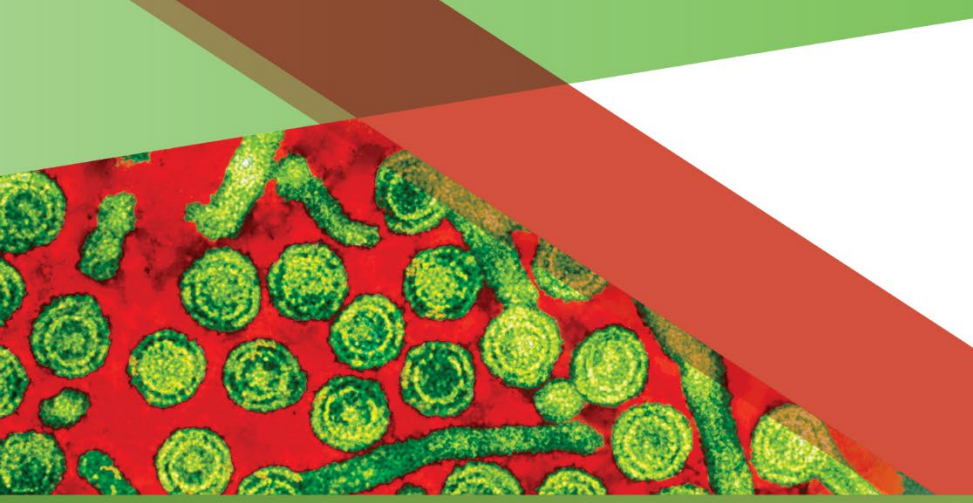

SURVEILLANCE REPORT

Hepatitis B

Annual Epidemiological Report for 2022

Key facts

- For 2022, 30 EU/EEA countries reported 28 855 cases of hepatitis B virus (HBV) infection. Excluding the three countries that only reported acute cases, the number of cases (28 420) corresponds to a crude rate of 8.5 cases per 100 000 population.
- Of all cases, 7% were reported as acute, 40% as chronic, 47% as 'unknown' and 6% as 'could not be classified'.
- The highest rates of both acute and chronic infections were observed among 35–44-year-olds. The overall male-to-female ratio was 1.4:1.
- Among acute cases with complete information, heterosexual transmission was most reported (20%), followed by transmission among men who have sex with men (16%) and nosocomial transmission (15%). Among chronic cases, mother-to-child transmission was the most reported route of transmission (41%). Migrants from high endemic countries are disproportionately affected by chronic infections.
- From 2013 to 2020, the rate of acute cases declined from 0.7 to 0.3 per 100 000, reflecting the impact of national vaccination programmes on the epidemic. From 2020 to 2022, the acute notification rate increased by 66% to 0.5 per 100 000 population.
- From 2013 to 2015, the rate of chronic cases increased from 4.4 to 5.6 per 100 000 population. Between 2016 and 2020, it decreased from 5.5 to 2.2 per 100 000 population, followed by a 72% increase to 3.8 per 100 000 population in 2022.
- Recent estimates showed that the number of people living with undiagnosed hepatitis B remains substantial in the EU/EEA. In this context, the substantial effort undertaken by some countries to reduce the number of undiagnosed infections through various testing/screening interventions should be highlighted and replicated for vulnerable populations in other countries.
- Prevention and control programmes, including comprehensive vaccination programmes, need further scaling up to achieve the elimination of hepatitis B in European countries.
- Surveillance data are important in monitoring the epidemiological situation. There is a need to improve their quality to better describe the global picture of the epidemic.

Introduction

Hepatitis B is a liver infection caused by the hepatitis B virus (HBV) [1]. The virus enters the body through infected blood or other bodily fluids. The transmission can occur via unprotected sex with an infected person, contaminated needles or medical equipment, contaminated blood transfusions or vertically from mother-to-child during pregnancy or delivery [1,2].

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Stockholm, April 2024

HBV commonly causes an acute short-term and asymptomatic infection, but some individuals can develop chronic hepatitis B (CHB). Less than 5% of infected adults will develop CHB and up to 95% of children infected before five years old will develop CHB [1,2]. CHB can lead to severe liver damage including cirrhosis and liver cancer.

Hepatitis B is a major public health threat worldwide [3]. In 2022, the global prevalence was estimated at 257 million people living with HBV infection (3.2%), with an estimated incidence of 1.5 million new cases per year [1,4]. In 2019, 820 000 deaths were attributable to hepatitis B globally [1,3]. In the European Union/European Economic Area (EU/EEA), the disease burden remains high, with an estimated 3.6 million people living with CHB and 64 000 deaths attributed to chronic viral hepatitis in 2015 [5-7].

Methods

This report is based on data for 2022 retrieved from The European Surveillance System (TESSy) on 12 January 2024.

For a detailed description of the methods used to produce this report, refer to the Methods chapter of the 'Introduction to the ECDC Annual Epidemiological Report' [8]. An overview of the national surveillance systems is available online [9]. A subset of the data used for this report is available through ECDC's online 'Surveillance Atlas of Infectious Diseases' [10].

EU/EEA countries reported data on newly diagnosed cases of hepatitis B to ECDC according to the EU 2018 case definition and differentiated acute and chronic cases using defined criteria (Table 1) [8]. When not possible to use the EU 2018 case definition, other case definitions were also accepted [8,11,12].

Table 1. Case definitions for acute and chronic hepatitis B

Stage	Definition
Acute	Any of the below, with or without symptoms and signs (e.g. jaundice, elevated serum aminotransferase levels, fatigue, abdominal pain, loss of appetite, intermittent nausea, vomiting, fever): • 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
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[a]
Unknown	• Any newly diagnosed case that cannot be classified in accordance with the above definition of acute or chronic infection

[a] *In the event that the case was not notified the first time.*

Surveillance systems across EU/EEA countries are heterogeneous [9]. Twenty-two countries submitted national data for 2022 based on the 2012 or 2018 EU case definitions [11,12]. Four countries (Austria, Cyprus, Czechia and Spain) used the 2008 EU case definition and four countries (Denmark, Germany, Italy and Liechtenstein) used national case definitions. All reported cases were included in the analysis regardless of the case definition used. Three countries (France, Hungary and Spain) only submitted data on acute cases. Two countries (Belgium and Bulgaria) submitted aggregate data only and did not differentiate between stages of infection. No data have been reported by the United Kingdom (UK) since 2019 due to its withdrawal from the EU on 31 January 2020. The UK data that were reported up to 2019 are presented in Table 1 but are not included in the analysis.

Annual notification rates were calculated per 100 000 population for countries with comprehensive surveillance systems using Eurostat population data [13].

Epidemiology

Overall trends

For 2022, 30 EU/EEA countries reported 28 855 cases of hepatitis B virus (HBV) infection. Excluding the three countries that only reported acute cases, the number of cases (28 420) corresponds to a crude notification rate of 8.5 cases per 100 000 population. Of all reported cases, 1 971 (7%) were reported as acute, 11 388 (40%) as chronic, 13 674 (47%) as 'unknown', and 1 822 (6%) could not be classified because of aggregated data combining acute and chronic cases.

Twenty-four countries were able to provide data on acute cases (Table 2). The overall notification rate of acute cases was 0.5 cases per 100 000 population, ranging from zero cases in Iceland and Malta to 1.8 cases per 100 000 population in Finland and Slovakia (Figure 1). When restricting the analysis to the 23 countries that reported consistently from 2013 to 2022, the notification rate for acute hepatitis declined continuously from 0.7 to 0.4 cases per 100 000 population between 2013 and 2019. In 2020, a steeper decrease was observed, with the lowest notification rate observed since 2013 (0.3 cases per 100 000 population). From 2020 to 2022, the notification rate increased for the first time since 2013 (+66% to 0.5 cases per 100 000 population) (Figure 2).

Twenty-four countries submitted data on chronic cases. The overall notification rate of chronic cases was 4.6 cases per 100 000 population, ranging from zero cases in Luxembourg, Poland and Slovakia to 13.8 cases per 100 000 population in Iceland (Table 2). Among the 17 countries that reported consistently between 2013 and 2022, the number of chronic cases increased from 4.4 cases per 100 000 population in 2013 to 5.6 in 2015. Between 2016 and 2020, it decreased from 5.5 to 2.2 cases per 100 000 population, followed by a 72% increase to 3.8 cases per 100 000 population in 2022 (Figure 2).

Table 2. Number of reported hepatitis B cases and rates per 100 000 population by country and year, 2018–2022

Country	2018		2019		2020		2021		2022							
	All[a]		All[a]		All[a]		All[a]		All		Acute		Chronic		Unknown	
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate
Austria	1 288	14.6	1 191	13.4	933	10.5	909	10.2	878	9.8	54	0.6	343	3.8	481	5.4
Belgium[b]	1 982	NRC	2 021	NRC	1 423	NRC	1 029	NRC	1 670	NRC	NDR	NRC	NDR	NRC	NDR	NRC
Bulgaria	215	3.0	198	2.8	112	1.6	83	1.2	152	2.2	NDR	NRC	NDR	NRC	NDR	NRC
Croatia	98	2.4	93	2.3	22	0.5	23	0.6	23	0.6	2	0.1	5	0.1	16	0.4
Cyprus	83	9.6	108	12.3	29	3.3	14	1.6	31	3.4	7	0.8	24	2.7	NDR	NRC
Czechia	323	3.0	317	3.0	169	1.6	144	1.3	266	2.5	48	0.46	218	2.07	NDR	NRC
Denmark	164	2.8	170	2.9	152	2.6	124	2.1	102	1.7	10	0.2	92	1.6	0	0.0
Estonia	19	1.4	18	1.4	23	1.7	23	1.7	34	2.6	2	0.2	32	2.4	NDR	NRC
Finland	239	4.3	238	4.3	166	3.0	236	4.3	379	6.8	99	1.8	280	5.0	NDR	NRC
France[c]	NDR	NRC	NDR	NRC	NDR	NRC	NDR	NRC	NDR	NRC	94	0.1	NDR	NRC	NDR	NRC
Germany	4 524	5.5	8 935	10.8	6 807	8.2	8 262	9.9	16 674	20.0	915	1.1	7 454	9.0	8 305	10.0
Greece[c]	NDR	NRC	NDR	NRC	NDR	NRC	165	1.5	183	1.7	25	0.2	158	1.5	NDR	NRC
Hungary[c]	NDR	NRC	NDR	NRC	NDR	NRC	NDR	NRC	NDR	NRC	23	0.2	NDR	NRC	NDR	NRC
Iceland	44	12.6	49	13.7	33	9.1	31	8.4	57	15.1	0	0.0	52	13.8	5	1.3
Ireland	499	10.3	513	10.5	333	6.7	426	8.5	501	9.9	12	0.2	483	9.5	6	0.1
Italy	379	0.6	341	0.6	172	0.3	144	0.2	91	0.2	NDR	NRC	NDR	NRC	91	0.2
Latvia	328	17.0	295	15.4	222	11.6	145	7.7	191	10.2	17	0.9	174	9.3	NDR	NRC
Liechtenstein	NDR	NRC	NDR	NRC	NDR	NRC	5	12.8	2	5.1	NDR	NRC	1	2.5	1	2.5
Lithuania[c]	NDR	NRC	NDR	NRC	25	0.9	27	1.0	27	1.0	7	0.2	20	0.7	NDR	NRC
Luxembourg	47	7.8	52	8.5	518	82.7	283	44.6	296	45.9	NDR	NRC	0	0.0	296	45.9
Malta	25	5.3	23	4.7	39	7.6	45	8.7	54	10.4	0	0.0	27	5.2	27	5.2
Netherlands	1 141	6.6	1 169	6.8	801	4.6	816	4.7	916	5.2	84	0.5	815	4.6	17	0.1
Norway	365	6.9	393	7.4	225	4.2	257	4.8	367	6.8	4	0.1	363	6.7	NDR	NRC
Poland	3 196	8.4	2 854	7.5	992	2.6	1 547	4.1	2 500	6.6	29	0.1	0	0.0	2 471	6.6
Portugal	189	1.8	201	2.0	128	1.2	125	1.2	158	1.5	34	0.3	61	0.6	63	0.6
Romania	119	0.6	103	0.5	21	0.1	18	0.1	1 823	9.6	47	0.2	4	0.02	1 772	9.3
Slovakia	131	2.4	141	2.6	89	1.6	77	1.4	98	1.8	98	1.8	0	0.0	NDR	NRC
Slovenia	78	3.8	60	2.9	94	4.5	128	6.1	121	5.7	15	0.7	36	1.7	70	3.3
Spain[c]	NDR	NRC	NDR	NRC	NDR	NRC	NDR	NRC	NDR	NRC	318	0.7	NDR	NRC	NDR	NRC
Sweden	1 130	11.2	1 098	10.7	804	7.8	744	7.2	826	7.9	27	0.3	746	7.1	53	0.5
Total EU/EEA (30 countries)	**16 606**	**4.8**	**20 581**	**6.1**	**14 332**	**4.2**	**15 830**	**4.7**	**28 420**	**8.5**	**1 971**	**0.5**	**11 388**	**4.6**	**13 674**	**5.2**
United Kingdom	7 778	11.7	9 254	13.9	NDR	NRC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
EU/EEA (31 countries)	24 384	6.1	29 835	7.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

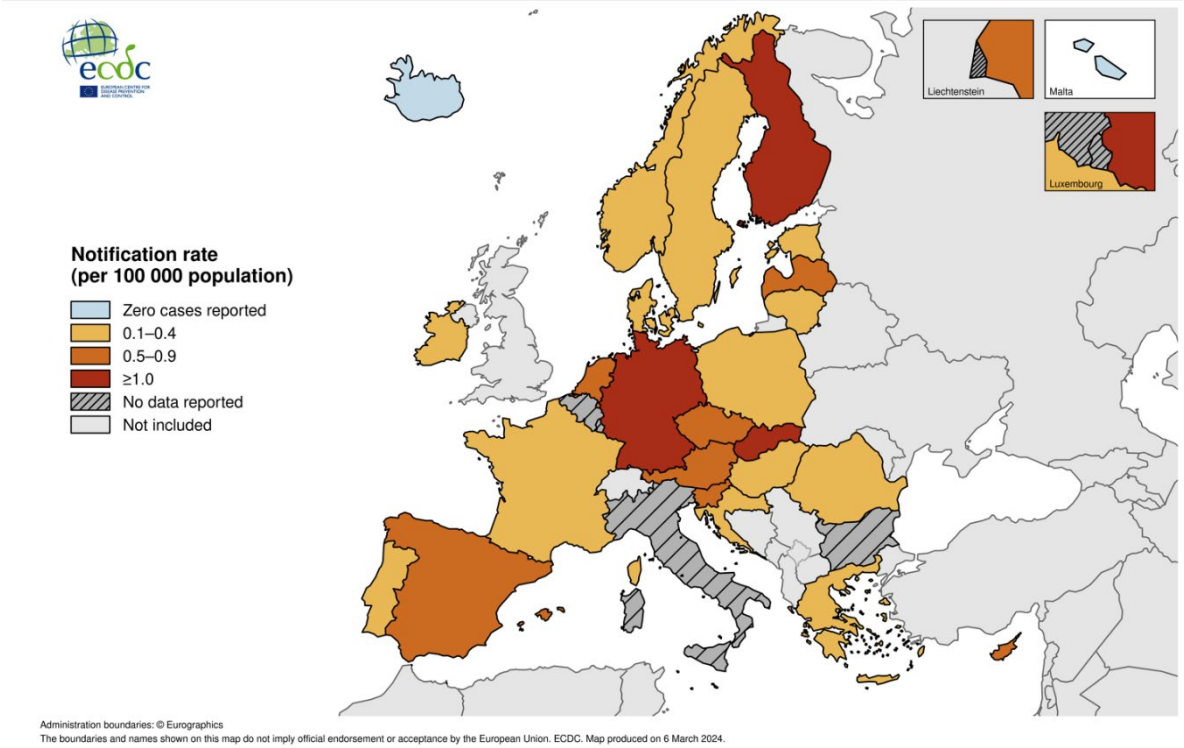
NA: not applicable; NDR: no data reported; NRC: no rate calculated.

[a] Includes cases reported by countries as acute, chronic or unknown.

[b] Data from Belgium came from a sentinel system with undefined coverage; therefore, population rates could not be calculated.

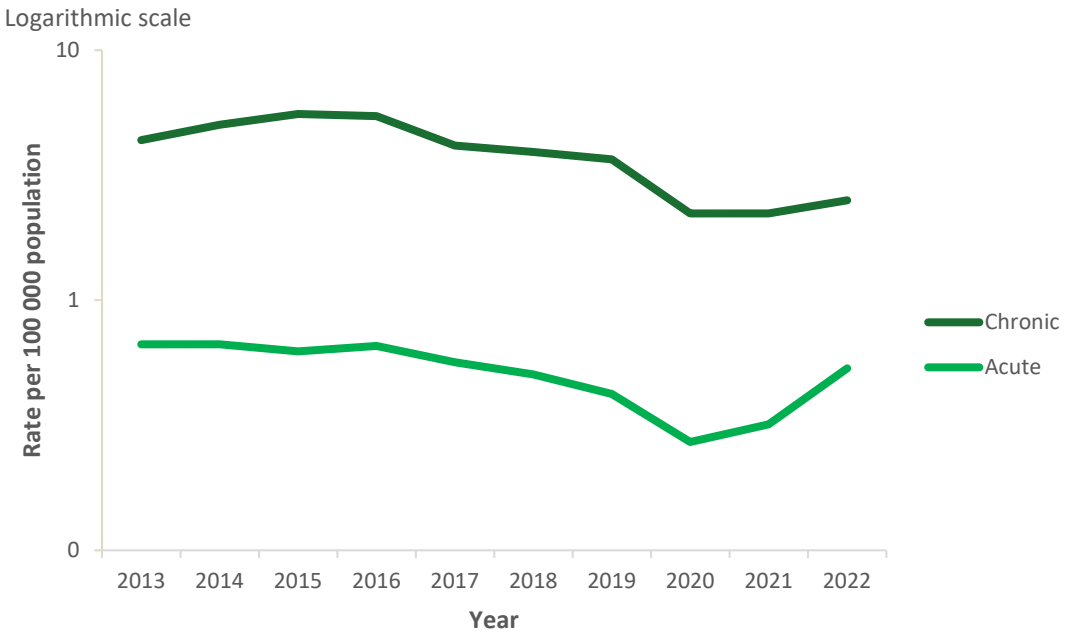
[c] As these countries only reported acute cases, their data are not included in the 'All' columns.

Figure 1. Notification rate of acute hepatitis B cases per 100 000 population by country, EU/EEA, 2022



Source: Country reports from Austria, Croatia, Cyprus, 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, EU/EEA countries reporting consistently, 2013–2022



Source for acute cases: Country reports from Austria, Cyprus, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Latvia, Lithuania, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain and Sweden. Source for chronic cases: Country reports from Austria, Cyprus, Denmark, Estonia, Finland, Ireland, Latvia, Luxembourg, Malta, the Netherlands, Norway, Portugal, Romania, Slovakia, Slovenia and Sweden.

Age and gender

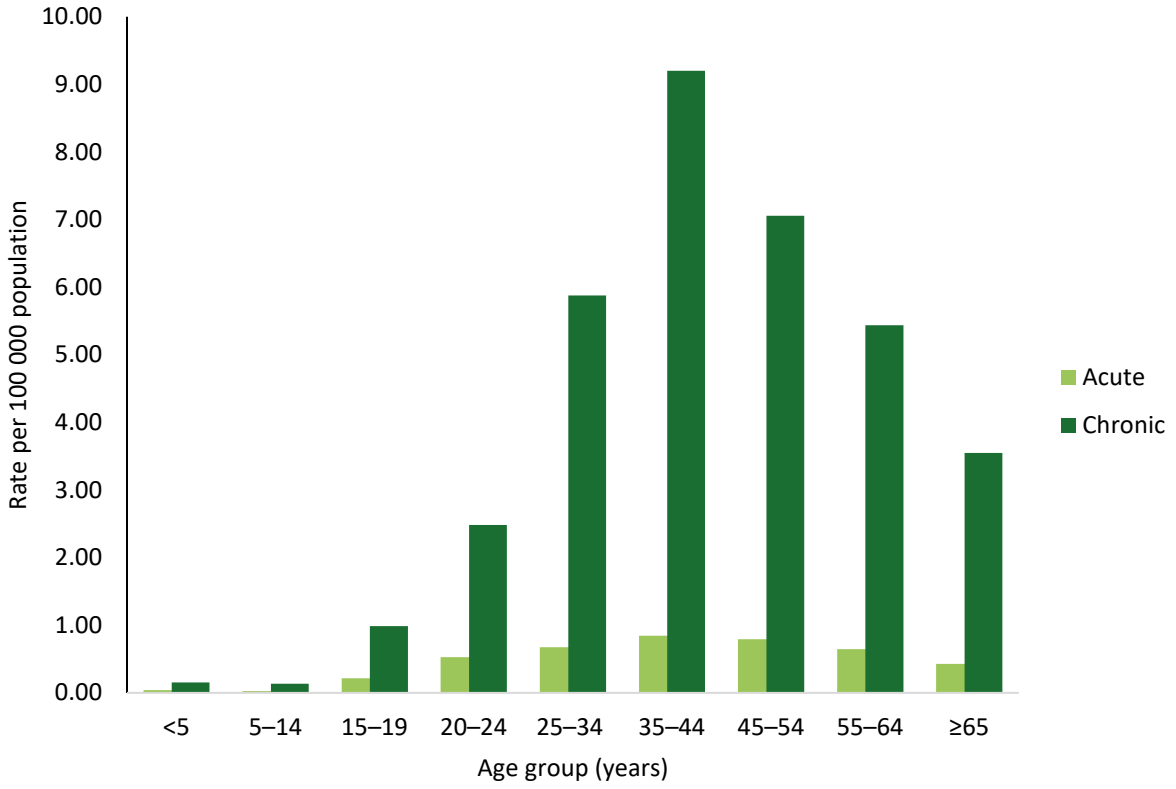
In 2022, 16 151 cases of hepatitis B were reported in men (9.8 cases per 100 000 population) and 12 128 cases were reported in women (7.1 cases per 100 000 population), excluding countries that only reported acute cases. This represents a male-to-female ratio of 1.4:1. The male-to-female ratio was higher among acute cases (2.0:1) than chronic cases (1.3:1).

Most cases were among 25–54-year-olds (63%). The age distribution among reported cases of acute and chronic infections were the same (Figure 3), with 8% of acute and 8% of chronic cases in people below 25 years of age.

Among countries reporting every year since 2013, the proportion of acute cases below 25 years old declined from 13% in 2013 to 8% in 2022. The proportion of chronic cases below 25 years old declined from 18% in 2013 to 4% in 2022.

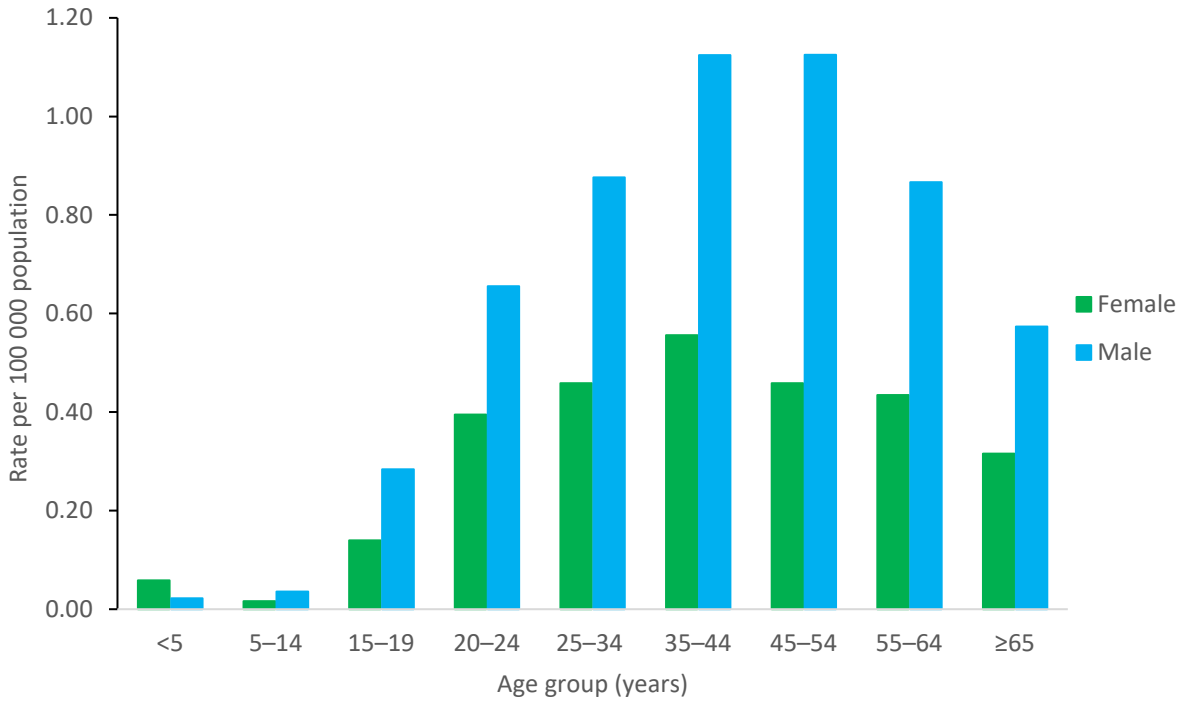
Notification rates were higher among men in all age groups except in people aged below five years (Figure 4).

Figure 3. Notification rates of acute and chronic hepatitis B per 100 000 population by age group and disease status, EU/EEA, 2022



Source for acute cases: Country reports from Austria, Croatia, Cyprus, Denmark, Estonia, Finland, France Germany, Greece, Hungary, Iceland, Ireland, Latvia, Lithuania, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain and Sweden.
Source for chronic cases: Country reports from Austria, Croatia, Cyprus, Denmark, Estonia, Finland, Germany, Greece, Iceland, Ireland, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia and Sweden.

Figure 4. Notification rate of acute hepatitis B cases per 100 000 population by age group and gender, EU/EEA, 2022



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

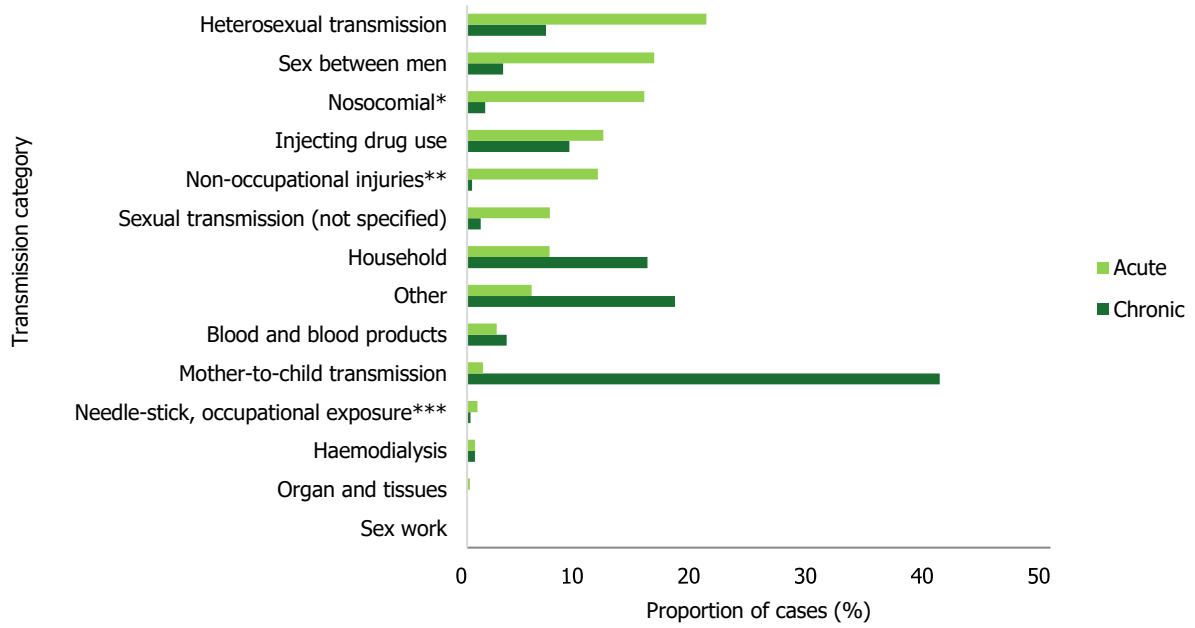
Transmission

Data on transmission were complete for 22% of the acute and 14% of the chronic hepatitis B cases reported in 2022. For the 442 acute cases with complete information, heterosexual transmission was reported most frequently (20%), followed by transmission among men who have sex with men (16%) and nosocomial transmission (15%; Figure 5). Italy accounted for 33% of the 63 acute cases attributed to nosocomial transmission.

For the 1 358 chronic cases with complete information, mother-to-child transmission was the most common transmission route (41%). Among the chronic cases attributed to mother-to-child transmission, 64% were reported by the Netherlands, 16% by Sweden and 11% by Denmark; in addition, 94% of these cases were classified as imported, mainly from Asia (51%) and Africa (29%). Due to data incompleteness and variation of reporting over time, trends are difficult to interpret and are not reported here.

Interestingly, 1 857 nosocomial infections were reported in 2022, with the largest proportion (73%) reported among the 2 430 cases with missing information on the hepatitis duration compared with the 15% of 67 acute cases and 2% of 1 358 chronic cases.

Figure 5. Transmission category of hepatitis B cases by acute and chronic disease status, EU/EEA, 2022



Source for acute cases: Country reports from Austria, Croatia, Czechia, Denmark, Estonia, Finland, France[i], Germany, Hungary, Iceland, Ireland, Italy, Latvia, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Spain and Sweden.
Source for chronic cases: Country reports from Austria, Croatia, Czechia, Denmark, Estonia, Finland, Germany, Ireland, Latvia, Luxembourg, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia and Sweden.
** 'Nosocomial transmission' includes transmissions that occurred in 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' includes bites and needle sticks that occur outside of a healthcare setting, tattoos and piercings.*
**** 'Needle-stick, occupational exposure' refers to occupational injuries.*

Importation status

Of 10 152 cases (38% of all reported cases) with information on importation status from 24 countries, 3 891 (38%) were reported as imported. Most imported cases (78%) were chronic infections; among these, 82% were reported by four countries: Germany (30%), the Netherlands (22%), Sweden (19%) and Norway (11%).

Among the nine countries with complete data (>75%), the proportion of cases classified as imported ranged from less than 10% (Latvia and Malta) to over 90% (Denmark, Iceland, the Netherlands, Norway and Sweden).

Discussion

Considering the various limitations of the surveillance data – including incompleteness and underreporting – these results show that the disease burden for hepatitis B remains high in the EU/EEA. The number of newly diagnosed hepatitis B cases is also high, even though the EU/EEA is a low endemicity area [2-4,6,14,15]. Most reported cases in 2022 were chronic hepatitis B infections.

The steady decrease of acute cases from 2013 to 2019, especially in populations under 25 years, reflected the increasing coverage of the national hepatitis B vaccination programmes [16]. However, only 10 EU/EEA countries reached the WHO target of 95% coverage with three doses of HBV vaccine. Most other countries have a vaccine coverage within 5% of the target [16,17]. The steeper decline observed in 2020 was likely due the impact of the COVID-19 pandemic [17-20]. Disruption in prevention services and behavioural changes were reported to have hampered case detection and reports [19]. Additionally, COVID-19 restrictions limited migration and possibly sexual exposure [21-23]. A study in the Netherlands found a 40% reduction in the number of diagnosed chronic cases in 2020 compared to 2019, with weekly reductions in new chronic HBV and HCV diagnoses mirroring increases in the number of COVID-19 cases [24,25]. Increasing notifications after 2021 might be explained by the end of restrictions, the recovery of health systems, testing initiatives, changes in surveillance, an increase in migrant populations in some countries and possible increases in transmission. Recent prevalence estimates showed that the number of notifications largely underestimated the global picture of the hepatitis B epidemic in the populations [4,6,15].

In this context, the substantial effort undertaken by countries such as Romania, Lithuania and Germany to reduce the number of undiagnosed cases through testing/screening interventions should be highlighted and encouraged in other vulnerable populations and areas [26-28].

The highest notification rates were observed in northern and western Europe. A marked variation in the distribution of acute and chronic cases between countries was observed. These geographical variations reflect differences in testing policies, reporting practices and underlying epidemiological differences. These disparities seem less marked for acute hepatitis B.

The highest hepatitis B prevalence was observed in southern and eastern Europe (unpublished data) [6]. Discrepancy between notifications and prevalence estimates highlight the difficulty to accurately assess the disease burden in populations through routine surveillance data, particularly for chronic infections. The reported chronic hepatitis B cases reflect the intensity of local or national testing and screening policies, the highest rates being observed in countries that are known to have comprehensive testing programmes [10,29]. Better surveillance data – including testing and positivity rates, as well as repeated prevalence surveys – might give a better picture of the disease burden and its evolution.

Despite poor completeness, the reported surveillance data are crucial to identify key populations to better guide response strategies and policies. The largest proportion of acute hepatitis B reported in 2022 was due to sexual contact (heterosexual and men who have sex with men). Migrants were disproportionately affected by chronic infections that probably occurred before migrating from highly endemic areas [6]. Burden estimates showed that migrants from endemic countries accounted for 25% of the chronic hepatitis B cases in Europe, although this population represents only 10% of the EU/EEA population (unpublished data) [6,30]. Mother-to-child transmission seems to drive the chronic hepatitis B epidemic, but the large proportion of nosocomial transmission reported among cases with missing information on the duration of the infection is also a concern. As mother-to-child transmission is not common in EU/EEA countries and nosocomial cases are commonly reported through event management systems instead of classic hepatitis surveillance, additional information will help to further analyse these routes of transmission [30,31]. The surveillance data gathered in 2022 highlighted the need to maintain highly effective practices in infection prevention and control in healthcare settings and to implement antenatal screening. Additionally, prevalence estimates highlighted the vulnerability of people in prisons in EU/EEA countries, which suggests that specific prevention programmes are required (unpublished data) [6].

Public health implications

Robust epidemiological information is essential to guide prevention and control interventions, evaluate strategies and monitor progress towards the global elimination targets. Considering the differences in testing and surveillance practices between countries, further analysis combining surveillance data and programmatic information – including prevalence estimates, testing, positivity rates and vaccine coverage – will help to better interpret the epidemiological situation across Europe by triangulation.

There is also a need for countries to improve the quality of surveillance data, especially for transmission routes, country of birth and country of probable acquisition data. ECDC supports EU/EEA countries by developing and fostering alternative surveillance methods such as seroprevalence surveys and sentinel surveillance to complement routine data.

In May 2017, the World Health Assembly adopted the first global health sector strategy on viral hepatitis that aims to eliminate the disease by 2030 [3]. The main elimination criteria require reducing the incidence of chronic infections by 90% and associated mortality by 65% by 2030 compared with 2015 levels. The relatively high number of reported cases (especially of chronic infections) and diversity in reported transmission routes across Europe suggest that EU/EEA countries need to maintain and strengthen local prevention and control interventions.

Significantly scaling-up key interventions such as comprehensive vaccination programmes (childhood vaccination, birth dose vaccination), evidence-based testing or screening initiatives in key populations and areas, systematic linkage to care for eligible persons, mother-to-child transmission prevention (antenatal screening, prophylaxis), harm reduction programmes targeting people who inject drugs, and infection prevention and control are crucial to accelerate progress towards the elimination goals.

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