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

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

<table>
<thead>
<tr>
<th>Categories</th>
<th>Категории</th>
<th>Стоимость, млрд. руб.</th>
<th>Proportion %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burden of Hepatitis C</td>
<td>Бремя ВГС</td>
<td>48,47</td>
<td>100,00%</td>
</tr>
<tr>
<td>Direct medical costs</td>
<td>Прямые мед. затраты</td>
<td>17,10</td>
<td>35,28%</td>
</tr>
<tr>
<td>Disability payments</td>
<td>Выплаты по инвалидности</td>
<td>5,32</td>
<td>10,97%</td>
</tr>
<tr>
<td>GDP losses</td>
<td>Потери ВВП</td>
<td>26,05</td>
<td>53,75%</td>
</tr>
</tbody>
</table>

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"**

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. Собраные mapCrowd данные доступны бесплатно на сайте mapCrowd.org;

![Chart showing the burden of direct medical costs associated with hepatitis C](image)
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...

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

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


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

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
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 certificate 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:

MORTALITY DATA FROM VIRAL HEPATITIS IN RUSSIA CAN BE FOUND IN PUBLICATIONS, BUT DATA SOURCES ARE OFTEN IMPOSSIBLE TO DETERMINE.....
NUMBER OF MEMBER STATES ABLE TO REPORT ON WHO CORE HBV/HCV INDICATORS, BASED ON INFORMATION OBTAINED FROM THE SURVEY

<table>
<thead>
<tr>
<th>Country</th>
<th>Liver cirrhosis</th>
<th>Chronic liver disease</th>
<th>Liver cancer</th>
<th>End stage liver disease</th>
<th>Liver transplant</th>
<th>Liver cirrhosis</th>
<th>Chronic liver disease</th>
<th>Liver cancer</th>
<th>End stage liver disease</th>
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<td>France*</td>
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<td>✓</td>
<td>✓</td>
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<td>✓</td>
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<td>✓</td>
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<tr>
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<td>✓</td>
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<tr>
<td>Romania*</td>
<td>✓</td>
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<td>✓</td>
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<td>✓</td>
</tr>
<tr>
<td>UK-E and W*</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>UK-Scotland*</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Total **</td>
<td>6 (18)</td>
<td>7 (14)</td>
<td>6 (20)</td>
<td>6 (12)</td>
<td>7 (18)</td>
<td>5 (18)</td>
<td>5 (16)</td>
<td>6 (21)</td>
<td>4 (12)</td>
</tr>
</tbody>
</table>

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

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

<table>
<thead>
<tr>
<th>HBV</th>
<th>HCV</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 (14%)</td>
<td>5 (23%)</td>
</tr>
<tr>
<td>7 (32%)</td>
<td>12 (55%)</td>
</tr>
<tr>
<td>6 (27%)</td>
<td>5 (23%)</td>
</tr>
<tr>
<td>5 (23%)</td>
<td>6 (27%)</td>
</tr>
<tr>
<td>5 (23%)</td>
<td>5 (23%)</td>
</tr>
</tbody>
</table>
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.

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

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

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.......

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

Joseph F. Perz1*, Gregory L. Armstrong1, Leigh A. Farrington1, Yvan J.F. Hutin2, Beth P. Bell1

1Centers for Disease Control and Prevention, National Center for Infectious Diseases, Division of Viral Hepatitis, Epidemiology Branch, Atlanta, GA 30333, USA
2World Health Organization, Department of Blood Safety and Clinical Technology, Geneva, Switzerland

Background/times: 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 329,000 deaths due to chronic HBV and HCV infections, including 46,000 cirrhosis deaths (HBV: n = 235,000; HCV: n = 211,000) and 453,000 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

<table>
<thead>
<tr>
<th>Region</th>
<th>Attributable fractions of cirrhosis (%)</th>
<th>Attributable fractions of HCC (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HBV</td>
<td>HCV</td>
</tr>
<tr>
<td>AFR-D/E</td>
<td>44</td>
<td>16</td>
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<tr>
<td>AMR-A</td>
<td>5</td>
<td>42</td>
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<tr>
<td>AMR-B/D</td>
<td>8</td>
<td>23</td>
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<tr>
<td>EMR-B</td>
<td>35</td>
<td>36</td>
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<tr>
<td>EMR-D</td>
<td>27</td>
<td>51</td>
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<tr>
<td>EUR-A</td>
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<td>38</td>
</tr>
<tr>
<td>EUR-B/C</td>
<td>25</td>
<td>34</td>
</tr>
<tr>
<td>SEAR-B</td>
<td>28</td>
<td>30</td>
</tr>
<tr>
<td>SEAR-D</td>
<td>26</td>
<td>14</td>
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<tr>
<td>WPR-A</td>
<td>14</td>
<td>62</td>
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<tr>
<td>WPR-B</td>
<td>57</td>
<td>21</td>
</tr>
<tr>
<td>World</td>
<td>30</td>
<td>27</td>
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</tbody>
</table>

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

G. Duarte123 | C. J. Williams34 | P. Vasconcelos2 | P. Nogueira2

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2Directorate General of Health, Lisbon, Portugal
3European Programme for Intervention Epidemiology Training (EPET), Stockholm, Sweden
4Public Health Wales, Cardiff, UK

Correspondence
Guilherme Duarte, Directorate General of Health, Lisbon, Portugal
Email: gsdurate@ds.snsaula.pt

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.

KEYWORDS
chronic hepatitis B, chronic hepatitis C, epidemiological monitoring, hepatocellular carcinoma, mortality
<table>
<thead>
<tr>
<th></th>
<th>Mortality (ICD 10 codes)</th>
<th>Deaths attributable to HCV (Mortality × AF)</th>
<th>Ratio HCV:HBV</th>
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</thead>
<tbody>
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<td></td>
<td>HCC</td>
<td>Cirrhosis</td>
<td>CLD</td>
</tr>
<tr>
<td>2014</td>
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<td>Cyprus</td>
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<td>35</td>
<td>43</td>
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<td>Czech Rep.</td>
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<td>UK</td>
<td>1728</td>
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</tr>
<tr>
<td>EU/EEA</td>
<td>24377</td>
<td>36020</td>
<td>42474</td>
</tr>
</tbody>
</table>

«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»
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

<table>
<thead>
<tr>
<th>Номер</th>
<th>Причина смерти</th>
<th>Городское население</th>
<th>Сельское население</th>
<th>Все население</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Urban population</td>
<td>Rural population</td>
<td>Total population</td>
</tr>
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<td>37</td>
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<td>1</td>
<td>2</td>
</tr>
<tr>
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<td>Острый гепатит В</td>
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<tr>
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<td>4</td>
<td>12</td>
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<td>55</td>
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<td>42</td>
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<td>Вирусные гепатиты</td>
<td>1799</td>
<td>325</td>
<td>2124</td>
</tr>
</tbody>
</table>

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).

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


Thank you very much for your attention...