The diverse and dynamic epidemics of viral hepatitis in Europe: challenges to elimination

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Hepatitis B and C: inputs and outputs to the prevalence pool

Source: adapted from Negro F, Digestive and Liver Diseases, 2014
Incidence: rates of acute hepatitis B cases in EU/EEA countries, 2008–2017

Source: ECDC Country reports from Austria, 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 was estimated at 73% in 2016.
** UK data exclude Scotland as Scottish data have not been reported consistently.
Incidence: Acute hepatitis B notifications

Greater decline in rates among countries with endemicity over 1% and with a high vaccine coverage (>95%)

Acute HBV notification rates in EU/EEA countries by prevalence HBsAg in the general population

Acute HBV notification rates in EU/EEA countries by vaccine coverage (coverage 3 doses %)

*Logarithmic scale
Source: Miglietta et al, Eurosurveillance 2018
SOURCE: ECDC, Country reports from Austria, 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 was estimated at 73% in 2016.
** UK data exclude Scotland as Scottish data have not been reported consistently.
Incidence: hepatitis C

Declining incidence reported following control of blood transfusion and iatrogenic transmission in 1990s

- Further declines following introduction of harm reduction

Incidence among **PWIDs** up to 66 per 100 person-years (Wiessing et al., 2014)

- Possible recent declines in some countries (e.g. Scotland)

Incidence among **HIV infected MSM** up to 11.8 per 100 person-years (Jin et al., 2017)

- Recent decline among HIV infected MSM related to direct acting antivirals in Netherlands

- Incidence among **HIV negative MSM** lower but epidemiology changing with CHEMSEX and use of PrEP
The scale of the hepatitis B and C epidemics in EU/EEA countries

Estimated number living with the infection

- HBV: 4.7 million
- HCV: 3.9 million

% undiagnosed

- HBV: 40-85%
- HCV: 20-91%

Sources: Hofstraat SHI et al 2017; ECDC 2018; van Sighem A et al 2017
HBsAg prevalence, general population, EU/EEA, 2008-2017


*Data from peer-reviewed publications 2008-2017 with a risk of bias score ≥4.
Anti-HCV prevalence, general population, EU/EEA, 2008-2017

*Data from peer-reviewed publications 2008-2017 with a risk of bias score ≥4.
Reported transmission category for acute hepatitis B notifications in EU/EEA countries, 2017

Source: ECDC reports - Austria, Cyprus, Denmark, Estonia, France, Germany, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain and Sweden.
Reported transmission category for acute hepatitis C notifications in EU/EEA countries, 2017

Source: ECDC - Country reports from Austria, Denmark, Estonia, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Malta, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden.
Prevalence in specific populations

Source:
EMCDDA: http://www.emcdda.europa.eu/data/
ECDC hepatitis B and C prevalence databases:
Injecting drug use and hepatitis

- Injecting drug use is central to the hepatitis C epidemic in Europe
- Anti-HCV prevalence among PWIDs **50 times** greater than the general population (Hahné et al., 2013)

Source: EMCDDA, 2019

Seroprevalence studies
- Samples with national coverage
- Samples with sub-national coverage

Diagnostic test results
- Samples with national coverage
- Samples with sub-national coverage

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Migrants comprise around 10% of the EU/EEA population, yet account for 25% of all chronic HBV cases and 14% of chronic HCV cases.

**Estimated number of chronic hepatitis B (CHB) and hepatitis C (CHC) cases among migrants in the EU/EEA and size of the migrant population**

*HBsAg endemicity <2%  
#Anti-HCV endemicity <1%  
Source: ECDC, 2016
MSM and hepatitis

General: Increasing cases of syphilis and gonorrhoea among MSM
HCV: Increasing cases sexually acquired HCV infection
HBV: Higher HBV prevalence among MSM in eastern European countries

Percentage of respondents to EMIS 2017 survey reporting a full course of hepatitis B vaccination* in EU/EEA countries**

* Excluding men with a history of hepatitis B
** Data from Liechtenstein reported with Switzerland and not included in map.
Morbidity: liver cancer hospital data

Inpatient hospital discharge rates of primary liver cancer for select* EU/EEA countries per 100,000 population, 2004 - 2014

Source: Eurostat

*Countries using ICD10 coding across reporting period
Mortality: Age-standardised mortality rates per 100,000 population from non-alcoholic cirrhosis and hepatocellular carcinoma in the EU/EEA countries in 2015

Source: Eurostat and Mardh O et al, (paper submitted to J Hepatol for publication).
Mortality: rates from hepatocellular carcinoma, chronic viral hepatitis and chronic liver disease across EU/EEA countries, 2011 - 2015

<table>
<thead>
<tr>
<th></th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>% change 2011 to 2015*</th>
<th>Difference in number of cases</th>
<th>Poisson regression for trend, p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hepatocellular carcinoma</td>
<td>4.5</td>
<td>4.6</td>
<td>4.6</td>
<td>4.7</td>
<td>4.7</td>
<td>5.30%</td>
<td>1456</td>
<td>0.935</td>
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<tr>
<td>Chronic viral hepatitis</td>
<td>1.3</td>
<td>1.3</td>
<td>1.3</td>
<td>1.3</td>
<td>1.3</td>
<td>2.30%</td>
<td>225</td>
<td>0.999</td>
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<tr>
<td>Chronic liver disease</td>
<td>8.4</td>
<td>8.3</td>
<td>8</td>
<td>7.9</td>
<td>7.8</td>
<td>-7.20%</td>
<td>-2479</td>
<td>0.857</td>
</tr>
</tbody>
</table>

*(2015 rate -2011 rate)/2011 rate

Note: Countries reporting in ICD-9 codes format (Greece) or in ICD-10 format with a three-digits precision (Bulgaria and Slovakia) during the period, were not included.

Source: Eurostat and Mardh O et al, (paper submitted to J Hepatol for publication).
Deaths from HIV, tuberculosis and viral hepatitis* in EU/EEA countries, 2015

*Deaths from chronic liver disease (K72 - K75) + primary liver cancer (C22) attributable to HBV and HCV and deaths from chronic viral hepatitis (B18.0 - B18.2)

Source: Eurostat and Mardh O et al, (paper submitted to J Hepatol for publication).
Additional challenges to elimination

**HCV reinfection**
- Reports of high reinfection rates post HCV treatment among HIV positive MSM

**HIV**
- Impact of HIV pre-exposure prophylaxis (PreP) on HCV infections
- Influence of HIV prevention programmes on HCV transmission among PWIDs

**Alcohol**
- Declining trends EU alcohol consumption, but high associated mortality and increasing consumption in eastern and central European countries
Conclusions

▪ The epidemiological, demographic and socio-political situation relating to hepatitis B and C in Europe is complex

▪ Whilst overall incidence of both infections is decreasing, incidence and prevalence remains high in specific populations with ongoing transmission and a high disease burden

▪ Primary prevention remains important for hepatitis B and C in Europe but, with a large pool of existing infections, increasing access to testing and treatment are major challenges to elimination

▪ A better understanding of the epidemiology and key drivers of the epidemics, such as demographic changes and responses, underpin efforts for eliminating hepatitis.
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