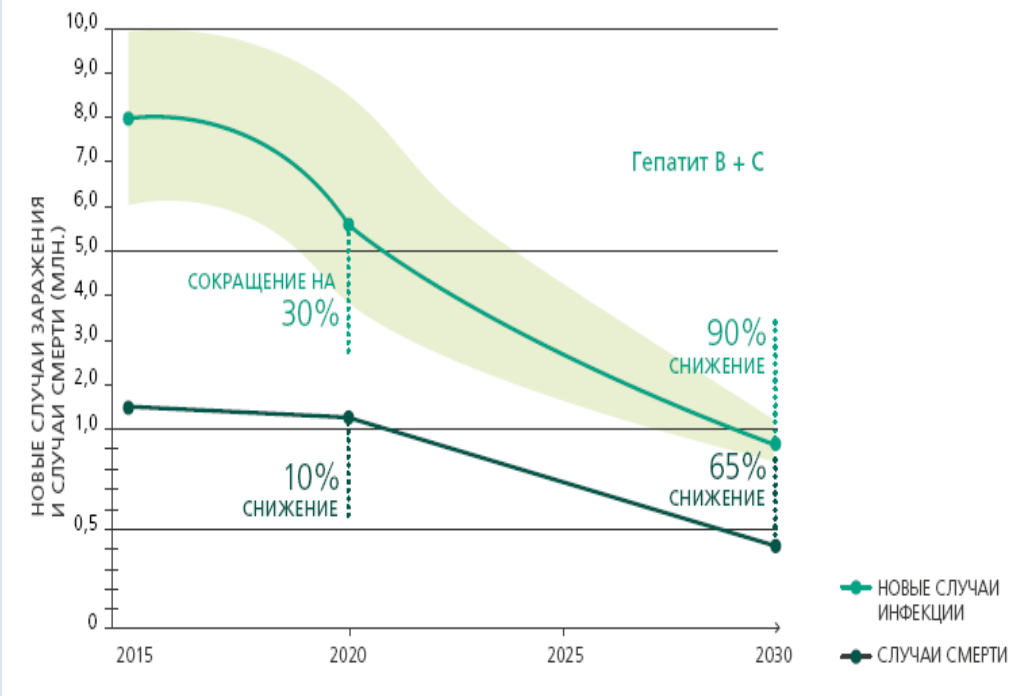
http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistics/publications/catalog/11c4980041c1bcbf9ee9fe27f9898572

CURRENTLY, IT IS NECESSARY FOR THE RUSSIAN HEALTH CARE TO DEVELOP A NATIONAL PLAN – STRATEGY TO COMBAT VIRAL HEPATITIS IN THE CONTEXT OF THE WHO GLOBAL STRATEGY.

BUT! We need our own objective data on the current epidemiological situation in the country

Such Indicators as burden of infection, the most affected age groups, the frequency of adverse outcomes (liver cirrhosis and hepatocellular carcinoma), associated mortality and its consideration are the most "problem areas" which should be taken into account in the reduction strategy of the burden of hepatitis B and C in the Russian Federation.

The WHO global strategy to reduce morbidity and mortality



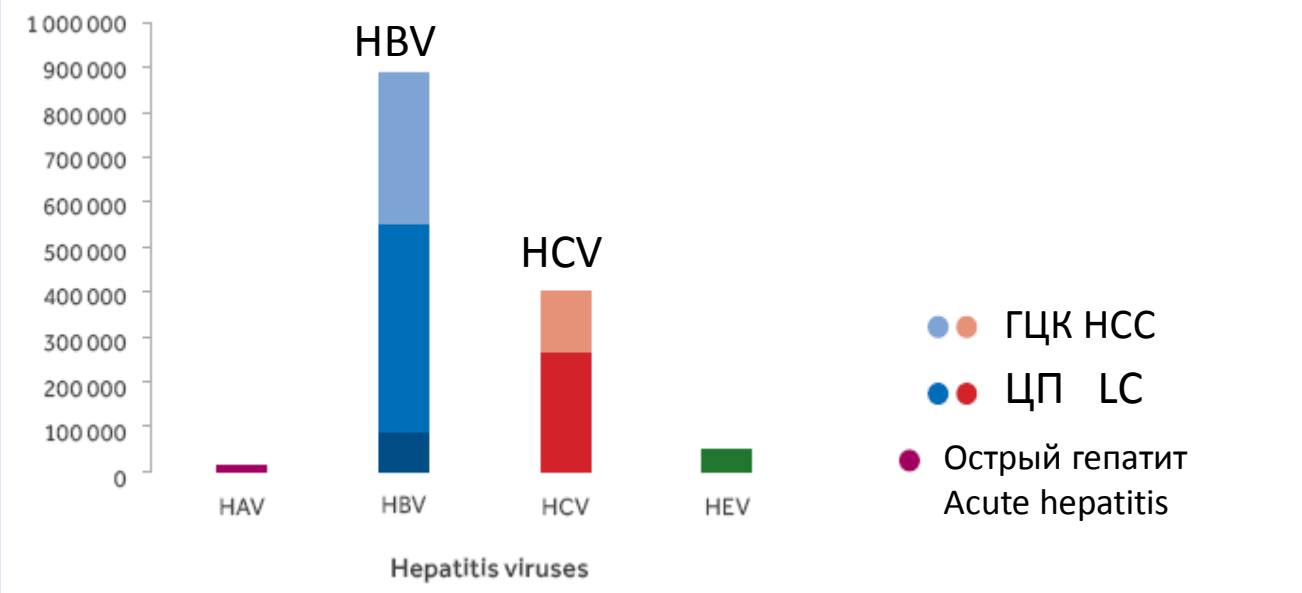
World Health Organization

GLOBAL HEPATITIS REPORT, 2017

MOST VIRAL HEPATITIS DEATHS ARE DUE TO THE LATE COMPLICATIONS OF HBV AND HCV INFECTION [1].

«In many patients with end-stage HBV or HCV liver disease, the viral infection is not mentioned on the death certifi cate when death occurs from cirrhosis or hepatocellular carcinoma. In the absence of such a link, these deaths are considered as deaths from noncommunicable diseases, and the burden of disease from viral hepatitis remains underestimated[3]».

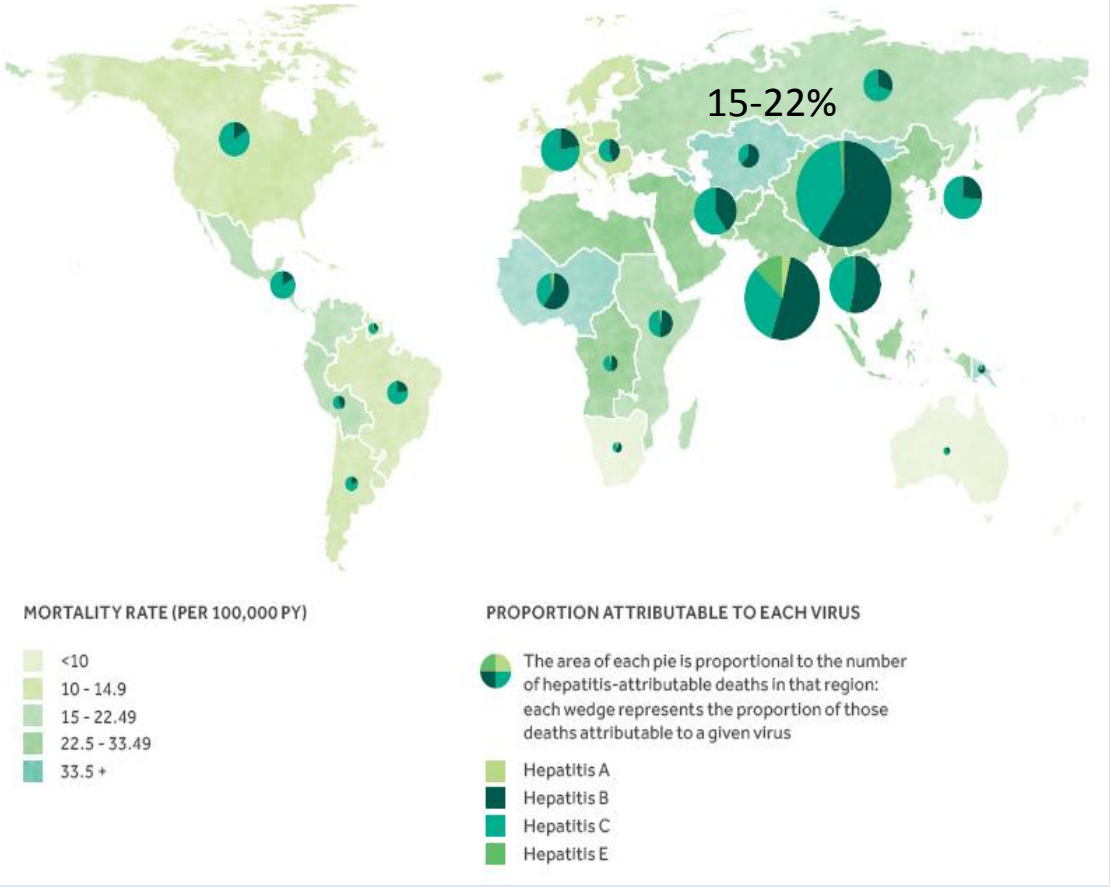
Deaths from viral hepatitis, 2015:



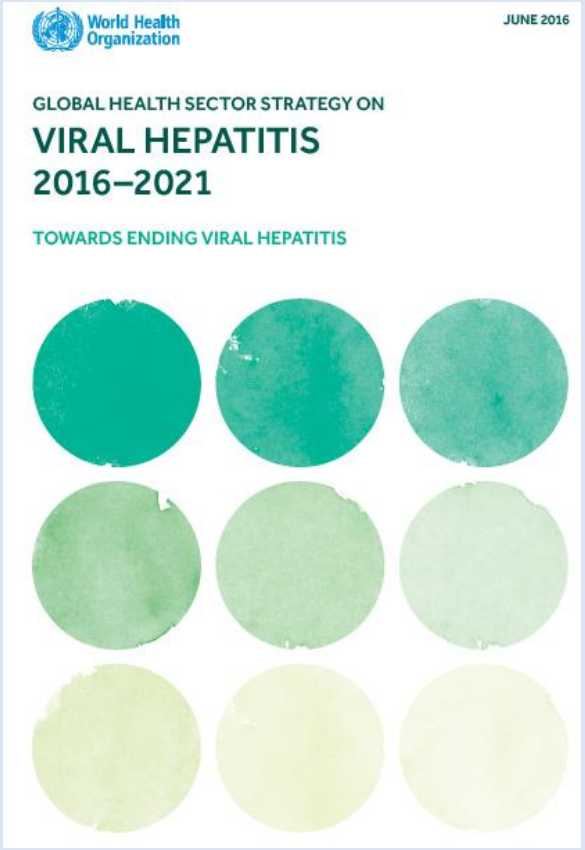
1.Stanaway JD et al. The global burden of viral hepatitis 1990–2013. Lancet. 2016,
2. Imperial College Applied Modelling Group. Global investment case document. Unpublished report commissioned by WHO´s Global Hepatitis Programme.
3.Global hepatitis report 2017, World Health Organization 2017
4. http://www.who.int/ru/news-room/detail/21-04-2017-new-hepatitis-data-highlight-need-for-urgent-global-response,
5. http://www.who.int/publications/10-year-review/hepatitis/ru/

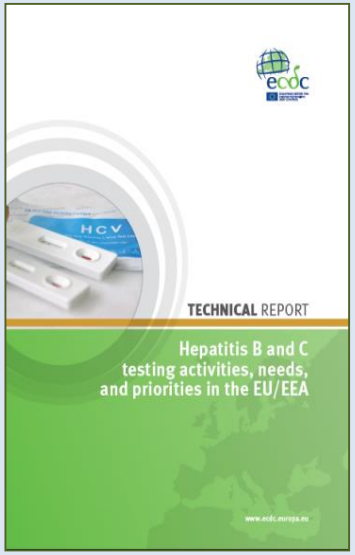
MORTALITY DATA FROM VIRAL HEPATITIS IN RUSSIA CAN BE FOUND IN PUBLICATIONS, BUT DATA SOURCES ARE OFTEN IMPOSSIBLE TO DETERMINE…..

Figure 3. Regional distribution of viral hepatitis deaths



Source: Stanaway and Cooke (personal communication) ?





NUMBER OF MEMBER STATES ABLE TO REPORT ON WHO CORE HBV/HCV INDICATORS, BASED ON INFORMATION OBTAINED FROM THE SURVEY

Country	Morbidity data					Mortality data			
	Liver cirrhosis	Chronic liver disease	Liver cancer	End stage liver disease	Liver transplant	Liver cirrhosis	Chronic liver disease	Liver cancer	End stage liver disease
France*	✓	✓	✓	✓	?	✓	✓	✓	
Lithuania*	✓	✓	✓	✓	✓	✓	✓	✓	✓
Romania*	✓	✓	✓	✓	✓	✓	✓	✓	✓
UK–E and W*	✓	✓	✓	✓	✓	✓	✓	✓	✓
UK–Scotland*	✓	✓	✓	✓	✓	✓	✓	✓	✓
Total **	**6** (18)	**7** (14)	**6** (20)	**6** (12)	**7** (18)	**5** (18)	**5** (16)	**6** (21)	**4 (12)**

*Cell shaded = data available; ✓= HBV/HCV status available in the data; X = HBV/HCV status not available in data; ? = HBV/HCV status not known; * = Data sharing may be possible; (*) = Data sharing may be possible for morbidity data only; ^ = Only HCV*

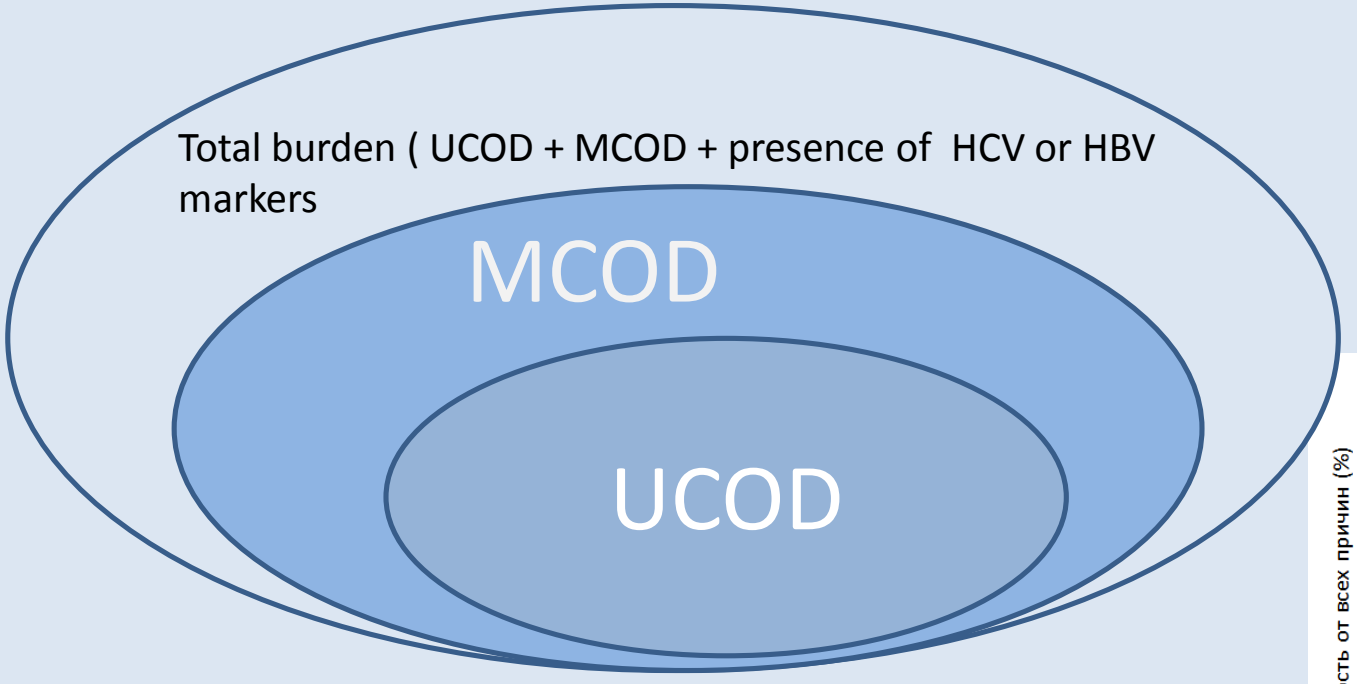
Table A2.1: Number of Member States able to report on WHO core HBV/HCV indicators, based on information obtained from the survey

World Health Organization Indicator [WHO 2016]	Number (%) of EU/EEA Member States with data available to monitor this indicator, N=22	
	HBV	HCV
C.6: Proportion of people living with chronic HBV/HCV who have been diagnosed	3 (14%)	5 (23%)
C.7.a: Proportion of HBV-infected persons who are currently on treatment	7 (32%)	
C.7.b: Proportion of persons diagnosed with chronic HCV started on treatment during a specified time frame		12 (55%)
C.10: Deaths attributable to HBV/HCV infection: Due to liver cancer Due to cirrhosis Due to chronic liver disease Data available on all three causes of HBV/HCV liver death	6 (27%) 5 (23%) 6 (27%) 5 (23%)	6 (27%) 5 (23%) 6 (27%) 5 (23%)

How is mortality from viral hepatitis estimated in individual countries and the world ?

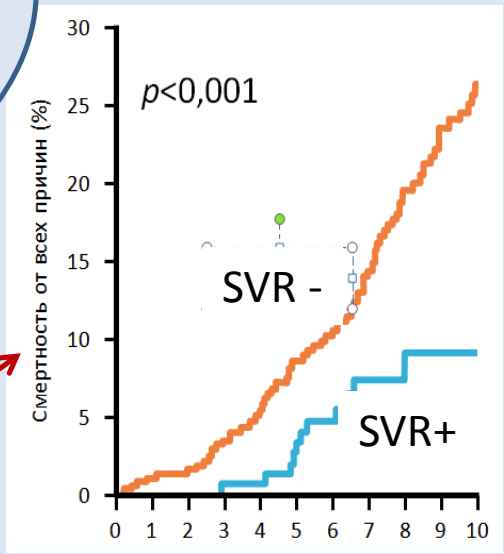
Standard mortality statistics are usually based on internationally adopted algorithms that identify a single underlying cause of death (UCOD) from all the conditions reported in the certificate.

Analyses based on any mention of a disease irrespective of its selection as the UCOD, the so-called multiple causes of death approach (MCOD), can more fully describe the burden of mortality associated with chronic diseases



The physicians filling in death certificates may be unaware of HCV or HBV infection in the patient or may not consider that the disease contributed to the death. Among elderly patients affected by multiple comorbidities, there may be no simple etiologic chain leading to the identification of a single underlying cause; death often results from a complex interaction between multiple factors.

Mortality due to all causes among patients with CHC



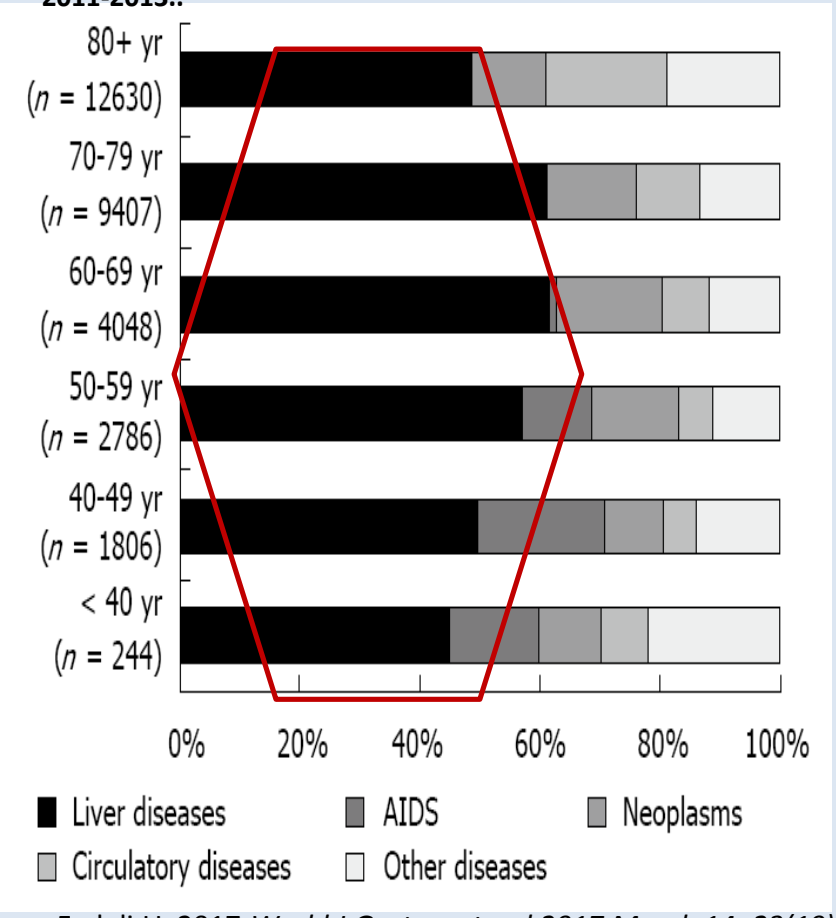
Fedeli U. 2017 World J Gastroenterol 2017 March 14; 23(10) Mortality associated with hepatitis C and hepatitis B virus infection: A nationwide study on multiple causes of death

Van der Meer JAMA 2012;308:2584–93

An example of a study. Italy, mortality analysis 2011-2013

All deaths from January 1, 2011 to December 31, 2013 of subjects resident in Italy and aged ≥ 20 years with any mention in the death certificate of HCV (ICD-10 codes B17.1, B18.2) or HBV infection (ICD-10) B16.0-B16.9, B17.0, B18.0, B18.1) were extracted.

Distribution of the underlying cause of death among decedents with mention of hepatitis C or hepatitis B infection, by age class, Italy, 2011-2013..



(MCOD)

Multiple causes of death analyses carried out on the Italian National Cause of Death Register

Table 1 Mortality associated with hepatitis C virus infection across Italian areas: age-standardized mortality rates per 100000 (European standard population), 2011-2013

	Italy	North-West	North-East	Centre	South	Islands
20-39 yr	0.4	0.4	0.4	0.5	0.4	0.5
40-59 yr	7.7	9.1	6.8	8.7	6.5	6.7
60-79 yr	30.9	31.1	22.8	21.9	45.0	34.5
80+ yr	106.1	120.3	99.9	80.1	125	95.2
All ages 20+	17.7	19.1	14.8	14.0	22.1	17.6

Fedeli U. 2017 *World J Gastroenterol 2017 March 14; 23(10)* Mortality associated with hepatitis C and hepatitis B virus infection: A nationwide study on multiple causes of death

Another approach to the estimation of mortality……..

2006

ELSEVIER

Journal of Hepatology 45 (2006) 529–538

Journal of Hepatology

www.elsevier.com/locate/jhep

The contributions of hepatitis B virus and hepatitis C virus infections to cirrhosis and primary liver cancer worldwide☆

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[1]*Centers for Disease Control and Prevention, National Center for Infectious Diseases, Division of Viral Hepatitis, Epidemiology Branch, Atlanta, GA 30333, USA*

[2]*World Health Organization, Department of Blood Safety and Clinical Technology, Geneva, Switzerland*

Background/Aims: End-stage liver disease accounts for one in forty deaths worldwide. Chronic infections with hepatitis B virus (HBV) and hepatitis C virus (HCV) are well-recognized risk factors for cirrhosis and liver cancer, but estimates of their contributions to worldwide disease burden have been lacking.

Methods: The prevalence of serologic markers of HBV and HCV infections among patients diagnosed with cirrhosis or hepatocellular carcinoma (HCC) was obtained from representative samples of published reports. Attributable fractions of cirrhosis and HCC due to these infections were estimated for 11 WHO-based regions.

Results: Globally, 57% of cirrhosis was attributable to either HBV (30%) or HCV (27%) and 78% of HCC was attributable to HBV (53%) or HCV (25%). Regionally, these infections usually accounted for >50% of HCC and cirrhosis. Applied to 2002 worldwide mortality estimates, these fractions represent 929,000 deaths due to chronic HBV and HCV infections, including 446,000 cirrhosis deaths (HBV: $n = 235{,}000$; HCV: $n = 211{,}000$) and 483,000 liver cancer deaths (HBV: $n = 328{,}000$; HCV: $n = 155{,}000$).

Conclusions: HBV and HCV infections account for the majority of cirrhosis and primary liver cancer throughout most of the world, highlighting the need for programs to prevent new infections and provide medical management and treatment for those already infected.

Estimates of the attributable fractions of cirrhosis and hepatocellular carcinoma due to infection with HBV and HCV, by region

Region	Attributable fractions of cirrhosis			Attributable fractions of HCC		
	HBV (%)	HCV (%)	Combined (%)	HBV (%)	HCV (%)	Combined (%)
AFR-D/E	44	16	60	47	18	65
AMR-A	5	42	47	16	48	64
AMR-B/D	8	23	31	43	21	64
EMR-B	35	36	71	59	13	72
EMR-D	27	51	78	26	47	73
EUR-A	13	38	51	18	44	62
EUR-B/C	25	34	59	51	15	66
SEAR-B	28	30	58	37	27	64
SEAR-D	26	14	40	47	28	75
WPR-A	14	62	76	25	66	91
WPR-B	57	21	78	65	18	83
World	30	27	57	53	25	78

2017

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SHORT COMMUNICATION

WILEY JVH

Capacity to report on mortality attributable to chronic hepatitis B and C infections by Member States: An exercise to monitor progress towards viral hepatitis elimination

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[3]European Programme for Intervention Epidemiology Training (EPIET), Stockholm, Sweden

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Summary

Viral hepatitis is globally leading causes of death, and 96% of these are due to hepatitis B and C (HBV/HCV) late outcomes. The first Global Health Sector Strategy (GHSS) aims to reduce by 65% the mortality associated with HBV/HCV, and an indicator (C10) is proposed to monitor progress. Data on viral hepatitis and liver-related mortality are required, and different methods of estimation can be used, depending on availability and quality of sources. We aimed to understand the current situation and practicality of calculating C10, accessing available sources to estimate initial figure for Europe. We listed and compiled regional and national data sources reporting deaths from HCC, cirrhosis and chronic liver disease (CLD) and available estimates of attributable fraction. We critically appraised quality of data, highlighting gaps in current data and estimated mortality attributable to HBV and HCV, for 31 EU/EEA countries from 2010 to 2015. Mortality data are available for 30/31 countries. Quality varies but 60% of national sources report with specificity as required by WHO indicator. Attributable fraction is only available through the literature search. We estimated C10 for 87.6% country-years. Deaths attributable to HBV/HCV for this period and region were 292 600, while HCV deaths were three times higher. Incomplete data for 2015 prevented calculation of time trends. Regional sources are outdated for monitoring C10, but national sources are capable of reporting mortality data. Sources for attributable fraction are sparse, outdated and much needed. We recommend improvement of death registration allowing measuring this indicator. Studies measuring attributable fraction on national and subnational levels are crucial.

KEYWORDS

chronic hepatitis B, chronic hepatitis C, epidemiological monitoring, hepatocellular carcinoma, mortality

	Mortality (ICD 10 codes)			Deaths attributable to HCV (Mortality × AF[f])					
	HCC	Cirrhosis	CLD						
2014	C22.0	K74.3, K74.4, K74.5, K74.6	K72 - K75	HCC	Cirrhosis	CLD	Total	HCV mortality rate (100 000)	Ratio HCV:HBV
Austria[a]	994	1480	1548	365	562	588	1515	17.8	3.1
Belgium[a]	395	606	738	127	145	177	449	4.0	2.4
Bulgaria[b]	277	1211	1649	122	460	627	1209	16.7	2.9
Croatia[b]	191	421	441	84	160	168	412	9.7	2.8
Cyprus[c]	8	35	43	4	13	16	33	3.8	2.8
Czech Rep.[b]	274	483	628	121	116	151	387	3.7	1.4
Denmark[a]	189	49	115	83	19	44	145	2.6	2.6
Estonia[b]	35	61	207	15	23	79	117	8.9	2.9
Finland[b]	275	114	143	121	43	54	219	4.0	2.6
France[d]	4211	2568	3214	1735	976	1221	3932	6.0	2.8
Germany[b]	4217	5622	6340	759	1619	1826	4204	5.2	1.8
Greece[a]	616	1094	1442	71	416	548	1035	9.5	1.5
Hungary[a]	151	362	438	66	138	166	370	3.7	2.8
Ireland[b]	100	95	122	44	36	46	126	2.7	2.7
Italy[b]	4960	4913	5590	2921	3439	3913	10 274	16.9	4.9
Latvia[a]	47	229	241	21	87	92	199	9.9	2.8
Liechtent.[a]	0	1	1	0	0	0	1	2.7	-
Lithuania[d]	81	462	484	36	176	184	395	13.4	2.9
Luxembourg[c]	28	30	37	12	11	14	38	6.9	2.7
Malta[a]	8	6	12	4	2	5	10	2.4	2.5
Netherlands[a]	373	337	422	76	166	208	450	2.7	2.7
Norway[d]	64	56	104	28	21	40	89	1.7	2.8
Poland[b]	418	1968	2518	184	748	957	1889	5.0	2.9
Portugal[b]	535	455	623	340	173	237	750	7.2	3.5
Romania[c]	757	7850	8512	333	2983	3235	6551	32.8	2.9
Slovakia[a]	131	319	405	58	121	154	333	6.1	2.8
Slovenia[a]	276	36	52	121	14	20	155	7.5	2.5
Spain[b]	2791	3127	3656	1602	1188	1389	4180	9.0	3.6
Sweden[d]	247	260	358	36	99	136	271	2.8	3.1
UK[b]	1728	1770	2391	475	673	1389	2537	3.9	3.1
EU/EEA[e]	24 377	36 020	42 474	9965	14 627	17 684	42 274	8.2	3.0

«We listed and compiled regional and national data sources reporting deaths from HCC, cirrhosis and chronic liver disease (CLD) and available estimates of attributable fraction»

G. Duarte. Capacity to report on mortality attributable to chronic hepatitis B and C infections by Member States: An exercise to monitor progress towards viral hepatitis elimination. *J Viral H © 2018 John Wiley & Sons Ltd epat. 2018*

What are the data on mortality from viral hepatitis in Russia? Federal state statistics service data: mortality due to causes of death in 2017

www.gks.ru/free_doc/new_site/population/demo/demo24-2.xls

Шифр по краткой номенклатуре причин смерти	Причина смерти Cause of death	Городское население Urban population	Сельское население Rural population	Все население Total population
А	Б	1	2	3
37	Острый гепатит А	1	1	2
38	Острый гепатит В	20	1	21
39	Острый вирусный гепатит С	8	4	12
40	Хронические вирусные гепатиты В	268	55	323
41	Хронический вирусный гепатит С Chronic hepatitis C	1340	224	1564
42	Прочие вирусные гепатиты	162	40	202
37-42(Вирусные гепатиты)		**1799**	**325**	**2124**

Смертность на 100 населения в России -1,08?. The mortality per 100 of the population in Russia - 1,08?

Население России 144,5 млн. The population of Russia is 144.5 million (2017)

In 2018, a prospective analysis of mortality in various liver lesions for 6 months of 2018 was carried out in Moscow.

Deaths caused by HCV/HBV virus infection as a primary cause of death (UCOD) were analyzed.

The analysis of a representative for the studied population sample of protocols of pathoanatomical autopsies and medical histories of medical institutions of the Department of Health of the city of Moscow with extrapolation of the obtained parameters to the total number of deaths in Moscow.

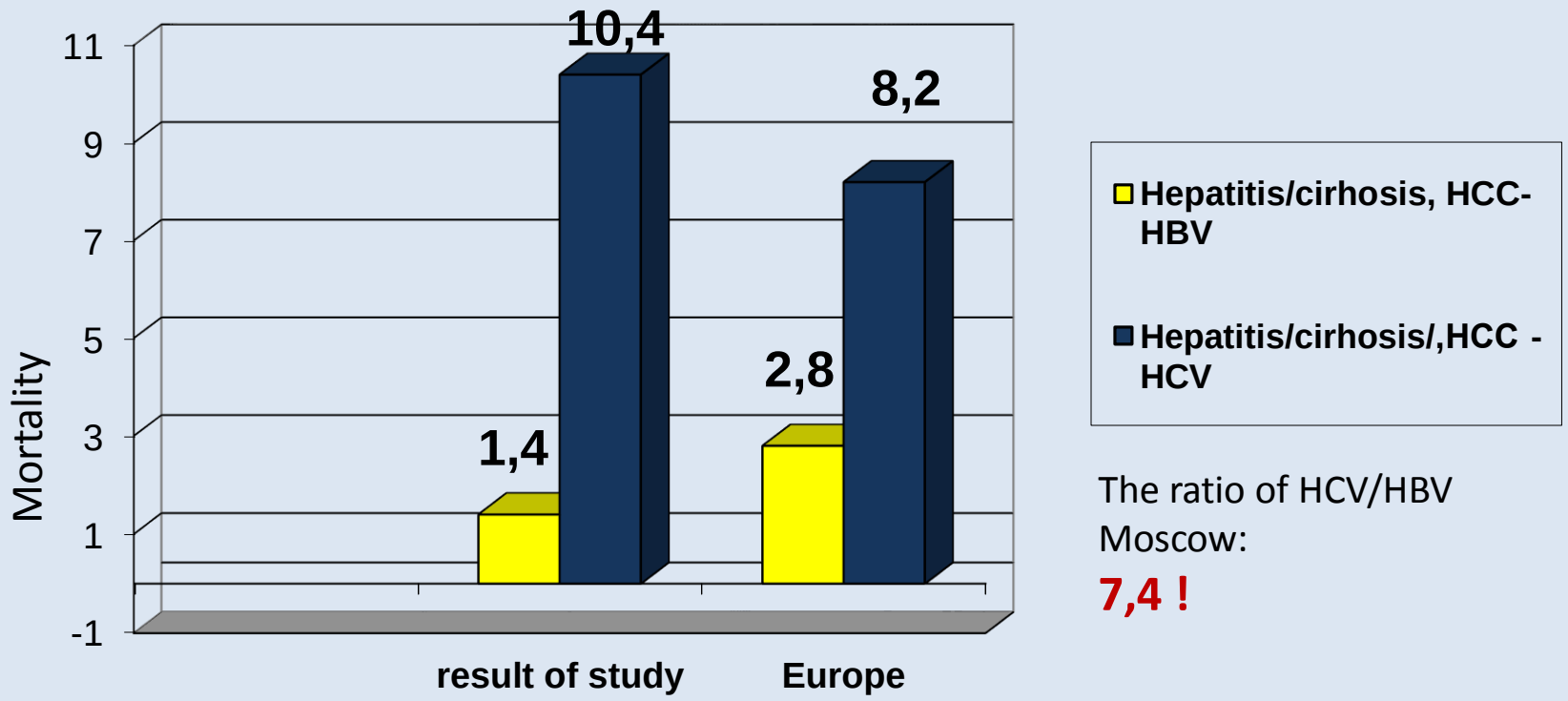
The Bernoulli theorem and the Laplace function for 95% confidence probability (P=0.95 and t = 1.96) were used to extrapolate the obtained parameters to the number of deaths in Moscow in 6 months of 2018 (at $p<0.05$).

N.D. Yuschuk, O.O. Znoyko, N.A., Zairatyants O. V., Gudkova, S., B. Dudina K. R. Unpublished data

Ющук Н.Д., Зайратьянц О.В., Знойко О.О., Гудкова С.Б., Дудина К.Р. Неопубликованные данные

THE RESULTS OF THE STUDY: THE NUMBER OF DEATHS FROM HCV AND HBV FOR 6 MONTHS OF 2018, MOSCOW

Taking into account only the original causes of death-the main diseases of UCOD



The ratio of HCV/HBV Moscow:

7,4 !

Примечания: *результаты исследования* – экстраполяция данных ПАО ЛПУ ДЗМ на общее число умерших от всех причин в г. Москве (2018 г 6 мес) ; данные по Европе за 2014 г. (Duarte G., Williams C. J., Vasconcelos P., Nogueira P., J. Viral Hepat. 2018; 25:878–882). Численность населения г. Москвы на 01.01.2018 г. – **12.506.500** человек (по данным Росстата, www.gks.ru)

N.D. Yuschuk, O.O. Znoyko, N.A., Zairatyants O. V., Gudkova, S., B. Dudina K. R. Unpublished data

Thank you very much for your attention…