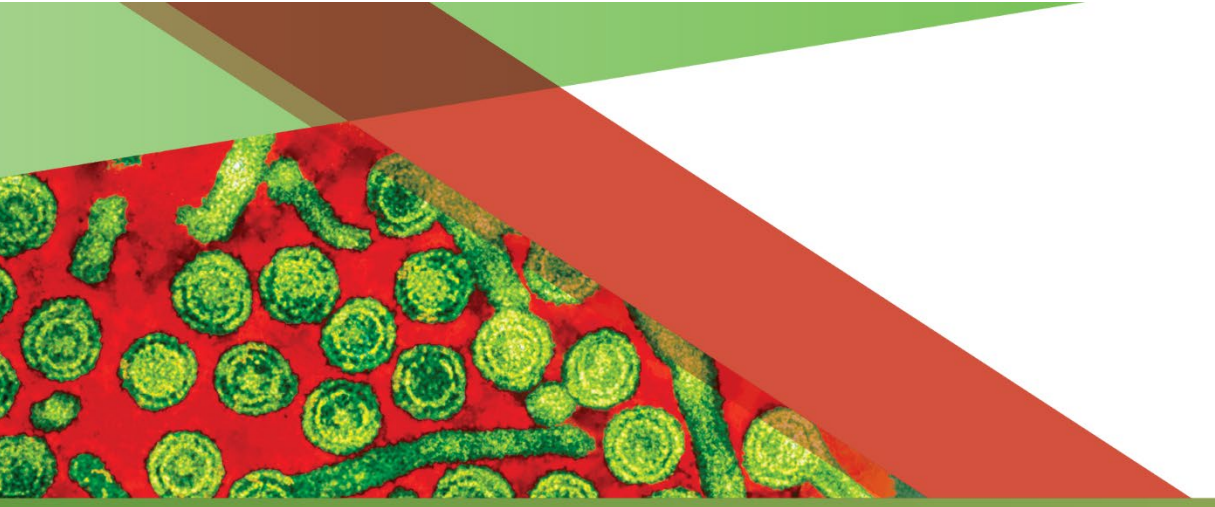


SURVEILLANCE REPORT

Hepatitis B

Annual Epidemiological Report for 2020

Key facts

- For 2020, 29 EU/EEA Member States reported 14 428 cases of hepatitis B virus (HBV) infection. Excluding the five countries that only reported acute cases, the number of cases (14 137) corresponds to a crude rate of 4.2 cases per 100 000 population.
- Of all cases, 7% were reported as acute, 43% as chronic, 40% as 'unknown' and 11% could not be classified.
- The highest rate of acute infections was observed among 35–44-year-olds, the highest rate of chronic infections among 25–34-year-olds. The overall male-to-female ratio was 1.5:1.
- The rate of acute cases continued to decline over the last few years, which is in accordance with global trends and most likely reflects the impact of national vaccination programmes.
- Among acute cases with complete information, heterosexual transmission was most commonly reported (32%), followed by transmission among men who have sex with men (14%) and nosocomial transmission (12%). Among chronic cases, mother-to-child transmission and nosocomial transmission were the most common routes of transmission reported (52% and 12% respectively).
- Prevention and control programmes need further scaling up if European countries are to achieve the goal of eliminating hepatitis B. Surveillance data are important in monitoring the epidemiological situation, and there is a need to improve their quality.

Methods

This report is based on 2020 data retrieved from The European Surveillance System (TESSy) on 2 February 2022. The European Surveillance System is a system for the collection, analysis and dissemination of data on communicable diseases.

For a detailed description of methods used to produce this report, refer to the *Methods* chapter [1].

An overview of the national surveillance systems is available on the ECDC website [2].

A subset of the data used for this report is available through ECDC's online *Surveillance atlas of infectious diseases* [3].

Erratum: The figure 28% in the 'Age and sex' section on page 5 was corrected to 15% on December 19 2022.

Suggested citation: European Centre for Disease Prevention and Control. Hepatitis B. In: ECDC. Annual epidemiological report for 2020. Stockholm: ECDC; 2022.

Stockholm, July 2022

This report includes data on newly diagnosed cases of hepatitis B reported to ECDC by EU/EEA countries. Countries were requested to apply the EU 2018 case definition for reporting at the European level, but other case definitions were also accepted [2].

Acute and chronic hepatitis B infections were differentiated by countries using defined criteria (Table 1).

Table 1. Criteria for differentiating acute and chronic hepatitis B

Stage	Definition
Acute	Detection of IgM core antigen-specific antibody (anti-HBc IgM) or Detection of hepatitis B surface antigen (HBsAg) and previous negative HBV markers less than six months ago or Detection of hepatitis B nucleic acid (HBV-DNA) and previous negative HBV markers less than six months ago Any of the above with or without symptoms and signs (e.g. jaundice, elevated serum aminotransferase levels, fatigue, abdominal pain, loss of appetite, intermittent nausea, vomiting, fever)
Chronic	Detection of HBsAg or HBeAg or HBV-DNA and No detection of anti-HBc IgM (negative result) or Detection of HBsAg or HBeAg or HBV-DNA on two occasions that are six months apart*
Unknown	Any newly diagnosed case which cannot be classified in accordance with the above definition of acute or chronic infection

**: in the event that the case was not notified the first time.*

Surveillance systems across EU/EEA countries are heterogeneous [2]. Twenty-two countries submitted national data for 2020 based on the 2012 or 2018 EU case definitions. The 2012 and 2018 case definitions are essentially identical, except that the 2018 definition explicitly states that countries should differentiate between acute and chronic cases according to ECDC requirements [4,5]. Four countries used the 2008 EU case definition and three countries (Denmark, Germany and Italy) used national case definitions. The 2008 EU case definition only allows for the reporting of acute hepatitis B cases, while the 2012 and 2018 case definitions include both acute and chronic cases. All reported cases were included in the analysis regardless of the case definition used. Five countries (France, Greece, Hungary, Lithuania and Spain) only submitted data on acute cases. Two countries (Belgium and Bulgaria) submitted aggregate data only and did not differentiate stages of infection. No data for 2020 were reported by the United Kingdom (UK) due to its withdrawal from the EU on 1 February 2020.

Annual notification rates were calculated per 100 000 population for countries with comprehensive surveillance systems using Eurostat population data[1].

Hepatitis B data are presented by the 'date of diagnosis' or, if not available, by 'date used for statistics'. When comparing data using these two dates across the database, there were only minor differences between them in a few countries.

Italy reported data using two data sources. One of these sources had national coverage but included only a limited number of variables and did not identify cases as acute or chronic, which limited its inclusion in this report. The other data source in Italy was a voluntary reporting system of acute cases covering 82.4% of the population in 2020. The sentinel population was considered representative of the wider population, so data were scaled up to 100%. This data source contains information on a range of variables and is used for certain epidemiological analyses, including the route of transmission and importation status. The data source for Belgium was a sentinel system with undetermined coverage. National rates were therefore not calculated for Belgium.

Epidemiology

Overall trends

For 2020, 29 EU/EEA Member States reported 14 428 cases of hepatitis B virus (HBV) infection. No data were reported from Liechtenstein. Excluding the five countries that only reported acute cases, the number of cases (14 137) corresponds to a crude rate of 4.2 cases per 100 000 population. Of all cases, 979 (7%) were reported as acute, 6 172 (43%) as chronic, 5 742 (40%) as 'unknown', and 1 535 cases (11%) could not be classified due to an incompatible data format.

[1] Eurostat database: http://epp.eurostat.ec.europa.eu

Twenty-five countries were able to provide data on acute cases (Table 2). The overall rate of acute cases was 0.3 per 100 000 population, ranging from no cases in Croatia, Cyprus and Malta to 0.8 cases per 100 000 population in Latvia (Figure 1). When restricting the analysis to the 20 countries that reported consistently from 2011–2020, the rate for acute cases showed a steady decline from 0.8 cases per 100 000 population in 2011 to 0.4 in 2019, with a drop to 0.2 in 2020 (Figure 2).

Twenty-one countries submitted data on chronic infections. The overall notification rate was 2.6 cases per 100 000 population, ranging from zero in in Luxembourg, Malta and Romania to 8.8 in Iceland (Table 2). Among the 16 countries that reported consistently between 2011 and 2020, there has been a variable rate of reported chronic cases with a high of 6.6 in 2015 and a low of 2.8 in 2020 (Figure 2).

Table 2. Number and rate per 100 000 population of reported hepatitis B cases in the EU/EEA by country and year, 2016–2020

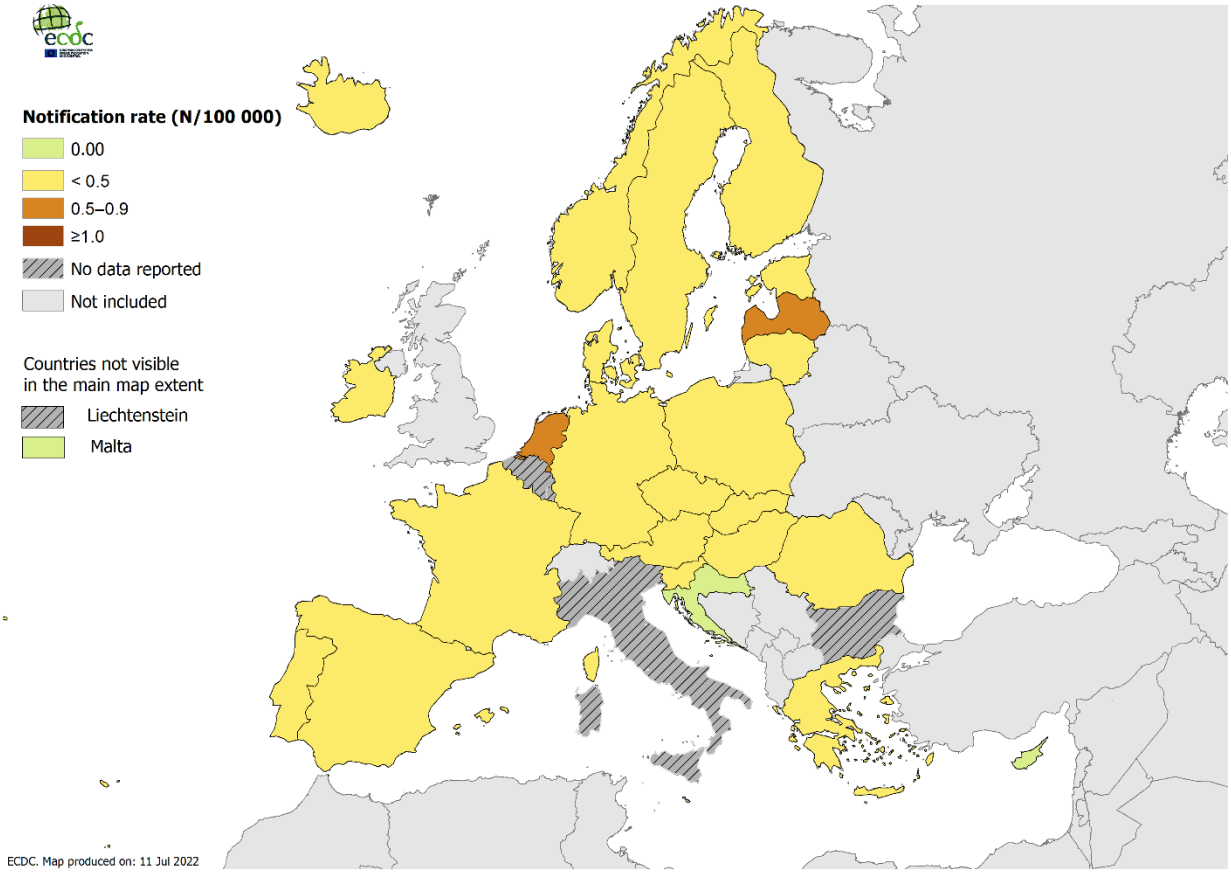
Country	2016		2017		2018		2019		2020							
	All		All		All		All		All		Acute[i]		Chronic[i]		Unknown[i]	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Austria	1 533	17.6	1 418	16.2	1 288	14.6	1 191	13.4	937	10.5	36	0.4	329	3.7	572	6.4
Belgium[ii]	1 722	-	1 634	-	1 982	-	2 021	-	1 423	-	.	-	.	-	.	-
Bulgaria	219	3.1	249	3.5	215	3.0	198	2.8	112	1.6	.	-	.	-	.	-
Croatia	117	2.8	97	2.3	98	2.4	93	2.3	22	0.5	0	0.0	7	0.2	15	0.4
Cyprus	3	0.4	35	4.1	83	9.6	108	12.3	29	3.3	0	0.0	29	3.3	.	-
Czechia	270	2.6	303	2.9	323	3.0	317	3.0	169	1.6	27	0.3	142	1.3	.	-
Denmark	275	4.8	262	4.6	164	2.8	170	2.9	152	2.6	15	0.3	136	2.3	1	0.0
Estonia	23	1.7	14	1.1	19	1.4	18	1.4	23	1.7	2	0.2	21	1.6	.	-
Finland	348	6.3	266	4.8	239	4.3	238	4.3	166	3.0	4	0.1	162	2.9	.	-
France[iii, iv]	.	-	.	-	.	-	.	-	.	-	51	0.1	.	-	.	-
Germany	3 461	4.2	3 594	4.4	4 521	5.5	8 937	10.8	6 712	8.1	371	0.4	3 034	3.6	3 307	4.0
Greece[iii]	.	-	.	-	.	-	.	-	.	-	14	0.1	.	-	.	-
Hungary[iii]	.	-	.	-	.	-	.	-	.	-	14	0.1	.	-	.	-
Iceland	59	17.7	68	20.1	44	12.6	49	13.7	33	9.1	1	0.3	32	8.8	0	0.0
Ireland	484	10.2	527	11.0	498	10.3	513	10.5	333	6.7	10	0.2	252	5.1	71	1.4
Italy	308	0.5	437	0.7	379	0.6	341	0.6	172	0.3	-	-	.	-	172	0.3
Latvia	450	22.9	348	17.8	326	16.9	294	15.3	162	8.5	15	0.8	147	7.7	.	-
Lithuania[iii]	.	-	.	-	.	-	.	-	.	-	10	0.4	.	-	.	-
Luxembourg	66	11.5	60	10.2	47	7.8	52	8.5	518	82.7	-	-	0	0.0	518	82.7
Malta	33	7.3	25	5.4	25	5.3	23	4.7	39	7.6	0	0.0	0	0.0	39	7.6
Netherlands	1 128	6.6	1 224	7.2	1 141	6.6	1 169	6.8	799	4.6	92	0.5	695	4.0	12	0.1
Norway	763	14.6	478	9.1	365	6.9	393	7.4	225	4.2	4	0.1	221	4.1	.	-
Poland	3 806	10.0	3 363	8.9	3 196	8.4	2 854	7.5	993	2.6	14	0.0	156	0.4	823	2.2
Portugal	168	1.6	181	1.8	189	1.8	201	2.0	112	1.1	29	0.3	35	0.3	48	0.5
Romania	196	1.0	133	0.7	119	0.6	103	0.5	21	0.1	21	0.1	0	0.0	.	-
Slovakia	165	3.0	141	2.6	131	2.4	140	2.6	87	1.6	18	0.3	69	1.3	.	-
Slovenia	40	1.9	77	3.7	78	3.8	60	2.9	94	4.5	2	0.1	26	1.2	66	3.1
Spain[iii]	.	-	.	-	.	-	.	-	.	-	202	0.4	.	-	.	-
Sweden	2 039	20.7	1 239	12.4	1 130	11.2	1 098	10.7	804	7.8	27	0.3	679	6.6	98	0.9
United Kingdom	12 572	19.2	10 390	15.8	7 778	11.7	9 254	13.9	.	-	.	-	.	-	.	-
Total EU/EEA	**30 248**	**7.8**	**26 563**	**6.8**	**24 378**	**6.1**	**29 835**	**7.5**	**14 137**	**4.2**	**979**	**0.3**	**6 172**	**2.6**	**5 742**	**2.3**

Data presented by date of diagnosis.

.: data not reported

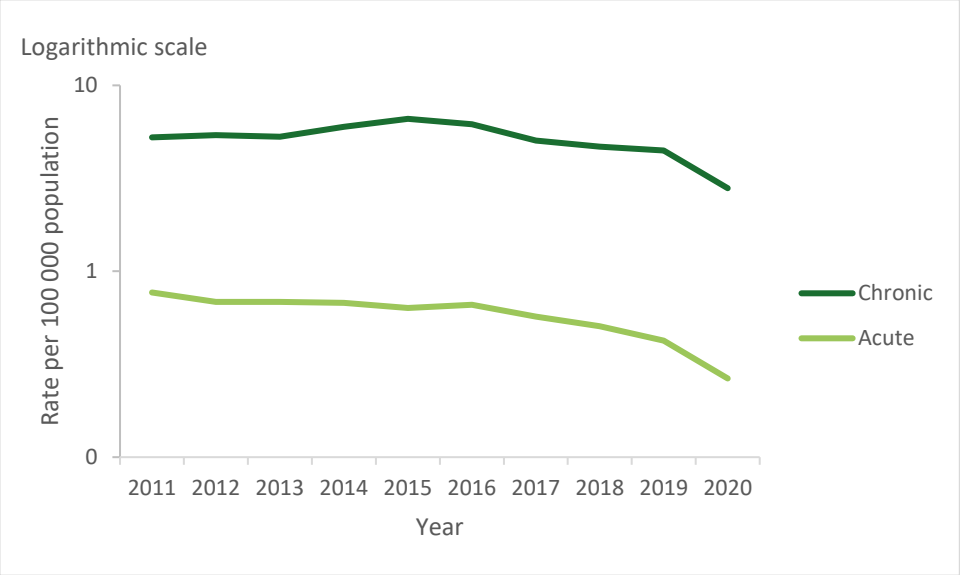
-: rates not calculated
i: Includes cases reported by countries as acute, chronic or unknown using the differentiation criteria.
ii: Data from Belgium came from a sentinel system with undefined coverage, therefore population rates cannot be calculated.
iii: 'All cases' not displayed for countries that only reported acute cases.
iv: Underreporting of acute hepatitis B in France estimated at 73% in 2016.

Figure 1. Notification rate of acute hepatitis B cases* per 100 000 population by country, EU/EEA, 2020



**: Countries included if able to present data by disease status, used case definition that includes only acute cases (e.g. EU 2008) or known to only report acute cases and had national coverage.*
***: Underreporting of acute hepatitis B in France estimated at 73% in 2016.*
*Source: Country reports from Austria, Croatia, Cyprus, the Czechia, Denmark, Estonia, Finland, France**, Germany, Greece, Hungary, Iceland, Ireland, Latvia, Lithuania, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, and Sweden.*

Figure 2. Notification rates of acute and chronic hepatitis B per 100 000 population by year in EU/EEA countries reporting consistently, 2011–2020

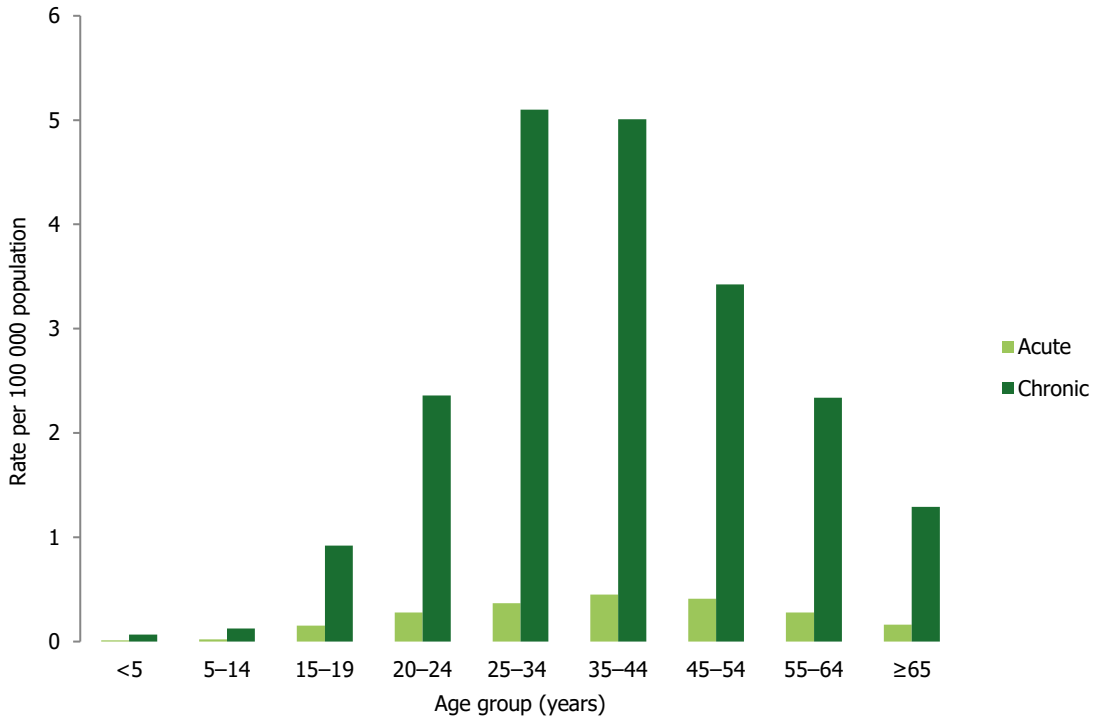


Source: Country reports.
Acute cases: Country reports from Austria, the Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Latvia, Lithuania, Malta, the Netherlands, Norway, Poland, Romania, Slovakia, Slovenia, Spain, Sweden.*
Chronic cases: Country reports from Austria, Cyprus, Denmark, Estonia, Finland, Ireland, Latvia, Malta, the Netherlands, Norway, Portugal, Romania, Slovakia, Slovenia and Sweden.
**: Underreporting of acute hepatitis B in France estimated at 73% in 2016.*

Age and sex

In 2020, 8 127 cases of hepatitis B were reported in males (5.0 cases per 100 000 population) and 5 911 cases were reported in females (3.4 cases per 100 000 population), excluding countries that only reported acute cases. This represents a male-to-female ratio of 1.5:1. The male-to-female ratio was higher among acute cases (2.1:1) than chronic cases (1.3:1). Half of all cases were among 25–44-year-olds. The age distributions among reported cases of acute and chronic infections were similar (Figure 3), with 10% of acute and 7% of chronic cases in people under 25 years of age. Among countries reporting consistently every year since 2011, the proportion of acute cases below 25 years of age declined from 15% in 2011 to 10% in 2020. The proportion of chronic cases under 25 declined from 20% in 2011 to 8% in 2020.

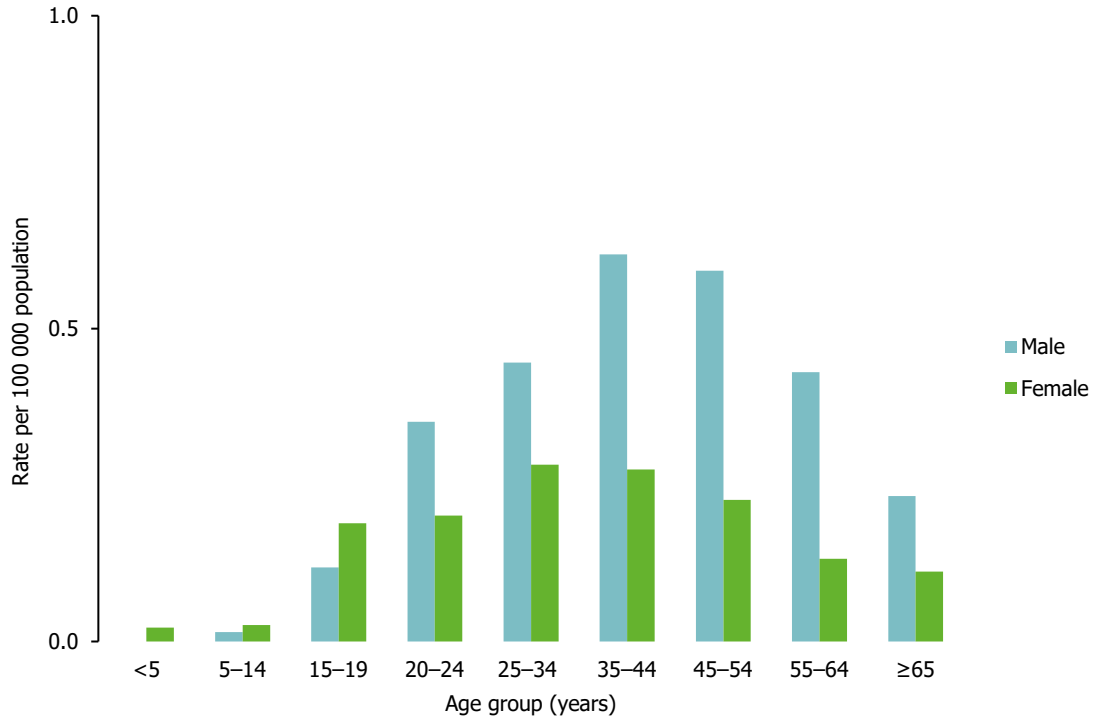
Figure 3. Notification rates of acute and chronic hepatitis B per 100 000 population by age group and disease status, EU/EEA, 2020



Source: Country reports.
Acute cases – Austria, Croatia, Cyprus, the Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Latvia, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain and Sweden.*
Chronic cases – Austria, Croatia, Cyprus, the Czechia, Denmark, Estonia, Finland, Germany, Iceland, Ireland, Latvia, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia and Sweden.
**: Underreporting of acute hepatitis B in France estimated at 73% in 2016.*

The age distribution among male and female acute cases was similar, although female cases tended to be younger. Rates were higher among females in the younger age groups, but in age groups 20 and older, the rates were higher among males (Figure 4).

Figure 4. Rate of reported acute hepatitis B cases per 100 000 population by age group and sex, EU/EEA, 2020

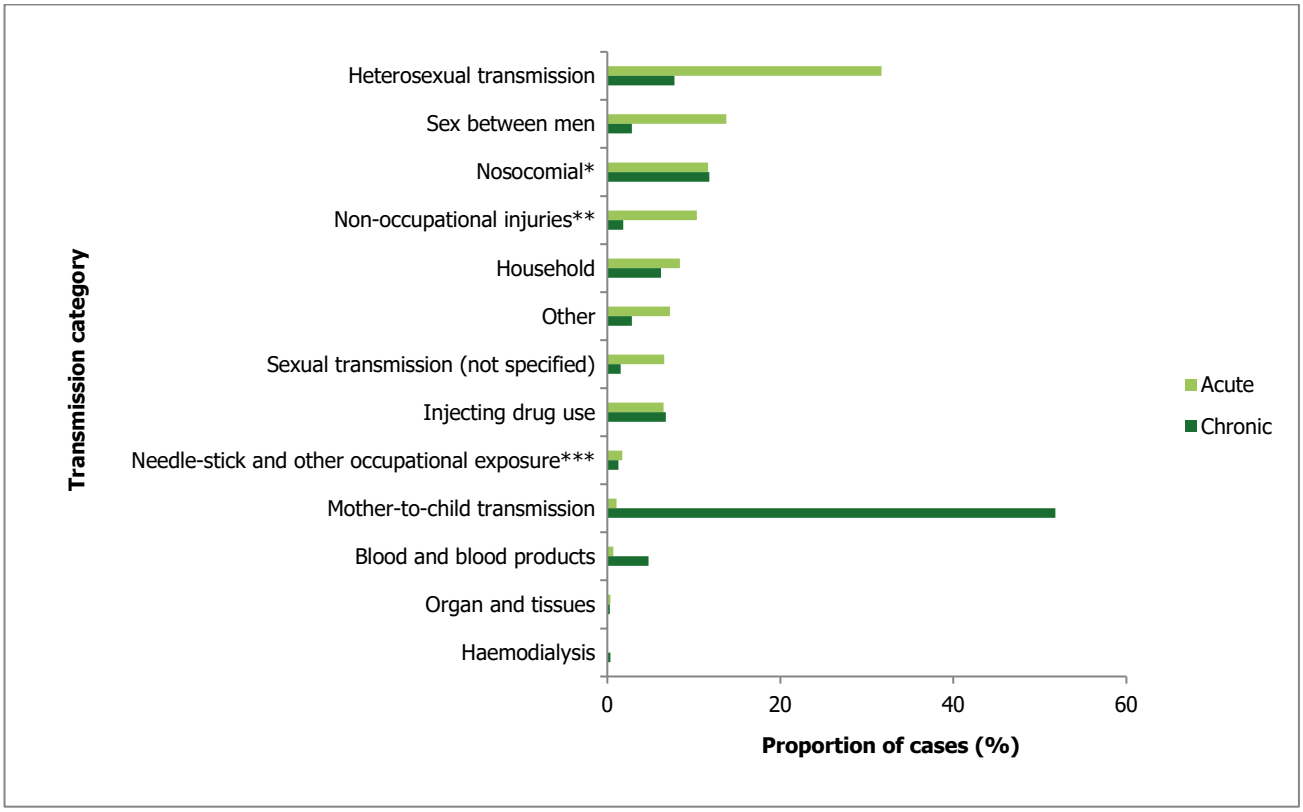


Source: Country reports.
Austria, Croatia, Cyprus, the Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Latvia, Lithuania, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain and Sweden.*
**: Underreporting of acute hepatitis B in France estimated at 73% in 2016.*

Route of transmission

Data on transmission were complete for 29% of the acute and 18% of the chronic hepatitis B cases reported in 2020. For the 287 acute cases with complete information, heterosexual transmission was most commonly reported (32%), followed by transmission among men who have sex with men (14%) and nosocomial transmission (12%; Figure 5). Italy and Poland accounted for 77% of the acute cases attributed to nosocomial transmission. For the 1 095 chronic cases with complete information, mother-to-child transmission and nosocomial transmission were the most common routes of transmission reported (52% and 12% respectively). Poland reported 79% of chronic cases attributed to nosocomial transmission. Among chronic cases attributed to mother-to-child transmission, 61% were reported by the Netherlands, 17% by Denmark and 13% by Sweden. Of the chronic cases attributed to mother-to-child transmission, 77% were classified as being imported. Due to incompleteness and variation of reporting over time, trends are difficult to interpret and not reported.

Figure 5. Transmission category of hepatitis B cases by acute and chronic disease status, EU/EEA, 2020[a]



[a]*Cases with known transmission status.*
**: Nosocomial transmission includes hospitals, nursing homes, psychiatric institutions and dental services. This category refers mainly to patients exposed through healthcare settings, distinct from 'needle-stick and other occupational exposure', which refers to staff.*
***: 'Non-occupational injuries' include needle sticks that occur outside a health care setting, bites, tattoos, piercings.*
****: 'Needle-stick and other occupational exposure' refers to occupational injuries*
Source: Acute reports from Austria, the Czechia, Denmark, Estonia, Finland, France, Germany, Hungary, Ireland, Italy, Latvia, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Spain and Sweden.
Chronic reports from Austria, Croatia, Denmark, Estonia, Finland, Germany, Ireland, Latvia, the Netherlands, Norway, Poland, Portugal, Slovakia and Sweden.
i: Underreporting of acute hepatitis B in France estimated at 73% in 2016.

Importation status

Of 5 241 cases (36% of all reported cases) with information on importation status from 15 countries, 2 322 (44%) were reported as imported. The majority of these imported cases (86%) were chronic infections, and among those, 86% were reported by four countries (Germany, the Netherlands, Norway and Sweden). The proportion of chronic cases (64%) reported as imported was higher than the proportion of acute cases (15%), indicating that migrant populations are disproportionally affected, mainly because migrants are already infected with hepatitis B prior to arrival. Data completeness on importation status among chronic cases varied across countries, but among those with complete data (>75%), the proportion of cases classified as imported ranged from <10% (the Czechia, Estonia, Poland, Slovakia) to over 90% (Iceland, Ireland, the Netherlands, Norway and Sweden).

Discussion

The number of newly diagnosed hepatitis B infections reported from countries across Europe remains high, with the majority of these infections classified as chronic. A marked variation between countries in the distribution of acute and chronic cases was observed. This geographical variation most likely reflects differences in local testing and reporting practices as well as underlying epidemiological differences. For acute hepatitis B cases, no important geographical trends were observed, even though the underlying prevalence of chronic hepatitis B infection is known to be highest in eastern Europe [6]. For newly diagnosed cases of chronic hepatitis B reported to ECDC, the geographical trends are unclear as data for many countries are missing. However, some of the highest rates were reported from northern and western European countries, such as Iceland, Ireland, and Sweden which is contrary to what may be expected based on seroprevalence surveys that indicate these countries to be of low endemicity (<1.0%) [6]. The discrepancy between reported notifications and prevalence estimates highlights the difficulty in interpreting routine surveillance data for chronic infections which are mostly asymptomatic until the late stages of the disease. The chronic hepatitis B data reported appear to reflect the intensity of local testing and screening policies, with the highest rates reported from countries that are known to have comprehensive testing programmes [8,9]. Prevalence surveys using rigorous sampling methods give a better indication of disease burden. However, prevalence surveys from northern European countries with high levels of immigration may underestimate the true prevalence of hepatitis B, as their studies might not include the migrant populations from intermediate and high (>1.0%) endemicity countries [7]. The high number of cases of chronic hepatitis B reported from northern Europe also has a strong influence on trends.

The overall trend for acute cases in the EU/EEA has shown a steady decline from 2011–2020. The decrease is most likely related to national hepatitis B vaccination programmes [10]. For both acute and chronic cases, a steeper decline in rates of new diagnoses was seen in 2020 compared to the trajectory in earlier years. This may be the result of a combination of changes in healthcare seeking behaviours and testing practices during the COVID-19 pandemic. For acute cases, changes in behaviours and reduced sexual contact patterns may also have resulted in a reduction of new infections.

A survey of wide range of actors involved in the provision of testing services found that the majority reported service disruptions and declines in testing volumes during the COVID-19 pandemic, in particular, in the early part of 2020 [11]. A study in the Netherlands found a 40% reduction in the number of diagnosed chronic cases in 2020 compared to 2019 and found that the weekly relative reduction in new chronic HBV and HCV diagnoses mirrored the weekly number of COVID-19 admissions [12]. An earlier study did not find a reduction in the number of acute cases, likely because acute hepatitis B infection is often symptomatic and diagnoses rates are less likely to be impacted by changes in testing efforts or healthcare seeking behaviours [13]. It will be important to monitor trends in 2021 and 2022 to gain a more complete picture.

Data completeness for several variables is poor but has improved recently. The number of countries reporting data has remained stable over the last few years.

Data on importation status of cases remain incomplete, but the impact of migration on reported cases of hepatitis B in Europe is striking for some countries, especially among chronic infections. In recent decades, migrants to many countries in Europe have come from countries with high prevalence of hepatitis B and prevalence among some of these migrant groups is high [7,14]. A recent study on the epidemiological burden of hepatitis among migrant populations estimated the burden of infection among migrants in relation to the overall number of chronically infected hepatitis B cases in Europe to be around 25% [14]. The study concluded that migrant populations are often disproportionately affected by hepatitis B and are a key risk group for chronic hepatitis B in certain EU/EEA countries. The influence of migration on hepatitis B highlights the need for countries to develop evidence-based screening interventions that target the most affected migrant communities. It also highlights the importance of monitoring routine surveillance indicators of migration, such as importation status.

Transmission data are key to understanding the epidemiology of hepatitis B. While transmission data completeness is better for acute cases than chronic cases, the overall incompleteness impairs the interpretation of differences between countries and data are unlikely to be fully representative. The most common routes of transmission reported among acute cases include heterosexual contact, sex between men and nosocomial transmission. Although nosocomial transmission is uncommon for acute cases in most European countries, it remains a key route of transmission in some, highlighting the importance of maintaining robust infection prevention and control practices across healthcare settings. Mother-to-child transmission was the most common route of transmission among reported chronic cases but is dominated by the large number of cases reported by three western European countries (Denmark, the Netherlands and Sweden), with most of these cases classified as imported. The validity of the reported route of transmission among imported cases is not known and could form a subject for future study. Changes over time in the completeness of transmission data reporting impede any comparisons of the data over the period.

Public health implications

Robust epidemiological information is essential to inform effective prevention and control priorities, assess the impact of implemented strategies and monitor progress towards achieving the global elimination targets. The interpretation of hepatitis B data collected through routine notification-based surveillance is challenging because of the asymptomatic nature of chronic infections, differences in testing programmes, continued differences in surveillance practices between countries and data quality issues. Despite such challenges, the relatively high number of reported cases (especially of chronically infected persons) and diversity in reported transmission routes across Europe suggest that countries need to maintain and strengthen local prevention and control programmes, including comprehensive vaccination programmes. Robust evidence of ongoing transmission and the continued importation of cases to many European countries demonstrate a clear need to improve the quality of surveillance data, especially regarding data on transmission routes, country of birth and whether cases are considered imported. Further work is also needed to assist countries in adopting the current EU case definition to standardise surveillance across countries. ECDC will continue to support Member States in this area and develop alternative epidemiological methods to complement routine surveillance, such as seroprevalence surveys and sentinel surveillance which will help provide a more complete understanding of the epidemiology.

In May 2017, the World Health Assembly adopted the first global health sector strategy on viral hepatitis that aims at elimination by 2030 [15]. The concept of elimination for these infections is based on reducing the incidence of chronic infections by 90% and associated mortality by 65% by 2030 compared to 2015 levels. Achieving these targets will require significant scaling up of key interventions, including comprehensive hepatitis B childhood vaccination, birth dose vaccination or other means to prevent mother-to-child transmission, improved systems to assure safe blood transfusions/blood products, injection safety, interventions aimed at prevention of transmission among people who inject drugs and increased testing with linkage to care and treatment. To support the implementation of this strategy, it is important that countries maintain a strong surveillance system to monitor the impact of the interventions. This also highlights the need for continued efforts to improve the quality of the collected and reported data.

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