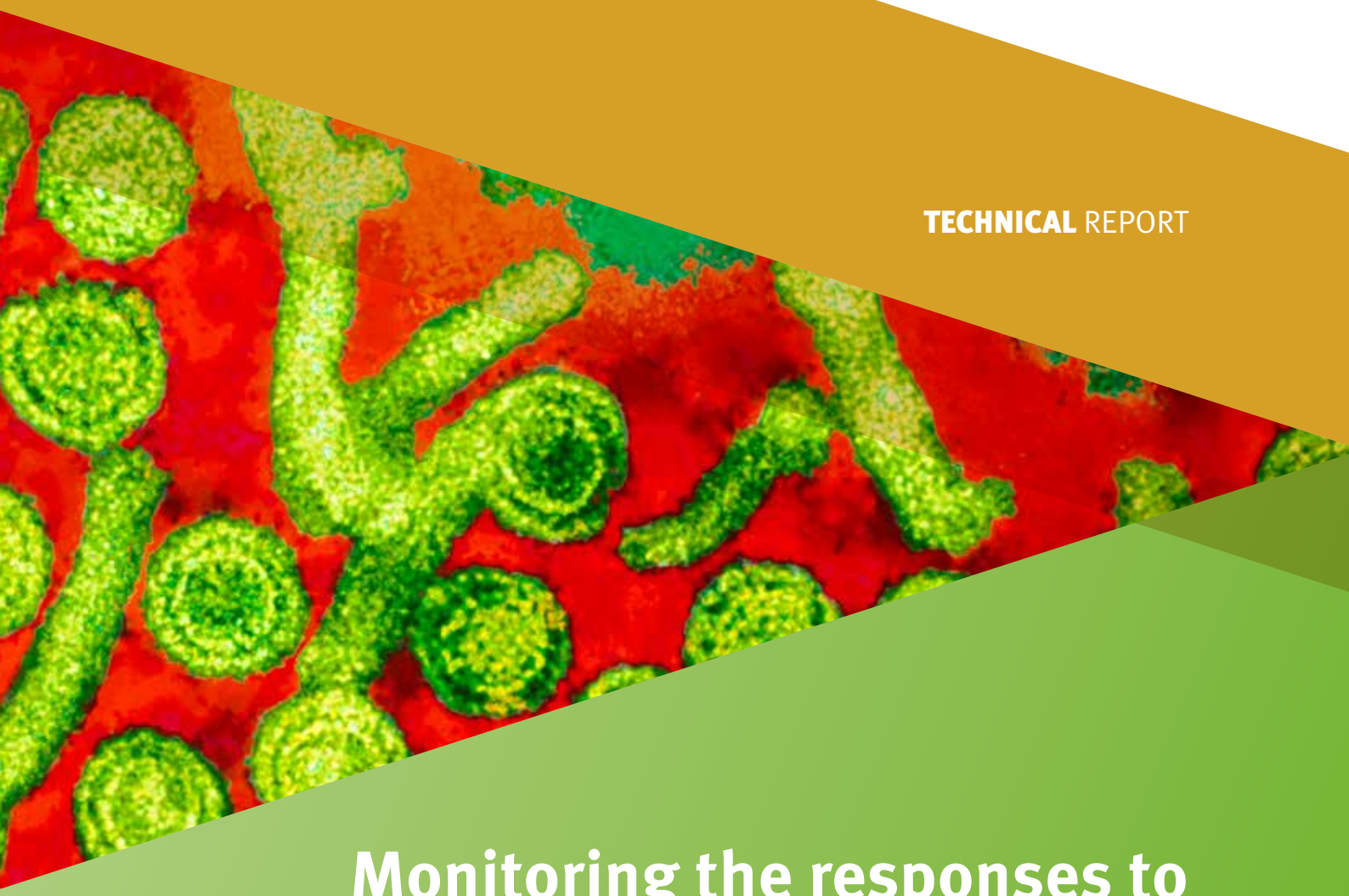
ecdc
EUROPEAN CENTRE FOR DISEASE PREVENTION AND CONTROL



TECHNICAL REPORT

Monitoring the responses to hepatitis B and C epidemics in the EU/EEA Member States

2019

www.ecdc.europa.eu

ECDC TECHNICAL REPORT

Monitoring the responses to hepatitis B and C epidemics in EU/EEA Member States, 2019

This report was produced by Erika Duffell and Teymur Noori of the European Centre for Disease Prevention and Control (ECDC).

Acknowledgements
The authors would like to thank the following individuals for their invaluable input in reviewing the document.

Austria: Bernhard Benka, Irene Kaszoni-Rueckerl, Robert Sauermann, Daniela Schmid. Belgium: Sophie Quoilin. Bulgaria: Marieta Simonova, Mariya Tyufekchieva, Tonka Varleva. Croatia: Tatjana Nemeth Blažić, Adriana Vince. Cyprus: Petros Katsioloudes. Czech Republic: Jitka Castkova, Vratislav Nemecek. Denmark: Susan Cowan. Estonia: Kristi Rüütel, Jevgenia Epštein. Finland: Henrikki Brummer-Korvenkontio, Tuija Leino, Kirsi Liitsola. France: Cecile Brouard, Mathias Bruyand, Stella Laporal. Lionel Lavin. Germany: Sandra Dudareva, Thomas Harder, Christian Kollan, Katrin Kremer, Daniel Schmidt, Ida Sperle-Heupel, Gyde Steffen, Ruth Zimmermann. Greece: Georgia Nikolopoulou, George Papatheodoridis. Hungary: Mihály Makara, Zsuzsanna Molnár. Iceland; Thorolfur Gudnason, Sigurdur Olafsson. Ireland; Linda Cosgrove, Kevin Kelleher, Mary Kelleher, Joanne Moran, Niamh Murphy, Karen Logan, Lois O'Connor, Aisling O'Leary. Italy: Maria Elena Tosti, Francesco Paolo Maraglino, Barbara Suligoi. Latvia: Raina Nikiforova, Ieva Melišus. Liechtenstein: Andrea Leibold. Lithuania: Irma Caplinskiene, Ligita Jančorienė. Luxembourg: Vic Arendt, Carole Devaux, Laurence Guillorit, Patrick Hoffman. Malta: Jackie Maistre Melillo, Tanya Melillo. Netherlands: Irene Veldhuijzen. Norway: Hans Blystad, Hilde Kløvstad, Øivind Nilsen. Poland: Magdalena Rosińska, Małgorzata Stępień. Portugal: Isabel Aldir, Ana Cláudia Cordeiro Fernandes, Rui Tato Marinho. Romania: Adriana Pistol, Corina Silvia Pop, Odette Popovici. Slovakia: Mária Avdičová, Ľubomír Skladaný. Slovenia: Kastelic Andrej, Mitja Ćosić, Mojca Gobec, Irena Klavs, Janja.Krizman-Miklavcic, Zdenka Kastelic, Sandra Kosmac, ; Tanja Kustec, Ines Kvaternik, Eva Leban, Snezna Levicnik, Mojca Matičič, Mario Poljak, Maja Socan, Marta Vitek. Spain: Raquel Boix Martínez, Asunción Díaz Franco. Sweden: Maria Axelsson, Josefine Lundberg Ederth. United Kingdom: England – Koye Balogun, Ian Hayden, Ross Harris, Helen Harris, Goergina Ireland, Sema Mandal; Scotland - David Goldberg, Sharon Hutchinson, Andrew McAuley, Allan McLeod, Shanley Smith, Lesley Wallace, Alan Yeung; Wales – Noel Craine, Brendan Healy, Amy Plimmer, Jane Salmon, Josie Smith, Drew Turner, Jana Zitha.

European Liver Patients Association: Marko Korenjak, Tatjana Reic.
European Monitoring Centre for Drugs and Drug Addiction: Thomas Seyler.
WHO Regional Office for Europe: - Giorgi Kuchukhidze, Antons Mozalevskis.
EMIS-2017: Axel J Schmidt.
Correlation Network – Eberhard Shatz
Viral Hepatitis Prevention Board – Greet Hendrickx
European Association for the Study of the Liver – Francesco Negro, Maria Buti
World Hepatitis Alliance – Rachel Halford

ECDC: Andrew Amato-Gauci, Otilia Mardh, Lina Nerlander.

Suggested citation: European Centre for Disease Prevention and Control. Monitoring the responses to hepatitis B and C epidemics in EU/EEA Member States, 2019. Stockholm: ECDC; 2020.

Stockholm, April 2020

ISBN 978-92-9498-461-6
doi: 10.2900/034039
Catalogue number TQ-04-20-221-EN-N

Contents

Figures

Tables

Abbreviations

CLD	Chronic liver disease
CVH	Chronic viral hepatitis
CoE	Council of Europe
EAP	European Action Plan
EEA	European Economic Area
EMCDDA	The European Monitoring Centre for Drugs and Drug Addiction
EMIS	European Men-Who-Have-Sex-With-Men Internet Survey
EU	European Union
FTE	full-time equivalent
GHSS	Global Health Sector Strategy
HAI	healthcare-associated infection
HAV	Hepatitis A virus
HBV	Hepatitis B virus
HBsAg	Hepatitis B surface antigen
HCC	Hepatocellular carcinoma
HCV	Hepatitis C virus
HDV	Hepatitis D virus
HIV	Human immunodeficiency virus
ICD	International Classification of Diseases
IPC	Infection prevention and control
NAT	Nucleic acid testing
NSP	Needle and syringe programme
MSM	Men who have sex with men
OST	Opioid substitution therapy
PPS	Point prevalence survey
PWID	People who inject drugs
STIs	Sexually transmitted infections
SDGs	Sustainable Development Goals
UN	United Nations
WHO	World Health Organization

Key findings

- Based on **estimates of prevalence** in the general population, there are an estimated total of 4.7 million chronic hepatitis B virus (HBV) cases and 3.9 million chronic hepatitis C virus (HCV) cases in the European Union/European Economic Area (EU/EEA). Although the region is a low prevalence region for both infections, there is wide variation among countries with estimates of hepatitis B surface antigen (HBsAg) prevalence in the general population up to 4.4% and anti-HCV prevalence to 5.9%. Estimates of HBsAg among key risk groups show similar variation with very high prevalence of HBsAg reported among prisoners (25.2% in Bulgaria) and injecting drug users (5.6% in Cyprus), highlighting gaps in vaccination programmes. There is greater variation in the range prevalence of anti-HCV among key risk groups with extremely high levels of infection (>50%) reported among injecting drug users in most countries with available data and among prisoners (45.8% in Finland).
- **Estimates of the size of key populations** affected by hepatitis are important but are lacking in most countries. Estimates of the prevalence of injecting drug use are available from the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) and these show variation between countries. Data from three countries indicate that nearly a half of those injecting report having shared needles/syringes in the last four weeks.
- **Vaccination** is a major component of any hepatitis B prevention strategy and data indicate that although four countries lack a national policy for universal vaccination of children, 83% of EU/EEA countries that implement childhood vaccination have achieved 90% coverage with three doses of HBV vaccine. Robust data on coverage among key populations such as prisoners and people who inject drugs (PWID) are lacking and available information suggests gaps in local policies targeting these groups.
- Perinatal transmission of HBV is not commonly reported in EU/EEA countries. Countries implement different strategies to **prevent mother-to-child transmission** but data are lacking on these programmes. Available data from the five countries that implement universal new-born vaccination indicate that four of these countries (80%) report 85% coverage with a timely HBV birth dose[1] and all the countries that implement antenatal screening and have available data report 85% coverage of screening in pregnant women and 90% coverage with post-exposure prophylaxis.
- In terms of **blood safety**, the prevalence of HBV and HCV infections among first time blood donors is low and the number of transfusion associated HBV and HCV infections reported by EU/EEA countries is low. All EU/EEA countries screen blood donations using quality assured methods in accordance with to EU standards and have haemovigilance systems in place.
- **Transmission of infection among men who have sex with men** (MSM) was reported to account for around one in seven acute HBV and HCV infections in 2017. Evidence from the recent European Men-Who-Have-Sex-With-Men Internet Survey (EMIS) indicates gaps in service provision in relation to HBV vaccination targeting MSM.
- PWID are disproportionally affected by HBV and HCV infections due to the **sharing of injecting equipment** and epidemiological evidence indicates a high prevalence of both infections, especially HCV, and ongoing transmission. Countries have implemented **prevention programmes targeting PWID** but data on the **coverage** are lacking from half the countries. The available data indicate that only a small proportion of countries have achieved the 2020 target for coverage of needle and syringe programmes (NSP) but the majority of countries with data have reached the 40% coverage target for opioid substitution therapy (OST).
- Around a third of all EU/EEA countries reported no **action plan or strategy for hepatitis** prevention and control and, of those with a plan/strategy, nearly half reported there was no funding for implementation. However, it should be noted that the existence of an action plan or strategy does not always correlate with progress made at the local level towards elimination.
- Overall, 23 countries provided data for at least one of the four key stages of the **continuum of hepatitis B care** and 27 countries provided data for **hepatitis C care**. Two countries were able to provide data along the continuum for hepatitis B and 11 countries provided data for hepatitis C. There were significant gaps in the completeness of data and the robustness of the data is suboptimal in many areas. Increasing the availability and robustness of data is important, as it enables countries to assess with confidence the effectiveness of their hepatitis B and C response; monitor progress towards the Sustainable Development Goals (SDGs) and European Action Plan targets and identify areas that require greater attention, particularly the significant health inequalities faced by certain key population groups.

[1] Given within 24 hours of birth.

- In terms of **diagnosis**, for hepatitis B, among the 12 countries with data only one in five people with the infection have been diagnosed. Among these 12 countries, only four have already achieved the 2020 target of having 50% of all persons with chronic infection diagnosed. For hepatitis C, among the 16 countries with data available just over a quarter of the cases were reported to have been diagnosed. Among these 16 countries, six have already achieved the 2020 target for diagnosis. Among the limited number of countries with estimates of the proportion of newly diagnosed HBV and HCV cases with end-stage liver disease, estimates varied across countries, reaching up to 49.3% for HBV and 45% for HCV.
- Few countries had data available regarding **linkage to care.** Only six countries had data on both the number of people with HBV infection diagnosed and the number receiving care for HBV, and seven countries had data on numbers diagnosed and receiving care for HCV. None of the countries with available data achieved the 2020 target of having 90% of diagnosed HBV or HCV patients linked to care.
- In terms of **treatment,** no country was able to provide data on the number of patients diagnosed with chronic HBV infection who were eligible for treatment and receiving treatment to assess progress towards the target of having over 75% on treatment. For hepatitis C, only one of the 12 countries reporting data had achieved the target of having 75% of the diagnosed eligible patients with chronic HCV infection receive effective treatment. One of the three countries with available data on viral suppression has reached the target of having 90% of those on long-term treatment achieving viral suppression for hepatitis B. All of the 12 countries with available data for hepatitis C have achieved the target of having at least 90% of those treated cured.
- In terms of **mortality**, the total number of deaths in 2015 from end-stage liver diseases, as defined by WHO, was 65 029. When compared with 2011, the mortality rate in 2015 for all cases of hepatocellular carcinoma and chronic viral hepatitis increased by 5.3% and 2.3%, respectively, but the rate decreased for non-alcohol related cirrhosis and chronic liver disease by 9.5% and 7.2%. None of these trends were statistically significant. Progress towards the 2030 elimination target of a 65% reduction in mortality from the 2015 baseline is currently sub-optimal.

1 Background

1.1. Context

In the European Union (EU) and European Economic Area (EEA) an estimated 4.7 million people are living with chronic hepatitis B virus (HBV) and 3.9 million people with the hepatitis C virus (HCV) [1]. Both infections are major causes of chronic liver disease, liver cirrhosis and hepatocellular carcinoma. The resulting burden of disease presents a public health challenge for national health systems. Although the incidence of new infections has declined across Europe due to effective HBV vaccination programmes and prevention strategies targeting transmission through injecting drug use, blood safety and healthcare, modelling suggests that long-term morbidity and mortality will continue to increase [2,3].

The United Nations (UN) Sustainable Development Goals (SDGs) [4] were adopted by world leaders in 2015 to further develop and promote prosperity while protecting the planet. The 17 goals (and 169 targets) are considered integrated and indivisible and promote a multi-sectoral approach in providing solutions. SDG3[2] includes Target 3.3 'End the epidemics of AIDS, tuberculosis, malaria, and neglected tropical diseases and combat hepatitis, water-borne and other communicable diseases'. Given the different modes of transmission and main groups affected, reducing hepatitis infections and their subsequent morbidity/mortality requires a strong multi-disciplinary approach that is aligned with the universal health coverage framework which underpins the SDGs. The EU/EEA is committed to implementing the 2030 Agenda for Sustainable Development[3] and the SDGs and monitoring progress towards these goals in EU/EEA countries.

The World Health Organization (WHO) Global Health Sector Strategy (GHSS) for viral hepatitis, adopted in 2016, aims to eliminate viral hepatitis as a public health threat by 2030 and provides an opportunity to upscale efforts for tackling the epidemics of hepatitis B (HBV) and hepatitis C virus (HCV) infections [5]. The concept of elimination for these infections is based on the global targets set by WHO for reducing the incidence of chronic infections by 90% and the attributable mortality by 65% by 2030. The WHO Regional Office for Europe (WHO Europe), has developed a hepatitis action plan to steer the implementation of the GHSS in the European Region [6]. This regional plan was endorsed by the 53 Member States of the WHO European Region in September 2016. Some of its targets are even more ambitious than the global targets, in recognition of the existing prevention and control efforts in the European Region and the capacity of existing systems to further impact on the epidemics.

Understanding the complexity of the hepatitis B and C epidemics and determining the effectiveness and efficiency of the programmatic responses to these infections requires robust data and information that can be provided by a sustainable and comprehensive monitoring and evaluation system drawing on data from various sources. To date there has been no formal system at the EU level to monitor and evaluate the progress made towards the hepatitis targets included in the SDGs, the GHSS on Viral Hepatitis or the WHO European Action Plan for the elimination of hepatitis. The European Centre for Disease Prevention and Control (ECDC) was asked by the European Commission to develop a hepatitis monitoring system to support EU/EEA countries, similar to the established system for monitoring implementation of the Dublin Declaration on Partnership to Fight HIV/AIDS in Europe and Central Asia[4].

1.2 Aims and objectives of the monitoring system

ECDC has developed a monitoring framework for hepatitis B and C covering the EU/EEA Member States that is closely aligned with the targets and milestones in the WHO European Action Plan and the monitoring and evaluation tool developed by WHO [7]. The framework aims to support the implementation and monitoring of the global strategy for hepatitis, and includes a set of pre-defined hepatitis-related indicators. The development of this framework was supported by a group of experts from EU/EEA countries and key partner organisations (see Annex 1).

The main aims of the EU/EEA monitoring system are to:

- support EU/EEA Member States in monitoring their responses to tackling the epidemics of hepatitis B and C in a standardised, high-quality and comparable manner; and
- analyse and interpret these data and disseminate reports that could guide the European Commission, other European Agencies, WHO and other organisations to support Member States in achieving their goal of elimination.

[2] 'Ensure healthy lives and promote well-being for all at all ages'

[3] Communication from the Commission to the European Parliament, The Council, The European Economic and Social Committee and the Committee of the Regions. Next steps for a sustainable European future. European action for sustainability. COM(2016) 739 final. Strasbourg, 22.11.2016.

[4] https://ecdc.europa.eu/en/all-topics-zhiv-infection-and-aidsprevention-and-control/monitoring-implementation-dublin

2 Methods

2.1 Development of the European monitoring system

Using the structure, milestones and targets of the WHO European Action plan as the basis (see Annex 2), key areas relevant for monitoring hepatitis B and C across EU/EEA Member States were identified. In consultation with an ECDC advisory group (Annex 1), potential indicators were determined that best cover each of these areas. Wherever possible, indicators were harmonised with those developed by WHO.

The various indicators and potential sources of data were mapped to identify existing sources of data for inclusion in the system and to identify gaps in the available data sources where data would need to be collected directly from countries. Annex 3 highlights the indicators included in the monitoring system and the data sources for each of these indicators.

2.2. Collation of data from existing sources

The mapping identified several relevant EU projects and other existing data sources and, where possible, the system uses data from these sources to reduce the reporting burden on countries. The most recent data were collated from each of these data sources. A detailed overview of these data sources are listed in Table 1.

Table 1. Details of the existing data sources included in the monitoring system

Data source	Indicator	Details
ECDC	• Prevalence of hepatitis B and C in the general population and risk groups	ECDC Hepatitis B Prevalence Database ECDC Hepatitis C Prevalence Database
	• Infection prevention and control staff	Point Prevalence survey of healthcare associated infections and antimicrobial use in European acute care hospitals [8]
	Incidence of acute HBV infection notifications	ECDC Surveillance Atlas
	• Hepatitis testing policy	ECDC Technical report Hepatitis B and C testing activities, needs, and priorities in the EU/EEA [9]
	• Vaccination of healthcare workers	ECDC survey of strategies used in EU/EEA Member States for protection of hospital-based healthcare workers and third parties (ECDC, Technical report pending publication) [10]
	• HBV vaccination policy	ECDC vaccine scheduler
EMCDDA	• Estimates of the size of the PWID population • Syringes distributed • Number of people receiving OST • National hepatitis policy inclusive of PWID • Testing policies in harm reduction services and prisons	EMCDDA Statistical Bulletin EMCDDA Barometer
WHO/UNICEF	• Coverage of third dose of hepatitis B vaccine (policy and coverage) • National provision of a birth dose of HBV vaccine (Policy and coverage)	WHO immunization, Vaccines and Biologicals – Data, statistics and graphics
WHO EURO survey	• HBV vaccination for key risk groups (policy and coverage for healthcare workers) • HAV (hepatitis A) vaccination for general population and key risk groups (policy) • National antenatal HBV screening programme (policy and coverage) • Provision national antenatal screening programme HCV • Post-exposure prophylaxis of children born to mothers with HBV (policy and coverage) • Provision of antiviral treatment for pregnant women with HBV	WHO Europe– data collected from European countries during 2019 but currently unpublished

Data source	Indicator	Details
WHO Health in Prisons European Database (HIPED)	• HBV vaccination availability in prisons • HBV vaccination coverage in prisons	WHO Health in Prisons European Database
EUROSTAT	• Deaths from hepatocellular carcinoma, cirrhosis and chronic liver diseases • Estimates of migrant populations	https://ec.europa.eu/eurostat/data/database
Council of Europe	• Source of blood donations • HBV and HCV infections among blood donors • HBV and HCV infections among blood donor recipients	Report on the collection, testing and use of blood and blood components in Europe [11]
European Men-Who-Have-Sex-With-Men Internet Survey (EMIS-2017)	• Condom use in MSM • Vaccination against HAV and HBV among MSM • Prevalence of HBV or HCV among HIV infected MSM	European men who have sex with men internet survey [12]

2.3 Collection of data directly from EU/EEA Member States

The mapping of indicators and data sources identified significant gaps in the availability of existing data for several areas and to fill these gaps ECDC developed a standardised, basic data collection tool to collect the data directly from nominated expert focal points working with the national authorities[5]. The questionnaire was developed using the online EU survey tool[6]. Where possible, the indicators were derived from the Global reporting system for hepatitis[7] to ensure close alignment across the systems. The indicators collected through the questionnaire are outlined in Annex 3.

The questionnaire was piloted in four countries via the ECDC hepatitis focal points during 2018. All four pilot countries considered the questionnaire tool easy to use and the proposed questions acceptable, and countries reported that data were available at the national (and sub-national) level for the majority of these data points. After the pilot phase, in order to minimise the reporting burden on countries, the number of indicators was reduced and the questionnaire tool restricted to cover mainly the testing and treatment indicators for which data were not available from existing sources.

Countries were asked to complete the online survey between mid-December 2018 and the end of March 2019. When completing the questionnaire countries were requested to provide national level data for 2017 wherever possible. However, in this first round of data collection countries were encouraged to submit whatever data were available and to provide details as to the date of the data, the source and the geographical coverage. In June 2019, the information reported by each country was returned for validation. Subsequent notifications of corrections were used to update the data reported.

The main analysis conducted was a summary of the data at the national and regional level and an assessment of progress against the European Action Plan milestones and targets. The report is structured around the monitoring framework developed for the project. The report has been developed in cooperation with WHO Europe and EMCDDA and each country has had the opportunity to review the report and validate the data presented on behalf of their country.

[5] https://ec.europa.eu/eusurvey/runner/HepatitisMonitoring2018
[6] https://ec.europa.eu/eusurvey/home/welcome
[7] https://www.who.int/hepatitis/reporting-database/en/

3 Results

3.1 Epidemic context

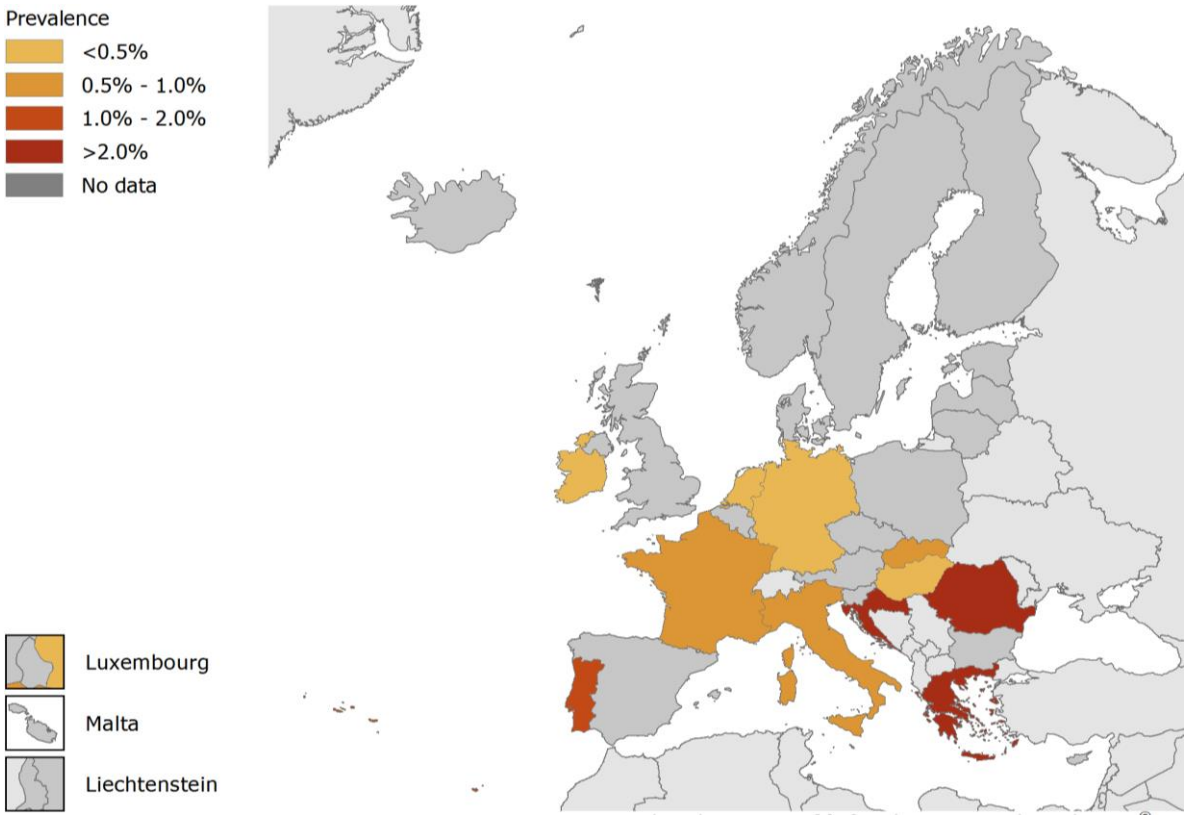
3.1.1 Prevalence

General population

Based on estimates of prevalence in the general population, there are an estimated total of 4.7 million chronic HBV cases and 3.9 million chronic HCV cases in the EU/EEA [1]. According to WHO criteria, the EU is considered to be a low prevalence region for both infections (prevalence <2%).

Between 2008 and 2017, 35 estimates of HBsAg prevalence in the general population from 18 countries were identified and included in the ECDC prevalence database (Annex 6, Table 1). A total of 11 countries had estimates considered to be of higher quality[8] (score ⩾4) (Figure 1). For Germany and Italy, multiple higher quality estimates were available and these were used to calculate a pooled estimate. Among the estimates of higher quality, the HBsAg prevalence in the general population ranged from 0.1% in Ireland to 4.4% in Romania.

Figure 1. HBsAg prevalence in the adult general population in the EU/EEA from studies published 2008–2017*

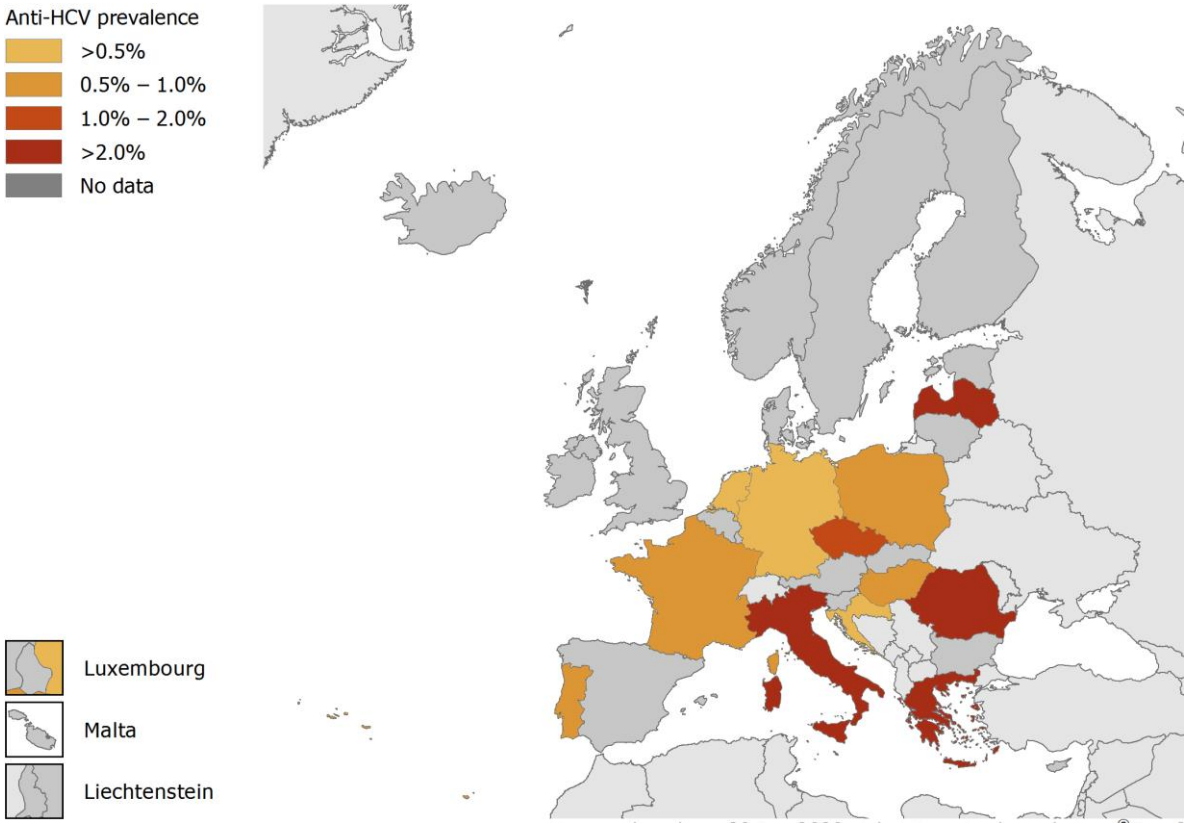


Source: ECDC hepatitis B and C prevalence database: https://ecdc.europa.eu/en/all-topics-zhepatitis-btools/hepatitis-b-prevalence-database
**Data from peer-reviewed publications 2008–2017 with a risk of bias score ⩾4.*
NB. More recent estimates of prevalence reported from Greece - national study found HBsAg prevalence of 1.3% [Reference: personal communication Georgia Nikolopoulou 11.10.2019] and France – national study from 2016 found prevalence of HBsAg of 0.3% [personal communication Cecile Brouard 14.10.2019]. In the United Kingdom, on the basis of a modelling study, HBsAg prevalence was estimated to be <0.5% [personal communication Sema Mandal 14.11.2019].

[8] Studies were evaluated for risk of selection bias using a framework which included the domains of age, gender, sampling method and response rate, and geographical coverage as possible sources of selection bias. Points were awarded in each domain for representativeness or lower risk of bias, and a total score was calculated by summing the values in each domain. This resulted in a score between zero and six for the general population studies. A general population estimate was considered of high quality when it achieved a study quality score ⩾4.

Between 2008 and 2017, there were 44 estimates of anti-HCV prevalence in the general population from 17 countries identified and included in the ECDC prevalence database (Annex 6; Table 2). A total of 12 countries had estimates considered to be of higher quality[9] (score ⩾4) (Figure 2). For Germany, Italy and Poland, multiple higher quality estimates were available and used to calculate a pooled estimate. Among the estimates of higher quality, the anti-HCV prevalence in the general population ranged from 0% in Croatia to 3.9% in Italy.

Figure 2. Anti-HCV prevalence in the adult general population in the EU/EEA*



Source: ECDC hepatitis B and C prevalence database: https://ecdc.europa.eu/en/all-topics-zhepatitis-ctools/hepatitis-c-prevalence-database
**Data from peer-reviewed publications 2008-2017 with a risk of bias score ⩾4.*
NB. More recent estimate of prevalence for Greece from national study in general population found anti-HCV prevalence of 0.7% [reference: personal communication Georgia Nikolopoulou 11.10.2019], France – national study from 2016 with prevalence of HCV RNA of 0.3% [personal communication Cecile Brouard 14.10.2019], Spain - national study in general population 2017–18 with anti-HCV prevalence 0.7% and RNA 0.2% [personal communication Asuncion Diaz 26.09.2019] and Ireland – national study with anti-HCV prevalence of 1.0% (Garvey et al, 2017). In the United Kingdom a modelling study estimated chronic HCV prevalence to be <0.5% [personal communication Sema Mandal 14.11.2019].

People who inject drugs

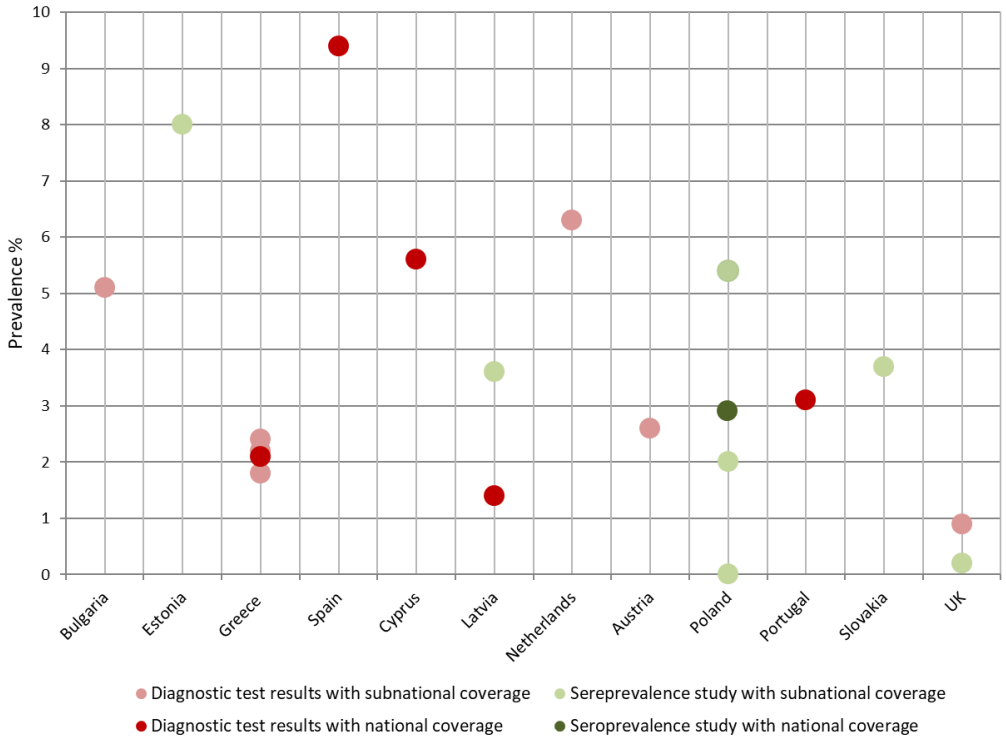
Injecting drug use is a major driver of the hepatitis C epidemic in Europe, with estimates of prevalence up to 81.5% and evidence of ongoing transmission with 40% of acute hepatitis C notifications attributed to injecting drug use [13].

National and subnational estimates of the prevalence of HBsAg and anti-HCV in people who inject drugs (PWID) are collected by the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) (Annex 6; Table 3). The estimates are derived from sero-prevalence studies and from the results of diagnostic testing in drug treatment centres and low-threshold services. EMCDDA recognises that estimates from diagnostic testing sites may be biased and suggests that the data should be interpreted in combination with the data derived from epidemiological studies.

[9] Studies were evaluated for risk of selection bias using a framework which included the domains of age, gender, sampling method and response rate, and geographical coverage as possible sources of selection bias. Points were awarded in each domain for representativeness or lower risk of bias, and a total score was calculated by summing the values in each domain. This resulted in a score between zero and six for the general population studies. A general population estimate was considered of high quality when it achieved a study quality score ⩾4.

National estimates of the prevalence of HBV among PWID were available for six countries in 2016–2017 (Cyprus, Greece, Latvia, Poland, Portugal and Spain). The national prevalence estimates for HBsAg from these countries ranged from 1.4% in Latvia to 9.4% in Spain (Annex 6: Table 3; Figure 3).

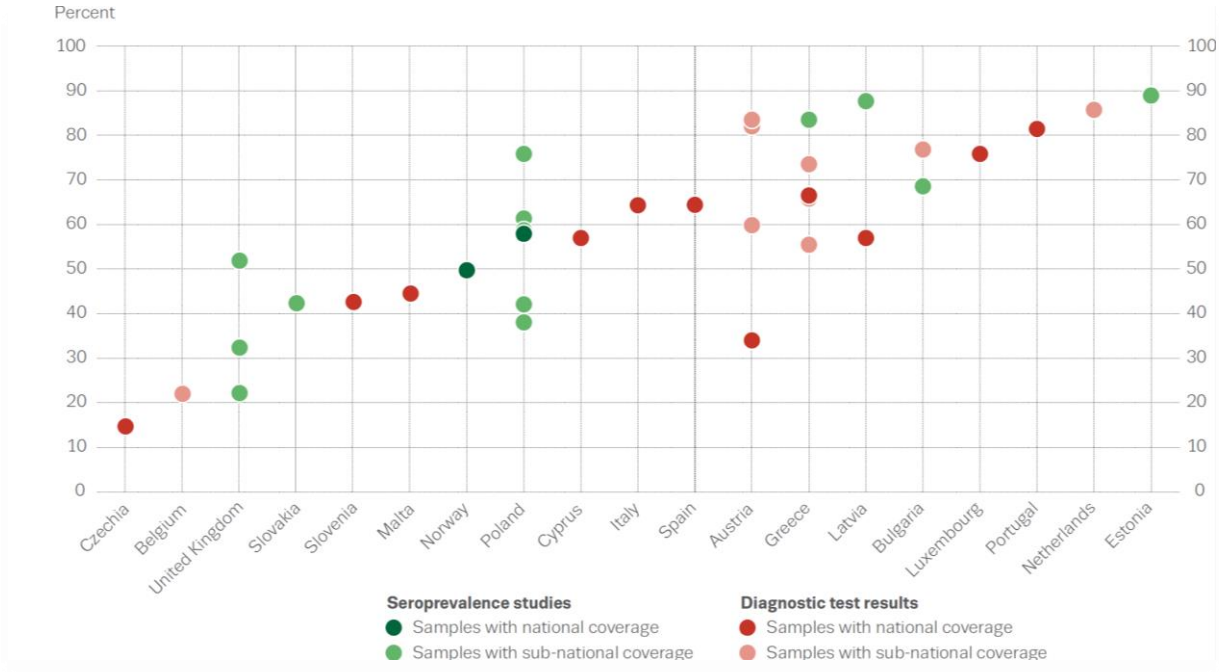
Figure 3. HBsAg prevalence (%) among PWIDs: results from prevalence studies and diagnostic tests with national and subnational coverage, 2016–17



Source: EMCDDA Statistical Bulletin 2019 – drug-related infectious diseases: http://www.emcdda.europa.eu/data/stats2019/drid

National estimates of the prevalence of anti-HCV among PWID were available for 13 countries in 2016–2017 based on the results from prevalence studies and diagnostic testing (Austria, Cyprus, the Czech Republic, Greece, Italy, Latvia, Luxembourg, Malta, Norway, Poland, Portugal, Slovenia, Spain). The national prevalence estimates for anti-HCV in these countries ranged from 14.7% in the Czech Republic to 81.5 % in Portugal (Annex 6: Table 4; Figure 4). In eight of the 13 countries with national data in 2016–17, more than half of PWIDs were reported to be infected with HCV. Among countries with national trend data for the period 2011–17, a declining anti-HCV prevalence among injecting drug users was reported in four countries, while three reported an increase.

Figure 4. HCV antibody prevalence (%) among people who inject drugs: results from sero-prevalence studies and diagnostic tests, with national and subnational coverage, 2016–17



Source: EMCDDA Statistical Bulletin 2019 – drug-related infectious diseases: http://www.emcdda.europa.eu/data/stats2019/drid

Men who have sex with men

Transmission among men who have sex with men continues for both hepatitis B and C, with 13% of acute hepatitis B and 15% of acute hepatitis C notifications attributed to sex between men [13, 14]. The prevalence of infection among this population group is relatively low for both infections, with estimates up to 1.6% for hepatitis B and 4.8% for hepatitis C.

A total of 10 studies published between 2008 and 2017 on the prevalence of HBV in MSM from seven countries (Croatia, Denmark, Estonia, France, the Netherlands, Spain and the United Kingdom) are included in the ECDC prevalence database (Annex 6; Table 5). The prevalence ranged from 0% in studies undertaken in Glasgow (United Kingdom) and Estonia to 1.6% in a study in Barcelona (Spain).

Between 2008 and 2017, a total of 14 studies were published on the prevalence of anti-HCV in MSM from eight countries (Croatia, Estonia, France, Italy, the Netherlands, Spain, Sweden and the United Kingdom) (Annex 6; Table 6). The prevalence ranged from 0% in a study conducted in Sicily (Italy) to 4.8% in a study undertaken in the Netherlands.

Prisoners

Throughout the EU/EEA, the prison population is a key population group for hepatitis B and C and has a high burden of infection, with estimates of prevalence up to 25% for HBsAg and 46% for anti-HCV.

A total of 13 studies were published between 2008 and 2017 on the prevalence of HBV among prisoners. These studies were from 11 countries (Bulgaria, Croatia, Finland, France, Hungary, Ireland, Italy, Portugal, Romania, Spain and the United Kingdom) (Annex 6; Table 7). The prevalence ranged from 0% in a study undertaken in a prison in London, (United Kingdom) to 25.2% in a study undertaken in Bulgaria.

During the same period there were 32 studies published on anti-HCV prevalence among prisoners from nine countries (Bulgaria, Croatia, Finland, France, Hungary, Ireland, Portugal, Spain and the United Kingdom) (Annex 6; Table 8). The prevalence ranged from 2.3% in a study undertaken in a prison in London (United Kingdom) to 45.8% in a study undertaken in Finland.

Co-infection and re-infection

HCV coinfection in people living with HIV

Interaction between HIV and HCV infection affects the transmission and natural history of HCV infection, with HIV increasing the transmission efficiency of HCV and leading to much less favourable clinical outcomes associated with HCV infection. In a recent systematic review, among HIV-infected individuals, HIV–HCV co-infection in EU/EEA countries ranged from 15.1% in Sweden to 95.2% in Italy among PWIDs and from 3.0% in Italy to 13.3% in Germany among MSM [15].

Self-reported co-infections and re-infections in MSM

The European MSM Internet Survey (EMIS-2017) conducted in 2017 was one component of the European Surveys and Training to Improve MSM Community Health (ESTICOM) project, a three-year project (2016–2019) funded by the European Commission [12]. EMIS collected information about the sexual health of gay men, bisexual men and other MSM across Europe. EMIS-2017 covers many European non-EU/EEA countries such as Switzerland, Albania, Bosnia and Herzegovina, Kosovo, Montenegro, Serbia, Turkey, Belarus, Moldova, Ukraine, Russia, and Israel. Therefore the EMIS-2017 results are not transferrable to all EU/EEA countries. The EMIS-2017 EU estimates come closest to what would be a 31-country estimate. In the survey, information was collected from respondents on the hepatitis and coinfections among people with HIV. Among respondents, 5.8% (127 196) reported a history of hepatitis B infection that had cleared and 0.5% reported chronic hepatitis B. Men were asked 'Have you ever been diagnosed with hepatitis C?' Overall, 1.9% answered 'yes' (and 3.5% answered 'don't know'). These men were also asked 'When were you FIRST diagnosed with hepatitis C?' and were offered a recency scale. Among the 1.9% who had ever been diagnosed with hepatitis C, 0.4% were first diagnosed in the past 12 months.

Men who had ever been diagnosed with hepatitis C were asked 'How many times have you picked up hepatitis C infection?' and were offered the options: 'Once'; 'Twice'; or 'Three times or more'. Of the men who had been diagnosed with hepatitis C, 88.5% reported they had had the infection once, 8.7% had had it twice and 2.8% had had it three times or more (N=2 309, missing for n=63).

In EMIS-2017, HIV/hepatitis co-infection was defined as being diagnosed with HIV plus chronic hepatitis B or having any history of hepatitis C. Among the whole sample, 1.2% reported HIV/hepatitis co-infection at the time of survey completion but there was variation across countries from 0% in Estonia and Iceland to 3.1% in the Netherlands (Table 2).

Table 2. Responses from EMIS-2017 on reported co-diagnosis of HIV with HBV or HCV

EU/EEA Member State	% of respondents co-diagnosed with HIV and either HBV or HCV
Austria	0.6%
Belgium	2.0%
Bulgaria	0.2%
Croatia	0.2%
Cyprus	0.7%
Czech Republic	0.8%
Denmark*	1.8%
Estonia	0.0%
Finland	0.1%
France*	1.6%
Germany	1.6%
Greece	0.4%
Hungary	0.2%
Iceland	0.0%
Ireland	0.5%
Italy*	1.1%
Latvia	1.2%
Lithuania	0.5%
Luxembourg	1.8%
Malta	0.7%
Netherlands	3.1%
Norway	0.5%
Poland	1.0%
Portugal*	0.6%
Romania	0.6%
Slovakia	0.1%
Slovenia	0.3%
Spain*	1.2%
Sweden	0.5%
United Kingdom*	1.4%
EU Member States**	1.2 %

Source: The EMIS Network. EMIS-2017: The European Men-Who-Have-Sex-With-Men Internet Survey [12].
**includes microstate(s) and/or overseas territory*
***Does not include Norway or Iceland*

3.1.2 Estimated size of populations at increased risk of infection

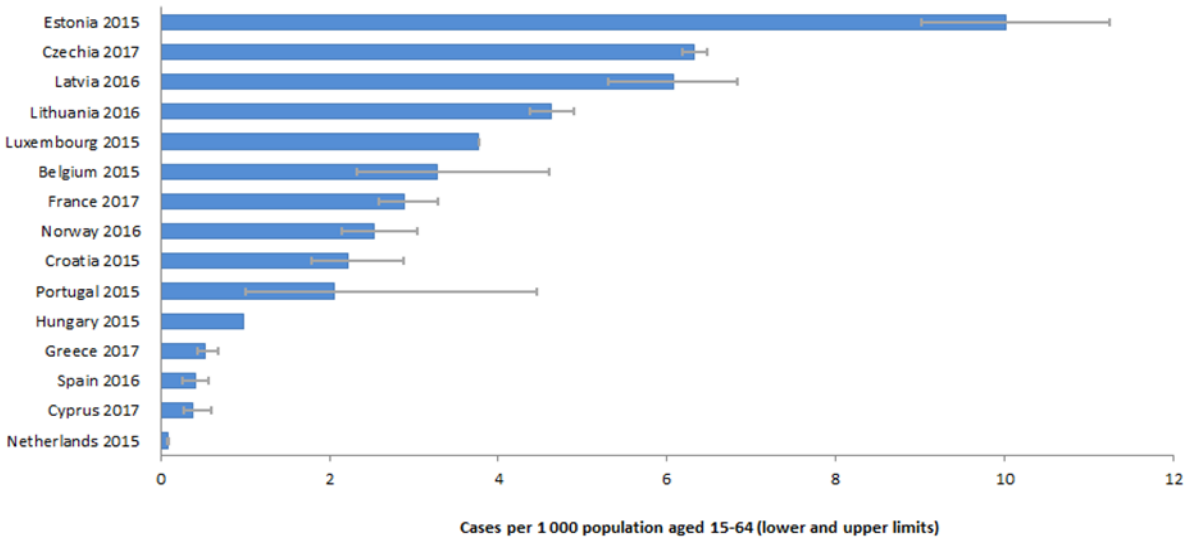
Estimates of MSM population

The National Surveys of Sexual Attitudes and Lifestyles (Natsal) in the UK estimate that 2.8% (95% confidence interval 2.3–3.3%) of the adult male population are MSM [16]. National estimates of the size of the MSM population are lacking in most other EU/EEA countries and the NATSAL estimate is sometimes used by other countries. Estimates have not been collated at the EU level but will be collected from countries in the next round of Dublin Declaration monitoring in 2020.

Estimates of PWID population and indication of the most commonly injected drugs

The prevalence of injecting drug use (IDU), defined by EMCDDA as the proportion of the population aged 15–64 years who has injected illicit drugs in the last 12 months, is measured through indirect statistical methods such as capture-recapture or treatment multiplier studies and these estimates have a high degree of uncertainty [17]. Among the 15 national studies conducted from 2015, the estimated prevalence of IDU ranges from less than 0.5 per 1 000 in Cyprus, the Netherlands and Spain to more than five per 1 000 in the Czech Republic, Estonia and Latvia (Annex 8 Table 1; Figure 5). In terms of absolute numbers, available estimates of the population injecting drugs ranged from 221 in Cyprus to 110 000 in France. Heroin and other opioids remain overall the most commonly injected drugs among drug treatment entrants, with the exception of the Czech Republic (methamphetamine) and Norway (amphetamine). Reports from low threshold services suggest that stimulants are commonly injected in France (cocaine), Hungary (synthetic cathinones), Latvia (amphetamine) and Luxembourg (cocaine).

Figure 5. Estimated prevalence of injecting drug use in the European Union and Norway, 2015–17



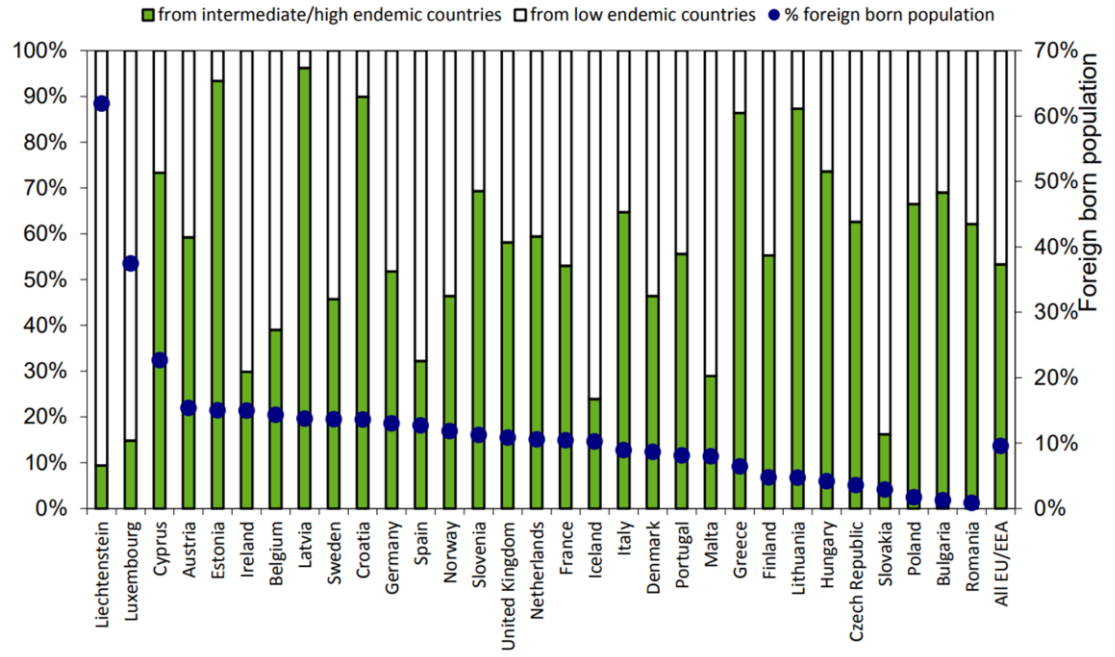
Source: EMCDDA, The elimination barometer for viral hepatitis among PWID in Europe, 2019 [17].

From data submitted to EMCDDA, people entering specialised drug treatment who report drug injecting are asked about their sharing of used needles/syringes in the previous four weeks. Whilst these data may not be representative of all PWID, the data available for 17 countries in 2017 suggest that, in eight countries, more than 10% of all treatment entrants who report injecting drugs have recently shared a needle or syringe [16]. In recent national or local biological and behavioural surveillance studies, the proportion of PWIDs reporting sharing used needles/syringes in the previous four weeks was 47 % in Bulgaria, 40 % in Romania and 39 % in Hungary [16].

Estimates of migrant populations from intermediate/high HBV/HCV endemicity countries

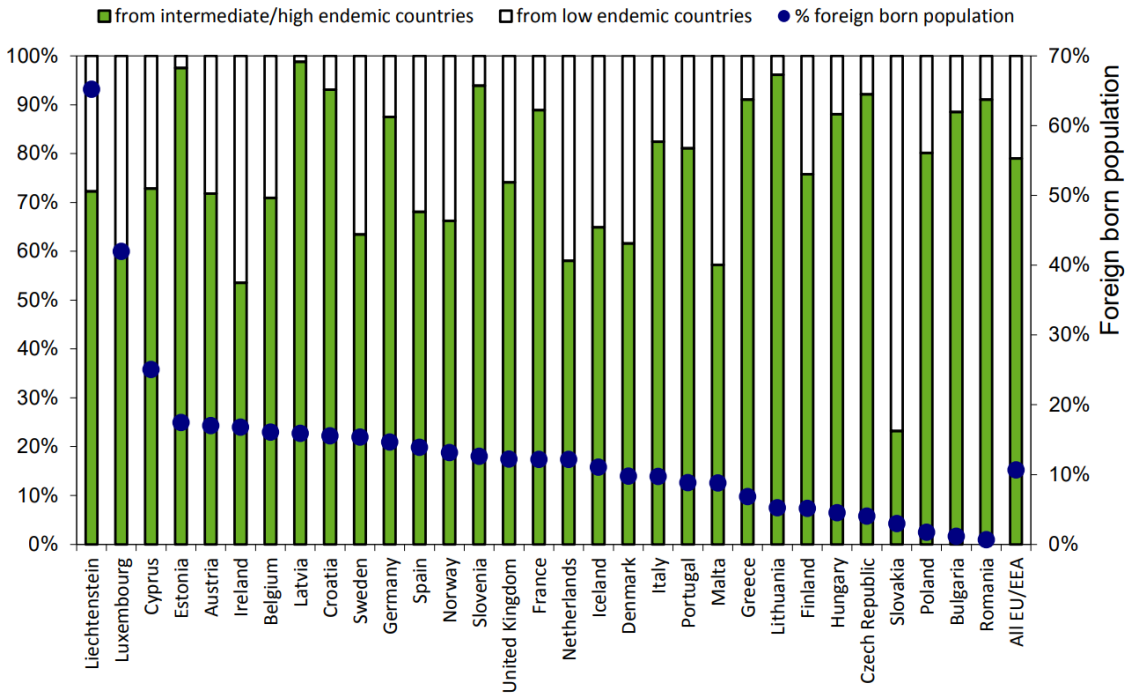
In EU/EEA countries, 10.3% of the population and 11.4% of the adult population are foreign-born [17]. The foreign-born proportion of the population ranges from 0.9% in Romania and 1.3% in Bulgaria to more than 40% in Luxembourg and Liechtenstein. ECDC conducted an epidemiological assessment to determine the burden of chronic hepatitis among the migrant population in these countries. Based on an assessment of demographic data sources and information in the published literature on the prevalence of HBV and HCV, it is estimated that 53% of the total foreign-born population in the EU/EEA was born in HBV intermediate/high endemic countries (prevalence of 2% or higher) and around 79% of the foreign-born adult population was born in a country with a prevalence above 1% (Figures 6 and 7) [18]. The proportion of migrants from high/intermediate HBV endemicity countries ranged from 9% in Liechtenstein to over 90% in Latvia and Estonia. For HCV the proportion from high/intermediate HCV endemicity countries ranged from 23% in Slovakia to over 90% in Croatia, the Czech Republic, Estonia, Greece, Latvia, Lithuania, Romania and Slovakia.

Figure 6. Foreign-born population (%) and proportion of population from HBV-endemic countries*



Source: ECDC, Epidemiological assessment of hepatitis B and C among migrants in the EU/EEA. Stockholm: ECDC; 2016 [18].
**Prevalence>2%*

Figure 7. Foreign-born population (%) and proportion of the population from HCV-endemic countries*



Source: ECDC, Epidemiological assessment of hepatitis B and C among migrants in the EU/EEA. Stockholm: ECDC; 2016 [18].
**Prevalence>=1%*

The same epidemiological study estimated the burden of chronic infection among migrants in relation to the overall number of infected cases to be around 25% for hepatitis B, and 14% for hepatitis C. The burden of hepatitis among migrants in relation to the overall burden of both chronic HBV and HCV is lowest in Romania, Bulgaria, Slovakia and Poland (<4%). These are all countries where the proportion of migrants in the total population is relatively low (<1.5%). In some countries (i.e. Ireland, the Netherlands and Sweden) the relative burden among migrants from intermediate and high-endemicity countries as a proportion of the overall chronic viral hepatitis B

burden in the host country was estimated to be exceptionally high. The epidemiological assessment considered that overestimation of the relative burden among migrants was possible and could be a consequence of an underestimation of the prevalence in the general population of the host country, or an overestimation of the prevalence among migrants (when basing this on the prevalence in the migrants' country of origin).

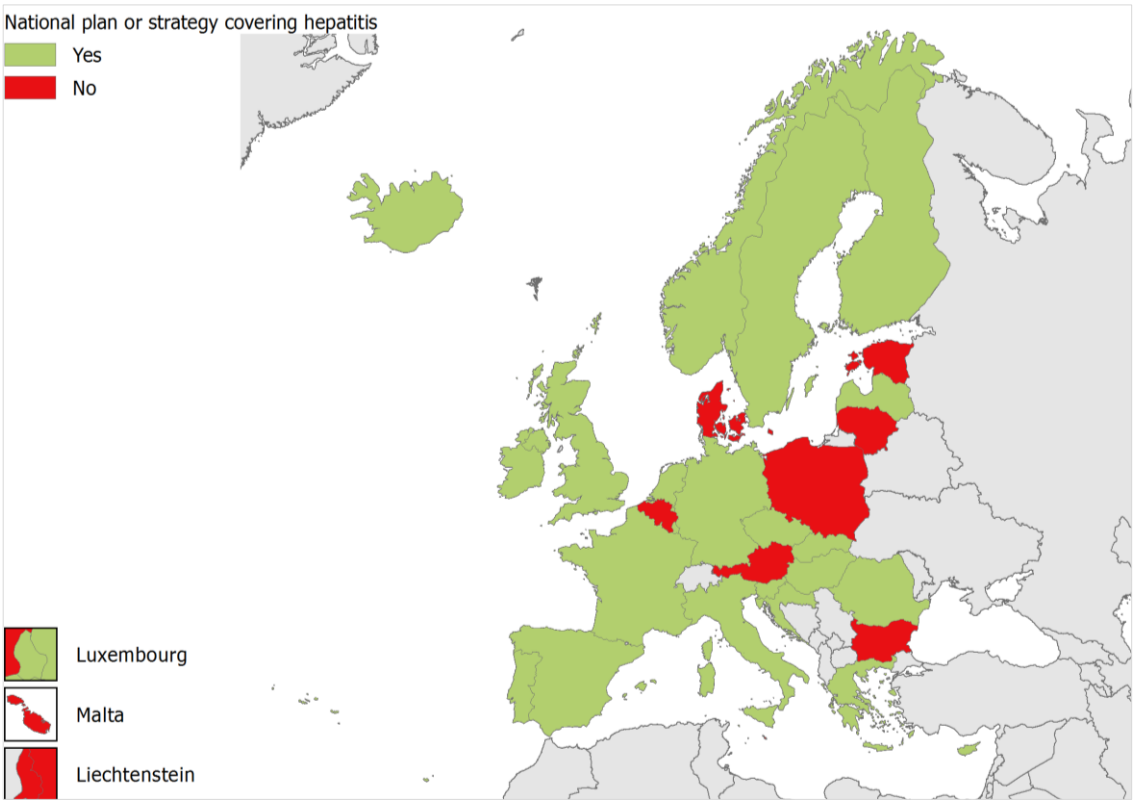
3.2 Policy

2018 milestone: *A costed and funded national hepatitis plan with clear targets or a viral hepatitis response plan integrated into a broader health strategy or action plan.*

EU progress: 32.2% (10/31) countries have a costed and funded national hepatitis plan.

Countries were asked directly whether a national plan or strategy existed that covered the response to viral hepatitis. Of the 31 responding countries, 20 (64.5%) reported there was a plan and 10 of these countries reported that there were funds allocated from the national budget to implement the plan (Figure 8).

Figure 8. Existence of a national plan or strategy* that covers the response to viral hepatitis in EU/EEA countries, 2019**



**Definition of what constituted a national plan or strategy considered unclear by some countries.*
***Noted by some countries that the existence of a national plan or strategy does not always correlate with local efforts relating to the elimination of hepatitis.*
Source: ECDC Member State Survey 2019

3.3 Prevention

3.3.1 Vaccination

HBV vaccination of children

2018 milestones:

- 90% coverage among infants (<12 months of age) with three doses of HBV vaccine in countries that implement universal childhood vaccination
- National guidelines on risk group HAV and HBV vaccination developed and implemented

EU progress: 83.3% (20/24) of EU/EEA countries that implement universal childhood vaccination have achieved 90% coverage with three doses of HBV vaccine

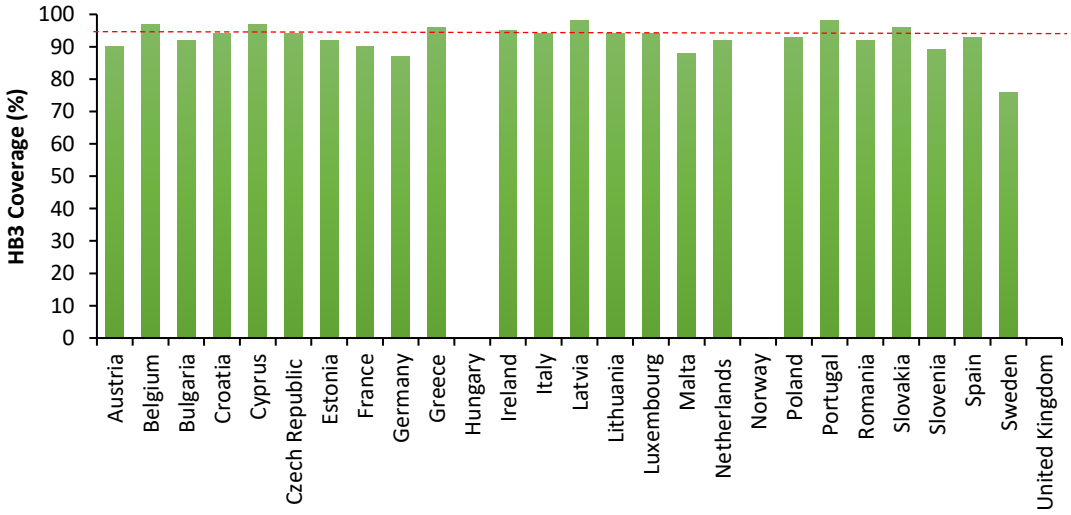
2020 targets:

- *95% coverage among infants (<12 months of age) with three doses of HBV vaccine in countries that implement universal childhood vaccination*
- *≤0.5% HBsAg prevalence in vaccinated cohorts*
- *80% of healthcare workers vaccinated against HBV.*

EU progress: 29.2% (7/24) of EU/EEA countries that implement universal childhood vaccination have 95% coverage with three doses of HBV vaccine.

A total of 27 EU/EEA countries recommend universal childhood vaccination against hepatitis B. Three countries do not have a national policy for universal vaccination (Denmark, Finland and Iceland) and one country (Sweden) has regional implementation of universal hepatitis B vaccination. Of the 27 countries with a universal childhood HBV vaccination programme, three countries (Hungary, Malta, Slovenia) offer the vaccine outside of the primary schedule. Data on vaccine coverage in 2017 were available from 24 countries. Of these countries, 20 (83.3%) have reached the 2018 milestone of 90% coverage and seven (29.2%) have already reached the 2020 target of 95% coverage (Figure 9).

Figure 9. Coverage (%) of three doses of HBV vaccine in EU/EEA countries that implement universal HBV vaccination in 2017*♯ ¥



**No data available from Hungary as the programme is a two-dose regime provided from the age of 13 years.*
♯ Data for Austria based on HB3 coverage among children aged four years.
¥ National programme in Sweden only implemented during 2016 and in the United Kingdom in 2017 (with estimated coverage in 2019 >90%)
Source: WHO/UNICEF coverage estimates available from https://www.who.int/immunization/monitoring_surveillance/data/en/

HBV vaccination of prisoners

Data on vaccination programmes in prisons were collected by WHO for the European Region in 2016–2017 and were obtained from the Health in Prisons European Database (HIPED). No data were available from Austria, Greece, Hungary or Liechtenstein.

Twenty-one countries with data for 2016–2017 reported HBV vaccination programmes in prisons (Table 3). The availability of vaccination in these countries varies, with 12 countries reporting that the vaccine was offered to all eligible prisoners.

Table 3. HBV vaccination in prisons, EU/EEA, 2016–2017

Availability	Countries	Number of countries
Available on request (opt-in)	Belgium, Croatia, Denmark, Slovakia, Slovenia	5
Offered to at-risk groups	Estonia and Norway	2
Offered to all eligible prisoners	Czech Republic, Finland, France, Germany, Iceland, Ireland, Italy, Malta, Portugal, Spain, Sweden, UK	12
MSM	Netherlands	1
Upon physician request	Poland	1
Not available to prisoners	Bulgaria, Latvia, Lithuania and Romania	4
No national data	Cyprus	2

Source: WHO HIPED database

Two of the 27 reporting countries had HBV vaccination coverage data, with Estonia reporting that 96 HBV vaccinations were given during 2016 (representing 3.5% (96/2 768) of the total prison population in Estonia in 2015) and Sweden reporting that 66% of prisoners were vaccinated against HBV in 2015 (Table 4).

Table 4. HBV vaccination in prisons, EU/EEA, 2015-2016

Country	Year	Number of HBV vaccinations given	Proportion vaccinated against HBV (%)
Estonia	2016	96	No national data
Sweden	2015	No national data	66

HBV vaccination of healthcare workers

Countries were asked whether HBV vaccination was provided to healthcare workers, including medical and nursery students. All of the 18 EU/EEA countries that responded to this question, except Estonia, reported that healthcare workers were vaccinated. Data on vaccine coverage among this group were only available from one country (Czech Republic) with coverage reported to be 99.9%.

In a survey conducted by ECDC among experts in immunisation from EU/EEA Member States in 2018, information was collected on strategies used for the protection of healthcare workers [19]. Of the 31 EU/EEA Member States invited to participate in this survey, 28 responded, with no responses from Bulgaria, Denmark and Romania. Among the 28 responding countries, twelve Member States had at least one vaccine that was mandatory for healthcare workers with increased risk of exposure working in hospitals. The most commonly mandated vaccine for healthcare workers is hepatitis B, which is mandatory in eight countries (Belgium, Croatia, the Czech Republic, France, Hungary, Malta, Poland, Slovenia). In all of the responding countries, there are recommendations for hepatitis B vaccination of all or some hospital healthcare workers. In the survey, Estonia reported that hepatitis B vaccination was only recommended for specific groups of healthcare workers.

HBV vaccination of key risk groups apart from healthcare workers

In the WHO regional survey, countries were asked whether hepatitis B vaccination was provided to other groups with high risk of infection, in addition to healthcare workers. A total of 16 of the 18 EU/EEA countries who responded to the questionnaire reported that other risk groups were vaccinated. A wide range of different risk groups were reported including haemodialysis patients, sexual partners and household contacts of HBsAg positive persons, PWIDs, sex workers, prison staff and patients with chronic liver disease. However, data on coverage of vaccination among these risk groups are not available.

HBV and HAV vaccination of MSM

As part of the EMIS-2017, information was collected on whether MSM responding to the survey had been vaccinated against hepatitis A (HAV) and HBV (Table 5) [12]. In total, 40.1% of respondents reported they had received the hepatitis A vaccine and completed the course, with a further 4.6% reporting that they had been vaccinated but had not completed the course. For HBV vaccination, 44.8% reported they had been vaccinated and had completed the course, 3.8% had been vaccinated but not completed the course and a further 1.2% had been vaccinated but reported that they had not responded to the vaccinations.

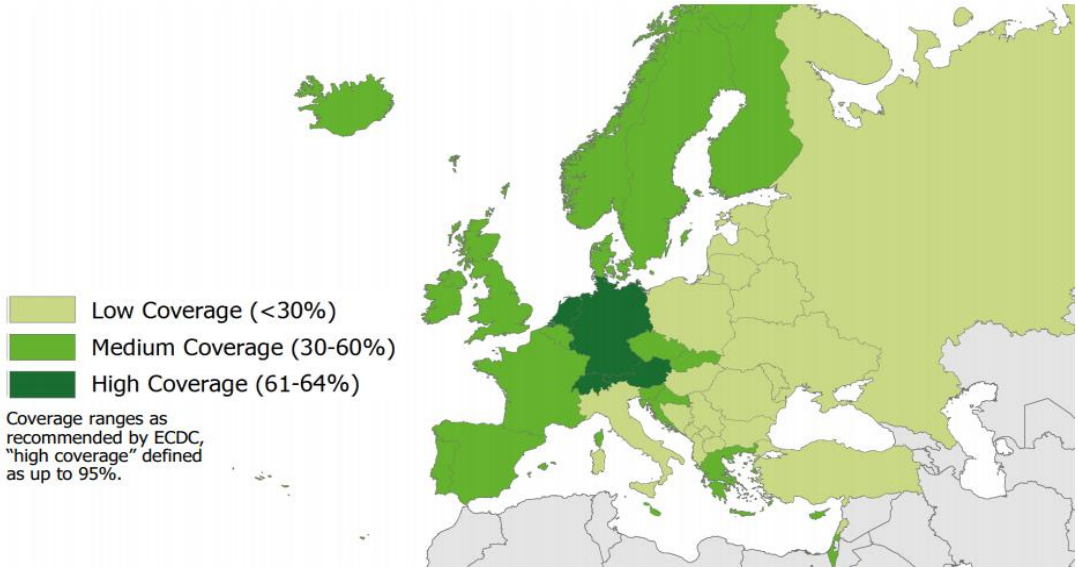
Table 5. Hepatitis A and B vaccination status among respondents to EMIS-2017 living in 48 European countries, including all 31 EU/EEA countries, 2017

Hepatitis vaccination status	% vaccinated against hepatitis A (N=127 126, missing n=666)	% vaccinated against hepatitis B (N=127 196, missing n=596)
No, because I've had hepatitis [A/B] (and am now naturally immune)	7.4	5.8
No, and I don't know if I'm immune	26.6	23.3
No, I have chronic hepatitis B infection	-	0.5
Yes, and I completed the course	40.1	44.8
Yes, but I did not complete the course	4.6	3.8
Yes, but I did not respond to the vaccinations	-	1.2
I don't know	21.3	20.6

Source: The EMIS Network. EMIS-2017: The European Men-Who-Have-Sex-With-Men Internet Survey [12].

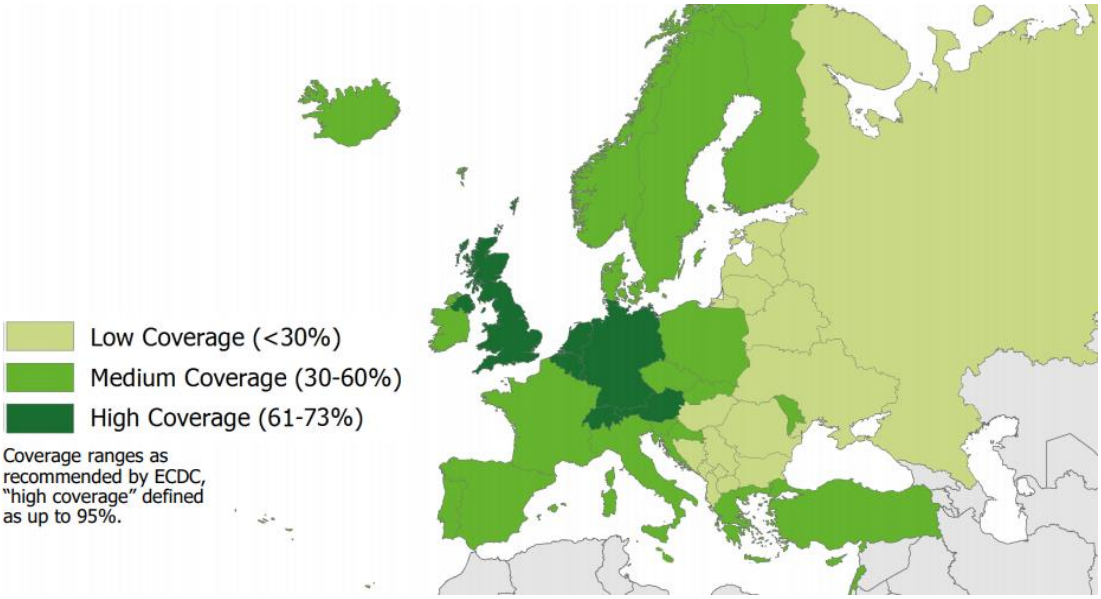
Results from the survey found that when men with a past history of hepatitis were excluded, 43% reported a full course of vaccination against hepatitis A (Figure 10), and 49% against hepatitis B (Figure 11).

Figure 10. Percentage of respondents to EMIS 2017 reporting a full course of hepatitis A vaccination, excluding men with a history of hepatitis A (N=117 748, 48 countries)



Source: The EMIS Network. EMIS-2017: The European Men-Who-Have-Sex-With-Men Internet Survey [12]

Figure 11. Percentage of respondents to EMIS 2017 reporting a full course of hepatitis B vaccination, excluding men with a history of hepatitis B (N=119 277, 48 countries)



Source: The EMIS Network. EMIS-2017: The European Men-Who-Have-Sex-With-Men Internet Survey [12].
Slide/map available from: http://sigmaresearch.org.uk/files/EMIS-2017_EuropeanMaps_DDM.pdf

In the survey men who were previously unvaccinated or partially vaccinated against hepatitis A and B (and who did not know they were immune), or who were unclear of their vaccination status were asked if they knew where they could be vaccinated. For both infections, just over half of the respondents (54.1% hepatitis A; 54.3% hepatitis B) reported that they did not know, or were not sure where they could access hepatitis vaccinations (Table 6).

Table 6. Knowledge of where to get hepatitis A and B vaccinations among men that could benefit from them among respondents to EMIS-2017

Response	*Do you know where you could get vaccinated against hepatitis A?*	*Do you know where you could get vaccinated against hepatitis B?*
	% of men who could benefit from hepatitis A vaccination (N=66 359, missing n=371)	**% of men who could benefit from hepatitis B vaccination** (N=62 098, missing n=149)
No	36.0	35.9
Not sure	18.1	18.4
Yes	45.9	45.7
TOTALS	100.0	100.0

Source: The EMIS Network. EMIS-2017: The European Men-Who-Have-Sex-With-Men Internet Survey [12].

All men were asked 'Have you ever been offered any hepatitis vaccination by a health service?' Overall, 52% answered 'yes', 41% answered 'no' and 7% answered 'I don't know' (N=126 897, missing n=805). When those who did not know were excluded, 56% of MSM had been offered hepatitis vaccination by a health service.

HAV vaccination of key risk groups

None of the 18 EU/EEA countries responding to the survey conducted by WHO in 2019 reported that a universal hepatitis A virus (HAV) vaccination had been implemented nationally. HAV vaccination for risk groups was reported to be provided by 11 countries (Austria, Belgium, the Czech Republic, Germany, Ireland, Italy, Malta, Norway, Poland, Slovakia, Spain). Bulgaria, Croatia, Estonia, Lithuania and Romania reported that it was not provided for risk groups and Latvia and the Netherlands reported that the information was unknown. Among the 11 countries reporting the provision of HAV vaccination for risk groups, the vaccine was reported to be recommended to a range of groups including persons travelling to countries with high or intermediate endemicity, food-handlers and sewage workers, patients with chronic liver disease, men who have sex with men, sex worker and PWIDs.

3.3.2 Prevention of mother-to-child transmission

2018 milestones:

For countries that implement universal vaccination of new-borns:

- 85% coverage with timely HBV birth dose vaccination

For countries that implement screening of pregnant women and post-exposure prophylaxis of newborns:

- 85% coverage with screening in pregnant women and 90% coverage with post-exposure prophylaxis in infants born to infected mothers.

EU progress: 80% (4/5) of EU/EEA countries that implement universal new-born vaccination and have available data report 85% coverage with timely HBV birth dose.

In the 26 countries that report implementation of HBV screening for pregnant women, 100% of those with data available for 2017 (5/5) report 85% coverage of screening in pregnant women and 100% (6/6) report 90% coverage with post exposure prophylaxis.

2020 targets:

For countries that implement universal new-born vaccination:

- 90% coverage with timely HBV birth dose vaccination

For countries that implement screening of pregnant women and post-exposure prophylaxis of new-borns:

- 90% coverage with screening in pregnant women and 95% coverage with post-exposure prophylaxis in infants born to infected mothers.

EU progress: 80% (4/5) of EU/EEA countries that implement universal new-born vaccination and have available data report 90% coverage with timely HBV birth dose.

In the 26 countries that report implementation of HBV screening for pregnant women, 80% of those with available data for 2017 (4/5) report 90% coverage of screening in pregnant women and 100% (6/6) report 95% coverage with post exposure prophylaxis.

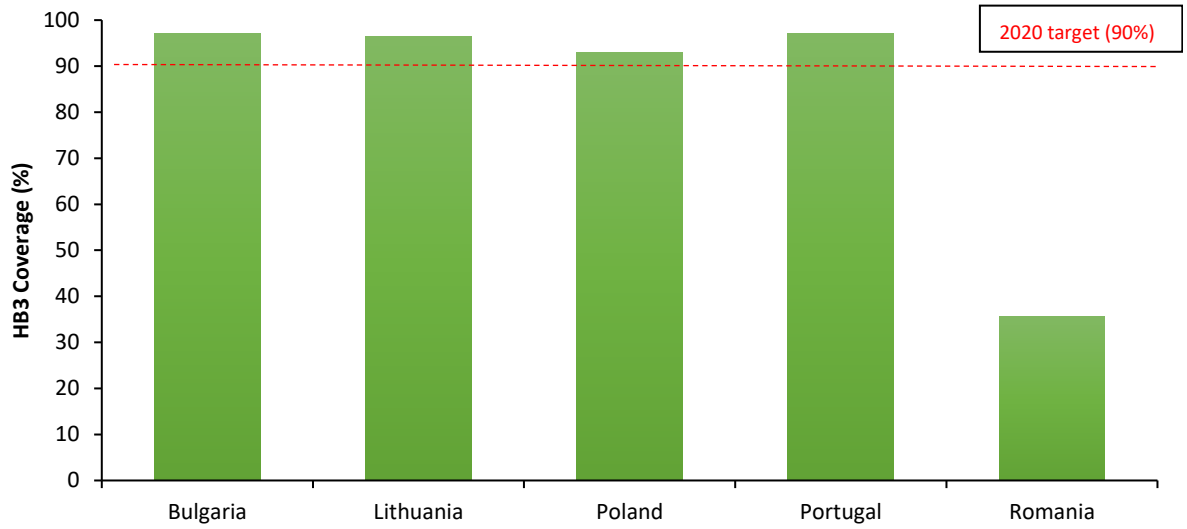
Perinatal transmission, from an HBsAg-positive mother to her new-born, is a concern relating to hepatitis B transmission since up to 90% of new-borns infected perinatally become chronically infected. Two strategies are

adopted in the European Region to prevent perinatal transmission [6]. The first is to ensure that all children are vaccinated with a dose of monovalent hepatitis B vaccine within 24 hours of birth and the second is to screen all pregnant women for HBsAg prenatally and then to provide post-exposure prophylaxis to infants of carrier mothers with HBV vaccine birth dose and hepatitis B immune globulin (HBIG).

Birth dose HBV vaccine

There are currently five EU/EEA countries that provide a universal birth dose of HBV vaccine (Bulgaria, Lithuania, Poland, Portugal and Romania) (Annex 4). The most recent data on vaccine coverage of the birth dose from 2017 were available from all of these countries. Four of these countries (Bulgaria, Lithuania, Poland and Portugal) have achieved the 2018 milestone of 85% coverage and the 2020 target of 90% coverage (Figure 12).

Figure 12. Coverage (%) of the birth dose of HBV vaccine in EU/EEA countries that implement universal new-born vaccination in 2017



Source: WHO/EUROPE survey 2019 and WHO/UNICEF coverage estimates

Screening of pregnant women

Data on antenatal screening programmes were collected directly from countries by WHO in 2019. Universal antenatal screening programmes were reported to be in place in all of the 26 EU/EEA countries that responded to the survey (Annex 9). Romania, which implements universal new-born HBV vaccination, reported that antenatal screening programmes for HBV were not systematically in place across the country. Data on coverage of the programme between 2015 and 2017 were available from five countries (Table 7). In 2017, coverage ranged from 86.7% in Latvia to 100% in the Czech Republic.

Table 7. Coverage of screening for HBsAg in pregnant women from EU/EEA countries reporting data, 2015–17

	Coverage of screening for HBsAg in pregnant women (%)		
	2017	2016	2015
Croatia	>90	>90	>90
Czech Republic	100	100	100
Germany	Not available	Not available	80.9% - 93.9%
Latvia	86.7	87	87.5
Netherlands	99	99.1	99.7
United Kingdom	99.5	99.6	Not available

Source: WHO EURO survey 2019

Among the 26 countries that reported having a national antenatal screening programme, 20 reported that antiviral treatment was provided for pregnant women with HBV infection. Three countries reported that treatment was not available (the Czech Republic, Italy, Latvia) and three countries (Hungary, Romania, Spain) reported that it was unknown whether treatment was provided.

Of the 26 countries with a screening programme, 25 reported that there was a policy on post-exposure prophylaxis for children born to mothers who have hepatitis B, and only one country (Lithuania) reported that there was no policy in place. Romania noted that post-exposure prophylaxis was available, but in most cities it was only available in private maternity clinics.

Six countries provided data on the coverage of the birth dose of HBV vaccine among children born to mothers who have hepatitis B (Table 8). In 2017, coverage ranged from 98.8% in the Netherlands and Slovakia to 100% in Croatia and Slovakia.

Table 8. Coverage of HBV vaccine birth dose among children born to mothers who have hepatitis B in EU/EEA countries reporting data, 2015–17

	Coverage of HBV vaccine birth dose among children (%)		
	2017*	2016*	2015
Croatia	100	100	100
Czech Republic	99.9	99.9	99.9
Malta	100	100	100
Netherlands	98.8	100	100
Slovakia	98.8	98.8	99.1
United Kingdom	98.9	98.4	Not available

Source: WHO/Europe survey 2019
**Data provided for periods 2016/7 and 2017/8*

In the WHO survey referred to above, countries were also asked whether there was a national policy of universal screening of pregnant women for hepatitis C and three (Estonia, Malta, Poland) confirmed that such a policy existed.

3.3.3 Infection prevention and control

2018 milestones:

- Safe injection policies and infection prevention and control (IPC) rules for preventing transmission of blood-borne infections in the health sector (including in prisons) in place and implemented.
- National disinfection and sterilisation protocols for non-healthcare settings (aesthetic cosmetology and tattoo facilities) developed and implemented.

EU progress: No data available.

2020 targets:

- 50% of injections administered with safety-engineered devices in and out of health care facilities.

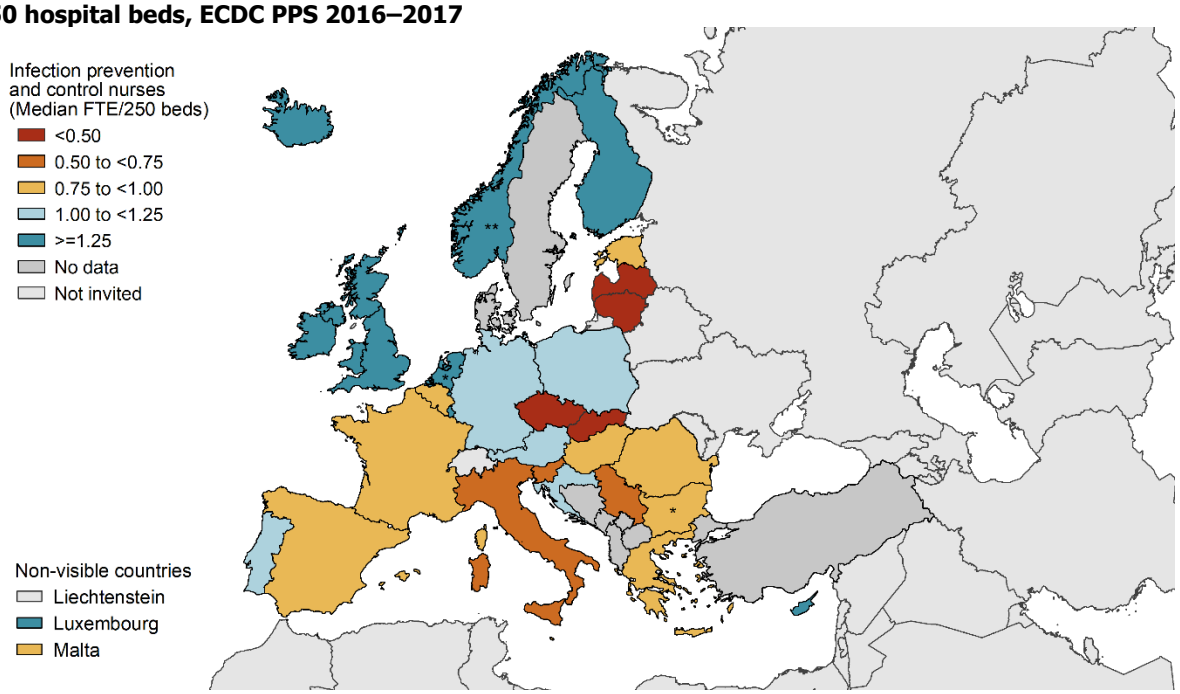
EU progress: No available data.

Around one in six acute hepatitis B and acute hepatitis C notifications from EU/EEA countries, where the route of transmission was reported, are attributed to nosocomial transmission [13, 14].

In 2016–2017, 28 EU/EEA Member States and one EU candidate country (Serbia) participated in the second EU-wide, ECDC-coordinated point prevalence survey (PPS) of healthcare-associated infections (HAIs) and antimicrobial use in acute care hospitals [8]. Data from 1 735 hospitals were submitted to ECDC. Of these, 1 275 hospitals were included in the final European sample for analysis. Although specific data relating to infection prevention and control for blood-borne viruses were not collected, data were collected on the characteristics of the hospitals, including staffing levels. Data on staffing provide proxy information for where infection control safety may be suboptimal [8].

The number of infection prevention and control nurses in terms of fulltime equivalents (FTE) was provided by 1 141 hospitals. Data from eight hospitals were discarded as outliers. The median number of IPCN FTE per 250 beds was 1.04 (IQR 0.58–1.56) and ranged from 0.0 in Lithuania and Slovakia to 2.22 FTE per 250 beds in the Netherlands (Figure 13). The median number of infection prevention and control nurse FTE per 250 beds decreased significantly with increasing hospital size ($p<0.001$), but did not vary significantly according to hospital type. In 169 (14.8%) hospitals from 18 countries, no infection prevention and control nurses were reported. The percentage of hospitals without infection prevention and control nurses was 50% or higher in Latvia, Lithuania and Slovakia, and was highest in small hospitals (p-value adjusted for country < 0.001). It was also higher in private for-profit hospitals (25.5% vs 14.1%) and lower in tertiary hospitals, but these differences were not significant after adjustment for hospital size and country.

Figure 13. Median number of infection prevention and control nurse full-time equivalents (FTE) per 250 hospital beds, ECDC PPS 2016–2017



Source: ECDC PPS, 2016–2017 [8].
**PPS data representativeness was poor in Bulgaria and the Netherlands. **Norway used a national protocol.*

3.3.4 Blood safety

2018 milestone:

- All countries have effective haemovigilance systems in place and all donations are tested as a minimum using serological methods for HBV and HCV infection.

EU progress: All EU/EEA countries screen blood donations using quality-assured methods according to EU standards and have haemovigilance systems in place with donations tested as a minimum using serological methods for HBV and HCV infections.

2020 target:

- All donated blood tested with NAT-screening methods for HBV and HCV
- All donated blood from non-remunerated donors.

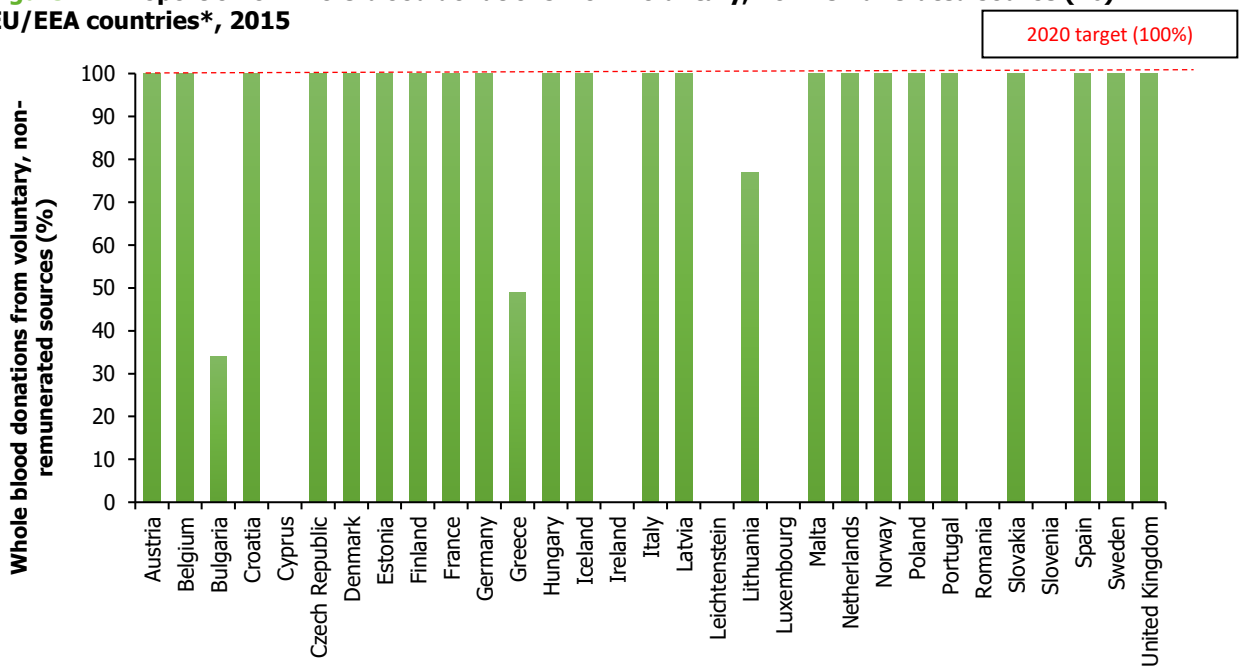
EU progress: thirteen of the 18 EU/EEA countries that reported data on NAT-screening through the Council of Europe in 2015 indicated that all donated blood was tested with NAT-screening methods for HBV and HCV infections.

In total, 88% (22/25) of EU/EEA countries report that all donated blood is from voluntary, non-remunerated donors.

Transmission of HBV and HCV through blood products is rare in EU/EEA countries, with few reports of transfusion-associated infections and less than 1% of acute HBV and HCV notifications attributed to transmission through blood or blood products [13, 14].

Data were collected from 25 EU/EEA countries in 2015 (most recent year available) by the Council of Europe (CoE) on the donors, collection, testing, use and quality aspects of blood and blood components [11]. Of the countries providing data on the profile of blood donors, 22 (88%) indicated that all whole blood donations were from voluntary, non-remunerated donors (Figure 14). Bulgaria, Greece and Lithuania reported that 34%, 49% and 77% of blood donations were from voluntary, non-remunerated donors respectively.

Figure 14. Proportion of whole blood donations from voluntary, non-remunerated source (%) in EU/EEA countries*, 2015

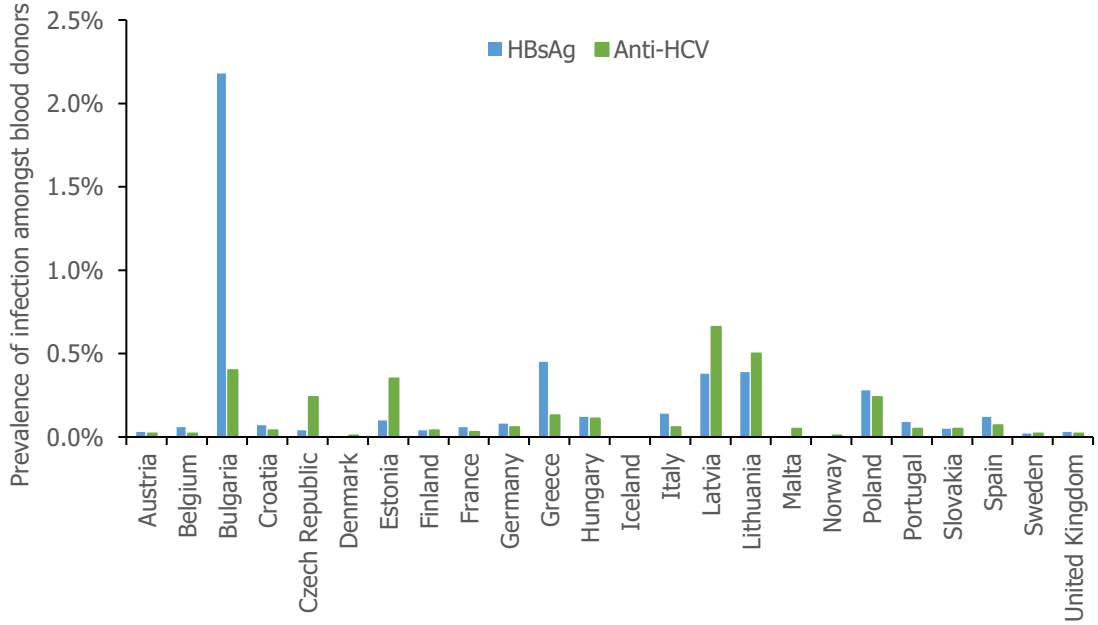


**100% of whole blood donations are voluntary in Slovenia according to data submitted to the International Haemovigilance Network (https://www.ihn-org.com/contact/).*
Source: Janssen and Rautmann, 2015 [11].

Of the 25 countries that provided 2015 data, all countries except Finland indicated that 100% of blood donations were tested for HBsAg and anti-HCV. In Finland 99% of the blood donations were reported to have been tested for HBsAg. A total of 18 EU/EEA countries reported data on NAT-screening, 13 of them indicating that all donated blood was tested with NAT-screening methods for HBV and HCV.

Data on the prevalence of HBsAg and anti-HCV in first-time blood donors by country were available in 2014 for 24 countries (Figure 15). The prevalence of HBV among first-time blood donors ranged from 0.0% in four countries (Denmark, Iceland, Malta and Norway) to 2.2% in Bulgaria. The prevalence of anti-HCV among first-time blood donors ranged from 0.0% in Iceland to 0.7% in Latvia.

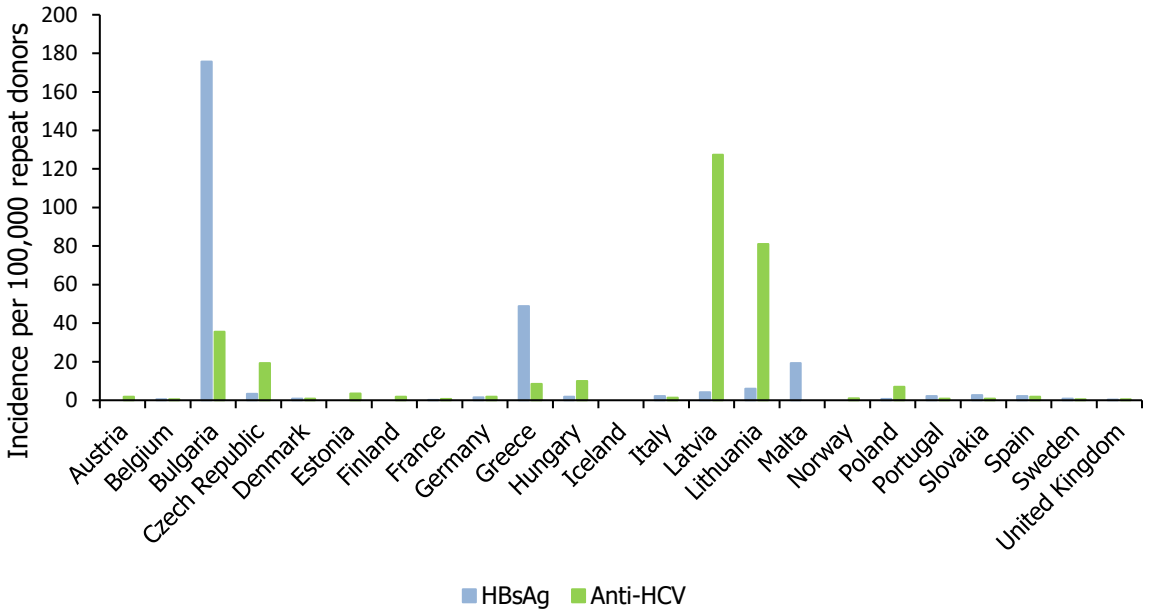
Figure 15. Prevalence of HBsAg and anti-HCV among first time blood donors in EU/EEA countries*, 2015



**In Slovenia HBsAg and anti-HCV prevalence among first time donors was 0.03% in 2015 according to data submitted to the International Haemovigilance Network (https://www.ihn-org.com/contact/).*
Source: Janssen and Rautmann, 2015 [11].

Data on the incidence of HBsAg and anti-HCV in repeat donors by country were available for 23 countries in 2015 (Figure 16). The incidence of HBV among repeat donors ranged from zero in five countries (Austria, Estonia, Finland, Iceland, Norway) to 175.7 per 100 000 in Bulgaria. The incidence of HCV ranged from 0 in two countries (Iceland and Malta) to 127.4 per 100 000 in Latvia.

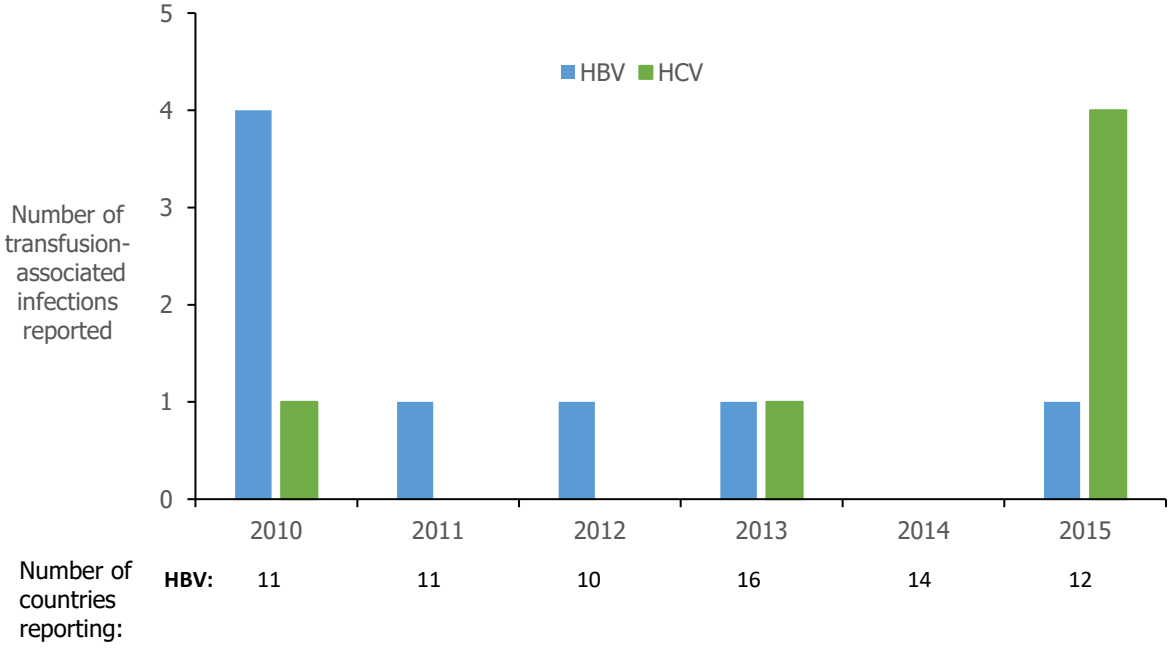
Figure 16. Incidence per 100 000 of HBsAg and anti-HCV among repeat blood donors in EU/EEA countries, 2015



Source: Janssen and Rautmann, 2015 [11].

In 2015, data on transfusion-associated HBV and HCV infections were reported by 12 countries (Figure 17). From those countries reporting data, one case of HBV and four cases of HCV infections were reported. Since 2010, the number of transfusion-associated HBV or HCV infections remained at low levels

Figure 17. Number of transfusion-associated HBV and HCV infections reported by EU/EEA countries and number of countries reporting data, 2010–2015



Source: Janssen and Rautmann, 2015 [11].

3.3.5 Prevention of sexual transmission of viral hepatitis

2018 milestone:

- 90% of countries provide STI services or links to such services in all primary, HIV, drugs, reproductive and perinatal care services.

EU progress: no data available.

2020 target:

- Access for all individuals to a full range of services relevant to STIs, including HIV and HBV and HCV, and access to condoms, testing and counselling.

EU progress: No data available.

Transmission among men who have sex with men accounted for 13% of acute HBV notifications and 15% of acute HCV notifications in 2017 [13, 14].

Data relating to the prevention and control of sexual transmission are insufficient to adequately monitor progress made in countries towards the WHO milestones and targets for the prevention of sexual transmission.

The best source of European data relating to condom use comes from EMIS-2017, providing information on self-reported condom use for men who have sex with men who responded to the survey. In EMIS-2017, men who had had a non-steady male intercourse partner in the last 12 months (68% of those who had ever had sex) were asked how often condoms were used when they had intercourse with non-steady male partners in the last 12 months [12]. Most (90%) men who had intercourse with non-steady partners in the last 12 months had some experience of condom use, with 41% reporting that condoms were always used, 49% being inconsistent users and 10% never using condoms (Table 9).

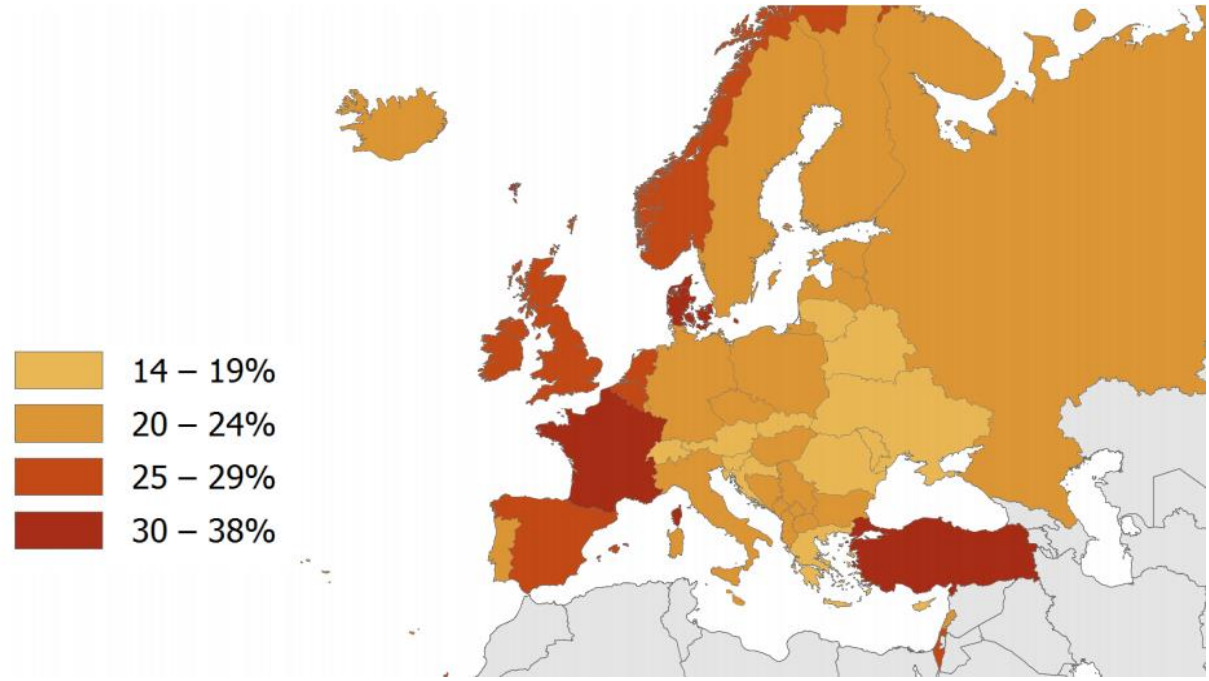
Table 9. Reported condom use for intercourse with non-steady partners in last 12 months among respondents to EMIS-2017

In the last 12 months, how often were condoms used when you had intercourse with non-steady male partners?	Proportion of respondents (%) (N=82 691, missing n=83)
Never	10.0
Seldom	9.4
Sometimes	11.4
Mostly	28.4
Always	40.8

Source: The EMIS Network. EMIS-2017: The European Men-Who-Have-Sex-With-Men Internet Survey [12].

Figure 18 below shows how condomless anal intercourse with non-steady partners of unknown HIV status varied across Europe.

Figure 18. Reported condomless anal intercourse with non-steady partners of unknown HIV status, last 12 months among respondents to EMIS 2017 (N=126 493)



Source: The EMIS Network. EMIS-2017: The European Men-Who-Have-Sex-With-Men Internet Survey [12].

3.3.6 Prevention of viral hepatitis among people who inject drugs

2018 milestone:

- Policies developed and implemented to support a comprehensive package for infection prevention and harm reduction among people who inject drugs including: needle and syringe programmes (NSPs); opioid substitution therapy (OST) and other evidence-based drug dependence treatment targeted information, education and communication for people who inject drugs and HAV and HBV vaccination.

EU progress: No data available.

2020 targets:

- A comprehensive package of harm reduction services for all persons who inject drugs, including:
  - at least 200 syringes distributed per PWID per year*
  - at least 40% of opioid-dependent PWID receiving opioid substitution therapy
  - HBV and HAV vaccination.
- 90% of PWID receiving targeted information education and communication provided through NSPs, drug treatment service sites (including OST) and other services targeting PWID.

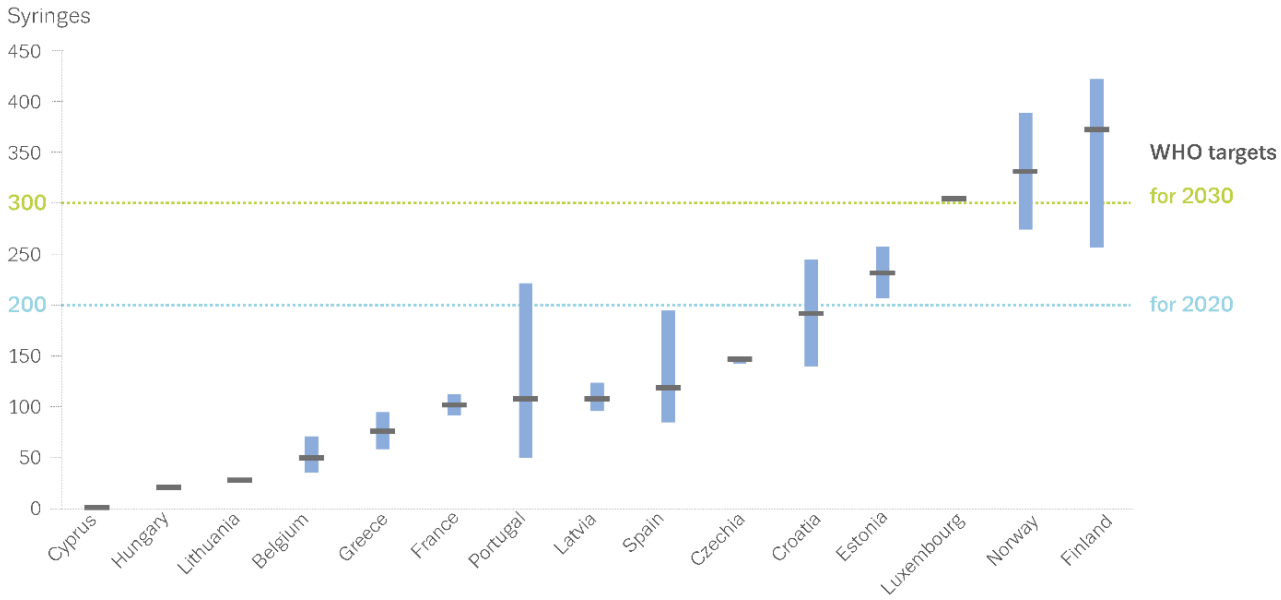
EU progress: 29% (4/14) of the countries with data have coverage of at least 200 syringes distributed per PWID per year; 61% (11/18) of the countries for which estimates of the high-risk opioid user population are available report coverage of at least 40% of high risk opioid users receiving OST.

PWID are disproportionally affected by HBV and HCV infections due to the sharing of injecting equipment. In EU/EEA countries injecting drug use accounts for 10% of acute HBV notifications [13, 14] and 40% of acute HCV infections, with estimates of prevalence among PWID up to 5.6% for HBV and 81.5% for HCV.

Needle and syringe programme coverage

National-level data on the coverage of needle and syringe programmes provided to the EMCDDA are available for 14 countries, with only four of these (Estonia, Finland, Luxembourg and Norway) reporting a level of coverage above the 2020 target of 200 syringes per injecting drug user (Figure 19).

Figure 19. Coverage of specialised syringe programmes: estimated number of syringes provided per person who injects drugs in 2017, European Union and Norway

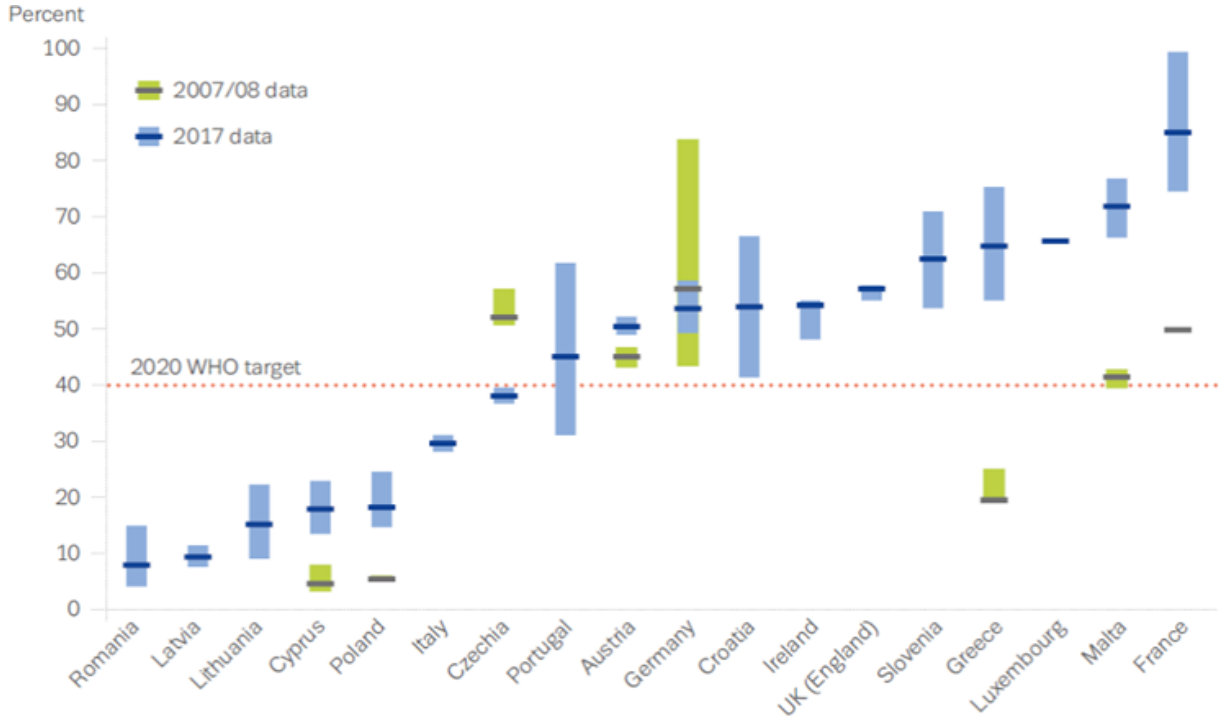


Source: EMCDDA. The elimination barometer for viral hepatitis among PWID in Europe, 2019 [17].

Opioid substitution treatment coverage

The coverage of opioid substitution treatment is estimated to be above the 2020 WHO target of 40 % in 11 of the 18 EU countries (Austria, Croatia, France, Greece, Germany, Ireland, Luxembourg, Malta, Portugal, Slovenia and the United Kingdom) for which estimates of the population of high-risk opioid users are available (Figure 20). Among EU/EEA countries with available data, about half of the high-risk opioid users receive substitution treatment. In countries for which data from 2007 or 2008 were available for comparison, there was generally an increase in coverage over time. Nevertheless, the levels of provision remain low in some countries and the data indicate a need to increase coverage of substitution treatment in many countries.

Figure 20. Coverage of opioid substitution treatment (percentage of estimated high-risk opioid users receiving treatment with uncertainty interval) in 2017 or most recent year and in 2007–08



Source: EMCDDA. The elimination barometer for viral hepatitis among PWID in Europe, 2019 [17].

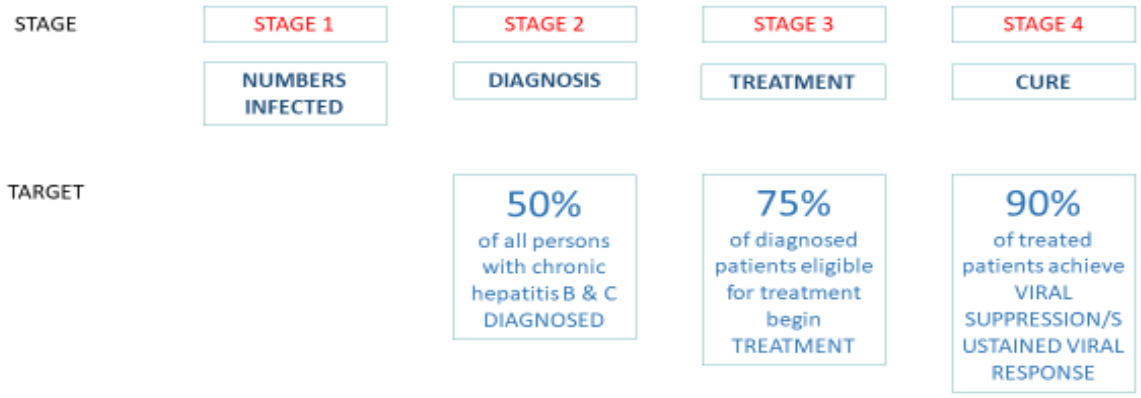
3.4 The continuum of care for hepatitis B and C

3.4.1 Background

The continuum of care for hepatitis B and C is a conceptual framework that enables countries to monitor the effectiveness of key areas of their response to these epidemics. The sequential nature of the stages in the continuum can clearly indicate where countries need to focus their efforts and which programmes and activities require improvement. More specifically, the continuum provides a snapshot of critical stages in achieving viral suppression among people living with chronic viral hepatitis. Achieving a high rate of viral suppression for chronic HBV and sustained viral response for chronic HCV plays a major role in reducing the impact of viral hepatitis, resulting in reduced morbidity and mortality and less new infections.

The continuum of care could also be a useful framework for assessing progress towards the WHO European Action Plan targets for 2020 (50% of those with chronic HBV and HCV are diagnosed; 75% of diagnosed patients who are eligible for treatment begin treatment; and 90% of HBV patients who receive long-term treatment achieve viral suppression and 90% of HCV patients who are treated achieve a sustained viral response) (Figure 21).

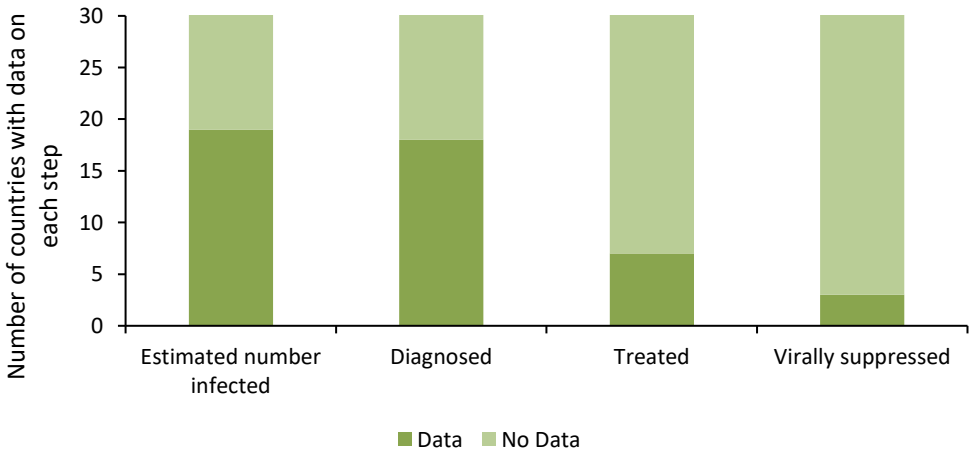
Figure 21. The continuum of care and the European Action Plan 2020 targets



3.4.2 Data availability

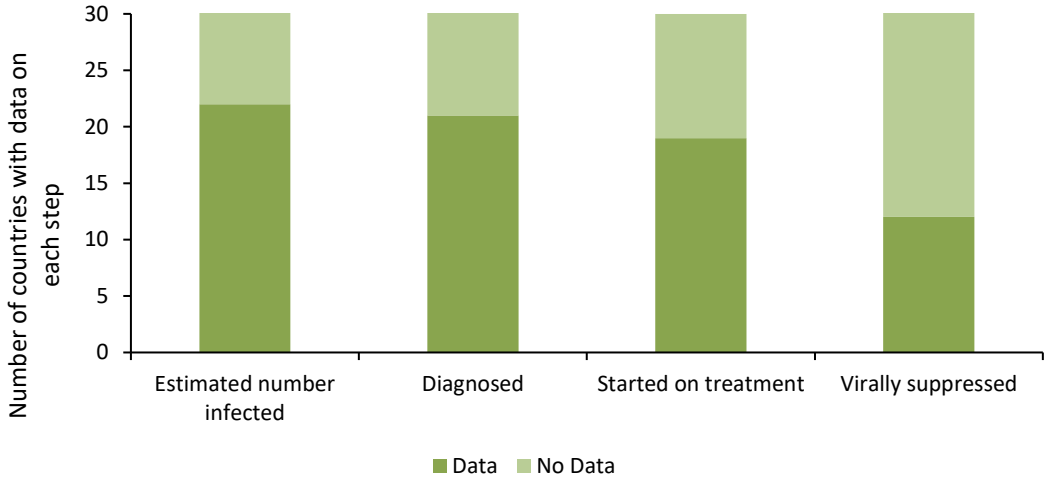
Responses to the monitoring questionnaire were submitted from all the 31 EU/EEA countries. Overall, 25 countries could provide data for one of the four key stages of the continuum for hepatitis B and 29 countries could provide data for hepatitis C (Annex 11; Tables 1 and 2, Annex 12). Two countries (Bulgaria and Romania) provided data for all four of the key stages for hepatitis B and nine countries (Bulgaria, Croatia, France, Hungary, Iceland, Ireland, Norway, Romania and the United Kingdom) provided data for all four stages for hepatitis C. A greater number of countries were able to report data for hepatitis C than for hepatitis B and over half of all countries provided data on the estimated numbers infected and diagnosed for both infections (Figures 22 and 23).

Figure 22. Number of countries* reporting data for different stages of the HBV continuum of care, EU/EEA countries in 2017



**For the United Kingdom, estimates of the number of people infected were available for England and Scotland, data on diagnosis available for Northern Ireland, Scotland and Wales.*
Source: ECDC survey, 2019

Figure 23. Number of countries* reporting data for different stages of the HCV continuum of care, EU/EEA countries in 2017



**For the United Kingdom, estimates of the number of people infected were available for England, Scotland and Wales, data on diagnoses and treatment were available for England, Northern Ireland, Scotland and Wales and data on viral suppression were available for England, Scotland and Wales.*
Source: ECDC survey, 2019

3.4.3 Stage 1: estimated number of people living with HBV and HCV

Hepatitis B

In total, 19 countries could provide data on the estimated number of people living with hepatitis B (Annex 12). Reported estimates ranged from 3 513 in Estonia (based on prevalence in blood donors in 2016) to 680 000 in Italy (based on a survey conducted in 2011). The majority of the estimates provided were based on the results of prevalence surveys conducted in the general population, with the remaining estimates derived from surveillance data or modelling studies.

Hepatitis C

A total of 21 countries could provide data on the estimated number of people living with hepatitis C. The estimates ranged from 250 in Iceland (based on programmatic data adjustments to existing estimates) to 850 000 in Italy (based on a survey conducted in 2014–15) (Annex 12). The source of the estimates provided from other countries varied from prevalence surveys to modelling and evidence synthesis methods.

3.4.4 Stage 2: number of people diagnosed with chronic HBV and HCV

2018 milestone

- High-quality viral hepatitis testing and diagnosis services are available and accessible for all;
- All countries have national HBV and HCV testing policies, aligned with WHO guidelines;
- All countries have estimated the diagnosis rate and the proportion of patients diagnosed at a late stage of viral hepatitis-related liver disease (cirrhosis or HCC);
- All healthcare workers know their viral hepatitis B and C sero-status.

EU progress

- In all, 90.5% (19/21) countries have national hepatitis B testing policies and 85.7% (18/21) have testing guidance covering hepatitis C;
- For hepatitis B, 12 countries have estimates of the diagnosis rate and for hepatitis C 16 countries have estimates;
- For hepatitis B, eight countries have estimates of the proportion of patients diagnosed at a late stage of viral hepatitis-related liver disease (cirrhosis or HCC). For hepatitis C, ten countries have estimates of the proportion of newly diagnosed patients with end-stage liver disease;
- In all, 57% (12/21) countries have a national policy for testing healthcare workers for HBV and 48% (10/21) have a policy for HCV.

2020 target

- 50% of all persons with chronic HBV, HCV and HDV diagnosed;
- 75% of estimated number of patients at a late stage of viral hepatitis-related liver disease (cirrhosis or HCC) diagnosed.

EU progress

- For hepatitis B, four of the 12 countries with data have already achieved the 2020 target of having 50% of all persons with chronic infection diagnosed. For hepatitis C, six of the 16 countries with data have already achieved the 2020 target.

Number and proportion of persons diagnosed with chronic hepatitis B

Among the 12 countries reporting data on both the estimated number of people living with HBV infection and the number diagnosed, there are an estimated 1 597 377 people with chronic HBV infection. of whom 20.3% (range 2.4–71.8%) were reported to have been diagnosed (Annexes 11 and 12; Table 10; Figure 24). This means that in these countries, approximately four in five people living with chronic hepatitis B are unaware of their status.

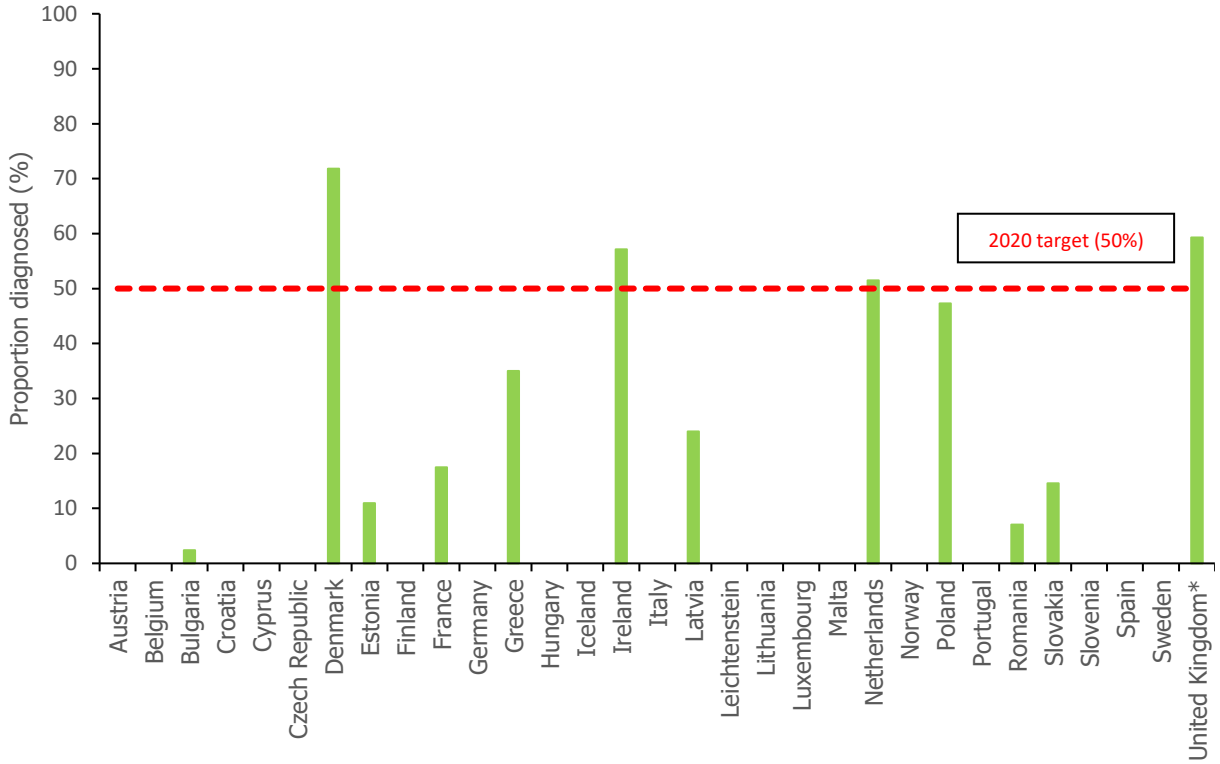
Table 10. Number and percentage of people living with HBV infection who have been diagnosed in EU/EEA countries with estimates of both the numbers infected and diagnosed, 2017

	Estimated number of people living with HBV (range)	Number diagnosed (range)	% of people diagnosed (range)
Hepatitis B (12 countries*)	1 597 377 (3 513–640 176)	323 851 (385–118 307)	20.3% (2.4–71.8%)

**Data for UK include Scotland only*
Source: ECDC survey, 2019.

Four countries (Denmark, Ireland, Netherlands and the UK) of the 12 with data on stages 1 and 2 have achieved the 2020 target of 50% of infections diagnosed (Figure 24).

Figure 24. Proportion (%) of people living with HBV who have been diagnosed in EU/EEA countries, 2017**



**Data represent Scotland only*
***Data incomplete on diagnosed cases from Bulgaria (data from 2016), Estonia (data from 2004) and the Netherlands (data from 2000).*
Source: ECDC survey, 2019.

Number and proportion of persons diagnosed with chronic hepatitis C

Among the 16 countries reporting data on both the estimated number of people living with HCV infection and the number diagnosed, there are an estimated 1 422 285 people with chronic HCV infection, of whom 26.8% (range 4.1–96.8%) have been diagnosed (Annexes 11 and 12; Table 11; Figure 25). This means that for these 16 countries, approximately three in four people living with chronic hepatitis C are unaware of their status.

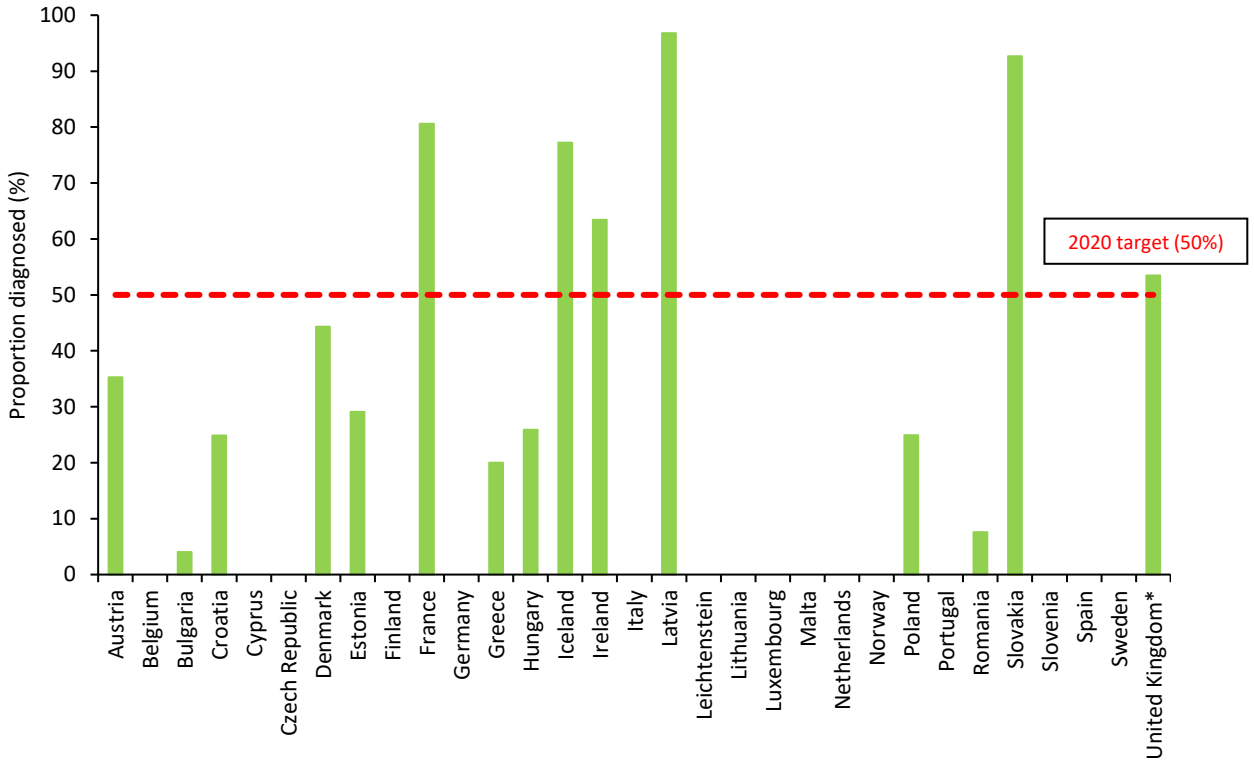
Table 11. Number and percentage of people living with HCV infection who have been diagnosed in EU/EEA countries, with estimates of both the numbers infected and diagnosed, 2017

	Estimated number of people with chronic HCV infection (range)	Number diagnosed (range)	% of people diagnosed (range)
Hepatitis C (16 countries)	1 422 285 (250–594 591)	381 503 (193–107 574)	26.8% (4.1–96.8%)

Source: ECDC survey, 2019

Six countries (France, Iceland, Ireland, Latvia, Slovakia and the United Kingdom) out of the 16 with data on both stage 1 and 2 have achieved the 2020 target of 50% of infections diagnosed (Figure 25).

Figure 25. Proportion (%) of people living with HCV who have been diagnosed in EU/EEA countries, 2017**



**Data represent England and Scotland.*
***Data incomplete on diagnosed cases from Austria (data from 2009), Bulgaria (data from 2016), Estonia (data from 2004)and Spain (data from 2015). For some countries data include cured/spontaneously resolved cases.*
Source: ECDC survey, 2019.

Proportion of newly diagnosed chronic HBV and HCV cases with end-stage liver disease

A total of eight countries could provide estimates of the number of newly diagnosed chronic HBV cases with end-stage liver disease (cirrhosis or hepatocellular carcinoma), with rates ranging from 0.2% in Latvia to 49.3% in Romania (Table 12). For hepatitis C, ten countries had estimates of the proportion of newly diagnosed chronic cases with end-stage liver disease, ranging from 0.2% in Latvia to 45% in Romania.

Table 12. Proportion of newly diagnosed chronic HBV and HCV cases with end-stage liver disease in EU/EEA countries, 2017

	Proportion of newly diagnosed chronic HBV cases with end-stage liver disease	Proportion of newly diagnosed chronic HCV cases with end-stage liver disease
Bulgaria	23%	20%
Croatia	15% cirrhosis	30% cirrhosis
Germany	6.2–28% - cirrhosis 1.6–9.9% - HCC	2–34% cirrhosis 1.2% HCC
Hungary		21.9%
Iceland	<5%	6%
Latvia	0.2–0.8%	0.2–0.4%
Poland	1.6%	4.5%
Spain		34.6% cirrhosis 1.0% HCC
Romania	49.3%	45%
UK (Scotland)	2.3%	2%

Hepatitis B and C testing guidance

In 2016–17, ECDC undertook a survey to assess needs and priorities prior to developing guidance on testing and screening for hepatitis B and C in the EU/EEA [9]. Of 21 countries responding to this survey, 19 (90.5%) had national-level testing guidance covering HBV, and 18 (86%) had national-level testing guidance covering HCV. In the survey information was also collected on the existence of 'dedicated testing guidance' which was defined as situations where the primary topic of the document is HBV and/or HCV and testing is the main component, or forms a component, of the guidance. Using this definition, six countries (29%) were considered to have dedicated HBV guidance, and ten countries (48%) were considered to have dedicated HCV guidance.

Costs of testing for hepatitis B and C

The 2016–17 survey also collected information concerning the costs of testing and data were available for 21 countries. Hepatitis B and C testing was reported to be offered free at the point of use or through reimbursed user fees in 15 (71%) countries. Only four (19%) countries (Belgium, Germany, Estonia, Latvia) reported that a non-reimbursed user fee was sometimes charged, but no country reported this as the only means of accessing testing.

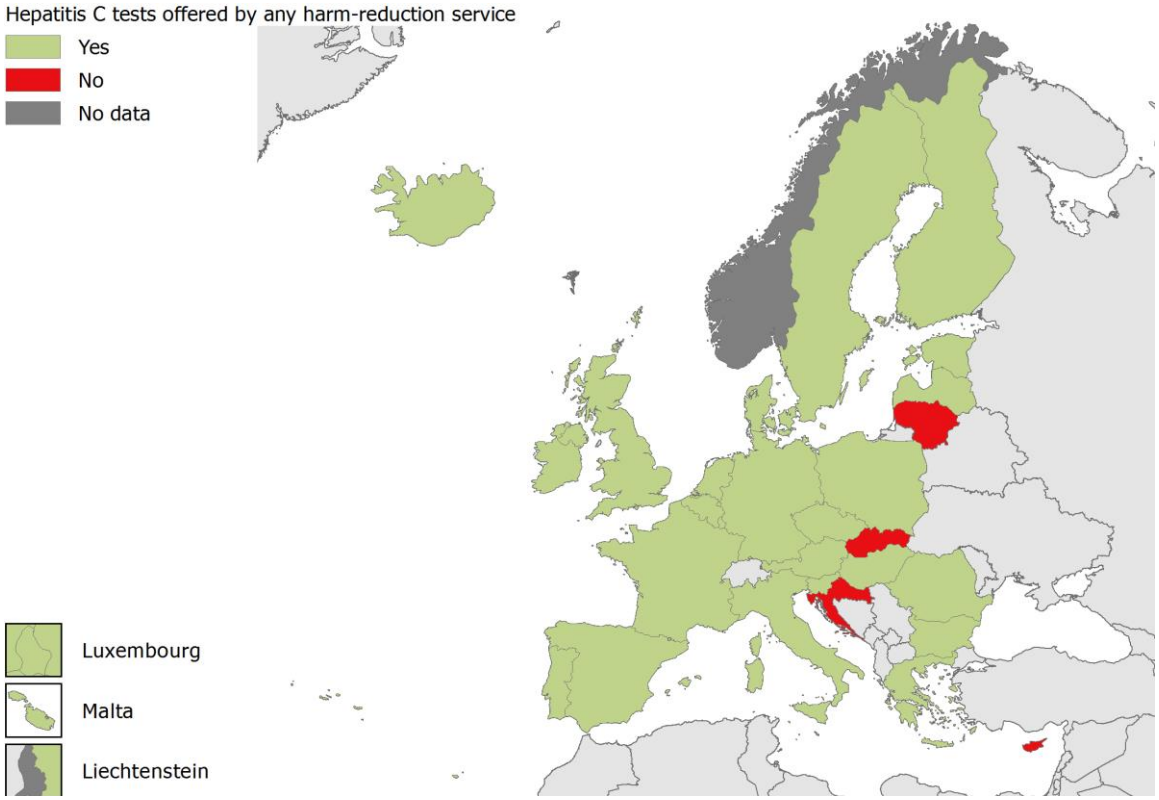
National policy of testing healthcare workers (for hepatitis B and C)

The survey also collected information from countries on the existence of a national policy for the testing of healthcare workers. For hepatitis B, 12 (57%) of the 21 responding countries reported that a policy did exist, five (24%) reported that there was no policy and four (19%) countries did not know. For hepatitis C, 10 countries (48%) reported that a policy existed for the testing of healthcare workers for hepatitis C, eight (38%) reported that no policy existed and three (14%) did not know.

Testing (of hepatitis B and C) in harm reduction services and prisons

Data are collected from EMCDDA on testing in harm reduction services and prisons. Of the 27 countries with available data, 22 reported that hepatitis C tests are offered by any harm reduction service and four countries (Croatia, Cyprus, Lithuania and Slovakia) reported they were not offered (Figure 26).

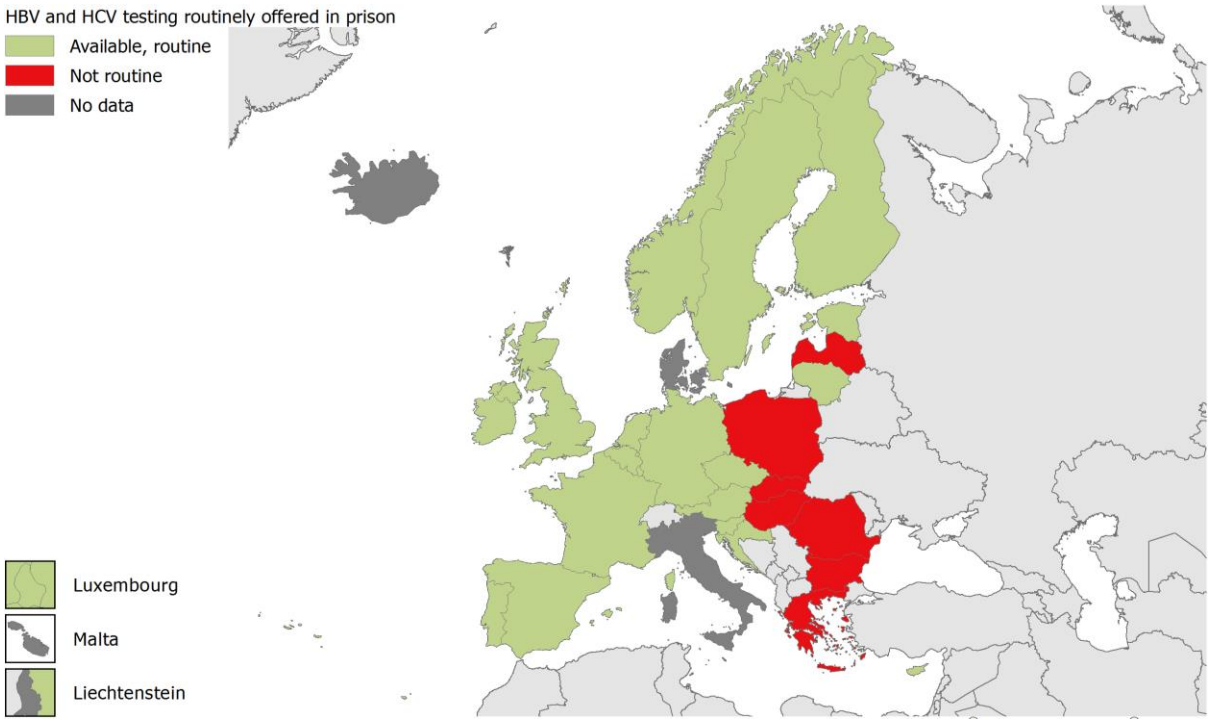
Figure 26. HCV tests offered by any harm-reduction service in EU/EEA countries, 2019



Source: EMCDDA, The elimination barometer for viral hepatitis among PWID in Europe, 2019 [13] and Pericàs, J.M. et al [13].*
** Additional information provided by countries: Iceland - HCV tests offered in both OST clinic and prison [personal communication Gudrun Sigmundsdottir, Poland]. Some harm reduction services offer HCV testing but this is not routine [personal communication Magda Rosinska, Slovenia]. HCV tests provided in high and low threshold harm reduction services [personal communication Mojca Maticic - Slovenia].*

Of the 26 countries reporting data on testing in prisons, 18 reported testing was routinely offered and eight countries reported that it was not routinely offered (Figure 27).

Figure 27. HBV and HCV testing offered routinely in prisons in EU/EEA countries, 2019

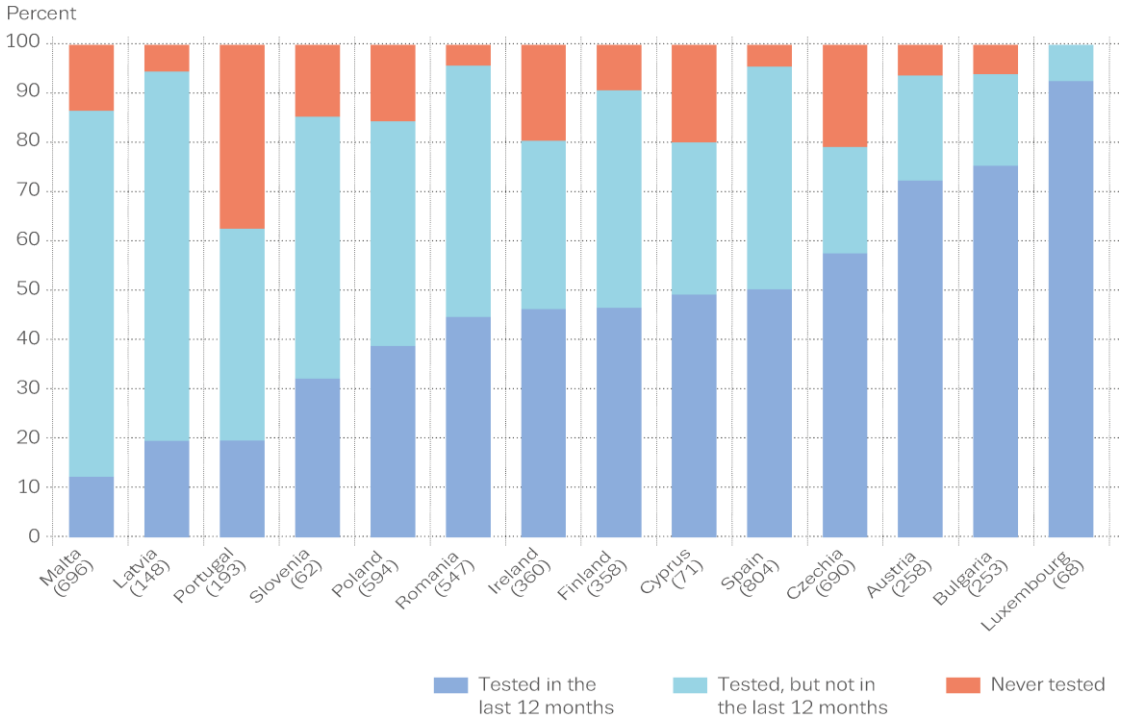


Source: EMCDDA. The elimination barometer for viral hepatitis among PWID in Europe, 2019 [13].

Previous HCV test among PWID treatment entrants

EMCDDA collected data from 16 countries on previous HCV tests on PWID treatment entrants. Only four countries (Czech Republic, Austria, Bulgaria and Luxembourg) reported over 50% of entrants having been tested for HCV in the last 12 months (Figure 28).

Figure 28. Percentage of people entering drug treatment reporting injecting drugs and having had an HCV test in the previous 12 months, 2017, EU/EEA countries*



Source: EMCDDA. The elimination barometer for viral hepatitis among PWID in Europe, 2019 [13].
Note: Sample size in parentheses.
** Data for 2017, except for Spain (2016).*

3.4.5 Stage 3: number of diagnosed patients with chronic hepatitis B and C who are linked to care and treated

2018 milestones:

National hepatitis treatment and care updates, in line with WHO guidelines established and regularly updated.

Baseline estimation of people who need to receive treatment for chronic HBV, HCV and HDV infection obtained, preferably by liver disease stage.

EU progress: four countries reported they had a baseline estimation of people who need to receive treatment for chronic HBV and 17 countries reported a baseline estimation for HCV.

2020 target:

- Treatment for chronic HBV, HCV and HDV infection, in line with international standards, is available and affordable for all.
- A total of 90% of diagnosed patients with chronic HBV, HCV and HDV infections are linked to care and adequately monitored.
- In all, 75% of the diagnosed patients with chronic HBV and HDV infection, who are eligible for treatment, begin treatment.
- A total of 75% of the diagnosed eligible patients with chronic HCV infection receive effective treatment.

EU progress:

- None of the six countries with data achieved the 2020 target of having 90% of diagnosed HBV patients linked to care. None of the seven countries with data achieved the target for HCV.
- No country had available data to assess progress towards the target of having over 75% of the diagnosed patients with chronic HBV infection who are eligible for treatment receiving treatment.
- One of the 12 countries reporting data had achieved the target of having 75% of the diagnosed eligible patients with chronic HCV infection receive effective treatment. However, it should be noted that many countries were unable to adjust the numbers diagnosed to remove those who had spontaneously resolved their infection or been cured.

Baseline assessment of the numbers needing treatment

A total of four countries (Greece, Lithuania, Romania and the United Kingdom (Scotland)) reported that a baseline estimation existed of the number of people who need to receive treatment for chronic HBV. For HCV, 17 countries (Austria, Belgium, Cyprus, the Czech Republic, Denmark, Finland, Greece, Iceland, Ireland, Lithuania, Malta, Norway, Portugal, Romania, Slovak Republic, Spain and the United Kingdom) reported having a baseline estimate of the number of people who needed to receive treatment for chronic HCV. Among these 17 countries, 15 also had estimates of the numbers chronically infected with HCV and in eight of the countries the estimates among numbers infected and numbers requiring treatment were the same.

Provision of treatment for 'current' injecting drug users

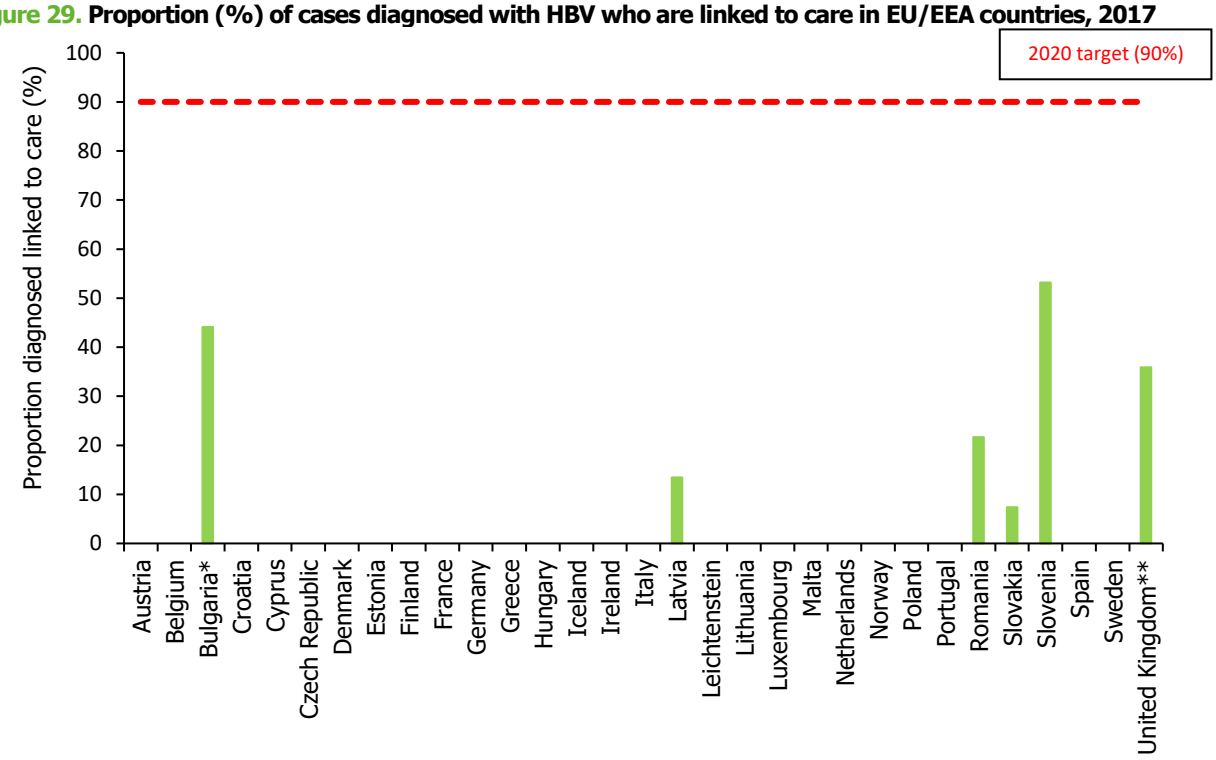
Data collected directly from countries by ECDC on the provision of antiviral treatment for hepatitis C for 'current' injecting drug users were available for 30 countries. Only three countries (Croatia, Malta, Poland) reported that antiviral treatment was not available.

Hepatitis B cases linked to care

Six countries were able to provide data on both the number of people with HBV infection diagnosed and the number receiving care[10] (Figure 29). The proportion of diagnosed HBV cases linked to care ranged from 7.4% in Slovakia to 53.2% in Slovenia.

[10] Defined as assessment of liver function/staging or biomarker testing or treatment

Figure 29. Proportion (%) of cases diagnosed with HBV who are linked to care in EU/EEA countries, 2017

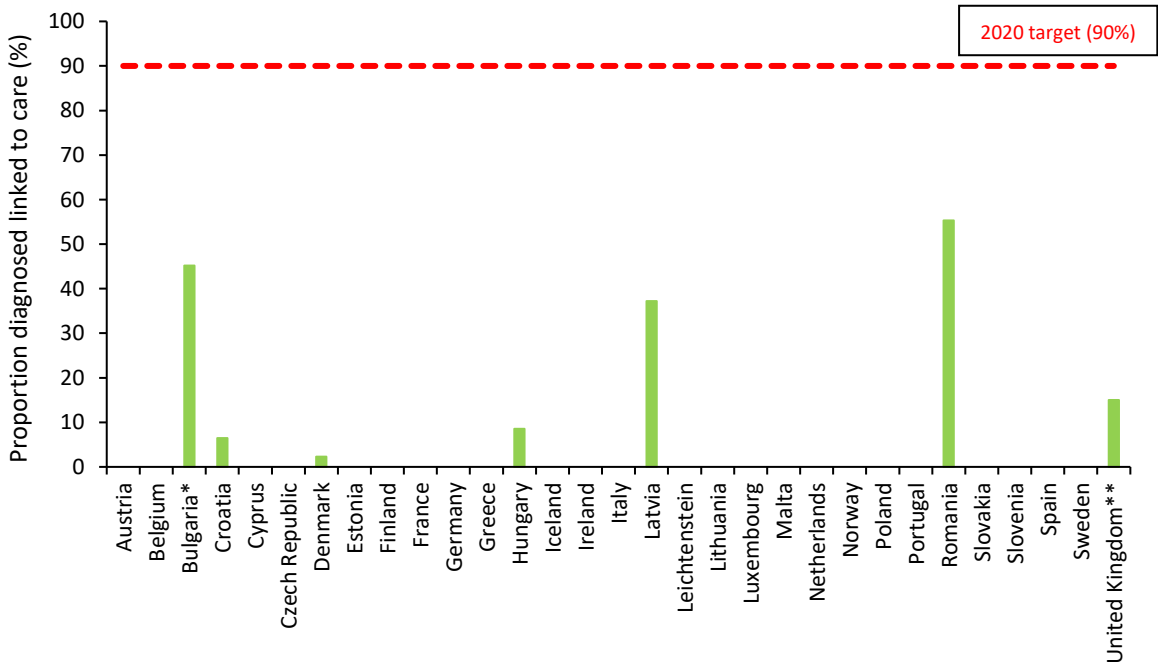


**Data on diagnosed cases are incomplete which may result in over-inflation of proportion.*
***Data from Scotland only.*
Source: ECDC survey, 2019

Hepatitis C cases linked to care

Seven countries were able to provide data on both the number of people with HCV infection diagnosed and the number receiving care[11] (Figure 30). The proportion of diagnosed HCV cases linked to care ranged from 2.3% in Denmark to 55.3% in Romania.

Figure 30. Proportion (%) of cases diagnosed with HCV who are linked to care in EU/EEA countries, 2017



**Data on diagnosed cases incomplete which may result in over-inflation of the proportion.*

[11] Defined as assessment of liver function/staging or biomarker testing or treatment.

***Data from England, Scotland and Wales.*
Source: ECDC survey, 2019.

Hepatitis B cases treated

Among the six countries reporting data on both the number of people with HBV infection diagnosed and the number treated, 25.1% of those diagnosed were on treatment (range 4.3 – >100%[12]) (Table 13). However, it should be noted that many of the cases who are diagnosed with chronic infection may not be eligible for treatment according to clinical guidelines. Only one country (Romania) was able to provide data on the estimated number of chronic HBV infections eligible for treatment and on the numbers on treatment, with an estimated 7.7% of all eligible individuals receiving treatment.

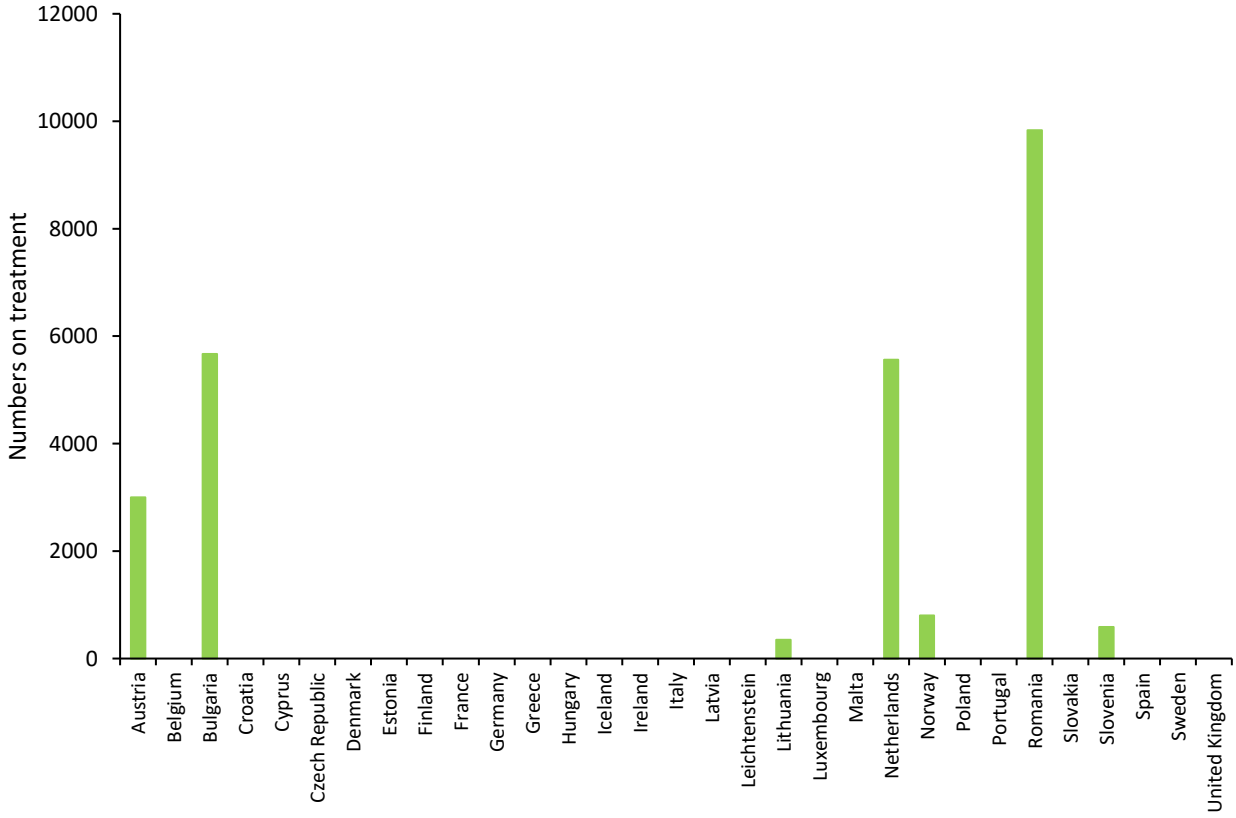
Table 13. Number and percentage of people diagnosed with HBV infection who are on treatment* in EU/EEA countries, 2017**

	Number diagnosed (range)	Estimated number of people on treatment (range)	Proportion diagnosed on treatment (%)
Hepatitis B (6 countries)	191 509 (2096–45 315)	25 450 (589–9 834)	25.1 (4.3–>100[13])

** Not all those diagnosed will be eligible for treatment according to clinical guidelines.*
*** Includes only countries with estimates of both the numbers diagnosed and treated.*
Source: ECDC survey, 2019.

Seven countries reported data on the number of patients on treatment for chronic HBV infection prior to and during 2017 (Figure 31). The number ranged from 349 people on treatment in Lithuania to 9834 in Romania.

Figure 31. Number of people with HBV on treatment in EU/EEA countries, 2017



Source: ECDC survey, 2019.

[12] An estimate exceeding 100% for Bulgaria was obtained due to underestimation of the denominator of numbers diagnosed using data based on cases diagnosed in 2016 and 2017 only.
[13] See footnote 12.

Hepatitis C cases treated

Among the 12 countries reporting data on both the number of people with diagnosed HCV infection and the number of those diagnosed who were started on treatment in 2017, 23.0% (range 5.8–100) had been started on treatment (Table 14).

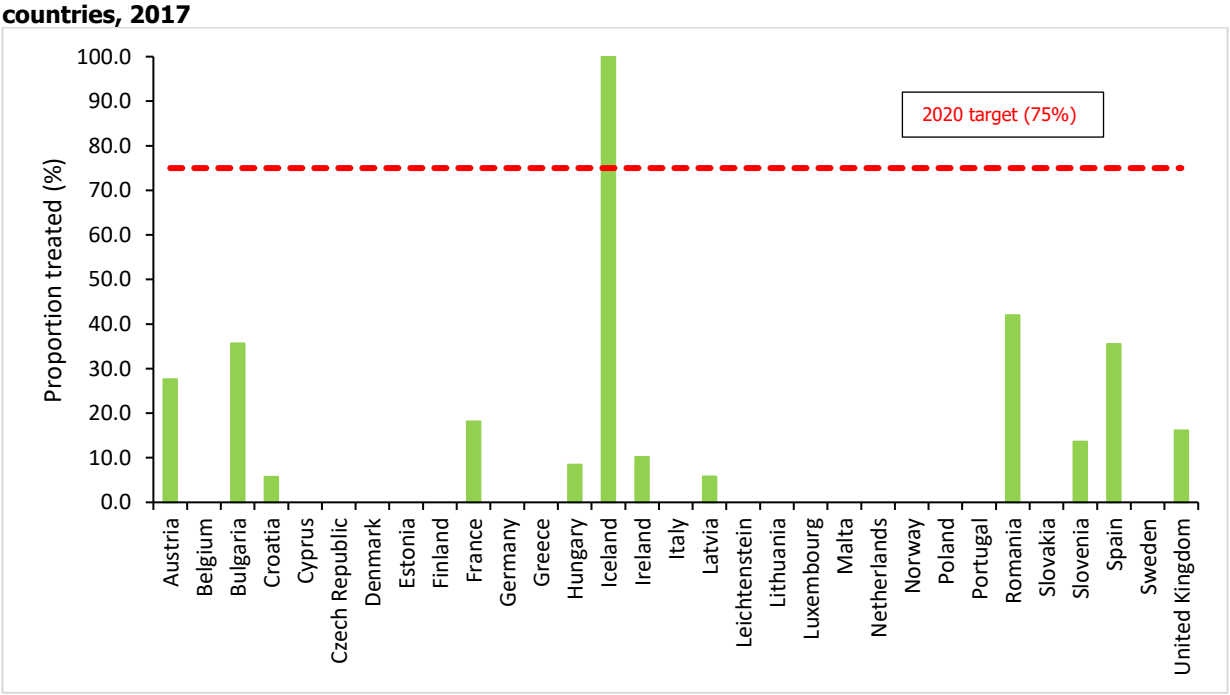
Table 14. Number and percentage of people diagnosed with HCV infection who have been treated in EU/EEA countries*, 2017

	Number diagnosed (range)	Estimated number of people started on treatment (range)	Proportion started on treatment (%)
Hepatitis C (13 countries)	386 059 (1094–107 574)	88 793 (181–29 012)	23.0 (5.8–100)

Source: ECDC survey, 2019.
** Includes only countries with estimates of both the numbers diagnosed and treated.*

Only one of the 12 countries with available data had achieved the 2020 target of 75% of diagnosed infections started on treatment in 2017 (Figure 32). Several of the countries reported that the data on the numbers diagnosed included those who had cleared their infection spontaneously or been cured through antiviral treatment and this would have resulted in an under-estimation of the true situation.

Figure 32. Proportion of people diagnosed with HCV who have been started on treatment in EU/EEA countries, 2017



Source: ECDC survey, 2019

3.4.6 Stage 4: Viral suppression/sustained viral response among patients treated for hepatitis B and C infection

2020 target:

- 75% of the diagnosed patients with chronic HBV and HDV infection, who are eligible for treatment, begin treatment and among those on long-term treatment for HBV, 90% obtain viral suppression;
- 75% of the diagnosed eligible patients with chronic HCV infection receive effective treatment and at least 90% of them are cured.

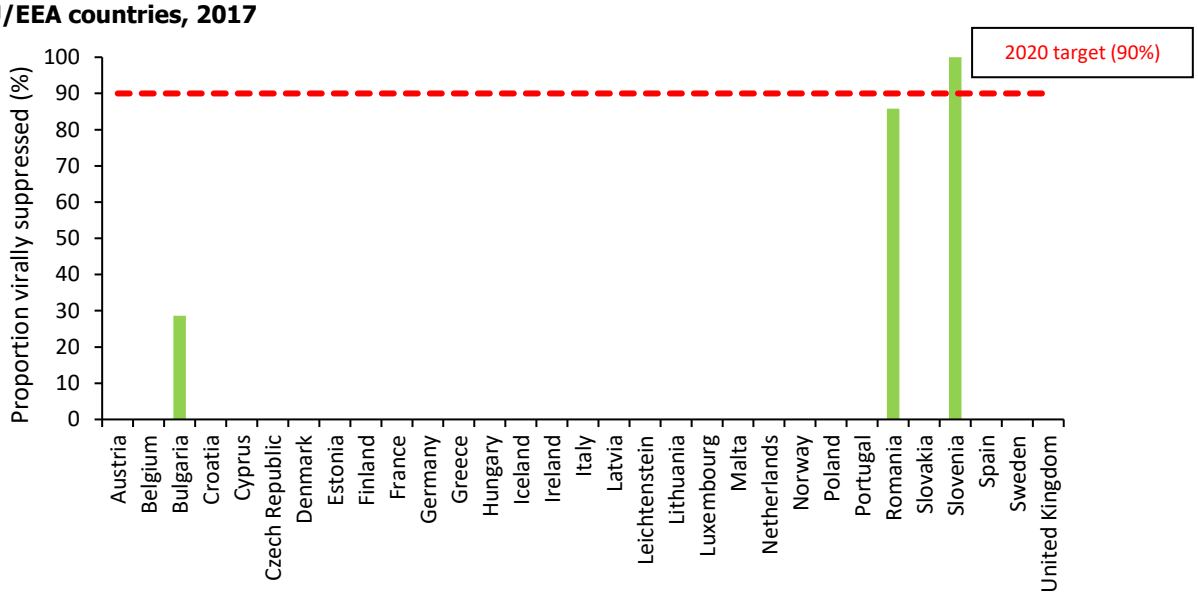
EU progress:

- one of the three countries with available data for hepatitis B has achieved the target of 90% of those on long-term treatment obtaining viral suppression;
- all of the 12 countries with available data for hepatitis C have achieved the target of having at least 90% of those treated being cured.

Hepatitis B cases virally suppressed

Only one of the three countries with available data on viral suppression had achieved the 2020 target for viral suppression (Figure 33).

Figure 33. Proportion of patients on treatment for HBV who have achieved viral suppression in EU/EEA countries, 2017

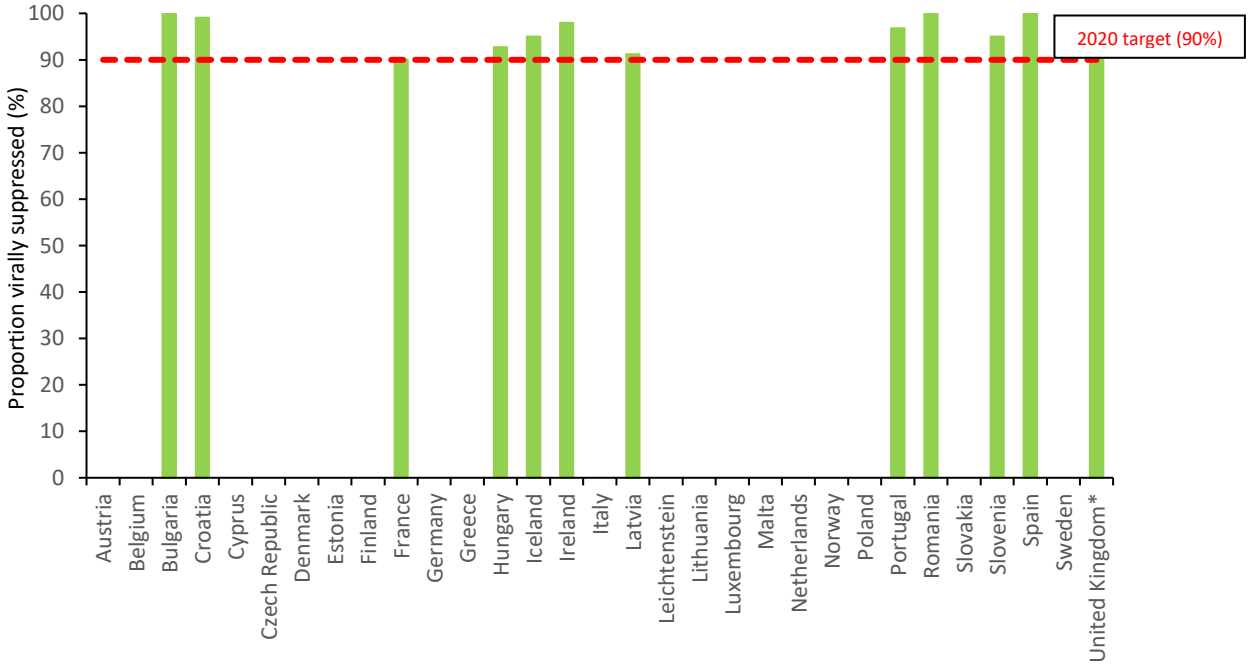


Source: ECDC survey, 2019.

Hepatitis C cases cured

All of the 12 countries with available data had achieved the 2020 target of patients having a sustained viral response (Figure 34).

Figure 34. Proportion of patients on treatment for HCV who achieved a sustained viral response in EU/EEA countries, 2017



**Represents data from England. Proportion with sustained viral response in Scotland estimated at 97% and in Wales 550 individuals had a sustained viral response.*
Source: ECDC survey, 2019.

3.5 Impact

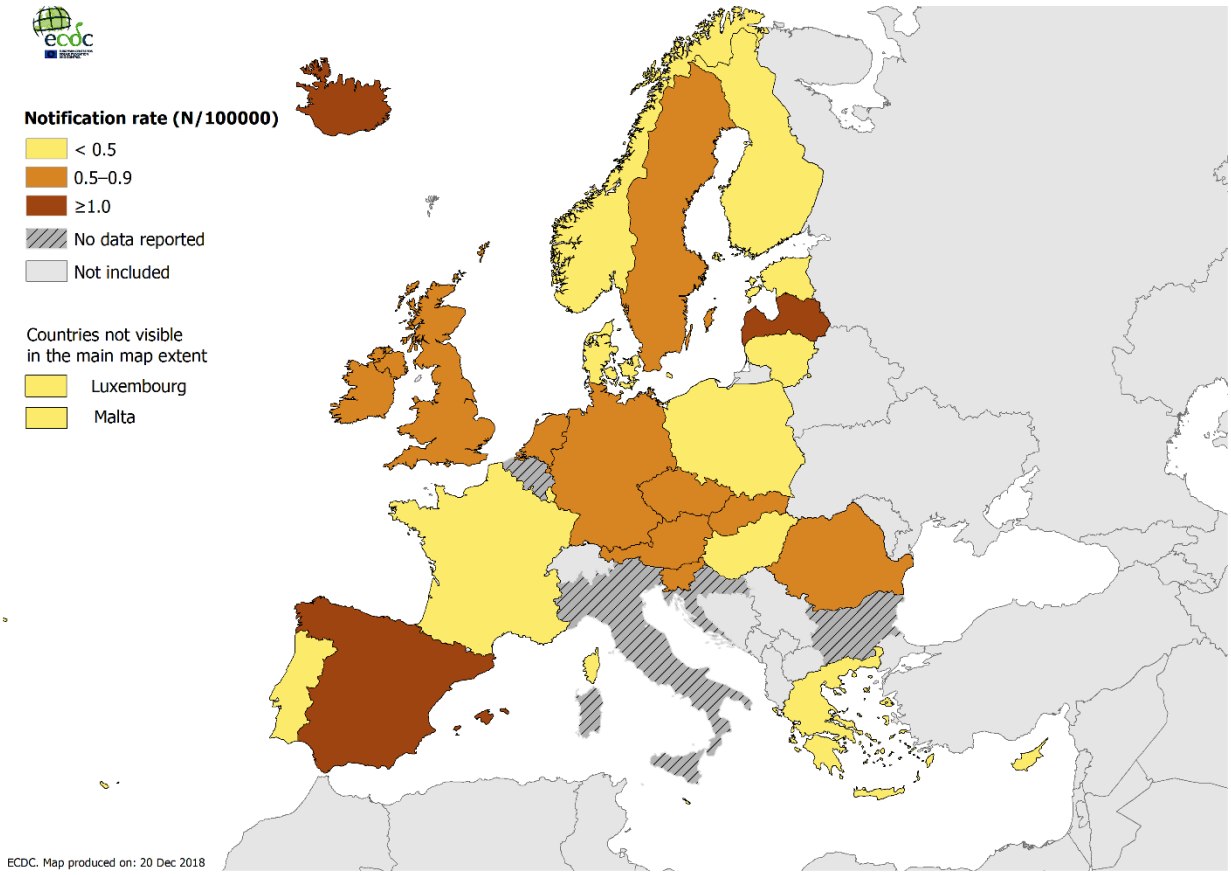
3.5.1 Incidence

Hepatitis B

Data on newly diagnosed cases of hepatitis B reported to ECDC by EU/EEA countries provide weak proxy data on the incidence. Notification-based data for hepatitis B are affected by differences in national surveillance systems and under-reporting of cases is known to be a major issue. Moreover, as most of the acute cases occur among adults (88% of notifications are among persons aged 25 years of age or over), and with most of these infections expected to resolve spontaneously, extrapolating from acute notification data to incidence of chronic infection is challenging. The information from modelling work commissioned by WHO will probably provide more robust estimates that can be used to monitor progress towards this elimination target. Nevertheless, data from acute notifications reported by Member States provide some indication of incidence, particularly in relation to trends.

Twenty-six countries provided data on acute cases in 2017 and the overall rate of acute cases was 0.6 per 100 000 population, with marked variation across countries ranging from no cases in Luxembourg to 2.2 cases per 100 000 population in Latvia. (Figure 35)

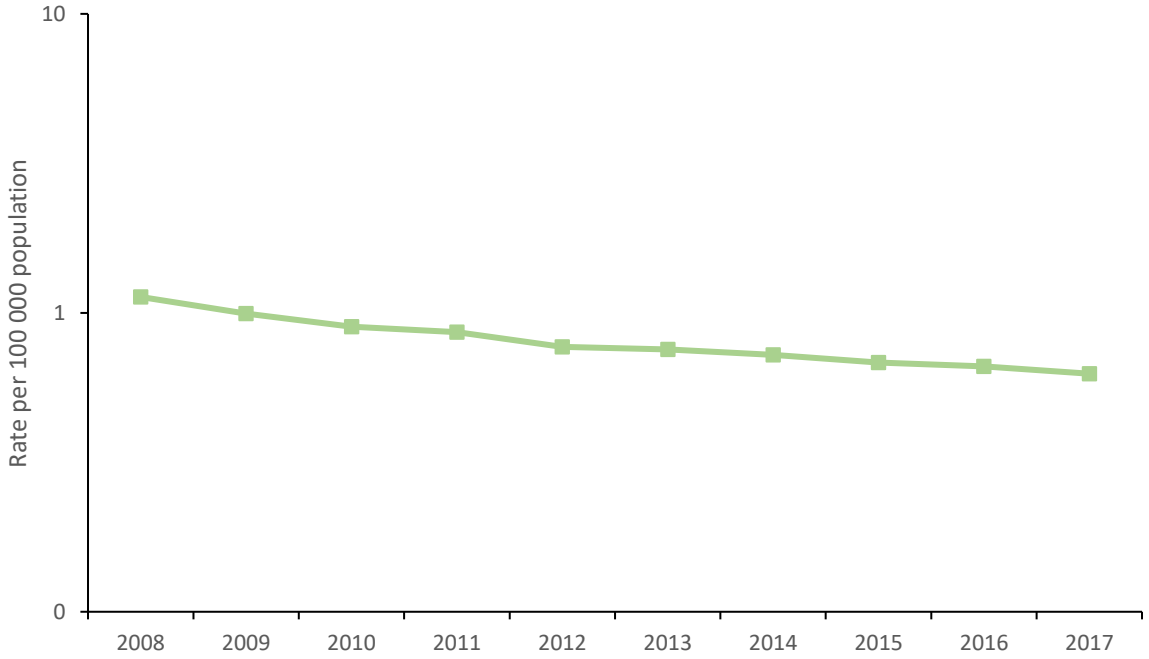
Figure 35. Notification rate of acute hepatitis B cases* per 100 000 population by country, EU/EEA, 2017



Source: ECDC, 2019 [14].
**Countries included if able to present data by disease status, if they used a case definition that includes only acute cases (e.g. EU 2008) or if known to report only acute cases and had national coverage.*

When restricting the analysis of the data to the 19 countries that reported consistently from 2008–2017, the notification rate for acute hepatitis B cases showed a steady decline from 1.1 cases per 100 000 population in 2008 to 0.6 in 2017 (Figure 36). This decline is observed in most countries, but not all of them (e.g. Portugal) follow the same trend.

Figure 36. Notification rates of acute hepatitis B per 100 000 population by year in EU/EEA countries reporting consistently, 2008–2017



Source: ECDC 2019 [14].
Country reports from Austria, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Latvia, the Netherlands, Norway, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.*
**: Underreporting of acute hepatitis B in France estimated at 73% in 2016.*

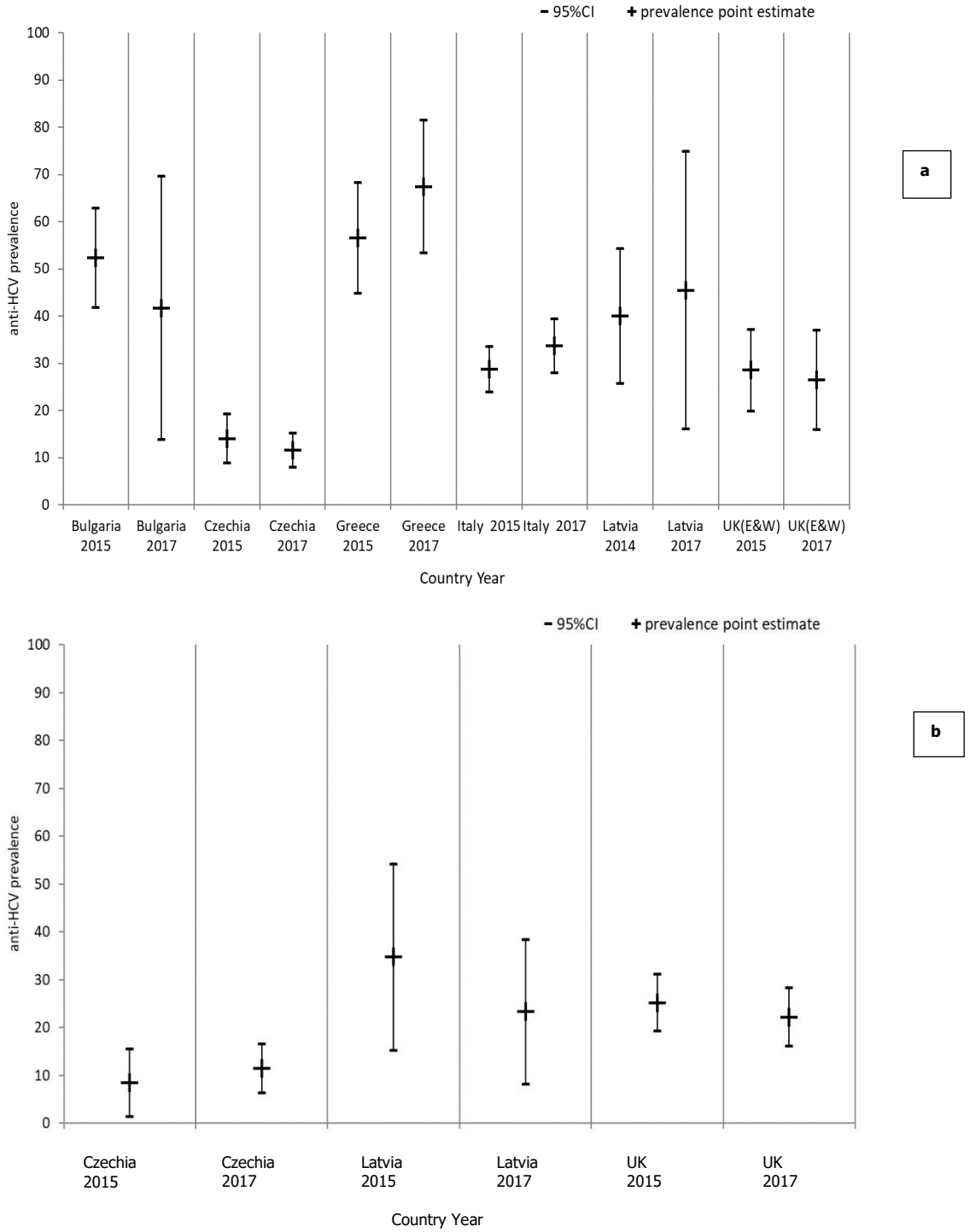
Hepatitis C

There are no empirical data available for the incidence of new hepatitis C infections. Information from modelling conducted by WHO will provide estimates that can be used to monitor progress towards the elimination target.

Data on prevalence of anti-HCV among PWID who are under 25 years (young injectors) and among those who have been injecting less than two years (new injectors) may be used as a rough proxy for trends in incidence in this risk group. The prevalence of infection in these two groups is considered to reflect relatively recent transmission.

In 2015, the prevalence of anti-HCV among young injectors found in studies ranged from 14% in the Czech Republic to 56.5 % in Greece. In 2017, it was 11.5 % in the Czech Republic and 67.4 % in Greece (Figure 37). The prevalence of anti-HCV among new injectors found in 2015 ranged from 8.5 % in the Czech Republic to 34.8 % in Latvia. In 2017, it ranged from 11.5 % in the Czech Republic to 23.3% in Latvia (Figure 37). Although some estimates are based on a small sample size, they suggest ongoing transmission of HCV among PWID in 2017 at levels that are not substantially different from those in 2015, with some countries reporting higher point estimates in 2017.

Figure 37. HCV antibody prevalence (%) among PWID (a) aged under 25 years and (b) injecting for less than two years: results from diagnostic tests and seroprevalence studies with national or multi-city coverage, baseline (2014–15) and 2017



Source: EMCDDA. The elimination barometer for viral hepatitis among PWID in Europe, 2019 [17].

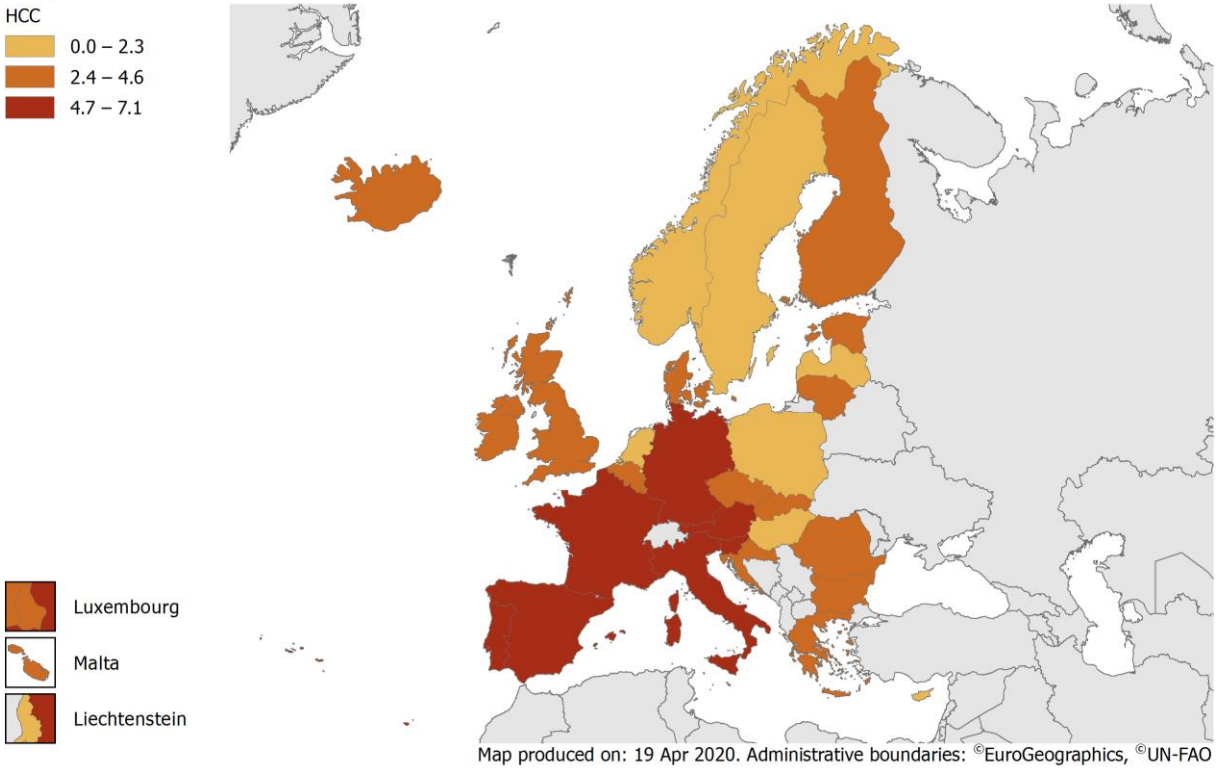
3.5.2 Mortality

Hepatocellular carcinoma

In 2015, a total of 23 883 persons were reported to have died of hepatocellular carcinoma (HCC) in the 31 EU/EEA countries, representing a rate of 4.6 per 100 000 population (Annex 10) [21]. France, Germany, Italy, Spain and the UK reported more than 2 000 deaths each and accounted for 77% (18 490) of the total number of EU/EEA cases. National mortality rates ranged between 1.3 in Cyprus to 7.1 in Italy (Figure 38). Countries with rates higher than the

EU/EEA rate of 4.6 per 100 000 included (in order of increasing size) Germany, Portugal, Austria, Spain, Slovenia, France and Italy. Overall most of the countries with the highest rates of HCC were in the western part of the region.

Figure 38. Age-standardised mortality rates per 100 000 population from hepatocellular carcinoma (ICD-10 code C22.0) in the EU/EEA countries in 2015



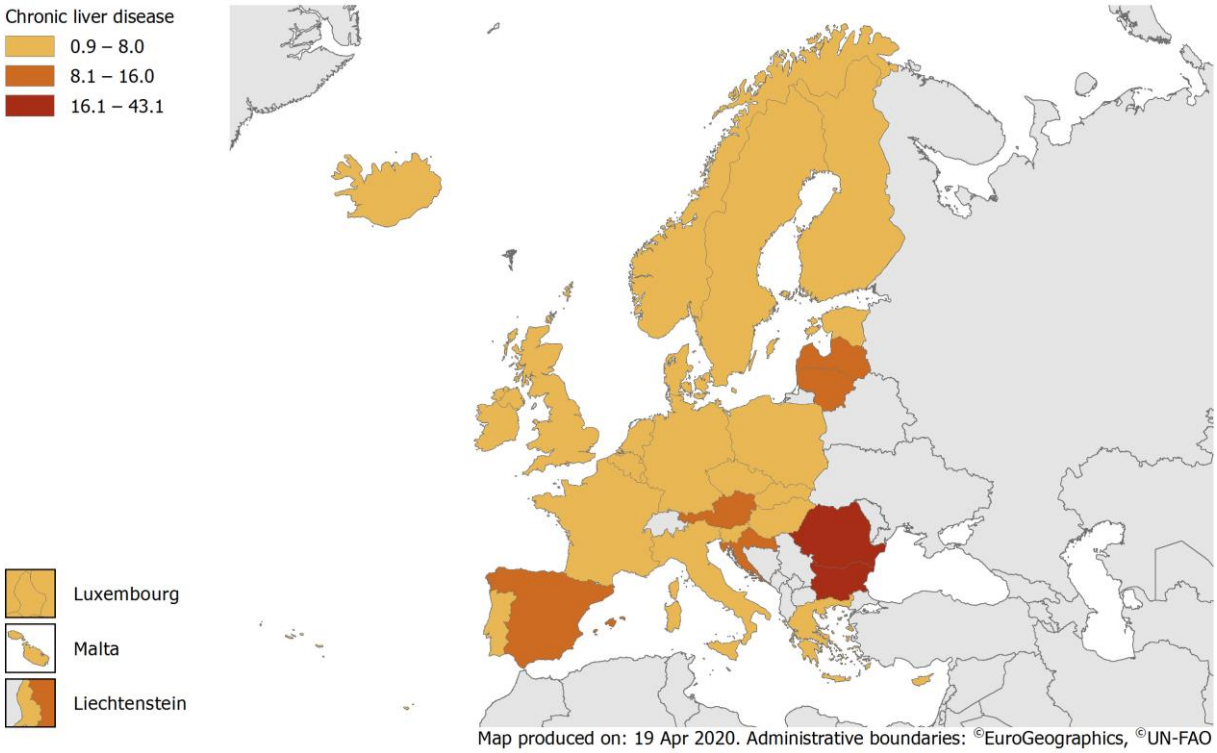
Source: Mardh O, et al [21].

Chronic liver disease (including cirrhosis)

There were 41 146 deaths from chronic liver diseases reported from 31 EU/EEA countries in 2015, a rate of 8.0 per 100 000 population (Annex 10) [21]. Just under half (49.4%) of the deaths were reported by three countries: Romania (8 222, 20.0%), Germany (6 719, 16.3%) and Italy (5 386, 13.1%). National rates ranged between 0.9 in Slovenia to 43.1 per 100 000 in Romania. Seven countries reported rates above the EU/EEA average rate value: Spain, Austria, Latvia, Croatia, Lithuania, Bulgaria and Romania (Figure 39).

Most (84%) of the chronic liver disease deaths in the EU/EEA in 2015 were due to cirrhosis (n=34 567). Geographical variation in mortality rate from cirrhosis was larger than for HCC, with the mortality rate in Romania (39.2 per 100 000) almost 50 times higher than that for Slovenia (0.8 per 100 000).

Figure 39. Age-standardised mortality rates per 100 000 population from chronic liver diseases (ICD-10 codes K72-K75) in EU/EEA countries in 2015

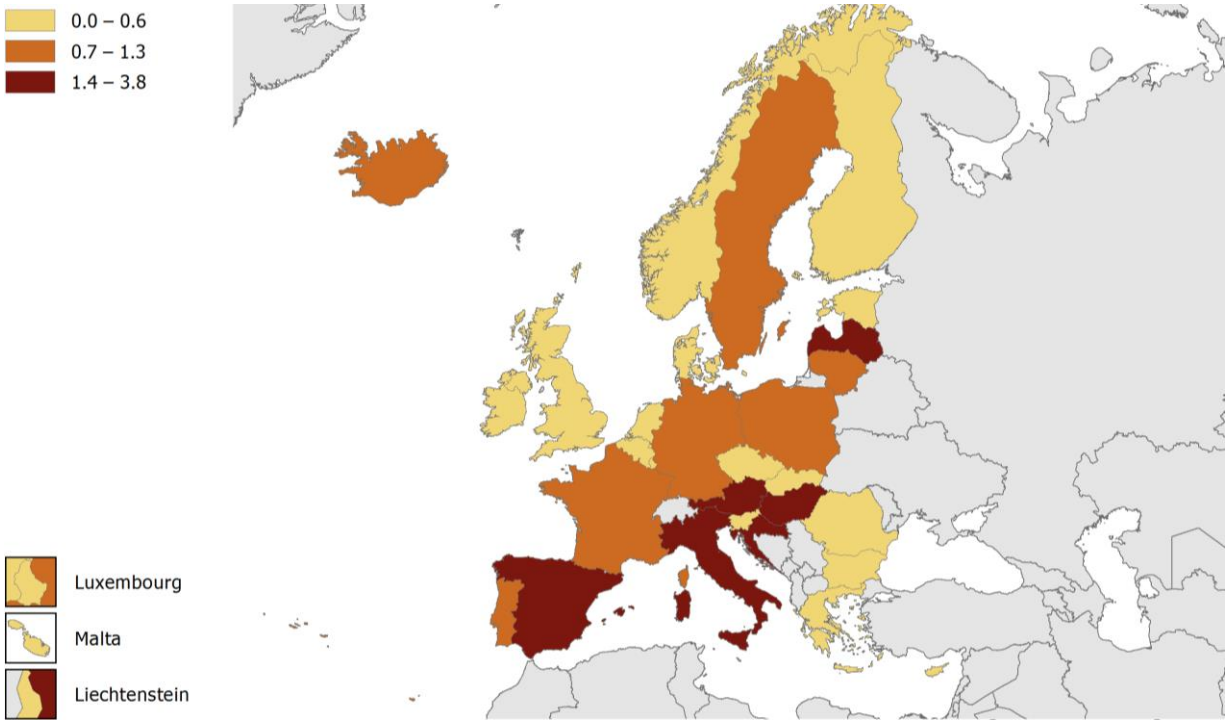


Source: Mardh O, et al [21].

Chronic viral hepatitis B and C

In 2015, 6 475 persons died with chronic hepatitis B and C as the underlying cause, resulting in an EU/EEA rate of 1.3 per 100 000 (Annex 10) [21]. Three countries reported two-thirds (66.1%) of the cases: Italy (40.7%, 2 637), Germany (13.2%, 855) and Spain (12.2%, 790); no deaths were reported from Liechtenstein and Malta. National mortality rates were above the EU/EEA average rate in Croatia, Spain, Hungary, Latvia, Austria and Italy (Figure 40).

Figure 40. Age-standardised mortality rates per 100 000 population from chronic viral hepatitis B and C (ICD-10 codes B18.0, B18.1, B18.2) in EU/EEA countries in 2015



Source: Mardh O, et al [21].

EU/EEA mortality baseline 2015

In 2015, a total of 65 029 deaths from liver diseases, as defined by WHO ICD10, were reported in the EU/EEA: 23 883 from HCC and 41 146 from chronic liver disease (CLD) (with 84% coded as cirrhosis) [21].

When compared with 2011, the mortality rate across all EU/EEA countries in 2015 from HCC increased by 5.3% (1 456 more deaths) and from chronic viral hepatitis (CVH) by 2.3% (225 more deaths). In contrast, the mortality rate across all EU/EEA countries from cirrhosis decreased by 9.5% (2 934 fewer deaths) and from CLD by 7.2% (2 479 fewer deaths).

In order to derive the hepatitis B and C specific mortality disease aetiology fraction and calculate a 2015 baseline mortality, estimates were sourced and applied to the mortality data. The availability of country specific aetiology fraction estimates for a less specific definition of liver cancer (C22) necessitated using the number of deaths from (all) liver cancer (C22) (n=53 250) instead of HCC (C22.0), leading to a slight overestimate. Similarly, CLD was redefined to fit the available aetiology fraction estimates, from K72 – K75 to a broader definition including also alcoholic liver diseases (K70), chronic viral hepatitis (B18). When applying the country specific aetiology fraction estimates (Annex 10, Table 2) to the number of deaths from liver cancer and CLD, the number of deaths from these conditions that can be attributed to HBV and HCV in 2015 were 29 029 and 34 898, respectively. This represented 55% of all liver cancer deaths and 45% of CLD deaths (broader definition) in the EU/EEA. Hence, the total number of deaths attributable to HBV and HCV in 2015 was estimated as 63 927.

4. Discussion and conclusions

This report provides the first collation of data relating to the monitoring of the progress towards the elimination of hepatitis B and C for EU/EEA countries. Data were collated from a range of existing sources pertaining to epidemiological context, prevention and control, and impact. Data were also collected directly from all 31 Member States on testing and treatment indicators for the continuum of care in relation to hepatitis B and C. Despite the limitations of existing data sources and inherent difficulties arising from the diversity of data and gaps in completeness, this collated information represents an important step towards understanding the priority areas for action and gaps in the national responses to the hepatitis B and C epidemics. The data also provide an important baseline to help map progress towards the WHO elimination targets and ultimately achieve the 2030 SDGs.

The implementation of this monitoring system supports EU/EEA countries in evaluating their responses to tackling the hepatitis B and C epidemics by means of a structured and harmonised approach. The system also provides a comprehensive overview of the situation to guide the European Commission and other European Agencies in their support to Member States in achieving their goal of elimination. These objectives have been achieved through the development of the monitoring framework by European experts from the areas of hepatitis and monitoring and through the support of national experts in providing the data (Annex 1).

Context

Compared to other regions, the prevalence of HBV and HCV infections in the EU/EEA is relatively low, with some evidence of declining trends, particularly for HBV [1]. The epidemiology of both infections is changing constantly, due to the impact of prevention and control programmes and changes in risk factors and the demographic structure of the populations. However, most countries lack recent robust epidemiological studies that provide reliable estimates of the burden of chronic viral hepatitis. This lack of high-quality, recent prevalence estimates and the heterogeneity of available data and studies makes it challenging to gain an accurate overview of the current epidemiological situation regarding chronic viral hepatitis.

The prevalence of chronic HBV and HCV in the general population varies widely across the countries for which estimates are available, with a tendency for a higher HBsAg and anti-HCV prevalence in countries in the eastern and southern part of the EU/EEA. For hepatitis B, the highest reported HBsAg estimate in the EU/EEA (Romania) was 44 times higher than in the country with the lowest estimated prevalence (Ireland). For hepatitis C, estimates of anti-HCV prevalence ranged from 0 in Croatia to 3.9% in Italy. This variation in prevalence for both infections is most probably due to differing risk factors, demographic factors and transmission routes in combination with variations in implementation of prevention and control strategies. Robust and recent prevalence estimates of chronic hepatitis infections are also lacking for key population groups including PWID, prisoners and MSM. In addition, many existing studies only considered prevalence of anti-HCV which does not provide a clear representation of chronic prevalence as many cases who have spontaneously cleared the infection or been treated retain this marker, so estimates of RNA prevalence are needed to provide a clearer understanding of the epidemics. However, data from the available studies together with data from notifications of newly diagnosed infections indicate that injecting drug use remains a major driver of the hepatitis C epidemic in Europe. In particular, prevalence estimates are high among PWID and a large proportion of acute infections are attributed to injecting drug use. Across EU/EEA countries, the prison population is another key population group for hepatitis B and C with a high burden of infection. Estimates of prevalence for this group are as high as 25% for HBsAg and 46% for anti-HCV.

The lower prevalence of HBV among some risk populations is undoubtedly the direct result of the implementation of primary prevention measures, especially childhood immunisation in the general population over the last few decades. However, it is also probable that vaccination of key risk groups has helped lower prevalence in some countries, such as the Netherlands and the United Kingdom, where universal childhood vaccination has only been implemented fairly recently. This highlights the importance of adequately resourcing primary prevention measures, as well as continuing to offer HBV vaccination to risk groups to protect public health.

Coinfection with HIV is an issue, particularly among PWIDs and MSM in EU/EEA countries. As HCV is more transmissible than HIV through blood, most PWID are already HCV-infected by the time they are diagnosed with HIV and whilst sexual transmission of HCV is less likely, several outbreaks of acute hepatitis C have been described in HIV-positive MSM in Europe [22]. Information on co-infections from a recent systematic review indicates high prevalence of HIV-HCV coinfections among HIV infected individuals. Furthermore, self-reported data for MSM from the EMIS-2017 report indicate that 1.2% of respondents had a co-diagnosis of HIV with either HBV or HCV across the EU, with most respondents indicating that few of them had been infected with HCV more than once. The evidence of co-infection with HBV and HCV among PLHIV endorses the recommendations by the European AIDS Clinical Society and the European Association for the Study of the Liver that individuals diagnosed with one of the infections should be tested for the others [23, 24]. However, it is likely that implementation of co-infection testing may be suboptimal, missing a key opportunity for earlier diagnosis in a population group that is already in contact with the health services [10]. ECDC has recently published guidance for integrated testing of HBV, HCV and HIV to

promote an integrated approach to testing for those accessing services. This approach advocates bringing services together and focusing on the individual [25].

Migrants are disproportionately affected by chronic hepatitis B and C and are a key risk group for HBV and HCV in the EU, accounting for an estimated 25% of all chronic hepatitis B cases and 14% of all chronic hepatitis C cases [18]. There is variation in the proportion of migrants from high/intermediate HBV and HCV endemicity countries across EU/EEA countries. The high burden of infection and variation across countries emphasises the importance of countries having a clear oversight of the demographic profile of their population to help assess whether there is a need for a targeted screening approach for migrants. Available evidence suggests coverage of migrant screening programmes in EU/EEA countries is low, which emphasises the importance of countries developing innovative and sustainable strategies to facilitate testing and linkage to care through a comprehensive healthcare approach [26]. Recent guidance by ECDC around migrant screening for a range of infectious diseases including hepatitis, provides some support to EU/EEA countries to develop national strategies to strengthen prevention and control strategies targeting migrants to help better meet the health needs of these populations [27].

There are limited data on the size of the PWID population, although data availability is improving. The available evidence indicates variation across countries in the number of PWIDs, although only three countries have a prevalence of injecting drug use of over five per 1 000. There are changes in the most commonly injected drugs, with stimulants becoming more common. Given the importance of injecting drug use to the HBV and HCV epidemics in Europe, changes in the dynamics of the PWID population undoubtedly have a major impact on these epidemics. Estimates of the size of the injecting drug population are necessary to calculate the coverage of harm reduction measures. A lack of estimates of the PWID population has resulted in limited information being available on the coverage of these measures across EU/EEA countries. Whilst injecting drug use remains a key driver of the hepatitis situation in Europe, estimates of the size of the PWID population are a key element of any monitoring strategy to support the elimination of HCV and HBV as a public health threat.

Prevention and policy

The existence of a national hepatitis plan or strategy is a fundamental component of an effective approach in tackling hepatitis and achieving the goal of elimination. Whilst the majority of responding countries reported having a plan or strategy, not all these plans are funded. All countries should have developed a specific hepatitis plan and WHO has drawn up a manual to support countries in developing and assessing national plans [28]. The development of such a plan is often one of the first steps in planning the national approach and such a plan needs funding, implementation and subsequent monitoring and evaluation. However, as some countries noted during the reporting process, the existence of a plan or strategy does not always correlate with the progress made locally towards elimination.

As referred to earlier, primary prevention through vaccination is a key element of prevention strategies targeting hepatitis B. Indeed, high vaccination coverage with three doses of hepatitis B vaccine in infants is known to have a major impact on the burden of disease and should be the foundation of all national HBV prevention programmes. Many EU/EEA countries have long established universal childhood vaccination programmes with high coverage and large cohorts of the population protected. However, not all countries have implemented a universal programme and a fifth of all countries with data that have implemented such a programme have not achieved the 2018 milestone of 90% vaccine coverage. Five countries in the region provide birth dose of HBV vaccine and among the three countries with recent data, only two have achieved the 2018 milestone of 85% coverage.

Vaccination of key risk groups including MSM, PWID and prisoners remains an important component of prevention strategies in EU/EEA countries, given the prevalence of HBV infection and ongoing transmission in these risk groups. In relation to HBV, there remain sizeable unprotected cohorts of adults who were not vaccinated in connection with childhood vaccination programmes, with some countries having only implemented such programmes within the last five to 10 years and others having sub-optimal levels of coverage. EMIS-2017 results suggest that around a half of all MSM who responded to the survey were potentially vulnerable to both HBV and HAV infection. Many countries in Europe affected by the outbreaks of hepatitis A among MSM in 2016–7 subsequently recommended vaccination and the highest proportion of respondents reporting HAV vaccination are in the countries that were affected. EMIS-2017, based on self-reported data, also highlighted that there were higher levels of MSM vulnerable to HBV in the countries where HBV prevalence is highest. The survey highlighted that a just over half of respondents did not know where to obtain vaccination against HAV or HBV. There are also gaps in the provision of vaccination against HBV in prisons, with only ten countries reporting that vaccination was routinely provided to all prisoners. Moreover, although data on vaccine coverage are limited, the evidence available suggests low provision of vaccination which is a concern, given the high prevalence among prisoners reported in studies.

Healthcare workers are an important group that should be targeted for HBV vaccination in all countries. While many of the younger workforce will be vaccinated through national childhood vaccination programmes, not all will be protected and evidence from EU/EEA countries suggests that vaccination programmes targeting this group are not comprehensive. Evidence of vaccine coverage among this group is lacking and this is one area that should be more closely monitored in future.

Mother-to-child transmission of HBV is an uncommon occurrence in EU/EEA countries. In Europe there are two strategies adopted by countries to prevent perinatal transmission. The first is vaccinating infants with a dose of monovalent HBV vaccine within 24 hours of birth. The second is screening pregnant women for HBV infection and providing post-exposure prophylaxis to infants born to mothers with chronic infection in the form of HBV vaccine at birth, together with hepatitis B immunoglobulin where indicated. Although data on both the birth dose and antenatal screening programme implementation were limited, there is evidence that provision of a timely birth dose is low in Romania which has the highest HBV prevalence in the region. Data on the implementation of antenatal screening programmes were only available from a handful of countries, however the indication is that coverage of screening for HBsAg among pregnant women is generally good and provision of post-exposure prophylaxis high. No data were available on the follow-up of infants born to HBV infected mothers in order to assess the impact of the programme and this is an area that should be considered for monitoring in the future. Greater investment should be considered by countries to support the collection of data from antenatal screening programmes once implemented in the future.

Nosocomial transmission is an ongoing route of transmission in many EU/EEA countries and has been an important driver for the HBV and HCV epidemics in the region in the past. Data collected to assess the coverage and impact of infection prevention and control programmes targeting blood borne virus transmission are limited. One option to facilitate the collection of data in this area in the future would be to include indicators in the next ECDC healthcare-associated infection point prevalence survey to enable a more in-depth assessment of the situation. Data from the survey provided some interesting contextual information on infection prevention and control staffing in hospitals. The data provide only a weak proxy for coverage of infection prevention and control services but, interestingly they do suggest higher levels of staffing for nurses, particularly in the northern and western European countries which have the lowest prevalence of HBV and HBV infections in the region.

The risk of HBV and HCV transmission through transfusion of contaminated blood and blood products is high but has become an uncommon route in EU/EEA countries, due to major improvements in blood safety underpinned by strict EU legislation. All EU/EEA countries now screen blood donations using quality-assured methods in accordance with EU standards and have good haemovigilance systems in place, with donations tested using serological methods for HBV and HCV infection as a minimum. The majority of countries now receive donations from voluntary non-remunerated donors. The prevalence of HBV and HCV infections among donors is low in all countries, with the exception of Bulgaria which reports high levels of HBV infections and is also known to have a low proportion of donors from voluntary, non-remunerated sources. The effective implementation of the programmes for blood safety in EU countries is demonstrated by the low number of transfusion associated HBV and HCV infections reported.

Sexual transmission is one of the key routes of transmission for hepatitis infections across Europe, especially for HBV. Measuring progress towards the 2020 target of the European Action Plan for individuals having access to a range of services relevant to STIs such as condoms, testing and counselling is challenging as comprehensive data are lacking in this area. Further exploration of national data sources could be considered to yield information on the implementation of strategies targeting sexual transmission of hepatitis.

PWID remain the key risk group for HCV infection in most EU countries due to widspread unsafe injection practices, such as the sharing of injecting equipment, and the high prevalence of infection among this group. Harm reduction services for PWID are cost effective in preventing transmission of HBV and HCV and such services should be interegrated into a more comprensive package of services for the prevention and management of substance misuse disorders. Harm reduction measures not only prevent new infections but also offer an opportunity to provide testing and linkage to care for this high-risk population. The available data indicate that coverage of both OST and NSP is sub-optimal in most countries in relation to the WHO elimination targets and data on the coverage of testing among PWID reflects missed opportunities for diagnosing individuals in drug treatment services and prisons. There are major data gaps across EU/EEA countries that limit a complete assessment of the effectiveness of implementation of these services. Given the high burden of infection in most countries in this risk group, the improved collection of data in this area should be a key priority in the future efforts in all countries in their monitoring of progress towards elimination.

Continuum of care

The collection of data from EU/EEA countries relating to the hepatitis continuum of care represents a major achievement and provides important evidence necessary for monitoring progress towards the elimination goals. However, construction of the continuum of care for hepatitis B and C is not straightforward. One of the most challenging aspects for hepatitis B is the issue that many diagnosed cases of chronic hepatitis B are not eligible for treatment, so the proportion receiving antiviral treatment out of all those diagnosed provides a somewhat misleading picture. Many individuals with chronic hepatitis B who are diagnosed but currently not eligible for treatment may still be connected to care and monitored and in the future this information needs to be represented. For hepatitis C, one of the key issues with the construction of the continuum is that, unless a country is able to adjust the data, individuals who spontaneously resolve their infection or are treated and subsequently cured still remain in the pool of individuals previously diagnosed. This results in misleading information.

Although major gaps in the completeness of the data exist across the region, especially for HBV, this first data collection still provides valuable information and the gaps in data availability highlight the areas where countries need to focus their efforts in collecting data. Data on testing and treatment are sourced from across the clinical and public health spectrum and countries where such collaboration occurred effectively, such as Slovenia, yielded the most complete data.

Estimates of the number of people living with HBV and HCV are essential in order to calculate the proportion of cases diagnosed and, although these estimates exist in the majority of countries, the quality of the data are generally weak. Basing estimates on outdated or weak sources of data, such as expert opinions or blood donations, are no substitute for robust data derived using sound epidemiological methods. A better understanding of the current viraemic pool in populations is needed. Additionally, such estimates should take into account migration, deaths and the impact of treatment.

The majority of countries report the existence of national guidance relating to testing for hepatitis B and C and this is an essential foundation on which to base local efforts to scale up testing and reduce the undiagnosed population. Nevertheless, data on testing from across the region indicate that potential barriers to testing still exist, such as the user fees at the point of access in some countries and a reported lack of testing in key locations (e.g. harm reduction services and prisons.) Data from EMCDDA on the availability of routine testing in prisons and harm reduction services highlight a worrying geographical trend, with poorer access in the countries where the HBV and HCV burden is greater. The data on the testing of persons accessing drug treatment centres also highlight missed prevention and control opportunities for this key group at high risk of onward transmission who would benefit from early diagnosis and linkage to care.

Information on the proportion diagnosed across the region is unfortunately only available in a small number of countries. In fact, most countries do not have robust data on numbers diagnosed so obtaining an accurate estimate of the proportion diagnosed is challenging. Moreover, for HCV the proportion diagnosed is difficult to interpret in view of changes in the denominator over time as infected individuals are treated and cured. The available data suggest that less than half of the countries able to provide data for HCV in 2019 have achieved the 2020 target of 50% of infections diagnosed and the situation for HBV appears even less favourable. The proportion diagnosed in countries known to have a high burden of infection in the general population, such as Romania and Bulgaria, indicate that the undiagnosed fraction remains high and this highlights a significant unmet need in these countries. However, the quality of the data is weak for many countries. For example, Bulgaria was only able to report data on the numbers diagnosed dating back two years, resulting in an under-estimation of the number of individuals diagnosed. Early diagnosis of hepatitis is critical for effective treatment and care and countries need to ensure there is greater access to a comprehensive range of testing services at a variety of locations in line with local needs. Added to this is the need to ensure sufficient laboratory capacity and appropriate linkage to care for diagnosed cases.

Effective antiviral drugs exist against hepatitis B and C, which have the potential to reduce associated morbidity and mortality, improve quality of life and prevent onward transmission of infection. For hepatitis C, direct-acting antivirals are an extremely effective treatment option and the major goal of therapy is to cure HCV infection. WHO guidelines recommend offering treatment to all individuals diagnosed with HCV infection aged 12 years or above, except for pregnant women [29]. The WHO guidelines also recommend the provision of treatment for PWID, with analyses indicating that treatment among this at-risk population, with high levels of infection and increased risks of transmission, is generally cost-effective. However, the cost–effectiveness may be decreased by re-infections, which underscores the need for harm reduction programmes [29]. For hepatitis B, effective treatments are now increasingly available to suppress the virus. For both infections, the direct beneficial impact of treatment for the infected individual and the indirect impact of reduced transmission in the community (treatment as prevention) make testing and linkage to treatment a core component of the elimination strategy.

Based on the reported information, there are still restrictions on access to direct-acting antiviral treatment for HCV in some countries, especially for patients with ongoing drug dependency. Information on the proportion of diagnosed individuals who are eligible for treatment and who have been treated for HBV was not available from any country to assess progress towards the 2020 target of having 75% treated. For hepatitis C, data were available from just under half of all countries, with only one country achieving the targets. It should also be noted that several countries reported that it was impossible to remove those cured or who may have spontaneously resolved their infection from the numbers diagnosed, which may result in an underestimation of the proportion treated. The treatment data collected fail to provide an overview of past efforts in several countries relating to hepatitis C in particular. Data on viral suppression for both infections were only available for a few countries but they indicated that a high proportion of treated cases had been effectively suppressed, which is to be expected given the highly effective treatments now available.

Impact

Obtaining a clear assessment of progress towards the target on incidence of new chronic infections is challenging due to the difficulty in accurately measuring incidence of hepatitis B and C infections. Although robust empirical data on the incidence of new chronic infections of hepatitis C data are lacking, notification data on acute infections of hepatitis B provide some proxy information, enabling an analysis of trends over time. The overall trend for acute

cases in the EU/EEA showed a steady decline during the period 2008–2017 and this decrease, which follows the global trend, is probably related to the effective implementation of national hepatitis B vaccination programmes.

In terms of mortality, the HBV and HCV attributable mortality in the EU/EEA is high, with estimates suggesting the attributable mortality is greater than that of tuberculosis and HIV combined. This emphasises the need for increased efforts to identify HBV and HCV infections at an early stage and link cases to care in order to reduce mortality from liver diseases. Deaths from cirrhosis account for the majority of all deaths linked to hepatitis, with the highest mortality rates seen in countries from the south-east and east of the EU/EEA, which is the opposite trend to HCC, where rates are highest in the west of the region. The explanation for this divergence in geographical trends is unclear but it could certainly be related to the impact of differing levels of access to diagnostic and specialist services across the region.

Monitoring progress towards the WHO core indicator relating to mortality requires data on the number of deaths from specific International Classification of Diseases (ICD) 10 codes that define HCC, liver cirrhosis and chronic liver disease. Mortality data need further adjustment to account for the proportion of patients with these conditions that died directly due to chronic HBV and/or HCV infection. This would make it possible to calculate the burden of mortality attributable to HBV and HCV. Country-specific estimates of the aetiology fractions are needed to be able to estimate HBV, HCV associated mortality more accurately and this is an area that ECDC has been developing in collaboration with EASL and WHO.

Limitations

The review of data in this report aims to provide as complete and reliable an overview of the situation as possible. Although efforts were made to ensure the data quality was of a sufficiently high standard, there are limitations to the data provided which limit the conclusions that can be drawn from it.

The issue of data comparability is important and this was addressed in the questionnaire tool by using standardised indicators. However, from the contextual information provided it is clear that the data provided by countries on the continuum of care were obtained using a variety of different methods. For example, data provided on the estimates of the number of people with chronic hepatitis came from a range of differing methodological approaches, including a summation of individuals reported through the notification system, epidemiological surveys and, in some instances, expert opinion. Countries were not always able to provide data for 2017 and for many of the indicators, especially for hepatitis B, data were not available. Capturing detailed contextual information on the data provided and obtaining further clarifications through the validation process did enable us to get a clearer understanding of the data. Nevertheless, there remain significant issues in relation to both the availability and the comparability of the data provided. These limitations should be borne in mind if considering comparisons between countries or an assessment of the regional situation.

The validity of the data presented in this report is dependent on the reporting authorities as ECDC during this first data collection was not able to systematically validate the data using information from secondary sources. The validation process attempted to identify potential errors in the data provided and countries were asked to check anomalies. The inclusion of various stakeholders, including civil society, in the review process has provided an opportunity for external validation of the data. However, given the weakness of some of the data sources, further triangulation of the data provided should be considered in the future.

Conclusions and priority options for future action

- The significant gaps in the data in relation to the prevention, testing and treatment of HBV and HCV in EU/EEA Member States present a major challenge to monitoring progress towards the SDGs and targets of elimination for hepatitis. In order to guide national responses to hepatitis B and C, countries should prioritise improving the quality of their monitoring systems.
- The epidemics of HBV and HCV are complex and dynamic and current evidence is insufficient to provide a clear understanding of the epidemiological situation. There is a need for high-quality epidemiological information on the burden of HBV and HCV to guide the scaling-up of prevention services and to inform regional and global activities that will shape the response to these epidemics. In particular, robust information is needed on estimates of prevalence in the general population and key risk groups, current routes of transmission and key population size.
- Evidence of coinfection of HBV and HCV among people living with HIV across the region underlines the importance of adopting an integrated approach to prevention and testing in key populations, especially MSM and PWID. Information on the extent of coinfections among PWID should be considered in future data collections.
- There is some evidence of suboptimal HBV vaccination coverage across EU/EEA countries, indicating a need to strengthen local vaccination programmes. Implementation of a universal HBV childhood vaccination programme in line with WHO recommendations in those countries lacking such a programme and increasing vaccination coverage in countries with suboptimal uptake could further contribute to elimination efforts.

- Vaccination of key risk groups against HBV infections is a key component of elimination strategies and greater emphasis should be given to the collection of information concerning coverage in programmes targeting such groups, especially healthcare workers.
- Programmes for the prevention of mother-to-child transmission for HBV infection are not well monitored and data from these programmes should be collected routinely to assess their effective delivery.
- Given the importance of harm reduction services tailored to PWID in most EU/EEA countries, there remains a need to scale up both prevention and testing services, as there is some indication of suboptimal implementation.
- Nosocomial transmission is a continued source of infection in some EU/EEA countries, but data on the true extent of the problem are lacking and this needs to be further investigated.
- The EU blood safety scheme appears to be operating effectively and monitoring of the scheme should be maintained.
- Data relating to the care continuum are lacking in most countries, particularly the data on the provision and outcome of antiviral treatment, and especially for hepatitis B. Due to this lack of data, it is important that public health and clinical bodies come together, with support from the community, to improve national estimates at all stages of the continuum of care.
- Available data suggest that a high proportion of people living with hepatitis B and C infections appear to be undiagnosed. This indicates that concerted efforts are needed to scale up testing for hepatitis B and C if countries in the EU/EEA are to have any chance of reaching the 2030 targets on diagnosis, treatment and viral suppression.
- Screening and linkage to care of people in prison settings is suboptimal across the region and needs to be scaled up, given the very high prevalence reported and the overlap with the PWID population.
- Despite the limitations of the reported data, there is evidence that large numbers of people living with diagnosed hepatitis B and C infection are not receiving life-saving treatment. Most countries in the EU/EEA are not on track to meet the 75% treatment targets for hepatitis B and C by 2020 and a significant scale-up in treatment is needed if they are to meet the SDGs by 2030. Given the public health benefits of providing treatment as prevention, especially for HCV, and including populations such as PWID that share risk behaviour, there is a need for treatment programmes to be inclusive of key risk groups, in line with international guidance.
- HBV and HCV related mortality is high in the region and there is very little evidence of progress towards the 2030 elimination target of a 65% reduction in mortality against the 2015 baseline. Accurate mortality data are important for monitoring progress and robust local estimates of the proportion of patients with these conditions that died with chronic HBV and/or HCV are needed to calculate the true burden of mortality attributable to HBV and HCV.

References

1. European Centre for Disease Prevention and Control (ECDC). Systematic review on hepatitis B and C prevalence in the EU/EEA. Stockholm: ECDC. Nov 2016. Available from: https://www.ecdc.europa.eu/en/publications-data/systematic-review-hepatitis-b-and-c-prevalence-eueea
2. Blachier M, Leleu H, Peck-Radosavljevic M, Valla DC, Roudot-Thoraval F. The burden of liver disease in Europe: a review of available epidemiological data. J Hepatol. 2013;58(3):593-608
3. Dultz G, Zeuzem S. Hepatitis C. A European perspective. Gastroenterol Clin North Am. 2015;44(4):807-24
4. United Nations. Transforming our world: the 2030 agenda for sustainable development. United Nations, New York (2015) https://sustainabledevelopment.un.org/post2015/transformingourworld
5. World Health Organization. Combating Hepatitis B and C to reach elimination by 2030. Geneva: WHO; 2016
6. World Health Organization Regional Office for Europe. Action plan for the health sector response to viral hepatitis in the WHO European Region. Copenhagen: WHO Europe; 2016.
7. World Health Organization. Monitoring and evaluation for viral hepatitis B and C: recommended indicators and framework. Geneva: WHO; 2016
8. European Centre for Disease Prevention and Control. Point prevalence survey of healthcare-associated infections and antimicrobial use in European acute care hospitals, 2016-2017. Stockholm: ECDC; 2019. [Publication pending].
9. European Centre for Disease Prevention and Control. Hepatitis B and C testing activities, needs, and priorities in the EU/EEA. Stockholm: ECDC; 2017. Available from: https://www.ecdc.europa.eu/en/publications-data/hepatitis-b-and-c-testing-activities-needs-and-priorities-eueea
10. European Centre for Disease Prevention and Control. Survey of strategies used in EU/EEA Member States for protection of hospital-based healthcare workers and third parties (publication pending)
11. Janssen MP, Rautmann G. The Collection, Testing and Use of Blood and Blood Components in Europe. European Directorate for the Quality of Medicines & HealthCare (EDQM) of the Council of Europe; 2015.
12. The EMIS Network. EMIS-2017 – The European Men-Who-Have-Sex-With-Men Internet Survey. Key findings from 50 countries. Stockholm: European Centre for Disease Prevention and Control; 2019. Available from: https://www.ecdc.europa.eu/en/publications-data/emis-2017-european-men-who-have-sex-men-internet-survey
13. European Centre for Disease Prevention and Control. Hepatitis C. In: ECDC. Annual epidemiological report for 2017. Stockholm: ECDC; 2019
14. European Centre for Disease Prevention and Control. Hepatitis B. In: ECDC. Annual epidemiological report for 2017. Stockholm: ECDC; 2019
15. Platt L, Easterbrook P, Gower E, McDonald B, Sabin K, McGowan C, et al. Prevalence and burden of HCV co-infection in people living with HIV: a global systematic review and meta-analysis. Lancet Infect Dis. 2016 Jul;16(7):797-808
16. Mercer CH, Tanton C, Prah P, Erens B, Sonnenberg P, Clifton S, et al. Changes in sexual attitudes and lifestyles in Britain through the life course and over time: findings from the National Surveys of Sexual Attitudes and Lifestyles (Natsal). Lancet. 2013;382(9907):1781-94.
17. European Monitoring Centre for Drugs and Drug Addiction (2019). The elimination barometer for viral hepatitis among PWID in Europe. Technical report. Publications Office of the European Union, Luxembourg. Available from: http://www.emcdda.europa.eu/system/files/publications/11796/Technical%20report_The%20elimination%20barometer%20for%20viral%20hepatitis%20among%20PWID%20in%20Europe_0.pdf
18. European Centre for Disease Prevention and Control. Epidemiological assessment of hepatitis B and C among migrants in the EU/EEA. Stockholm: ECDC; 2016. Available from: https://www.ecdc.europa.eu/en/publications-data/epidemiological-assessment-hepatitis-b-and-c-among-migrants-eueea
19. European Centre for Disease Prevention and Control. Immunisation strategies used in EU/EEA Member States for protection of health care workers and third parties - overview of strategies to ensure and increase vaccine uptake at the national level, with special focus on legislation and its implementation. [publication pending].
20. Pericàs JM, Bromberg DJ, Ocampo D, Schatz E, Wawer I, Wysocki, P, et al. Hepatitis C services at harm reduction centres in the European Union: a 28-country survey. Harm Reduction Journal 2019; 16(1): 20.
21. Mardh O, Duffell E, Quinten C, Amato-Gauci AJ. Mortality from liver diseases associated with hepatitis B and C in the EU/EEA – descriptive analysis and estimation of 2015 baseline. (Submitted to J Hepatol.)

22. Peters L, Mocroft A, Lundgren J, Grint D, Kirk O, Rockstroh J. HIV and hepatitis C co-infection in Europe, Israel and Argentina: a EuroSIDA perspective. BMC Infect Dis. 2014;14 Suppl 6:S13
23. European Association for the Study of the Liver. EASL Recommendations on Treatment of Hepatitis C 2018. J Hepatol. 2018 Aug;69(2):461-511.
24. European AIDS Clinical Society. HIV guidelines. Version 9.0. Brussels: EACS, 2017.
25. European Centre for Disease Prevention and Control. Public health guidance on HIV, hepatitis B and C testing in the EU/EEA – An integrated approach. Stockholm: ECDC; 2018. Available from: https://www.ecdc.europa.eu/en/publications-data/public-health-guidance-hiv-hepatitis-b-and-c-testing-eueea
26. Seedat F, Hargreaves S, Nellums LB, Ouyang J, Brown M, Friedland JS. How effective are approaches to migrant screening for infectious diseases in Europe? A systematic review. Lancet Infect Dis. 2018 Sep;18(9):e259-e271.
27. European Centre for Disease Prevention and Control. Public health guidance on screening and vaccination for infectious diseases in newly arrived migrants within the EU/EEA. Stockholm: ECDC; 2018. Available from: https://www.ecdc.europa.eu/en/publications-data/public-health-guidance-screening-and-vaccination-infectious-diseases-newly
28. WHO manual for the development and assessment of national viral hepatitis plans: a provisional document. Geneva: World Health Organization; 2015.
29. Guidelines for the care and treatment of persons diagnosed with chronic hepatitis C virus infection. Geneva: World Health Organization; 2018.

Annex 1. Members of the expert monitoring group

Name	Country/Organisation
Sarah Amele	EuroSIDA
Ana Maria Avellon Calvo	Spain
Jordi Casabona	Spain
Helena Cortez Pinto	EASL
Isabelle Giraudon	EMCDDA
Sharon Hutchinson	United Kingdom
Petros Katsioloudes	Cyprus
Mojca Maticic	Slovenia
Amanda Mocroft	United Kingdom
Antons Mozalevskis	WHO EURO
Gaetan Muyldermans	Belgium
Andre Noor	EMCDDA
Odette Popovici	Romania
Tatjana Reic	ELPA
Magdalena Rosińska	Poland
Eberhard Schatz	Correlation Network
Jean-Luc Sion	European Commission
Lelia Thornton	Ireland
Irene Veldhuijzen	The Netherlands
Nina Weis	Denmark
Ruth Zimmermann	Germany
ECDC staff	
Andrew Amato-Gauci	ECDC
Erika Duffell	ECDC
Otilia Mardh	ECDC
Lina Nerlander	ECDC
Teymur Noori	ECDC
Lara Tavoschi	ECDC

Annex 2. Summary of proposed milestones and targets

Table 1. 2018 milestones and 2020 targets included in the Action plan for the health sector response to viral hepatitis in the WHO European Region

2018 MILESTONES	2020 TARGETS
SURVEILLANCE AND DATA	
• Harmonized surveillance objectives and case definitions aligned with current WHO technical considerations and adopted • National disease burden estimate and investment case.	• Member States to have a national hepatitis infection surveillance programme (strategic information framework) that can detect outbreaks in a timely manner, assess trends in incidence, inform disease burden estimates and effectively track "in real time" the viral hepatitis diagnosis, treatment and care cascade, including in specific vulnerable populations.
EVIDENCE-BASED POLICY	
• A costed and funded national hepatitis plan with clear targets or a viral hepatitis response plan integrated into a broader health strategy or action plan.	
AWARENESS	
• World Hepatitis Day marked in all Member States.	• National viral hepatitis communication and awareness strategy adopted in a majority of Member States.
IMMUNSZATION	
• 90% coverage with three doses of HBV vaccine in countries that implement universal childhood vaccination • National guidelines on risk group HAV and HBV vaccination developed and implemented.	• 95% coverage with three doses of HBV vaccine in countries that implement universal childhood vaccination • ≤0.5% HBsAg prevalence in vaccinated cohorts • 80% of health care workers vaccinated against HBV.
PREVENTION OF MOTHER-TO-CHILD TRANSMISSION OF HBV	
For countries that implement universal newborn vaccination: • 85% coverage with timely HBV birth dose vaccination For countries that implement screening of pregnant women and post-exposure prophylaxis of new-borns: • 85% coverage with screening in pregnant women and 90% coverage with post-exposure prophylaxis in infants born to infected mothers.	For countries that implement universal newborn vaccination: • 90% coverage with timely HBV birth dose vaccination For countries that implement screening of pregnant women and post-exposure prophylaxis of new-borns: • 90% coverage with screening in pregnant women and 95% coverage with post-exposure prophylaxis in infants born to infected mothers.
BLOOD SAFETY	
• All countries have effective haemovigilance systems in place and all donations are tested at least with serological methods for HBV and HCV infection.	• All donated blood tested with NAT-screening methods for HBV and HCV • All donated blood from non-remunerated donors
INFECTION PREVENTION AND CONTROL IN HEALTHCARE SETTINGS AND BEYOND	
• Safe injection policies and IPC rules for preventing transmission of blood-borne infections in health sector (including in prisons) in place and implemented • National disinfection and sterilization protocols for non-health care settings (aesthetic cosmetology and tattoo facilities) developed and implemented.	• 50% of injections administered with safety-engineered devices in and out of healthcare facilities.
PREVENTION AMONG PEOPLE WHO INJECT DRUGS	
• Policies developed and implemented to support a comprehensive package for infection prevention and harm reduction among people who inject drugs including: needle and syringe programmes (NSPs); opioid substitution therapy (OST) and other evidence-based drug dependence treatment targeted information, education and communication (IEC) for people who inject drugs and HAV and HBV vaccination.	• A comprehensive package of harm reduction services to all persons who inject drugs, including: – At least 200 syringes distributed per PWID per year* – At least 40% of opioid dependent PWID receive opioid substitution therapy – HBV and HAV vaccination • 90% of PWID receiving targeted IEC provided by NSPs, drug treatment service sites (including OST) and other services targeting PWID.
PREVENTION OF SEXUAL TRANSMISSION	
• 90% of countries provide STI services or links to such services in all primary, HIV, drugs, reproductive and perinatal care services.	• Access for all individuals to a full range of services relevant to STIs, including HIV and HBV and HCV, and access to condoms, testing and counselling.
DIAGNOSING HEPATITIS VIRUS INFECTIONS	
• High quality viral hepatitis testing and diagnosis services are available and accessible for all • All countries have national HBV and HCV testing policies, aligned with WHO guidelines • All countries have estimated the diagnosis rate and the proportion of patients diagnosed at late stage of viral hepatitis-related liver disease (cirrhosis or HCC) • All healthcare workers know their viral hepatitis B and C sero-status.	• 50% of all persons with chronic HBV, HCV and HDV diagnosed • 75% of estimated number of patients at late stage of viral hepatitis-related liver disease (cirrhosis or HCC) diagnosed.

2018 MILESTONES	2020 TARGETS
ENHANCING CHRONIC HEPATITIS CARE AND TREATMENT	
• National hepatitis treatment and care updates, in line with WHO guidelines established and regularly updated. • Baseline estimation of people who need to receive treatment for chronic HBV, HCV and HDV infection obtained, preferably by liver disease stage	• Treatment for chronic HBV, HCV and HDV infection, in line with international standards, is available and affordable for all. • 90% of diagnosed patients with chronic HBV, HCV and HDV infections are linked to care and adequately monitored • 75% of the diagnosed patients with chronic HBV and HDV infection, who are eligible for treatment, begin treatment and among those on long-term treatment for HBV, 90% obtain viral suppression • 75% of the diagnosed eligible patients with chronic HCV infection receive effective treatment and at least 90% of them are cured

Source: WHO, 2017 accessed at http://www.euro.who.int/__data/assets/pdf_file/0008/357236/Hepatitis-9789289052870-eng.pdf

** A comprehensive package of evidence-based interventions to reduce harms associated with injecting drug use is outlined in the WHO, UNAIDS, UNODC technical guide for countries to set targets for universal access to HIV prevention, treatment and care for injecting drug users. Since blood-borne transmission is common to HIV and hepatitis viruses, interventions effective in preventing HIV among people who inject drugs help to prevent HCV/HBV transmission. Because HCV is more virulent than HIV, however, higher levels of intervention coverage may be necessary to achieve comparable reductions in incidence.*

WHO, UNAIDS, UNODC guidance suggests a target of 200 syringes distributed per PWID per year based upon studies in developed-country settings and mathematical modelling investigating the levels of syringe distribution and its impact on HIV transmission. Levels required for the prevention of HCV are likely to be much higher. The 40% OST target is based on levels of coverage achieved in countries with well-established OST programmes

Annex 3. Framework of the European Hepatitis Monitoring System

Table 1. Indicators included in the European Hepatitis Monitoring System

Indicator name (definition)	Data collected in ECDC questionnaire	Data collated from existing sources (Data source)
SECTION I: EPIDEMIC CONTEXT		
Prevalence of hepatitis B and C (Number and proportion of people living with chronic HBV and C infections)	Yes	General population and risk groups (ECDC Systematic review)
Hepatitis coinfections among persons with HIV (Number and proportion of people living with HIV who are co-infected with HBV and/or HCV)		Coinfections with HBV/HCV among HIV persons (EMIS-2017)
Estimated size of populations at increased risk of infection (Estimated size of key populations)		• Estimates of PWID population (EMCDDA) • Estimates of migrant populations from intermediate/high endemicity countries (EUROSTAT)
SECTION II: PREVENTION		
VACCINATION		
Coverage of third dose of hepatitis B vaccine (Proportion of infants (<12 months of age) who received the third dose of hepatitis B vaccine (HepB3))		Policy and Coverage (WHO/UNICEF)
National provision of a birth dose of HBV vaccine (National policy, implementing rules and regulations for the provision of a birth dose of hepatitis B vaccine within 24 hours of birth)		Policy and Coverage (WHO/UNICEF)
HBV vaccination among prisoners (Provision of HBV vaccination for prisoners)		WHO/EUROPE survey
Vaccination against HAV and HBV among MSM attending STI services (Proportion of MSM vaccinated against HAV and HBV)		HAV/HBV Vaccination among MSM (EMIS), WHO/EUROPE survey
HBV vaccination among health-care workers in hospital settings (Provision of HBV vaccination for healthcare workers)		Vaccine coverage (VENICE Survey), WHO/EUROPE survey
HAV and HBV vaccination for key risk groups (Provision of HAV vaccination for key risk groups)		WHO/EUROPE survey
PREVENTION OF MOTHER TO CHILD TRANSMISSION		
National antenatal screening programme (National programme for screening for HBV/HCV during pregnancy)		WHO/EUROPE survey
Coverage of antenatal screening programme (Coverage of screening for HBsAg in pregnant women)		WHO/EUROPE survey
National policy on post-exposure prophylaxis of children born to mothers with HBV (National policy for post-exposure prophylaxis for children of mothers born to mothers with HBV)		WHO/EUROPE survey
Provision of antiviral treatment for pregnant women with HBV (Provision of antiviral treatment for pregnant women)		WHO/EUROPE survey
Coverage of HBV vaccination among children born to mothers with HBV (Proportion of children who receive birth dose of HBV vaccine/timely birth dose of HBV vaccine/three doses of HBV vaccine)		WHO/EUROPE survey
Cases of HBV resulting from mother to child transmission (Number of HBV positive infants born to HBV positive mothers in the reporting country)		WHO/EUROPE survey
INFECTION PREVENTION AND CONTROL IN HEALTHCARE SETTINGS		
Infection prevention and control staff (Infection prevention and control nurses and doctors)		Number of Infection prevention and control nurses and doctors per 250 hospital beds (ECDC PPS)
BLOOD SAFETY		

Indicator name (definition)	Data collected in ECDC questionnaire	Data collated from existing sources (Data source)
HBV and HCV infections among blood donors (Proportion of blood donations with HBV/HCV)		Council of Europe
HBV and HCV infections among blood donor recipients (HBV/HCV infections related to blood donations)		Council of Europe
HBV and HCV testing of blood donors (Testing using serology/NAT)		Council of Europe
Blood from voluntary non-remunerated donors (Proportion of blood donations)		Council of Europe
PREVENTION OF SEXUAL TRANSMISSION		
Condom use in key populations (Proportion of MSM reporting condom use)		Condom use in MSM (EMIS, UNAIDS GAM)
PREVENTION AMONG PEOPLE WHO INJECT DRUGS (PWID)		
Needle syringe distribution (Number of needles–syringes distributed per PWID)		Needles and syringes distributed (EMCDDA)
Opioid substitution therapy (OST) coverage (Proportion of high-risk opioid users (PWID and non-PWID) receiving OST for six months)		OST coverage (EMCDDA)
SECTION III: THE CARE CASCADE		
TESTING		
People living with HCV and/or HBV diagnosed (Proportion of people estimated to be currently infected with HBV and/or HCV infection who have been diagnosed with HBV and/or HCV)	Yes	Proportion undiagnosed reported in published literature (ECDC systematic review, 2018)
Late stage diagnoses (Proportion of newly diagnosed cases who have viral hepatitis-related liver disease (cirrhosis or HCC))	Yes	
HBV/HCV testing (Number tested for hepatitis B/C)	Yes	• Numbers tested and number of tests (ECDC systematic review: Hepatitis B and C testing activities, needs, and priorities in the EU/EEA, 2017) • Number and proportion of ever/current PWIDs who report having been tested for HCV in past 12 months (EMCDDA) • Number of ever PWIDs tested for HCV in drug treatment centres (EMCDDA)
Number of persons newly diagnosed with HBV or HCV* (Number of newly identified persons with confirmed infection with HBV or HCV)	Yes	Number of newly diagnosed cases reported through surveillance (ECDC
National guidance on tests used for diagnosing hepatitis B/C (Existence of national guidance for tests to be used in diagnosing hepatitis)	Yes	Testing policies (ECDC systematic review: Hepatitis B and C testing activities, needs, and priorities in the EU/EEA, 2017)
National HBV and HCV testing practice in prisons (Testing HBV and HCV in prison)		Testing practices (ECDC systematic review: Hepatitis B and C testing activities, needs, and priorities in the EU/EEA, 2017)
TREATMENT		
Estimated population of people who need treatment (National baseline estimation of people who need to receive treatment for chronic HBV and HCV infection)	Yes	
HBV and HCV care coverage (Number and proportion of person with chronic HBV/HCV who are receiving care (assessment of liver function/ staging or biomarker testing or treatment)	Yes	
Treatment coverage for HBV (Number of HBV-infected persons who are currently on treatment= number continuing treatment before year of reporting + number newly started on treatment during the year)	Yes	
Treatment initiation for HCV (Number of persons diagnosed with chronic HCV infection (those who are diagnosed at start of the year) who are started on treatment during the previous year)	Yes	

Indicator name (definition)	Data collected in ECDC questionnaire	Data collated from existing sources (Data source)
Treatment completion for HCV (Number of persons with chronic HCV infection who have completed treatment during the year)	Yes	
Viral suppression for chronic HBV patients treated (Number of patients with chronic HBV infection on treatment in whom HBV viral load (VL) is suppressed)	Yes	
Cure for chronic HCV patients treated (Number of patients with chronic HCV cured among those who completed treatment)	Yes	
Documentation of treatment outcome (Number of patients with documentation of treatment effectiveness (HBV patients viral load past 12 months/HCV patients who completed treatment and had SVR assessed 12 - 24 weeks after end treatment))	Yes	
Access to antiviral treatment for active/current PWID (Access to treatment access for active/current PWID)	Yes	
SECTION IV: IMPACT		
INCIDENCE		
Cumulated incidence of HBV infection in children under 5 years of age* (Proportion of children 5 years of age with serological evidence of past or present HBV infection (anti-HBc positive) and/or chronic infection (HBsAg positive))		Modelled incidence (WHO)
Incidence of acute HBV infection notifications Number of acute HBV infection notifications reported through surveillance systems		Notification data (ECDC)
Incidence of HCV infection * (Number and rate of new infections with HCV (anti-HCV positive))		• Modelled incidence (WHO) • Incidence studies reported in the literature (ECDC Systematic Review) • Prevalence studies among young and new injectors (EMCDDA)
MORTALITY		
Deaths from hepatocellular carcinoma, cirrhosis and chronic liver diseases attributable to HBV and HCV infections (Deaths from hepatocellular carcinoma (HCC), cirrhosis and chronic liver diseases attributable to HBV and HCV)		Mortality data on hepatocellular carcinoma (HCC), cirrhosis and chronic liver diseases (Eurostat) + attributable fraction estimates
SECTION V: POLICY		
National plan for viral hepatitis (Existence of national plan for viral hepatitis)	Yes	

**Data not included in report*

Annex 4. ECDC vaccine schedule hepatitis B

Hepatitis B: recommended vaccinations

	Birth	Months 1	2	3	4	5	6	7	8	10	11	12	13	14	15	16	18	19	Years 2	5-6	7	10	11	12	13	14	15	16	17	18	>=19
Austria	HepB (1)		HepB		HepB						HepB (2)										HepB (3)									HepB	
Belgium	HepB (1)		HepB	HepB	HepB										HepB							HepB								HepB (4)	
Bulgaria	HepB (5)	HepB (6)	HepB (7)	HepB (7)	HepB (7)		HepB (6)																								
Croatia	HepB (8)		HepB		HepB		HepB								HepB									HepB (9)							
Cyprus	HepB (10)		HepB		HepB				HepB																						
Czech Republic	HepB (11)			HepB (12)		HepB					HepB																			HepB (13)	
Denmark	HepB (14)	HepB (14,15)	HepB (14,15)	HepB (14)				HepB (14)																							
Estonia	HepB (16)			HepB	HepB		HepB												HepB												
Finland	HepB (17)																														
France	HepB (18)		HepB		HepB						HepB										HepB (19)										
Germany	HepB (1)		HepB	HepB (20)	HepB						HepB				HepB																
Greece	HepB (21)	HepB			HepB		HepB																							HepB (22)	
Hungary	HepB (23)																							HepB (24)							
Iceland	HepB																														
Ireland	HepB (25)		HepB		HepB		HepB																								
Italy	HepB (26)			HepB		HepB					HepB																				
Latvia	HepB (27)		HepB		HepB		HepB					HepB														HepB (28)					
Liechtenstein	HepB (29)																							HepB (30)							
Lithuania	HepB	HepB					HepB																								
Luxembourg	HepB (31)		HepB	HepB									HepB											HepB (32)							

Hepatitis B: recommended vaccinations

Malta	HepB (31)											Hep B	Hep B				Hep B																	
Netherlands	HepB (33)	HepB (34)		Hep B	Hep B						Hep B																							
Norway				Hep B		Hep B						Hep B																							
Poland	HepB (35)		HepB					Hep B																										
Portugal	HepB		HepB				Hep B																											
Romania	HepB (36)		HepB		Hep B						Hep B																							
Slovakia	HepB (37)		HepB		Hep B					Hep B																								
Slovenia	HepB (38)																						Hep B (39)											
Spain	HepB (40)		HepB (41)		Hep B						Hep B (41)																							
Sweden	HepB (1)	HepB(42)		Hep B		Hep B						Hep B																							
United Kingdom	HepB (43)		HepB	Hep B	Hep B																													

Footnotes

1: Babies born to a mother infected with hepatitis B will be offered a dose at birth simultaneously with HB immunoglobulin
2: Minimum interval of 6 month after second dose
3: Primary immunisation (0/1/6 months) or catch-up depending on previous vaccination history
4: Vaccination of specific risk groups (see detailed information http://www.health.belgium.be/eportal/Aboutus/relatedinstitutions/SuperiorHealthCouncil/domains/vaccination/index.htm?fodnlang=fr#.VOr0BvnF-QA)
5: Administration within 24 hours after birth.
6: When using a monovalent vaccine, doses are administered at 1 and 6 months
7: When using a combination vaccine (e.g. hexavalent vaccine), doses are administered at 2, 3 and 4 months
8: Babies born to a mother infected with hepatitis B will be offered a dose immunoglobulins at birth.
9: Catch-up at 6th grade for those not vaccinated in infancy (3-doses scheme). Catch-up expected to end after 2018
10: Babies born to a mother infected with hepatitis B will be vaccinated and receive HB immunoglobulins within 24 hours after birth
11: Babies born to HBsAg-positive mothers will be given a first dose within 24 hours after birth by law
12: The first dose of hexavalent vaccine is given from the end of the 2nd month of life, at intervals of two months between the first and the second dose, and the third dose given between the eleventh and thirteenth months of the child's age
13: Three doses. if susceptible and no history of vaccination. mandatory for specific at risk groups
14: Babies born to a mother infected with hepatitis B will be offered a first vaccine dose at birth simultaneously with HepB immunoglobulin. Following vaccine doses are given at one month, 2 month and 12 month of age.
15: For specific at risk-groups only – vaccination provided at 1,2, and minimum of 5 months later.
16: within 12 hours after birth. only for at-risk newborns.
17: risk-groups only (to be given at the earliest age)
18: Babies born to a mother infected with hepatitis B will be offered a first dose at birth simultaneously with HB immunoglobulin, one month of age and 6 month of age. Four doses scheme (0-1-2-6 months) for premature <32 weeks or less than 2 kg. This intervention shall be evaluated at 9 month of age through HBs Ag and anti-HBs antibodies testing, preferably one to four month after the last vaccine dose.
19: Three doses in a 0, 1, 6 month schedule. From 11 to 15 years, 2 doses in a 0, 6 schedule. From 16 years of age vaccination is recommended for high risk groups.
20: Optional dose if monovalent vaccines are used
21: Babies born to a mother infected with hepatitis B and those whose immune status is unknown will be offered a first vaccine dose at birth simultaneously with HB immunoglobulin in the case of HBsAg mother.
22: Three doses catch-up for unvaccinated adults
23: Babies born to a mother infected with hepatitis B or unknown immune status will be offered a first vaccine dose within 12 hours after birth and simultaneously with HB immunoglobulin in case of HBsAg positive mother. Following vaccine doses are given 1 month later and the third dose, 6 months after first dose.
24: School-based vaccination in 7th grade. Vaccination mandatory for children from aged 13 in 7th grade with a two dose programme.
25: All babies born to these mothers should receive hepatitis B vaccine at 0, 2, 4 and 6 months and also HBIG as soon as possible ideally within 24 hours of birth, but no later than 7 days

26: Babies born to a mother infected with hepatitis B will be offered a first vaccine dose within 12-24 hours after birth and simultaneously with HB immunoglobulin. The following and second vaccine dose is given 4 weeks apart from the first. Starting from the third dose, which is given from 61 days of life onwards, the vaccination calendar schedule including the combined hexavalent vaccine should be used.
27: Babies born to a mother infected with hepatitis B or unknown immune status will be offered a first dose within 12 hours after birth. Vaccine administered according to indications.
28: If no previous vaccination. Three doses recommended.
29: Babies born to a mother infected with hepatitis B
30: Hepatitis B vaccination is primarily targeting adolescents aged 11 to 15 years, but can be given at any age (3 doses at 0, 1, 6 months). An accelerated vaccination scheme of adolescents 11-15 years adults in 2 doses (0 and 4-6 months) is possible, but only with vaccines licensed for this regimen, this scheme is valid when the first dose is administered before the 16th birthday. Vaccination of infants is also possible (hexavalent combined vaccine (DTPa-HBV-IPV-Hib): 4 doses at 2, 4,6, and 15-18 months).
31: Babies born to a mother infected with hepatitis B will be offered a first dose at birth
32: If no history of vaccination
33: Babies born to a mother infected with hepatitis B will be offered a first dose at birth, according to:
http://www.rivm.nl/Documenten_en_publicaties/Algemeen_Actueel/Uitgaven/Infectieziekten/Rijksvaccinatieprogramma/HepB_0_vaccinatie_HepB_dragersmoeders
34: Should be given at 6-9 weeks
35: Administration within 24 hours after birth
36: Within 24 hours after birth. For babies of HBsAg positive mothers a different schedule applies
37: Babies born to a mother infected with hepatitis B will be offered a first dose at birth simultaneously with HB immunoglobulin, and two additional doses: one at 1 month and one at 6 months
38: Babies born to a mother infected with hepatitis B will be offered a first dose within 12 hours after birth, one month of age, two months of age and one year of age. Mandatory
39: Three doses course of vaccination
40: Babies born to a mother infected with hepatitis B will be offered a first dose at birth, 2, 4 and 11 months of age and HB immunoglobulin at birth (first 24 hours of life). Schedule 2,4,11 months will be offered only when high coverage of pregnancy screening is assured
41: Babies born to a mother infected with hepatitis B will be offered a first dose at birth, one month and 6 month of age
42. Babies born to a mother infected with hepatitis B get vaccinated according to a special schedule, five doses: birth, 1, 3, 5, 12 months
42: Babies born to hepatitis B infected mothers. At birth, four weeks and 12 months old.

Source: ECDC **https://vaccine-schedule.ecdc.europa.eu/Scheduler/ByDisease?SelectedDiseaseId=6&SelectedCountryIdByDisease=-1**

Legend

Annex 5. Vaccination among MSM

Country	% offered any hepatitis vaccination by health service, ever	% with full course of hepatitis A vaccination, excluding men with a history of hepatitis A	% with full course of hepatitis B vaccination, excluding men with a history of hepatitis B
Austria	61.5	61.0	60.9
Belgium	62.8	56.5	60.5
Bulgaria	24.5	15.1	17.7
Croatia	51.4	34.0	45.6
Cyprus	53.6	33.7	39.4
Czech Republic	47.8	43.3	41.7
Denmark	51.8	48.9	50.4
Estonia	39.5	28.1	28.9
Finland	46.9	48.3	42.3
France	57.8	39.1	55.5
Germany	61.2	60.3	60.4
Greece	60.3	39.3	45
Hungary	30.1	25.7	29.3
Iceland	53.2	46.3	46.2
Ireland	64.6	50.4	57.6
Italy	38.5	28.0	42.9
Latvia	43.0	26.0	26.3
Lithuania	24.9	17.9	21.8
Luxembourg	67.3	60.3	61.7
Malta	64.1	48.4	52.6
Netherlands	75.5	60.9	72.6
Norway	55.9	46.2	51.1
Poland	35.2	27.4	36.6
Portugal	46.9	38.1	49.6
Romania	22.6	18.3	21.3
Slovakia	42.1	31.9	31.3
Slovenia	40.2	32.6	39.9
Spain	47.4	41.6	45.9
Sweden	44.6	42.4	42.5
United Kingdom	70.0	51.7	60.3

Source: The EMIS Network. EMIS-2017: The European Men-Who-Have-Sex-With-Men Internet Survey

Annex 6. Prevalence of chronic HBV and HCV infections

Table 1. Prevalence of HBsAg in the general population, EU/EEA countries 2008–2018

Country	Final year of study	Author (Year of publication)	Geographical coverage	Sampling method	Age group (s)	Number tested	Risk of bias*	Prevalence
Belgium	2003	Nardone (2009)	Unspecified	Convenience	Adults+children	1496	3	0.7% (0.4 - 1.3)
Bulgaria	2011	Kevorykan (2015)	Plovdiv	Convenience	Adults+children	865	3	3.9% (2.7-5.5)
Croatia	2007	Burek (2010)	National	Unspecified	Adults only	259	4	2.3% (0.9-5.0)
Croatia	2011	Vilibic-Cavlek (2014)	Unspecified (4 counties)	Convenience	Adults only	2009	3	0.8% (0.4-1.2)
Czech Republic	2001	Nardone (2009)	National	Random	Adults+children	2644	0	0.3% (0.2-0.7)
Estonia	2013	Parker (2017)	Multiple military bases	Convenience	Adults	186	2	0% (0.0-2.0)
France	2004	Meffre (2010)	National	Random	Adults only	14416	5	0.7% (0.5-0.9)
France	2010	Ramiere (2016)	Lyon	Convenience	Adults	57113	2	0.8% (0.7-0.9)
Germany	2002	Huetter (2014)	Leutkirch	Random	Adults only	2256	4	0.7% (0.4-1.1)
Germany	2011	Poethko-Müller (2013)	National	Random	Adults only	7047	5	0.3% (0.2-0.6)
Germany	2013	Wolffram (2015)	Northern Rhine Westaphalia	Convenience	Adults	21008	2	0.5% (0.4-0.6)
Greece**	2010	Drositis (2013)	Arkalochori	Random	Adults only	876	4	3.3% (2.2-4.7)
Hungary	2009	Treso (2012)	National	Convenience	Adults only	1066	4	0.4% (0.1-1.0)
Ireland	2003	Nardone (2009)	Unspecified	Convenience	Adults+children	2535	6	0.1% (0.0-0.4)
Ireland	2009	Talento (2010)	National	Exhaustive	Unspecified	1478	3	0.1% (0.0-0.4)
Italy	2002	Fabris (2008)	Vicenza	Exhaustive	Unspecified	965	3	1.0% (0.5-1.9)
Italy	2006	Fusco (2008)	Naples	Random	Adults	4496	4	2.2% (1.8-2.7)
Italy	2007	Cozzolongo (2009)	Bari	Random	Adults only	2195	3	0.6% (0.3-1.0)
Italy	2008	Dazzani (2009)	Bagnacavallo	Unspecified	Adults only	3207	2	0.6% (0.4-1.0)
Italy	2008	De Paschale (2012)	Legnano	Convenience	Adults+children	22758	3	2.1% (2.0-2.3)
Italy	2009	Boccalini (2013)	Tuscany	Convenience	Adults+children	1071	5	2.0% (1.2-3.0)
Italy	2014	Morisco (2017)	Naples	Random	-	772	5	1.7% (0.9-2.9)
Netherlands	2004	Veldhuijzen (2009)	Rotterdam	Random	Adults only	284	3	0.7% (0.1-2.5)
Netherlands	2007	Hahne (2012)	National	Random	Adults+children	6246	5	0.2% (0.1-0.4)
Poland	2008	Pszenny (2012)	National	Convenience	'Adults + children'	4774	1	0.9% (0.1-1.2)
Poland	2012	Hartleb (2012)	National	Exhaustive	'Adults ≥65 years only'	3826	2	1.1% (0.8-1.5)
Portugal	2014	Rocha (2017)	Coimbra	Convenience	Unspecified	531	1	0.6% (0.1-1.6)
Portugal	2014	Carvalhana (2016)	National	Random	Adults	1627	5	1.5% (0.9-2.0)
Romania	2002	Nardone (2009)	Unspecified	Convenience	Adults+children	1259	3	5.6% (4.4-7.1)
Romania	2008	Gheorghe (2013)	National	Random	Adults only	13127	6	4.4% (4.0-4.8)
Slovakia	2002	Nardone (2009)	Unspecified	Random	Adults+children	3569	4	0.6% (0.4-0.9)
Spain	2009	Pedraza-Flechas (2014)	Madrid	Random	Adults only	3695	3	0.7% (0.5-1.0)

Country	Final year of study	Author (Year of publication)	Geographical coverage	Sampling method	Age group (s)	Number tested	Risk of bias*	Prevalence
Spain	2010	Calleja-Panero (2013)	Murcia and Madrid	Convenience	Adults only	5017	3	0.7% (0.5-1.0)
United Kingdom	2009	Pepas (2011)	London	Exhaustive	Adults only	3910	3	1.7% (1.3-2.2)
United Kingdom	2014	Price (2016)	Mid-Essex	Convenience	Unspecified	5677	2	0.2% (0.1-0.4)

Source: ECDC hepatitis B and C prevalence database: https://ecdc.europa.eu/en/all-topics-zhepatitis-btools/hepatitis-b-prevalence-database
**The following four domains were considered as possible sources of selection bias in general population studies: • Age • Gender • Sampling method and response rate • Population coverage (i.e. the population covered by the sampling design in geographic/demographic terms) Points were given for representativeness or a lower risk of bias in each domain. A total score for risk of bias was calculated by adding up the scores in all four domains, resulting in a score of between 0 and 6. The highest score indicates the lowest risk of bias.*
***More recent estimate of prevalence from national study in general population found HBsAg prevalence of 1.3% (Reference: personal communication Georgia Nikolopoulou 11.10.2019).*

Table 2. Prevalence of anti-HCV in the general population, EU/EEA countries 2008–2017

Country	Author (Year of publication)	Year study completed	Geographical coverage	Sampling method	Age group (s)	Number tested	Prevalence	Risk of bias*
Croatia	Burek (2010)	2007	National	Unspecified	Adults only	259	0% (0.0-1.4)	4
Croatia	Vilibic-Cavlek (2014)	2011	Unspecified (4 counties)	Convenience	Adults only	1930	0.9 (0.6-1.5)	3
Czech Republic	Chlibeck (2017)	2015	Multi-Centre	Convenience	Adults only	3000	1.7% (1.2-2.2)	4
Estonia	Parker (2017)	2013	Multiple military bases	Convenience	Adults only	186	0% (0.0-2.0)	2
France	Meffre (2010)	2004	National	Random	Adults only	14416	0.84% (0.8-1.1)	5
France	Poynard (2009)	2009	Unspecified	Convenience	Adults only	7463	0.9% (0.7-1.1)	2
France	Ramiere (2016)	2010	Lyon	Convenience	Adults only	19439	1%(0.9-1.2)	2
Germany	Huetter (2014)	2002	Leutkirch	Random	Adults+children	2256	0.6%(0.3-1.0)	4
Germany	Poethko-Müller (2013)	2011	National	Random	Adults only	7047	0.3%(0.1-0.5)	5
Germany	Wolffram (2015)	2013	Northern Rhine Westphalia	Convenience	Adults	21008	1.0%(0.8-1.1)	2
Greece**	Drositis (2013)	2010	Arkalochori	Random	Adults only	876	2.2%(1.3-3.4)	4
Hungary	Treso (2012)	2009	National	Convenience	Adults only	1066	0.5%(0.2-1.1)	4
Ireland***	Talento (2010)	2009	National (organ donors)	Exhaustive	Unspecified	1478	0.1%(0.0-0.4)	3
Italy	Fabris (2008)	2002	Vicenza	Exhaustive	Unspecified	965	2.6%(1.7-3.8)	3
Italy	Fusco (2008)	2006	Naples	Random	Adults only	4496	7.5%(6.7-8.3)	4
Italy	Cozzolongo (2009)	2007	Bari	Random	Adults only	2195	2.6%(2.0-3.4)	3
Italy	De Paschale (2012)	2008	Legnano	Convenience	Adults+children	425	4.7%(2.9-7.2)	3
Italy	Dazzani (2009)	2008	Bagnacavallo	Unspecified	Adults only	3207	1.1%(0.8-1.5)	2
Italy	Guadagnino (2013)	2010	Calabria	Random	Adults only	1012	5.7%(4.4-7.4)	2
Italy	Morisco (2017)	2014	Naples	Random	Adults only	1315	3.0%(2.2-4.1)	5
Italy	Parisi (2014)	2014	Milan	Convenience	Adults only	4507	0.6%(0.4-0.9)	4
Latvia	Tolmane (2011)	2008	National	Random	Adults only	1459	2.4%(1.7-3.3)	6
Lithuania	Liakina (2012)	2010	National	Convenience	Adults only	1514	2.4%(1.7-3.4)	0
Netherlands	Veldhuijzen (2009)	2004	Rotterdam	Random	Adults only	271	1.1%(0.2-3.2)	3
Netherlands	Hahne (2012)	2006	Arnhem	Convenience	Adults only	2200	0.2%(0.1-0.5)	2
Netherlands	Vriend (2013)	2007	National	Random	Adults+children	4046	0.1%(0.0-0.2)	5
Poland	Clifford (2017)	2006	Warsaw	Random	Adults only	909	0.8%(0.3-1.6)	2
Poland	Pszenny (2012)	2008	National	Convenience	'Adults + children'	4733	2.6%(2.2-3.1)	1
Poland	Flisiak (2011)	2010	Unspecified	Convenience	Adults only	18,233	1.94% (1.75-2.15	4
Poland	Hartleb (2012)	2012	National	Exhaustive	'Adults ≥65 years only'	3826	2.9%(2.4-3.5)	2
Poland	Walewska-Zielecka (2016)	2014	Multi-city	Convenience	Adults+children	61.805	1.5%(1.3-1.7)	2
Poland	Parda N (2016)	2016	National	Random	Adults only	21875	1.1% (1.0-1.2),	6
Portugal	Rocha (2017)	2014	Coimbra	Convenience	Adults only	524	1.2%(0.4-2.5)	1
Portugal	Carvalhana (2016)	2014	National	Random	Adults only	1627	0.5%(0.2-0.9)	5
Romania	Gheorghe (2013)	2008	National	Random	Adults only	13146	3.2%(2.9-3.6)	6
Spain	Quesada (2015)	2005	Barcelona	Random	.	314	0.6%(0.2-2.5)	3
Spain	Garcia (2015)	2009	Madrid	Random/Convenience	Adults+children	3598	1.8%(1.3-2.5)	3
Spain	Calleja-Panero (2013)	2010	Murcia and Madrid	Convenience	Adults only	5017	0.6%(0.4-0.9)	3
Spain	Caballeria (2014)	2011	Barcelona	Random	Adults only	238	0.4%(0.0-2.3)	3

Country	Author (Year of publication)	Year study completed	Geographical coverage	Sampling method	Age group (s)	Number tested	Prevalence	Risk of bias*
Spain	Garcia-Alonso (2016)	2015	Madrid	Convenience	Adults only	285	2.1%(0.8-4.5)	2
United Kingdom	Balogun (2009)	2000	England and Wales	Convenience	Adults only	5068	1.2%(0.9-1.5)	3
United Kingdom	Pepas (2011)	2009	London	Exhaustive	Adults only	3953	0.4% (0.3-0.7)	3
United Kingdom	O'leary (2016)	2011	Glasgow	Convenience	Adults+children	3839	0.4% (0.4-0.7)	2
United Kingdom	Price (2016)	2014	Mid-Essex	Convenience	.	842	1.2% (0.6-2.2)	2

Source: ECDC hepatitis B and C prevalence database: https://ecdc.europa.eu/en/all-topics-zhepatitis-ctools/hepatitis-c-prevalence-database
**The following four domains were considered as possible sources of selection bias in general population studies: • Age • Gender • Sampling method and response rate • Population coverage (i.e. the population covered by the sampling design in geographic/demographic terms) Points were given for representativeness or a lower risk of bias in each domain . A total score for risk of bias was calculated by adding up the scores in all four domains, resulting in a score of between 0 and 6. The highest score indicates the lowest risk of bias.*
***More recent estimate of prevalence for Greece from national study in general population found anti-HCV prevalence of 0.7% (Reference: personal communication Georgia Nikolopoulou 11.10.2019)*
**** More recent estimate of prevalence for Ireland from national study in general population found anti-HCV prevalence of 1.0% (0.7. - 1.3) (Reference: Garvey et al, 2017).*

Table 3. Prevalence of HBsAg in the PWID, EU/EEA countries in 2015, or most recent available year

Country	Year of study	Number tested	National samples	Sub-national samples	Study design (diagnostic testing (DT), sero-prevalence study (SP))
Austria	2017	272		2.6	DT
Belgium	2015	18		5.6	DT
Bulgaria	2017	98		5.1	DT
Croatia	2008	192		0	SP
Cyprus	2017	72	5.6		DT
Czech Republic					
Denmark					
Estonia	2016–2018			8	SP
Finland					
France	2011–2013	1032		0.8	SP
Germany	2011–2014	2077		0.3 -2.3	SP
Greece	2017	871	2.1	1.8 - 2.4	DT
Hungary	2015	596	2.2		SP
Ireland	2010	200	0.5		SP
Italy					
Latvia	2017	1441	1.42	3.6	DT ;SP
Lithuania	2014	200		10.5	SP
Luxembourg					
Malta					
Netherlands	2017	16		6.3	DT
Norway	2015	227		0.9	SP
Poland	2017	172	2.9	2.0 - 5.4	SP
Portugal	2017	355	3.1		DT
Romania	2015	522		10.5	SP
Slovakia	2017	54		3.7	SP
Slovenia					
Spain	2016	1993	9.4		DT
Sweden					
United Kingdom	2017	3096		0.2 - 0.9	DT;SP

Source: Source: EMCDDA Statistical Bulletin 2019 – drug-related infectious diseases: http://www.emcdda.europa.eu/data/stats2019/drid

Table 4. Prevalence of anti-HCV in PWID, EU/EEA countries in 2015 or most recent available year

Country	Year of study	Number tested	National samples	Sub-national samples	Study design (diagnostic testing (DT), sero-prevalence study (SP))
Austria	2017	480	34	60.0 -83.5	DT
Belgium	2015/2016	71		22.0 -33.3	DT
Bulgaria	2017	319		76.8	DT
Croatia	2014	817		38.3	SP
Cyprus	2017	76	56.6		DT
Czech Republic	2017	2044	14.7		DT
Denmark					
Estonia	2016–18	112		89.3	SP
Finland	2014	589		74.02	SP (UAT)
France	2011	901		63.8	SP
Germany	2011–2014	2077		36.9 - 73.0	SP
Greece	2017	1047	66.5	55.6 - 83.5	DT
Hungary	2015	559	49.7	40.5 - 55.3	SP
Ireland	2010	200	41.5		SP
Italy	2017	7805	64.33		DT
Latvia	2017	1175	56.78	85.2	DT ;SP
Lithuania	2014	200		77	SP (UAT)
Luxembourg	2017	66	75.75		DT
Malta	2017	119	44.54		DT
Netherlands	2017	14		85.7	DT
Norway	2017	6104	49.71		SP
Poland	2017	171	57.9	38.0 - 75.8	SP
Portugal	2017	367	81.5		DT
Romania	2015	522		75.7	SP
Slovakia	2017	52		42.3	SP
Slovenia	2017	61	42.62		DT
Spain	2016	4265	64.4		DT
Sweden*	2013	62		96.8	DT
United Kingdom	2017	3119		22.5-52.2	SP (UAT); SP

Source: Source: EMCDDA Statistical Bulletin 2019 – drug-related infectious diseases: http://www.emcdda.europa.eu/data/stats2019/drid
Updated data for Sweden: Regional study published 2018 reporting 77% anti-HCV prevalence and 56% RNA prevalence (Kaberg M, Naver G, Hammarberg A, et al. Incidence and spontaneous clearance of hepatitis C virus (HCV) in people who inject drugs at the Stockholm Needle Exchange-Importance for HCV elimination. J Viral Hepat. 2018;25**(12):1452-1461).*

Table 5. Prevalence of HBsAg in MSM, EU/EEA countries, 2008–2017

Country	Year of publication	Geographical coverage	Sampling method	Number tested	Prevalence
Croatia	2009	Zagreb	Other	360	0.56%
Denmark	2015	Aarhus	Convenience	141	1.42%
Estonia	2015	Unspecified	Convenience	43	0.00%
Estonia	2015	National	Other	97	1.03%
France	2012	Paris	Convenience	876	1.4%
Netherlands	2017	National	Convenience	15335	0.83%
Netherlands	2017	National	Convenience	23576	0.48%
Spain	2017	Barcelona	Convenience	194	1.55%
United Kingdom	2008	Glasgow, Scotland	Convenience	81	0.00%
United Kingdom	2017	Mid-Essex	Convenience	325	0.31%

Source: ECDC hepatitis B and C prevalence database: https://ecdc.europa.eu/en/all-topics-zhepatitis-btools/hepatitis-b-prevalence-database

Table 6. Prevalence of anti-HCV in MSM, EU/EEA countries, 2008–2017

Country	Year of publication	Geographical coverage	Sampling method	Number tested	Prevalence
Croatia	2009	Zagreb	Other	360	2.5%
Croatia	2009	Zagreb, Split, Rijeka, Zadar, Osijek, Slavonski Brod, and Dubrovnik	Unspecified	205	2.9%
Estonia	2015	Unspecified	Convenience	43	4.7%
France	2012	Paris	Convenience	876	1.0%
Italy	2012	Sicily	Convenience	74	0.0%
Netherlands	2013	Amsterdam	Other	446	0.7%
Netherlands	2016	Amsterdam	Convenience	446	0.7%
Netherlands	2017	Amsterdam	Convenience	375	4.8%
Spain	2017	Barcelona	Convenience	254	2.0%
Sweden	2013	Stockholm	Convenience	1008	0.6%
United Kingdom	2013	London	Convenience	1121	2.1%
United Kingdom	2012	Unspecified	Unspecified	3395	1.6%
United Kingdom	2016	Mid-Essex	Convenience	294	0.7%
United Kingdom	2017	London	Convenience	794	2.3%

Source: ECDC hepatitis B and C prevalence database: https://ecdc.europa.eu/en/all-topics-zhepatitis-ctools/hepatitis-c-prevalence-database

Table 7. Prevalence of HBsAg in prisoners, EU/EEA countries, 2008–2017

Country	Year of publication	Geographical coverage	Sampling method	Number tested	Prevalence
Bulgaria	2012	Unspecified (2 juvenile centres)	Convenience	258	25.2%
Croatia	2010	National (All prisons)	Unspecified	3348	1.3%
Croatia	2010	National (All juvenile institutions)	Unspecified	140	1.4%
Finland	2011	National (All prisons and juvenile institutions)	Random	383	0.5%
France	2014	Clermont-Ferrand and Riom 2 prisons)	Exhaustive	347	0.6%
Hungary	2012	National (20 prisons)	Exhaustive	4894	1.5%
Ireland	2014	National	Random	777	0.3%
Italy	2005	Unspecified (Multicentre)	Convenience	973	6.7%
Portugal	2011	Coimbra (1 regional prison)	Exhaustive	151	0.7%
Romania	2011	Bacau (1 prison)	Convenience	197	10.7%
Spain	2010	18 prisons across Spain.	Random	.	2.6%
United Kingdom	2013	Broadmoor (1 maximum prison)	Exhaustive	129	0.0%
United Kingdom	2014	London (1 prison)	Convenience	511	2.0%

Source: ECDC hepatitis B and C prevalence database: https://ecdc.europa.eu/en/all-topics-zhepatitis-btools/hepatitis-b-prevalence-database

Table 8. Prevalence of anti-HCV in prisoners, EU/EEA countries, 2008 – 2017

Country	Year of publication	Geographical coverage	Sampling method	Number tested	Prevalence
Bulgaria	2010	Unspecified (One prison and juvenile institution)	Convenience	498	24.7%
Bulgaria	2012	Unspecified (2 juvenile institutions)	Convenience	258	20.5%
Croatia	2009	Unspecified (Multicentre)	Convenience	3348	14.2%
Croatia	2010	National (All prisons)	Unspecified	3348	12.5%
Croatia	2010	National (All juvenile institutions)	Unspecified	140	4.3%
Finland	2011	National (All prisons and juvenile institutions)	Random and exhaustive	384	45.8%
France	2009	Caen	Random	442	3.9%
France	2013	National	Random	1876	4.8%
France	2014	South-eastern France (3 prisons)	Convenience	5957	5.2%
France	2014	Unspecified (5 prisons)	Exhaustive	1720	6.5%
France	2010	Clermont-Ferrand and Riom (2 prisons)	Exhaustive	342	4.7%
Hungary	2012	National (20 prisons)	Exhaustive	4894	4.9%
Ireland	2014	National	Random	777	12.9%
Portugal	2008	Unspecified (2 prisons)	Unspecified	445	10.8%
Portugal	2011	Coimbra (1 regional prison)	Exhaustive	151	34.4%
Spain	2010	National	Other	.	44.9%
Spain	2010	National	Other	.	42.9%
Spain	2009	Alicante	Convenience	730	38.2%
Spain	2010	National	Other	.	38.9%
Spain	2010	National	Other	.	37.8%

Country	Year of publication	Geographical coverage	Sampling method	Number tested	Prevalence
Spain	2010	National	Other	.	37.2%
Spain	2010	National	Other	.	33.0%
Spain	2010	National	Other	.	30.0%
Spain	2010	National	Other	.	29.0%
Spain	2010	National	Other	.	27.0%
Spain	2010	18 prisons across Spain.	Random	.	22.7%
Spain	2010	National	Other	.	25.3%
Spain	2011	Valencia	Convenience	2332	14.7%
United Kingdom	2013	Scotland (All prisons including juvenile institutions)	Exhaustive	4810	19.2%
United Kingdom	2013	Oxfordshire (1 prison)	Convenience	118	11.0%
United Kingdom	2013	Broadmoor (1 maximum security psychiatric hospital/prison)	Exhaustive	129	2.3%
United Kingdom	2014	London (1 prison)	Convenience	511	4.3%

Source: ECDC hepatitis B and C prevalence database: https://ecdc.europa.eu/en/all-topics-zhepatitis-ctools/hepatitis-c-prevalence-database

Annex 7. Harm reduction for PWID

Table 1. NSP and OST coverage among PWID in EU/EEA countries in 2017 (or most recent year)

	NSP coverage			OST coverage		
Indicator	**Year for Needles/syringes reporting**	**Number sterile of Needles/syringes distributed in a year**	**NSP coverage % (Needles/syringes per PWID per year)**	**OST clients year**	**OST clients**	**OST coverage % (OST/HROU)**
Austria	2017	6293593	No data	2017	18632	50
Belgium	2017	1203077	50	2017	16546	No data
Bulgaria	2017	52927	No data	2017	3247	No data
Croatia	2017	244299	192	2017	4792	54
Cyprus	2017	245	1	2017	209	18
Czech Republic	2017	6409862	147	2017	5000	38
Denmark	No data	No data	No data	2015	7050	No data
Estonia	2017	1997158	232	2017	1186	No data
Finland	2017	5824467	373	2015	3329	No data
France	2015	11998221	109	2017	180000	85*
Germany	No data	No data	No data	2017	78800	54
Greece	2017	278415	76	2017	9388	65
Hungary	2017	137580	21	2015	669	No data
Ireland	2017	519578	No data	2017	10316	54
Italy	2017	515445	No data	2017	69642	30
Latvia	2017	833817	108	2017	669	9
Lithuania	2017	251370	28	2017	1136	15
Luxembourg	2017	447681	305	2017	1142	66
Malta	2017	315541	No data	2017	1025	72
Netherlands	No data	No data	No data	2014	5241	No data
Norway	2017	2884230	332	2017	7622	No data
Poland	2017	59958	No data	2017	2685	18
Portugal	2017	1421666	108	2017	16888	45
Romania	2017	1095287	No data	2017	1530	8
Slovakia	2017	395877	No data	2017	620	No data
Slovenia	2017	578926	No data	2016	3042	62
Spain	2016	1503111	119	2016	58749	No data
Sweden	2017	517381	No data	2017	4468	No data
United Kingdom	2017	7341774	No data	2017	1E+05	57

**Estimated using number of people with at least one prescription of OST during 2017 and the number of opioid users in a given month in 2017.*
Source: EMCDDA, Viral Hepatitis Elimination Barometer Legend: green=target reached; red=target not reached; grey=no data

Annex 8. Key population size

Table 1. Estimated current PWID population size in EU/EEA countries

Indicator	PWID study year	Geographical coverage (national, subnational)	Specify if sub-national	Estimated PWID population size (absolute number)	Estimated PWID prevalence per 1000 population aged 15-64 years
Austria	No data	No data	No data	No data	No data
Belgium	2015*	National*	n.a.	23828*	3.28*
Bulgaria	2004	Sub-national	Sofia	9686	10
Croatia	2016	National	n.a.	6344	2.21
Cyprus	2018	National	n.a.	221	0.37
Czech Republic	2018	National	n.a.	43700	6.32
Denmark	2006	National	n.a.	12754	3.56
Estonia	2018	National	n.a.	8606	10
Finland	2014	National	n.a.	15611	4.6
France	2018	National	n.a.	110000	2.4
Germany	No data	n.a.	n.a.	No data	No data
Greece	2018	National	n.a.	3655	0.53
Hungary	2016	National	n.a.	6707	0.98
Ireland	No data	No data	No data	No data	No data
Italy	No data	No data	No data	No data	No data
Latvia	2018	National	n.a.	7715	6.1
Lithuania	2017	National	n.a.	8868	4.63
Luxembourg	2017	National	n.a.	1467	3.77
Malta	No data	No data	No data	No data	No data
Netherlands	2017	National	n.a.	840	0.08
Norway	2018	National	n.a.	8682	2.52
Poland	2005	Subnational	Warsaw	1480-1940	1.2-1.6
Portugal	2017	National	n.a.	13162	2.06
Romania	2017	Subnational	Bucharest	9030	5.13
Slovakia	2006	National	n.a.	18841	4.86
Slovenia	2001	National	n.a.	7320	5.2
Spain	2018	National	n.a.	12684	0.41
Sweden	2015	National	n.a.	8021	1.8
UK	2011	National	n.a.	122894	3

**ever injectors*
Source: EMCDDA, Viral Hepatitis Elimination Barometer for PWID.
Legend: green=recent data available; grey=no data or no recent data.

Annex 9. Antenatal HBV and HCV screening

Table 1. Antenatal screening for HBV and HCV in EU/EEA countries, 2019

Indicator	Universal antenatal screening for HBV	Antiviral treatment available for pregnant women diagnosed with HBV	Post exposure prophylaxis available for children born to HBV positive mothers	Universal antenatal screening for HCV
Austria	Yes	Yes	Yes	No
Belgium	Yes	Yes	Yes	No
Bulgaria	Yes	Yes	Yes	No
Croatia	Yes	Yes	Yes	No
Czech Republic	Yes	No	yes	No
Cyprus				
Denmark	Yes	Yes	Yes	No
Estonia	Yes	Yes	Yes	No
France	Yes	Yes	Yes	No
Finland	Yes	Yes	Yes	No
Germany	Yes	Yes	Yes	No
Greece				
Hungary	Yes	Not known	Yes	No
Iceland				
Ireland	Yes	Yes	Yes	No
Italy	Yes	No	Yes	No
Latvia	Yes	No	Yes	No
Liechtenstein				
Lithuania	Yes	Yes	No	No
Luxembourg				
Malta	Yes	Yes	Yes	Yes
Netherlands	Yes	Yes	Yes	No
Norway	Yes	Yes	Yes	No
Poland	Yes	Yes	Yes	Yes
Portugal				
Romania	Yes*	Don't know	Yes**	No
Slovakia	Yes	Yes	Yes	No
Slovenia	Yes	Yes	Yes	No
Spain	Yes	Don't know	Yes	No
Sweden	Yes	Yes	Yes	No
United Kingdom	Yes	Yes	Yes	No

Source: WHO/Europe survey, 2019.
Legend: grey=no response to survey.
**Not systematic coverage*
***Post-exposure prophylaxis available in most cities only in private maternities*

Annex 10. Mortality

Table 1. Number of deaths and age-standardised rates per 100 000 population from hepatocellular carcinoma, liver cirrhosis, chronic liver disease and chronic viral hepatitis in 2015, EU/EEA countries

Country	HCC (ICD-10 codes C22.0)		Cirrhosis (ICD-10 codes K74.3-K74.6)		Chronic liver disease (ICD-10 codes K72-K75)		Chronic viral hepatitis (ICD-10 codes B18.0, B18.1, B18.2)	
	Deaths	Rate (adjusted)	Deaths	Rate	Deaths	Rate (adjusted)	Deaths	Rate (adjusted)
Austria	487	5.8	779	9.2	826	9.7	262	3.1
Belgium	400	3.7	611	5.6	770	7.1	34	0.3
Bulgaria	224	2.9	1356	18.0	1748	23.2	8	0.1
Croatia	188	4.4	435	10.0	464	10.7	60	1.4
Cyprus	9	1.3	30	4.3	36	5.2	4	0.6
Czech Republic	274	2.7	466	4.5	643	6.2	26	0.3
Denmark	206	3.7	53	10.0	123	2.2	15	0.3
Estonia	32	2.5	71	5.5	85	6.5	5	0.4
Finland	264	4.6	127	2.2	152	2.7	6	0.1
France	4342	6.7	2721	4.2	3460	5.4	502	0.8
Germany	4438	4.9	5942	6.6	6719	7.5	855	1.0
Greece	320	2.8	560	4.9	670	5.8	56	0.5
Hungary	163	1.7	349	3.6	418	4.3	185	1.8
Iceland	11	4.4	4	1.4	6	2.3	3	1.2
Ireland	112	3.3	89	2.6	119	3.4	21	0.5
Italy	4871	7.1	4752	7.0	5386	7.9	2637	3.8
Latvia	35	1.7	194	9.7	202	10.1	54	2.7
Liechtenstein	0	0.0	1	3.2	1	3.2		0.0
Lithuania	80	2.7	429	14.7	459	15.7	28	1.0
Luxembourg	17	3.9	27	5.8	33	7.1	3	0.5
Malta	15	3.5	6	1.4	7	1.6		0.0
Netherlands	279	1.7	393	2.4	566	3.5	34	0.2
Norway	85	1.9	55	1.2	102	2.3	12	0.3
Poland	477	1.4	1544	4.3	2116	6.0	293	0.8
Portugal	536	4.9	396	3.6	551	5.1	128	1.2
Romania	682	3.6	7482	39.2	8222	43.1	55	0.3
Slovakia	143	3.2	294	6.2	374	8.0	20	0.4
Slovenia	133	6.6	15	0.8	17	0.9	1	0.0
Spain	2727	6.0	3169	7.0	3726	8.2	790	1.7
Sweden	221	2.3	234	2.4	362	3.7	78	0.8
United Kingdom	2112	3.5	1983	3.3	2783	4.6	300	0.5
EU/EEA	**23883**	**4.6**	**34567**	**6.7**	**41146**	**8.0**	**6475**	**1.3**

Source: Mardh et al. 2019 [18]. Note: end-stage liver diseases as defined by WHO Core 10 mortality indicator

Table 2. Mortality attributable to HBV and HCV in 2015, EU/EEA – number of deaths from Eurostat adjusted by attributable fraction (AF) estimates from published literature

	Chronic liver disease (broader definition) (B18-B18.9, I85-I85.9, I98.2, K70-K70.3, K71.7, K74-K74.9, K75.2, K75.4-K76.2, K76.4-K76.9, K77.8)			Liver cancer (ICD-10 C22 "Malignant neoplasm of liver and intrahepatic bile duct")			Total deaths	Total mortality attributable to hep B/C
	Deaths	*AF GBD**	Mortality attributable to HBV and HCV (deaths x AF GBD*)	Deaths	AF GBD**	Mortality attributable to HBV and HCV (deaths x AF GBD**)		
	(a)		(b)	(c)		(d)	(a+c)	(b+d)
Austria	1739	0.43	722	929	0.45	418	2668	**1168**
Belgium	1440	0.34	622	948	0.44	417	2388	**905**
Bulgaria	1775	0.45	1244	677	0.48	325	2452	**1120**
Croatia	1002	0.41	315	495	0.36	178	1497	**587**
Cyprus	53	0.44	31	51	0.58	30	104	**53**
Czech Republic	1798	0.43	395	818	0.39	319	2616	**1094**
Denmark	585	0.42	107	441	0.44	194	1026	**440**
Estonia	290	0.42	59	103	0.33	34	393	**155**
Finland	1062	0.45	134	505	0.54	273	1567	**749**
France	7936	0.43	3007	8544	0.53	4528	16480	**7924**
Germany	15120	0.42	5779	7870	0.41	3227	22990	**9528**
Greece	888	0.45	585	1558	0.6	935	2446	**1336**
Hungary	3142	0.42	308	862	0.4	345	4004	**1676**
Iceland	13	0.38	6	19	0.61	12	32	**17**
Ireland	305	0.38	101	295	0.55	162	600	**278**
Italy	9395	0.70	4558	9702	0.71	6888	19097	**13418**
Latvia	434	0.43	139	134	0.55	74	568	**261**
Liechtenstein	1	NA	NA			0	1	**NA**
Lithuania	808	0.42	317	210	0.35	74	1018	**414**
Luxembourg	65	0.38	28	43	0.53	23	108	**47**
Malta	6	0.46	6	25	0.63	16	31	**19**
Netherlands	888	0.42	480	956	0.55	526	1844	**898**
Norway	206	0.45	88	265	0.63	167	471	**260**
Poland	5529	0.42	1431	2031	0.47	955	7560	**3276**
Portugal	1213	0.41	481	1134	0.54	612	2347	**1110**
Romania	8777	0.40	5401	3061	0.38	1163	11838	**4679**
Slovakia	1356	0.44	261	403	0.41	165	1759	**761**
Slovenia	423	0.44	12	250	0.4	100	673	**286**
Spain	5608	0.37	3357	5044	0.72	3632	10652	**5706**
Sweden	687	0.24	172	688	0.56	385	1375	**548**
United Kingdom	5550	0.44	2414	5189	0.55	2854	10739	**5276**
EU/EEA	**78094**	**0.45**	**32558**	**53250**	**0.55**	**29029**	**131344**	**63927**

Source: Mardh et al, 2019 [18].

**Global Burden of Disease Collaborative Network. Global Burden of Disease GBD) Study 2016 (GBD 2016) Results. Available from http://ghdx.healthdata.org/gbd-results-tool*

*** Global Burden of Disease Liver Cancer Collaboration. The burden of primary liver cancer and underlying aetiologies from 1990 to 2015 at the global, regional, and national level: results from the Global Burden of Disease Study 2015. 2017. JAMA Oncology*

Annex 11. Data on HBV and HCV testing and treatment in EU/EEA countries

Table 1. Data on HBV testing and treatment in EU/EEA countries in 2017 (or most recent year)

	Testing and diagnosis					Treatment				Treatment effectiveness			
	Number of persons diagnosed at the start of the reporting period*	Number of persons tested with serology throughout the reporting period**	Number of persons newly diagnosed throughout the reporting period	Ratio of diagnosed / tested throughout the reporting period	Number of persons diagnosed at the end of the reporting period	Persons treated at the start of the reporting period *	Persons started on treatment during the reporting period	Persons treated during the reporting period		Persons assessed for effectiveness throughout reporting period		Persons with effective treatment during the reporting system	
	Number	Number	Number	Ratio (%)	Number	Number	Number	Number	Ratio (%)	Number	Ratio (%)	Number	Ratio (%)
Code	(C1)	(C2)	(C3)	C3/C2	C1+C3	(C4)	(C5)	C4+C5	C4+C5/ C1+C3	(C10)	C10/ (C4+C5)	(C11)	C11/C10
Austria	4041		873		4914			2997	61.0				
Belgium													
Bulgaria	3028		2393		5421	3589	2079	5668	104.6	2070	36.5	1620	78.3
Croatia													
Cyprus													
Czech Republic			248										
Denmark	7500		400		7900								
Estonia	375		10		385								
Finland	9216		239		9455								
France	23749	4300000			23749								
Germany			6687										
Greece					70000								
Hungary													
Iceland													
Ireland	9 791	145 798	494	0.3	10285								

	Testing and diagnosis					Treatment				Treatment effectiveness			
	Number of persons diagnosed at the start of the reporting period*	Number of persons tested with serology throughout the reporting period**	Number of persons newly diagnosed throughout the reporting period	Ratio of diagnosed / tested throughout the reporting period	Number of persons diagnosed at the end of the reporting period	Persons treated at the start of the reporting period *	Persons started on treatment during the reporting period	Persons treated during the reporting period		Persons assessed for effectiveness throughout reporting period		Persons with effective treatment during the reporting system	
Italy													
Latvia	10 655	53 848	369	0.5	11024								
Liechtenstein	23		4		27								
Lithuania						264	85	349					
Luxembourg													
Malta			25										
Netherlands	24 000		1105		25105	5312	250	5562	22.2				
Norway	18 200		458		18658			800					
Poland	115 000		3 307		118307								
Portugal		438 300											
Romania	40 110	559 229	5 205	0.93	45315	5834	4000	9834	21.7	9539	97.0	8438	88.5
Slovakia	1 116		88		1204								
Slovenia					2096	547	42	589	28.1	589	100	589	100
Spain													
Sweden			1 218		20000 - 35000								
United Kingdom***													
England	-	576 000	-	-	-	-	-	-	-	-	-	-	-
Northern Ireland	1 220	50 957	92	0.2	1 312	-	-	-	-	-	-	-	-
Wales	150	81000	225	0.3	375	-	-	-	-	-	-	-	-
Scotland	4 812	123 603	344	0.3	5 156	-	-	-	-	-	-	-	-

** Data incomplete on diagnosed cases from Austria (data from 2009), Bulgaria (data from 2016), Estonia (data from 2004), Netherlands (data from 2000), Northern Ireland (data from 2000) and Wales (data from 2016).*

***Data for Northern Ireland reported to relate to tests and not individuals.*

****Data for England is from the Sentinel Surveillance study of blood borne virus testing which is estimated to cover 40% of the population of England. The data can't be extrapolated or used to estimate national figures and the data do not include rapid tests undertaken in these centres.*

Table 2. Data on HCV testing and treatment in EU/EEA countries in 2017 (or most recent year)

	Testing and diagnosis							Treatment effectiveness			
	Number of persons diagnosed at the beginning of the reporting period**	Number of persons tested with serology throughout the reporting period***	Number of persons newly diagnosed throughout the reporting period	Ratio of diagnosed / tested throughout the reporting period	Number of persons diagnosed at the end of the reporting period	Persons started on treatment during the reporting period	Persons who stopped Rx during the reporting period	Persons assessed for effectiveness throughout reporting period		Persons with effective treatment during the reporting system	
	Number	Number	Number	Ratio (%)	Number	Number	Number	Number	Ratio (%)	Number	Ratio (%)
Country	(C1)	(C2)	(C3)	C3/C2	C1+C3	(C5)	(C9)	(C10)	C10/C9	(C11)	C11/C10
Austria	7 570		899		8 469		2 342				
Belgium		700 000									
Bulgaria	2 025		1 661		3 686	1316	609	1 136	186.5	1 136	100.0
Croatia	6 750		206		6 956	400	350	350	100.0	347	99.1
Cyprus											
Czech Republic			992			1 000					
Denmark	9 000		300		9 300						
Estonia	2452		120		2572						
Finland	31 139		1 169		32 308						
France	107 574	4 100 000			107 574	19 248				17 325	90.0
Germany			4261			13600					
Greece					20 000						
Hungary	14 201		1 328		15 529	1 310	247	904	366.0	838	92.7
Iceland	158		35		193	200	231			190	
Ireland	9 900	123 309	607	0.5	10 507	1 066	958	930	97.1	911	98.0
Italy						45 313					
Latvia	22 155	53 288	1 067	2.0	23 222	1 342	1510	1 458	96.6	1 329	91.2
Liechtenstein	26		8		34						

	Testing and diagnosis							Treatment effectiveness			
	Number of persons diagnosed at the beginning of the reporting period**	Number of persons tested with serology throughout the reporting period***	Number of persons newly diagnosed throughout the reporting period	Ratio of diagnosed / tested throughout the reporting period	Number of persons diagnosed at the end of the reporting period	Persons started on treatment during the reporting period	Persons who stopped Rx during the reporting period	Persons assessed for effectiveness throughout reporting period		Persons with effective treatment during the reporting system	
Lithuania						951					
Luxembourg		53 429				200					
Malta	1 000		18		1 018						
Netherlands						1 179					
Norway											
Poland	37 125		4 010		41 135						
Portugal		337 040				3 732	3 243	2 822	87.0	2 732	96.8
Romania	40 745	523 043	4 427	0.8	45 172	18 956	18 265	18 198	99.6	18 190	100.0
Slovakia	3 661		141		3 802						
Slovenia	1 367		134		1 329	181		181	100	172	95.0
Spain	80 705		892		81 597	29 012		29 151		29 151	100.0
Sweden			1 659		20000 -30000						
United Kingdom*											
England	42 500	347 440	17 185	N/A	59 685	10 471	10 480	8 655	82.6	8 312	96.0
Northern Ireland	2 957	47 864	82	0.2	3 039	119	-	-	-	-	-
Scotland	13 000	64 000	1 100	1.7	14 100	2 000	1 500	1 500	100	-	97.0
Wales	4 500	48 500	500	1.0	5 000	580	-	-	-	550-	-

**Subnational estimates for tests conducted cover 75% of all those tested in Scotland and in England data is from the Sentinel Surveillance study of blood borne virus testing which is estimated to cover 40% of the population of England. The data cannot be extrapolated or used to estimate national figures and the data do not include rapid tests undertaken in these centres.*
***Data incomplete on diagnosed cases from Austria (data from 2009), Bulgaria (data from 2016), Estonia (data from 2004) Spain (data from 2015) and for Austria and Latvia includes cured/spontaneously resolved cases.*
****Data for Northern Ireland reported to relate to tests and not individuals.*
Source: ECDC survey, 2019

Annex 12. Continuum of care for hepatitis B and C

Table 1. Continuum of care for people living with hepatitis B and hepatitis C in EU/EEA countries, 2017

	Hepatitis B				Hepatitis C			
	Estimated number of people infected	Number diagnosed to end of 2017	Number on treatment in 2017	Number virally suppressed in 2017	Estimated number of people infected	Number diagnosed to end 2017	Number started on treatment in 2017	Number virally suppressed in 2017
Austria		4 914	2 997		24 000	8 469	2 342	
Belgium								
Bulgaria	227 260	5 421	5 668	1 620	90 904	3 686	1 316	1 136
Croatia	25 000				28 000	6 956	400	347
Cyprus								
Czech Republic	50 000				80 000		1 000	
Denmark	11 000	7 900			21 000	9 300		
Estonia	3513	385			8 833	2 572		
Finland		9 455				32 308		
France	135 706	23 749			133 466	107 574	19 248	17 325
Germany*	Adults (18+): 222 000 (172 000-285 000) Children (<18) 22 900 (19 800-26 500)				Adults: 223 000 (130 000-352 000)		13 600	
Greece	200 000	70 000			100 000	20 000		
Hungary					60 000	15 529	1 310	838
Iceland					250	193	200	190
Ireland	18 000	10 285			16 567	10 507	1 066	911
Italy	680 000				850 000		45 313	
Latvia	46 000	11 024			34 000	23 222	1 342	1 300
Liechtenstein		27				34		
Lithuania			349				951	
Luxembourg	5 900				5 375		200	
Malta						1 018		
Netherlands	48 756	25 105	5 562		22 885		1 179	
Norway		18 658	800					
Poland	250 000	118 307			165 000	41 135		
Portugal	42 000				54 600		3 732	2 732
Romania	640 176	45 315	9 834	8438	594 591	45 172	18 956	18 190
Slovakia	8 267	1 204			4 103	3 802		
Slovenia		2 096	589	589		1 329	181	172
Spain						81 597	29 012	29 151
Sweden	35-45 000	20- 35 000			35-45 000	20-30 000		
United Kingdom								
England	180 000	-	-	-	113 000	59 686	10 471	8 312
Northern Ireland	-	13 212	-	-	-	3 039	119	-
Scotland	8 700	5 156	-	-	25 000	14 100	2 000	-
Wales	-	375	-	-	12-14 000	5 000	580	550

*NB: note the limitations of the data as detailed in Annex 11, Tables 1 and 2. *Estimates from 2013. Source: ECDC survey, 2019.*

European Centre for Disease Prevention and Control (ECDC)

Gustav III:s Boulevard 40, 16973 Solna, Sweden

Tel. +46 858601000
Fax +46 858601001
www.ecdc.europa.eu

An agency of the European Union
www.europa.eu

Subscribe to our publications
www.ecdc.europa.eu/en/publications

Contact us
publications@ecdc.europa.eu

Follow us on Twitter
@ECDC_EU

Like our Facebook page
www.facebook.com/ECDC.EU

ECDC is committed to ensuring the transparency and independence of its work

In accordance with the *Staff Regulations for Officials and Conditions of Employment of Other Servants of the European Union* and the *ECDC Independence Policy*, ECDC staff members shall not, in the performance of their duties, deal with matters in which they may, directly or indirectly, have a personal interest that could impair their independence. Declarations of interest must be received from any prospective contractor before a contract can be awarded.
www.ecdc.europa.eu/en/aboutus/transparency

Publications Office
of the European Union