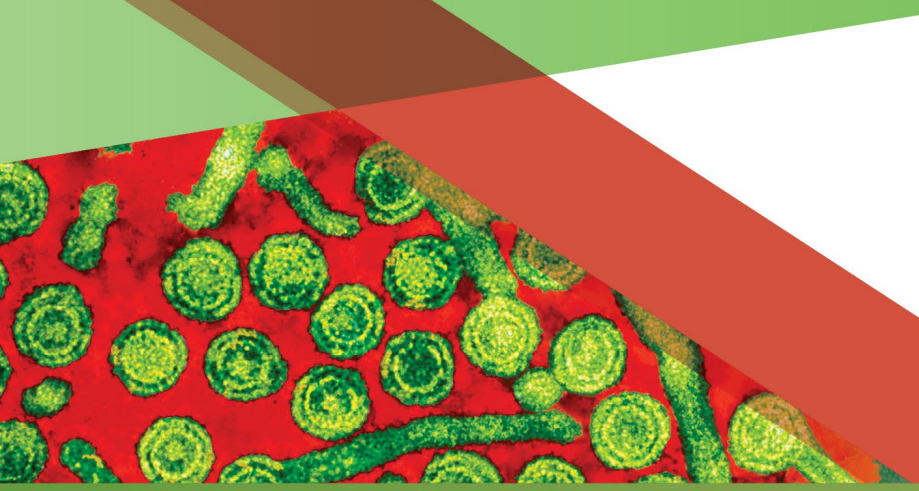


SURVEILLANCE REPORT

Hepatitis B

Annual Epidemiological Report for 2017

Key facts

- In 2017, 30 EU/EEA Member States reported 26 907 cases of hepatitis B virus (HBV) infection. Excluding the five countries that only reported acute cases, the number of cases, 26 262, corresponds to a crude rate of 6.7 cases per 100 000 population.
- Of all cases, 9% were reported as acute, 58% as chronic, 32% as 'unknown' and 1% 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 1.6:1.
- The rate of acute cases continues to decline, 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 (27%), followed by nosocomial transmission (16%) and transmission among men who have sex with men (13%). Among chronic cases, mother-to-child transmission and nosocomial transmission were the most common routes of transmission reported (41% and 28% 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 2017 data retrieved from The European Surveillance System (TESSy) on 10 December 2018. TESSy 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].

Suggested citation: European Centre for Disease Prevention and Control. Hepatitis B. In: ECDC. Annual epidemiological report for 2017. Stockholm: ECDC; 2019.

Stockholm, June 2019

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 2012 case definition for reporting at the European level[1], 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 the EU/EEA countries are heterogeneous [2]. Twenty-two countries submitted national data in 2017 based on the 2012 EU case definition [4], four countries used the 2008 EU case definition and four countries (Denmark, Germany, Italy and Romania) used national case definitions. The 2008 EU case definition only allows for the reporting of acute hepatitis B cases, while the 2012 case definition includes both acute and chronic cases. All reported cases were included in the analysis regardless of the case definition used. Data collected in accordance with the EU 2012 case definition represent confirmed cases, but a few countries submitted 'probable' cases using alternative case definitions. Five countries (France, Greece, Hungary, Lithuania and Spain) only submitted data on acute cases. Two countries (Bulgaria and Croatia) submitted aggregate data only and did not differentiate stages of infection.

Annual notification rates were calculated per 100 000 population for countries with comprehensive surveillance systems using Eurostat population data[2]. For trend analyses using data reported from the UK, population data from the Office for National Statistics were used to exclude Scotland, which did not report any hepatitis B data before 2015.

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 has national coverage, but includes only a limited number of variables and does not identify cases as acute or chronic, which limits its inclusion in this report. The other data source in Italy is a voluntary reporting system of acute cases covering 78% of the population in 2017. The sentinel population is considered representative of the wider population, so data were therefore 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 is a sentinel system with unknown coverage. National rates were therefore not calculated for Belgium.

Epidemiology

Overall trends

For 2017, 30 EU/EEA Member States reported 26 907 cases of hepatitis B virus (HBV) infection. Excluding the five countries that only reported acute cases, the number of cases, 26 262, corresponds to a crude rate of 6.7 cases per 100 000 population. No data were reported from Liechtenstein. Of all cases, 2 486 (9%) were reported as

[1] 2012/506/EC: Commission Implementing Decision of 8 August 2012 amending Decision 2002/253/EC laying down case definitions for reporting communicable diseases to the Community network under Decision No 2119/98/EC of the European Parliament and of the Council.

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

acute, 15 472 (58%) as chronic, 8 607 (32%) as 'unknown' and 342 cases (1%) could not be classified due to an incompatible data format.

Twenty-six countries were able to provide data on acute cases (Table 2). The overall rate of acute cases was 0.6 per 100 000 population, ranging from no cases in Luxembourg to 2.2 cases per 100 000 population in Latvia (Figure 1). When restricting the analysis to the 19 countries that reported consistently from 2008–2017, the rate for acute cases showed a steady decline from 1.1 cases per 100 000 population in 2008 to 0.6 in 2017 (Figure 2). Not all countries share in this trend, however: the rate of acute cases reported by Portugal has shown a steady increase since 2012, when the country started to report.

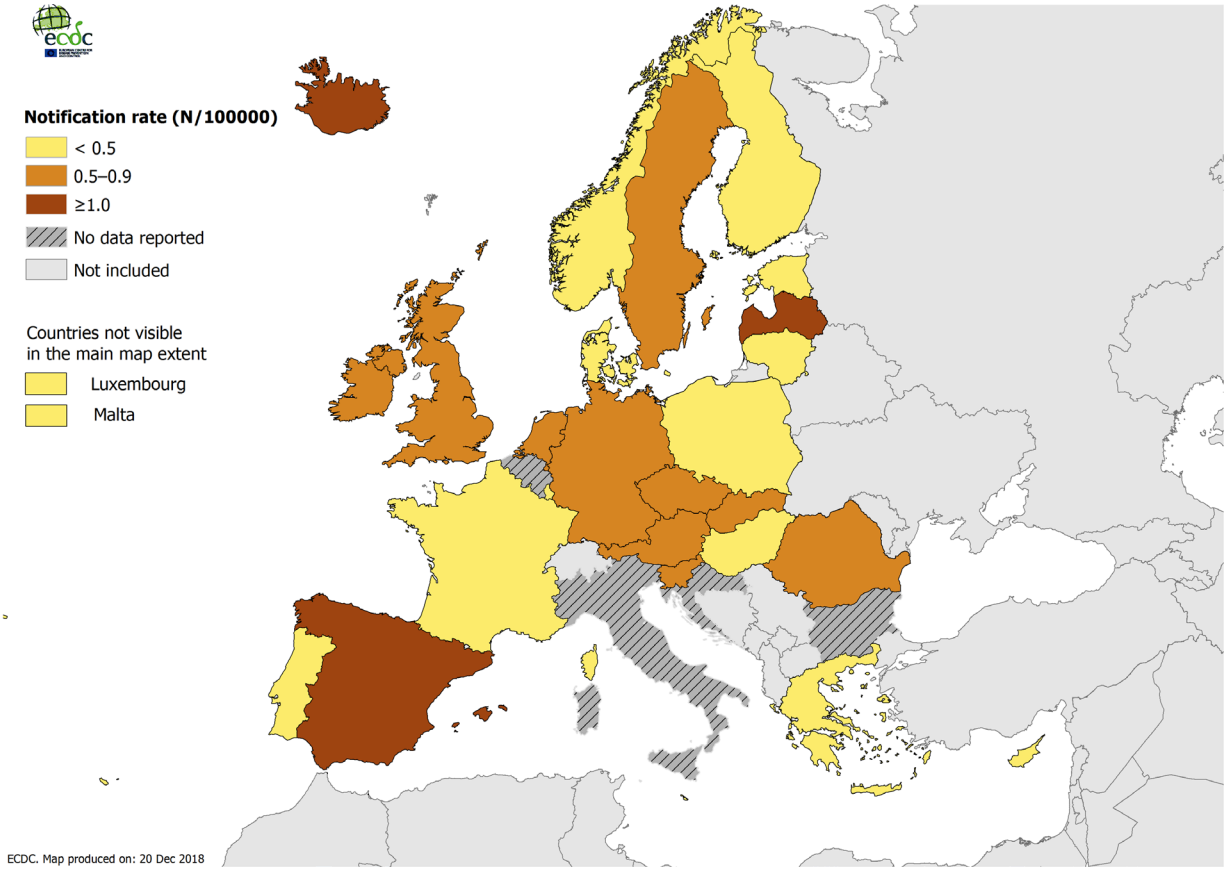
Twenty countries submitted data on chronic infections. The overall notification rate was 7.2 cases per 100 000 population, ranging from <0.1 in Romania to 18.0 in Iceland (Table 2). The United Kingdom reported 62% of all chronic cases reported in 2017. Among the 13 countries that reported consistently between 2008 and 2017, the rate of reported chronic cases increased from 6.7 cases per 100 000 population in 2008 to 10.2 in 2017 (Figure 2).

Table 2. Number and rate per 100 000 population of reported hepatitis B cases in EU/EEA by country and year, 2013–2017

Country	2013		2014		2015		2016		2017							
	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	708	8.4	1 416	16.6	1 269	14.8	1 350	15.5	1 225	14.0	70	0.8	626	7.1	529	6.0
Belgium[II]	1 800	-	1 557	-	1 734	-	1 722	-	1 634	-	.	-	.	-	1 634	-
Bulgaria	302	4.1	235	3.2	263	3.7	219	3.1	249	3.5	.	-	.	-	.	-
Croatia	136	3.2	149	3.5	112	2.7	117	2.8	93	2.2	.	-	.	-	.	-
Cyprus	9	1.0	4	0.5	2	0.2	2	0.2	35	4.1	2	0.2	33	3.9	0	0.0
Czech Republic	139	1.3	104	1.0	118	1.1	270	2.6	303	2.9	77	0.7	226	2.1	0	0.0
Denmark	283	5.1	229	4.1	276	4.9	275	4.8	262	4.6	6	0.1	255	4.4	1	0.0
Estonia	36	2.7	34	2.6	34	2.6	23	1.7	13	1.0	3	0.2	10	0.8	.	-
Finland	268	4.9	276	5.1	397	7.3	348	6.3	266	4.8	6	0.1	260	4.7	.	-
France[III, IV]	.	-	.	-	.	-	.	-	.	-	69	0.1	.	-	.	-
Germany[V]	687	0.9	767	0.9	2 061	2.5	3 010	3.7	3 530	4.3	661	0.8	.	-	2 869	3.5
Greece[III]	.	-	.	-	.	-	.	-	.	-	24	0.2	.	-	.	-
Hungary[III]	.	-	.	-	.	-	.	-	.	-	42	0.4	.	-	.	-
Iceland	16	5.0	28	8.6	17	5.2	59	17.7	68	20.1	5	1.5	61	18.0	2	0.6
Ireland	430	9.3	427	9.2	543	11.6	484	10.2	523	10.9	30	0.6	426	8.9	67	1.4
Italy	489	0.8	500	0.8	361	0.6	308	0.5	437	0.7	.	-	.	-	437	0.7
Latvia	306	15.1	306	15.3	402	20.2	448	22.8	284	14.6	43	2.2	241	12.4	.	-
Lithuania[III]	.	-	.	-	.	-	.	-	.	-	14	0.5	.	-	.	-
Luxembourg	38	7.1	32	5.8	46	8.2	66	11.5	60	10.2	0	0.0	1	0.2	59	10.0
Malta	17	4.0	22	5.1	18	4.1	33	7.3	25	5.4	2	0.4	17	3.7	6	1.3
Netherlands	1305	7.8	1217	7.2	1129	6.7	1128	6.6	1223	7.2	115	0.7	1092	6.4	16	0.1
Norway	738	14.6	695	13.6	815	15.8	763	14.6	478	9.1	20	0.4	458	8.7	.	-
Poland	1 541	4.0	2 762	7.3			3 806	10.0	3363	8.9	56	0.1	887	2.3	2 420	6.4
Portugal	25	0.2	57	0.5	144	1.4	168	1.6	158	1.5	41	0.4	66	0.6	51	0.5
Romania	309	1.5	266	1.3	229	1.2	194	1.0	135	0.7	133	0.7	2	0.0	.	-
Slovakia	194	3.6	191	3.5	197	3.6	164	3.0	136	2.5	49	0.9	87	1.6	.	-
Slovenia	52	2.5	39	1.9	44	2.1	40	1.9	77	3.7	15	0.7	37	1.8	25	1.2
Spain[III]	.	-	.	-	.	-	.	-	.	-	496	1.1	.	-	.	-
Sweden	1 691	17.7	1 966	20.4	2 281	23.4	2 039	20.7	1239	12.4	77	0.8	1 120	11.2	42	0.4
United Kingdom	9 149[VI]	15.6	11 705[VI]	19.8	12 648	19.5	12 197	18.7	10 446	15.9	430	0.7	9 567	14.5	449	0.7
Total EU/EEA	**20 668**	**5.3**	**24 984**	**6.5**	**25 140**	**7.1**	**29 233**	**7.5**	**26 262**	**6.7**	**2 486**	**0.6**	**15 472**	**7.2**	**8 607**	**2.2**

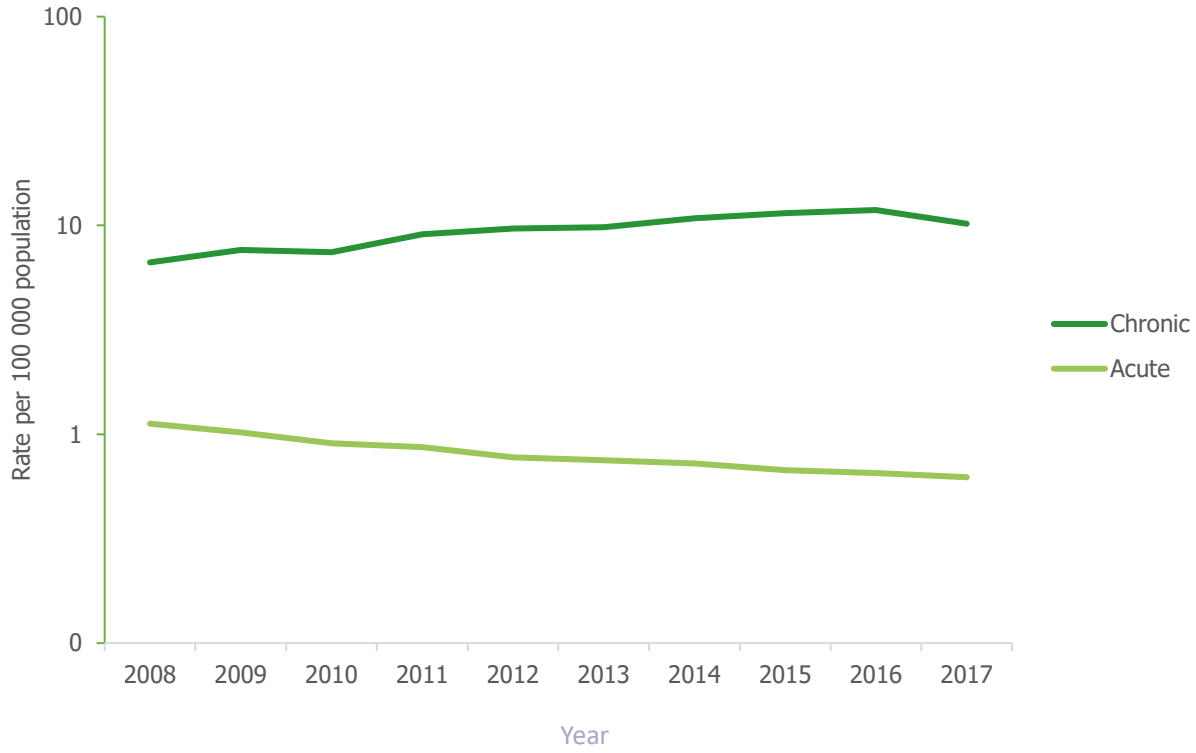
Data presented by date of diagnosis.
.: data not reported
-: rates not calculated
I: includes cases reported by countries as acute, chronic or unknown using the differentiation criteria
II: Data from Belgium come from sentinel system with unknown coverage, therefore population rates cannot be calculated.
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.
V :Germany uses national case definition that changed in 2015, likely explaining some of the recent increases in hepatitis B cases.
VI: excludes data from Scotland; rates calculated excluding population from Scotland.

Figure 1. Notification rate of acute hepatitis B cases* per 100 000 population by country, EU/EEA, 2017



*Source: Country reports from Austria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France**, Germany, Greece, Hungary, Iceland, Ireland, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.*
**: 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.*

Figure 2. Notification rates of acute and chronic hepatitis B per 100 000 population by year in EU/EEA countries reporting consistently, 2008–2017

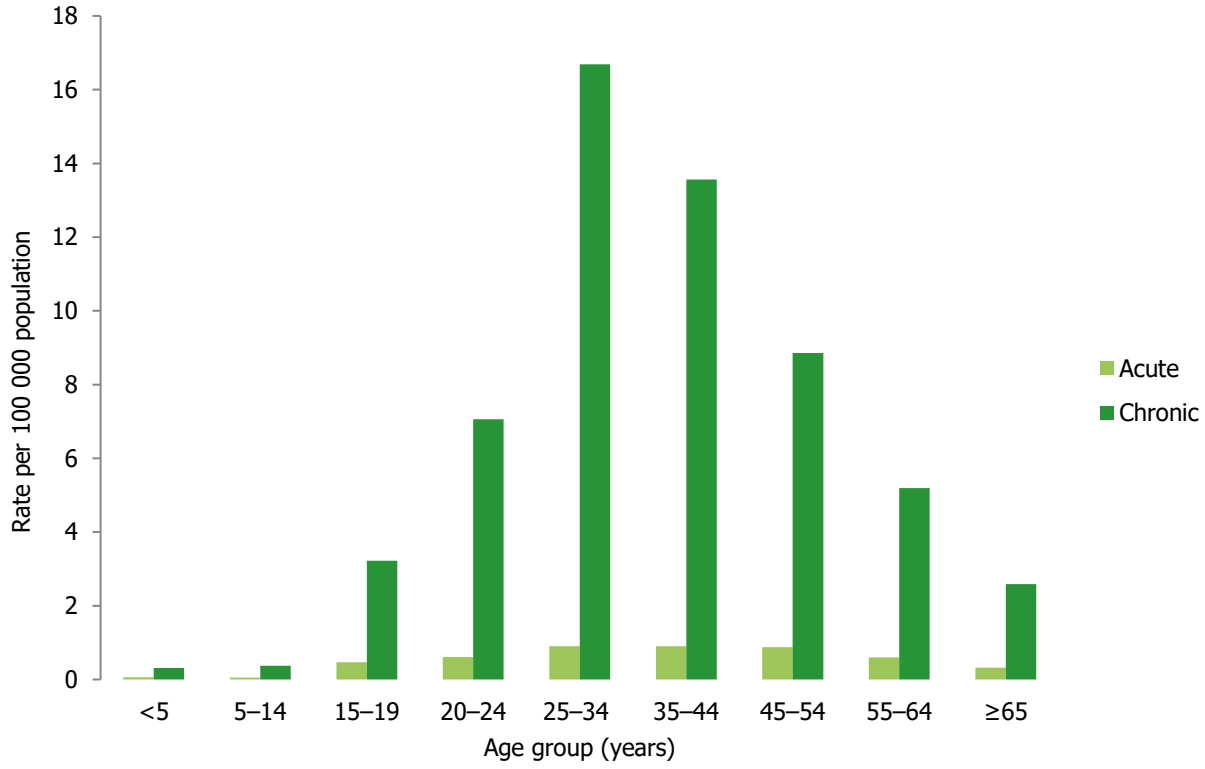


Acute cases: Country reports from Austria, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Latvia, the Netherlands, Norway, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom**.*
*Chronic cases: Country reports from Denmark, Estonia, Finland, Ireland, Latvia, Malta, the Netherlands, Norway, Portugal, Slovakia, Slovenia, Sweden and the United Kingdom**.*
**: Underreporting of acute hepatitis B in France estimated at 73% in 2016.*
***: UK data exclude Scotland as Scottish data not reported consistently from 2008–2017.*

Age and gender

In 2017, 15 596 cases of hepatitis B were reported in males (8.1 cases per 100 000 population) and 10 575 cases were reported in females (5.2 cases per 100 000 population), excluding countries that only reported acute cases. This represents a male-to-female ratio of 1.6:1. The male-to-female ratio was higher among acute cases (2.3:1) than chronic cases (1.4:1). Just under one-third of all cases (30%) were among 25–34-year-olds. The age distributions among reported cases of acute and chronic infections were similar (Figure 3), with 12% of acute and 9% of chronic cases in people under 25 years of age. Among countries reporting consistently every year since 2008, the proportion of acute cases below 25 years of age declined from 20% in 2008 to 12% in 2017. The proportion of chronic cases under 25 declined from 21% in 2008 to 10% in 2017.

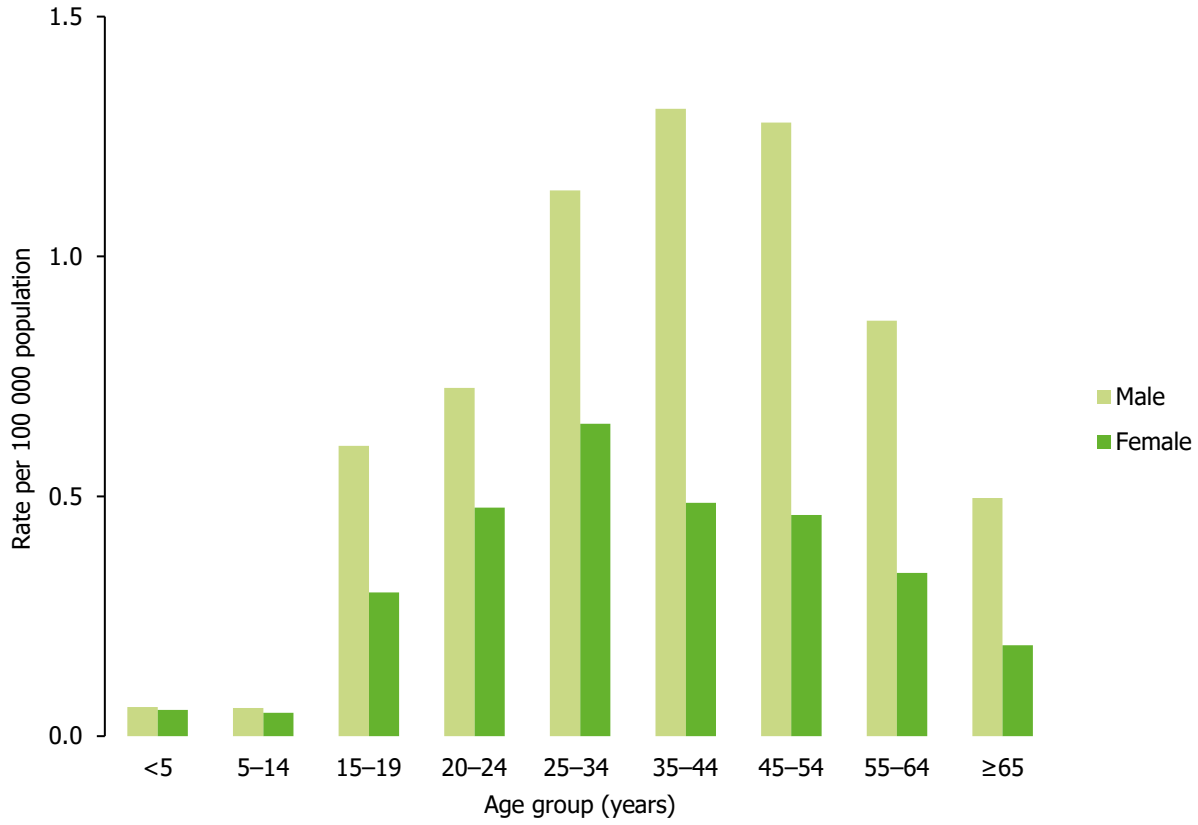
Figure 3. Notification rates of acute and chronic hepatitis B per 100 000 population by age group and disease status, EU/EEA, 2017



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

The age distribution among male and female acute cases was similar. In all age groups, the rates were higher among males than females (Figure 4).

Figure 4. Rate of reported acute hepatitis B cases per 100 000 population by age group and gender, EU/EEA, 2017

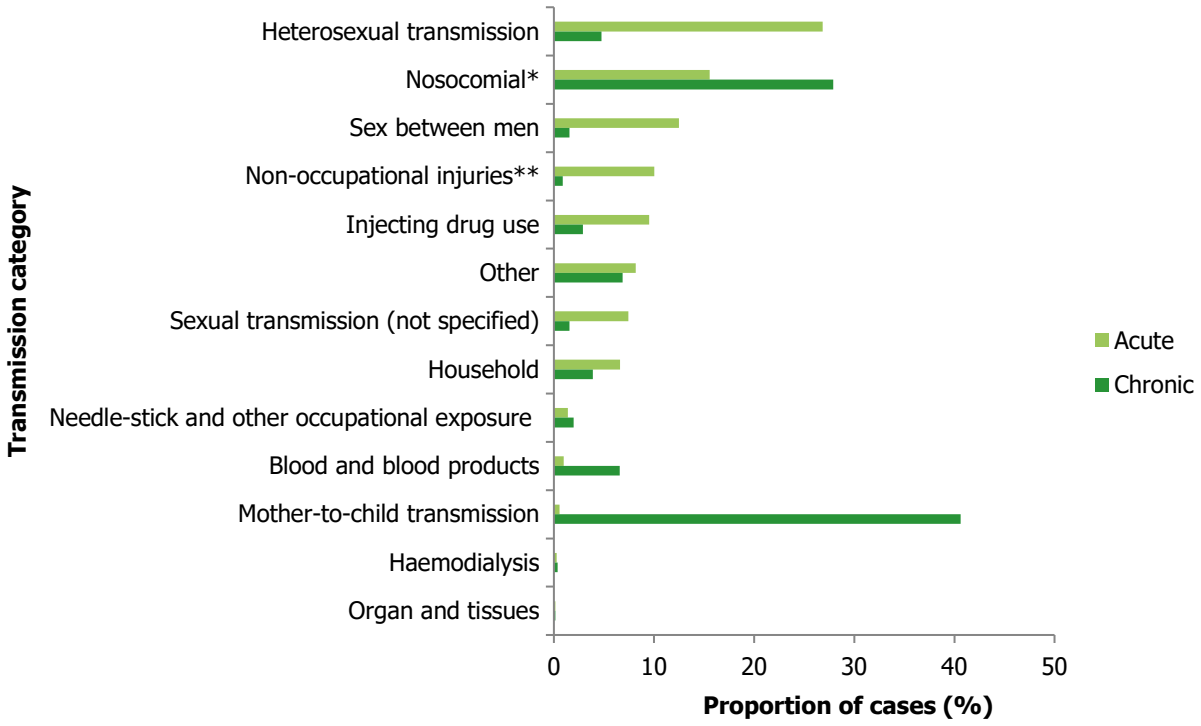


Source: Country reports from Austria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.*
**: Underreporting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

Route of transmission

Data on transmission were complete for 29% of acute and 13% of chronic hepatitis B cases reported in 2017. For the 718 acute cases with complete information, heterosexual transmission was most commonly reported (27%), followed by nosocomial transmission (16%), transmission among men who have sex with men (13%), non-occupational injuries (10%) and injecting drug use (10%; Figure 5). Italy, Poland and Romania accounted for 74% of the acute cases attributed to nosocomial transmission. For the 2 065 chronic cases with complete information, mother-to-child transmission and nosocomial transmission were the most common routes of transmission reported (41% and 28% respectively). Poland reported 90% of chronic cases attributed to nosocomial transmission. Among chronic cases attributed to mother-to-child transmission, 91% were reported by Denmark, the Netherlands, and Sweden. Of the chronic cases attributed to mother-to-child transmission, 91% were classified as being imported. Due to incompleteness and variation of reporting over time, trends are difficult to interpret.

Figure 5. Transmission category of hepatitis B cases by acute and chronic disease status, EU/EEA, 2017



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 healthcare setting, bites, tattoos and piercings.*
****: 'Needle-stick and other occupational exposure' refers to occupational injuries.*
Source: Acute reports from Austria, Cyprus. Denmark, Estonia, France[a], Germany, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain and Sweden. Chronic reports from Austria, Cyprus, Denmark, Estonia, Finland, Ireland, Latvia, Malta, the Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia and Sweden.
a: Underreporting of acute hepatitis B in France estimated at 73% in 2016.

Importation status

Of 12 018 cases (45%) with information on importation status, 3 778 (31%) were reported by 22 countries as imported. The majority of these imported cases (81%) were chronic infections and 2 820 (75%) were reported by four countries (Germany, the Netherlands, Norway and Sweden). The proportion of chronic cases (58%) reported as imported was higher than those for acute cases (15%). Data completeness varied across countries, but among those with complete data (>75%) on importation status among chronic cases, the proportion of cases classified as imported ranged from 0% (the Czech Republic, Estonia, Romania, Slovakia, Slovenia) to over 90% (Denmark, Iceland, Ireland, Luxembourg, 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 striking geographical trends were observed even though the underlying prevalence of chronic hepatitis B infection is known to be highest in eastern Europe [5]. 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, Norway, Sweden, and the United Kingdom, which is contrary to what may be expected based on results from seroprevalence surveys that indicate these countries to be of low endemicity (<1.0%). However, it is likely that prevalence surveys from northern European countries with high levels of immigration may underestimate the true prevalence of hepatitis B as studies may not include migrant populations from intermediate and high (>1.0%) endemicity countries [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. Indeed, 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 [7,8]. The high number of cases of chronic hepatitis B reported from northern Europe has a strong influence on trends.

The interpretation of the trends over time may be hampered by changes to the surveillance systems in certain countries. Germany uses a national case definition that changed in 2015, likely explaining some of the increase in cases of hepatitis B. Part of this may also be due to migration from high-prevalence countries, particularly among younger male cases.

The overall trend for acute cases in the EU/EEA has shown a steady decline from 2008–2017. The decrease is most likely related to national hepatitis B vaccination programmes [9].

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. Data from five western and northern European countries with fairly complete reporting (Denmark, Iceland, Norway, the Netherlands and Sweden) indicate that a high proportion of newly diagnosed infections are considered to have been acquired outside the reporting country. 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 often high [6,11]. 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% [11]. 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 disproportionately 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, nosocomial transmission and sex between men. Although nosocomial transmission is an uncommon route of transmission 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. 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 with regard to 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 in order 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 and sentinel surveys, 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 [12]. 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. Achieving these targets will require significant scaling up of key interventions, including 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 have 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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