

Current HBV epidemiology Far from eradicated disease

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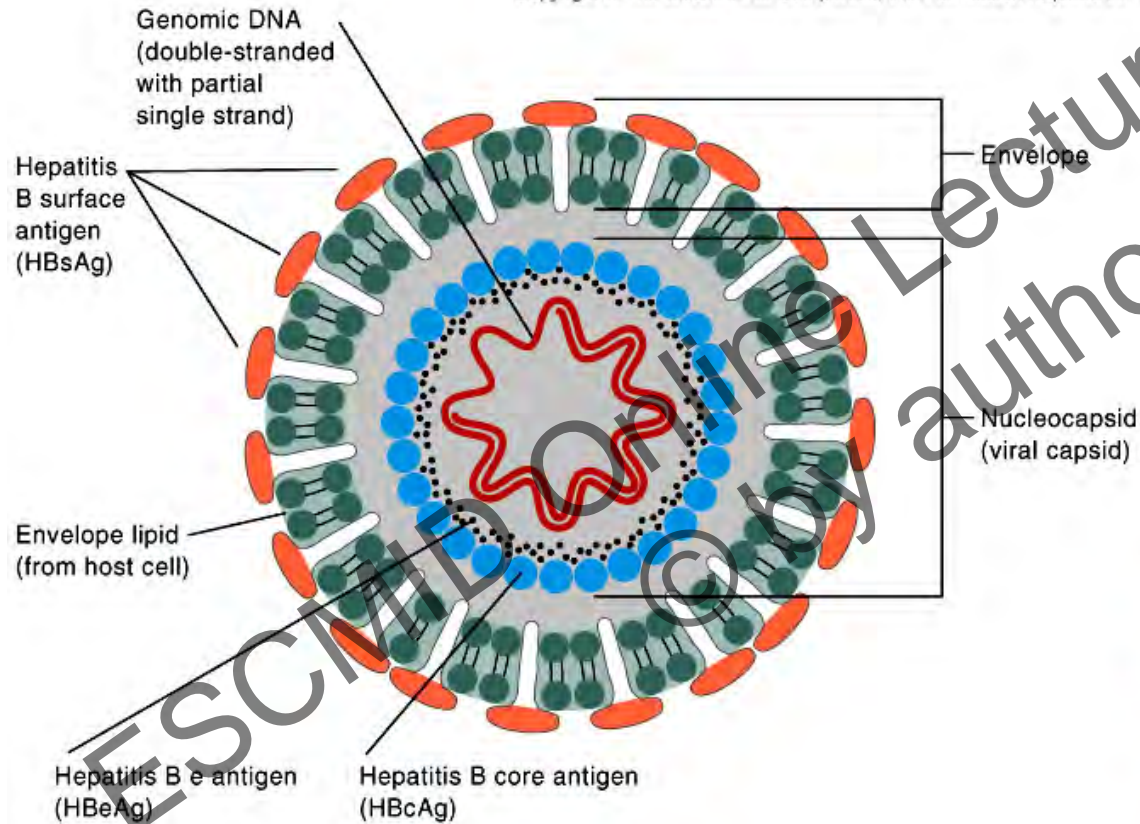
PGEC Cavtat , Croatia; 14-15 October 2016

Hepatitis B

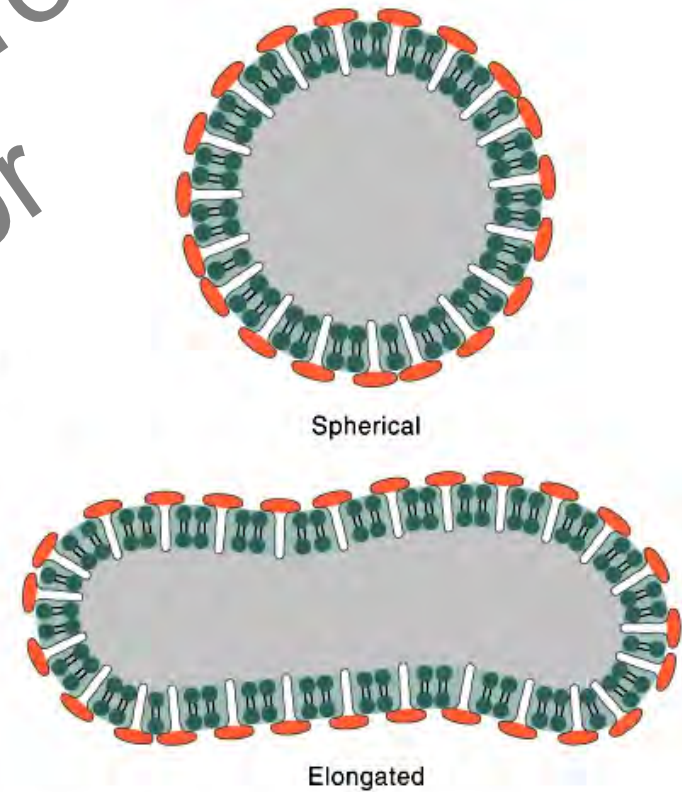
- Public health problem
- > 2 billion people worldwide infected
- Chronic HBV disease: 350 – 400 million people
- High mortality
 - 25%-40% of liver related death
 - 300 000 HCC cases each year
 - HBV is the second carcinogen after tobacco

HBV : Structure

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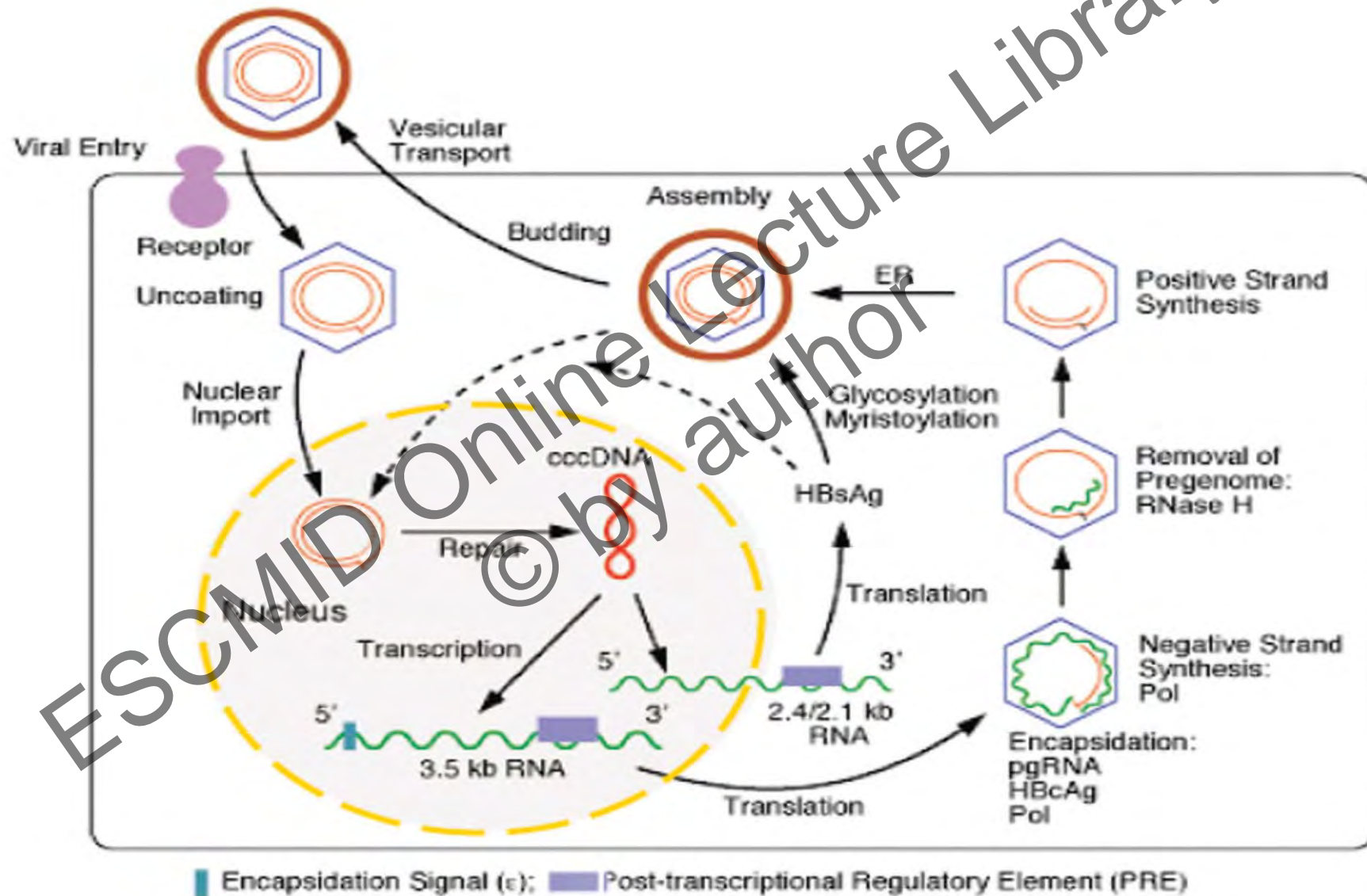


(a) Complete infectious virion



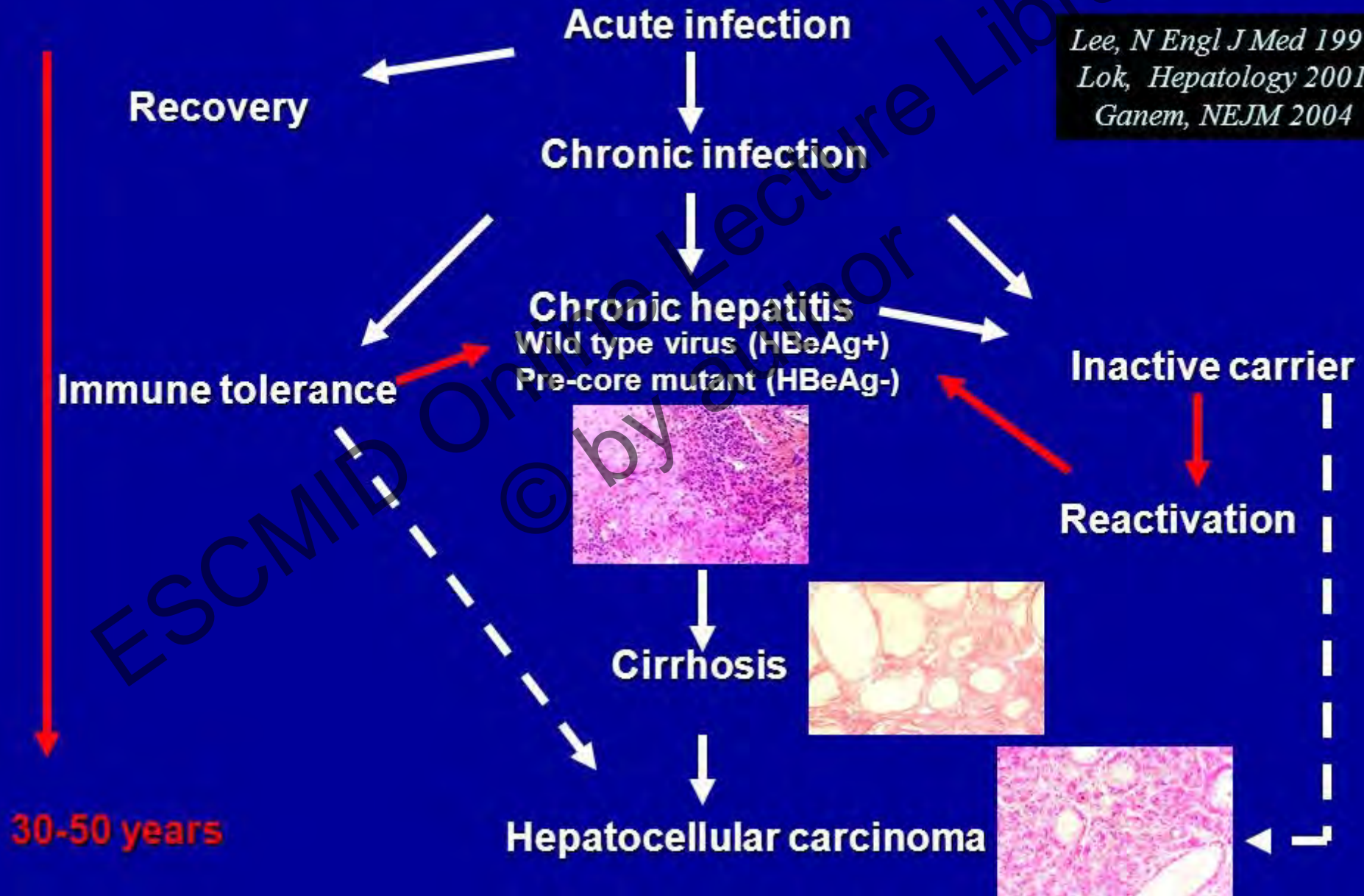
(b) Viral envelope particles containing HBsAg

The replication cycle of HBV



Natural history of hepatitis B

Lee, N Engl J Med 1997
Lok, Hepatology 2001
Ganem, NEJM 2004



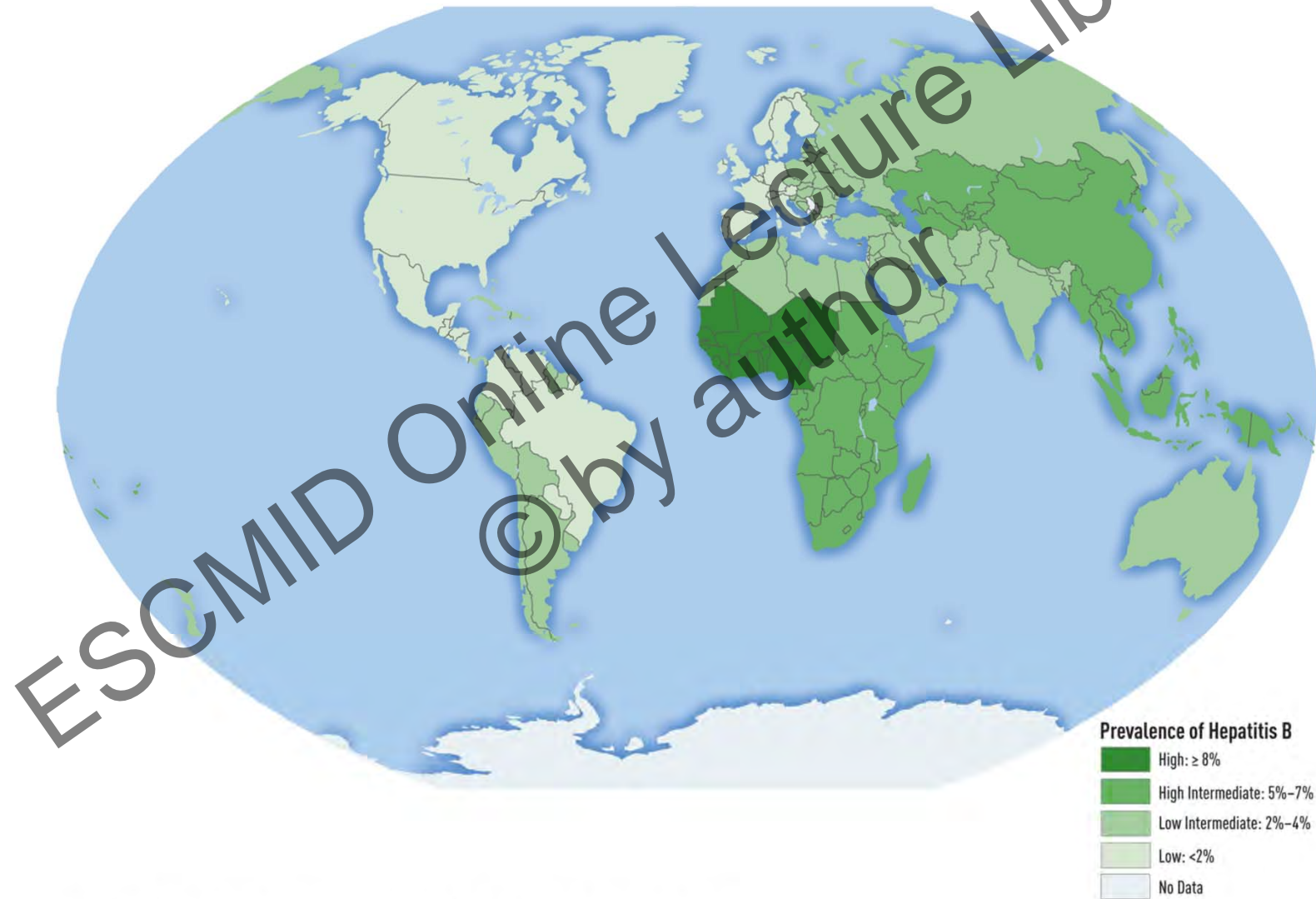
30-50 years

Natural history of HBV

- **Most healthy adults (90%) who are infected will recover and develop protective antibodies** against future hepatitis B infections
- **90% of infants and up to 50% of young children infected with hepatitis B will develop chronic infections.**
- **10% of adults are at risk for chronic infections**

Worldwide prevalence hepatitis B

(Source: CDC http://www.cdc.gov/travel-static/yellowbook/2016/map_3-04.pdf)



MAP 3-4. PREVALENCE OF CHRONIC HEPATITIS B VIRUS INFECTION AMONG ADULTS¹

¹ Disease data source: Ott JJ, Stevens GA, Groeger J, Wiersma ST. Global epidemiology of hepatitis B virus infection: new estimates of age-specific HBsAg seroprevalence and endemicity. *Vaccine*. 2012; 30(12): 2212-2219.

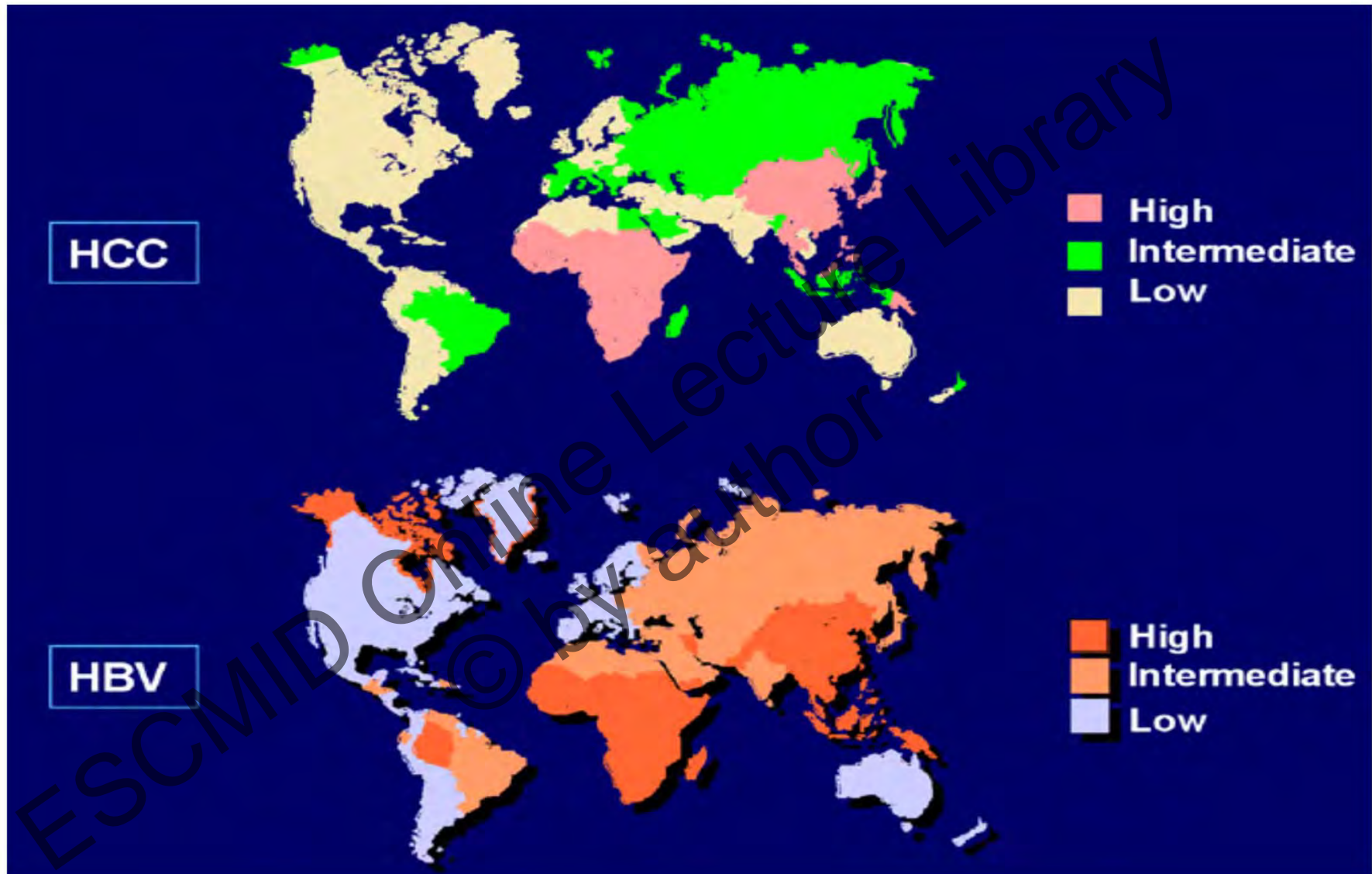
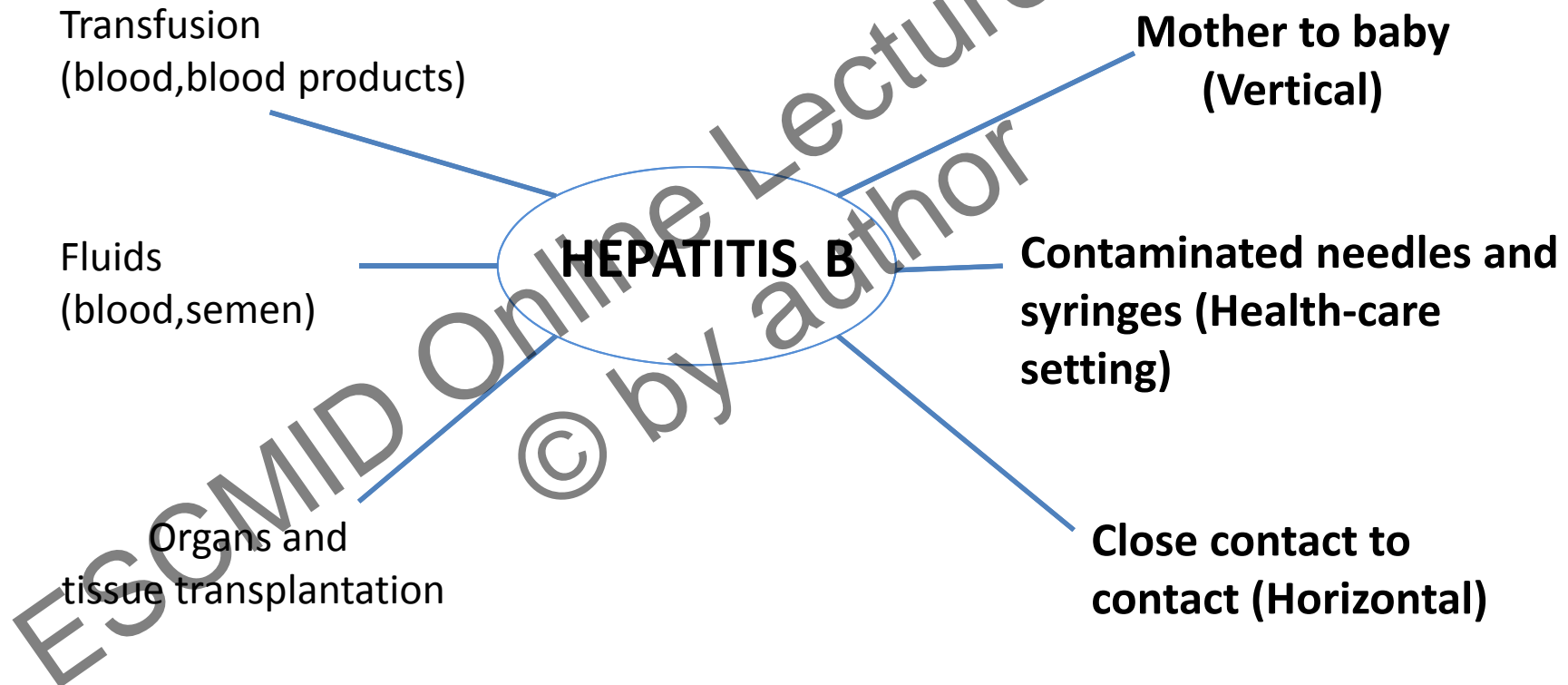


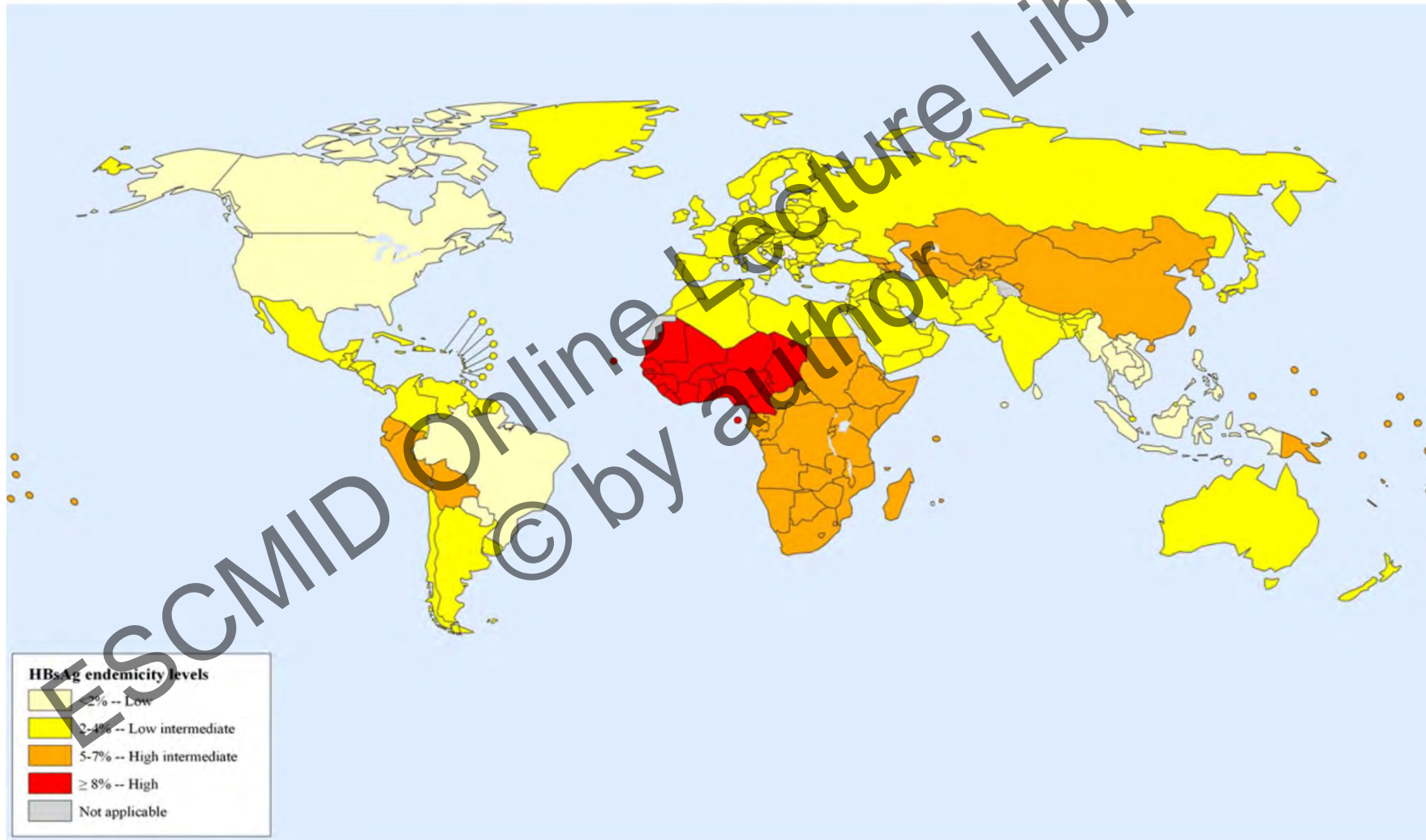
Fig. 1. The striking parallel geographical distribution of between the incidence of chronic hepatitis B virus infection, and that of hepatocellular carcinoma.

Transmission of HBV infection in highly endemic areas

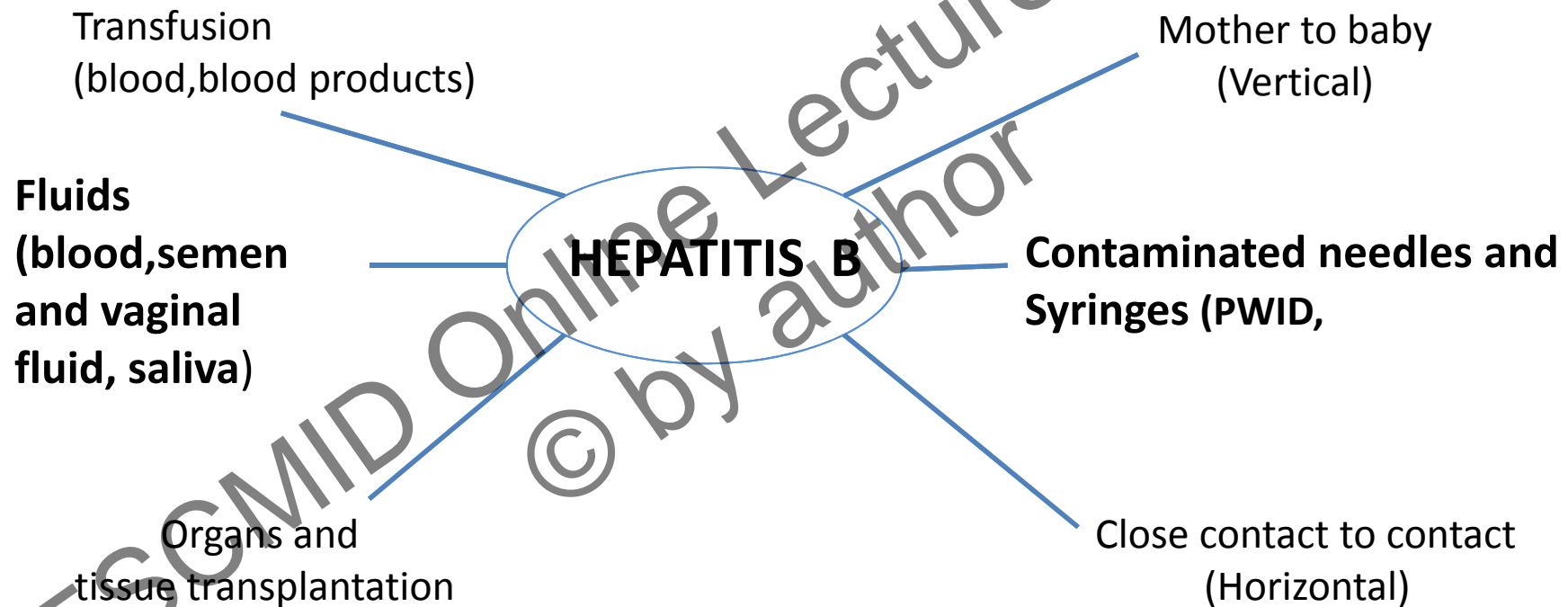


- **50-100 times more infectious than HIV**
- In highly endemic areas, spread from mother to child at birth or through horizontal transmission

Prevalence of hepatitis B infection, children 5-9 years, 2005

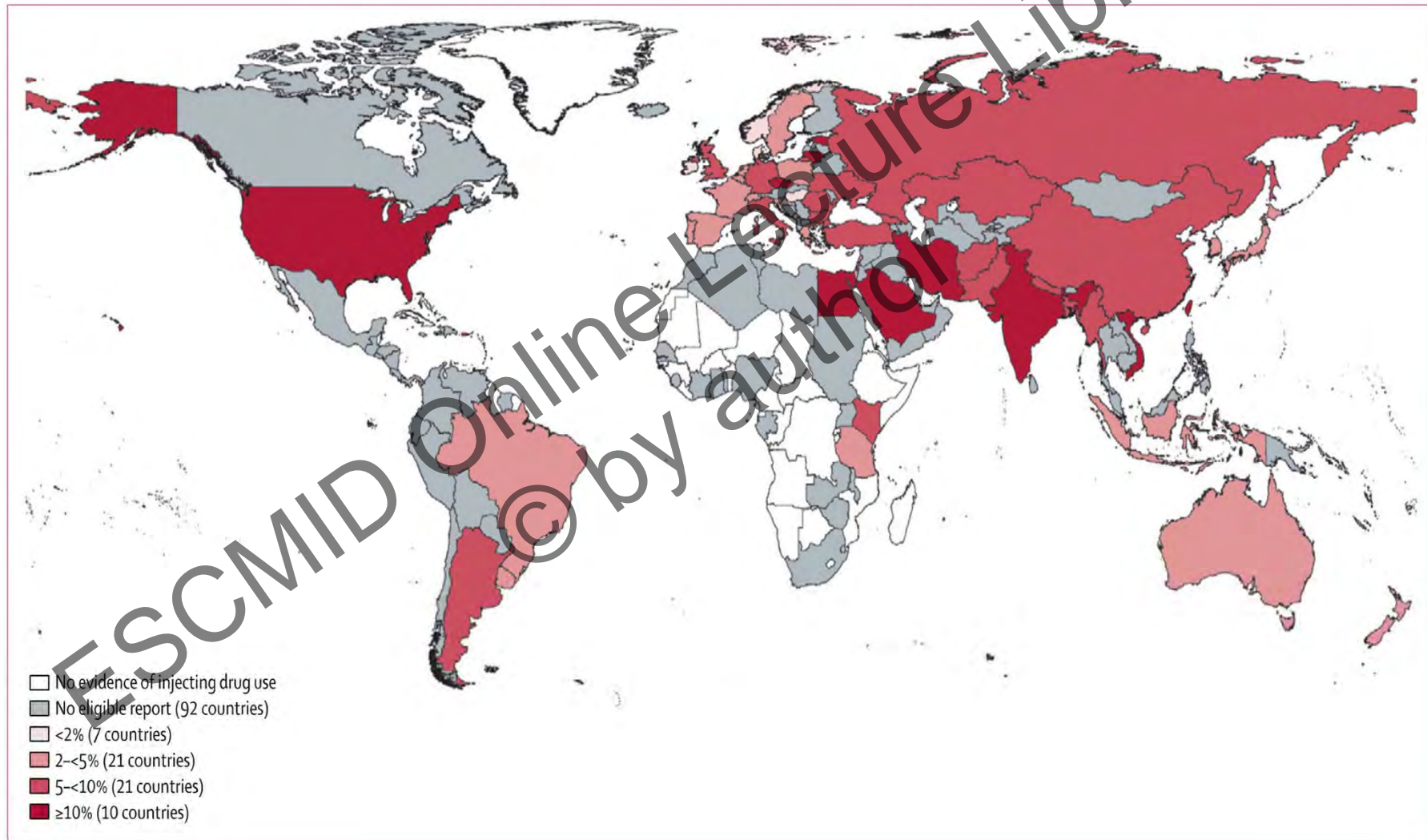


Transmission of HBV infection in low endemic areas



- **50-100 times more infectious than HIV**
- **Transmitted via blood, body fluids**

Prevalence of HBsAg in injecting drug users



Nelson PK et al. Lancet 2011, 378:571-83

Hepatitis B in the United States

- **12 million** Americans have been infected (1 out of 20 people).
- More than **one million** people are chronically infected .
- Up to **100,000** new people will become infected each year.
- **5,000** people will die each year from hepatitis B and its complications.
- Approximately 1 health care worker dies each day from hepatitis B.

Hepatitis B in China

- 1.3 billion people
 - The world's largest population of hepatitis B patients:
 - 120 million Chinese positive for hepatitis B
 - nearly half a million people dying of the liver disease every year
- =>severe public health problem in the country

Hepatitis B in Europe

- In 2014, **22 442 cases** of HBV infection reported by 30 EU Member States => rate of **4.2/ 100 000 population**
 - 11.9% acute
 - 64.0% chronic
 - 23.1% as 'unknown/not classified

Criteria for differentiating acute and chronic hepatitis B

Stage	Definition
Acute	Detection of IgM antigen-specific antibody (anti-HBc IgM) or Detection of HBsAg and previous negative HBV markers less than six months ago or Detection of 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

Hepatitis B, surveillance systems overview, 2014

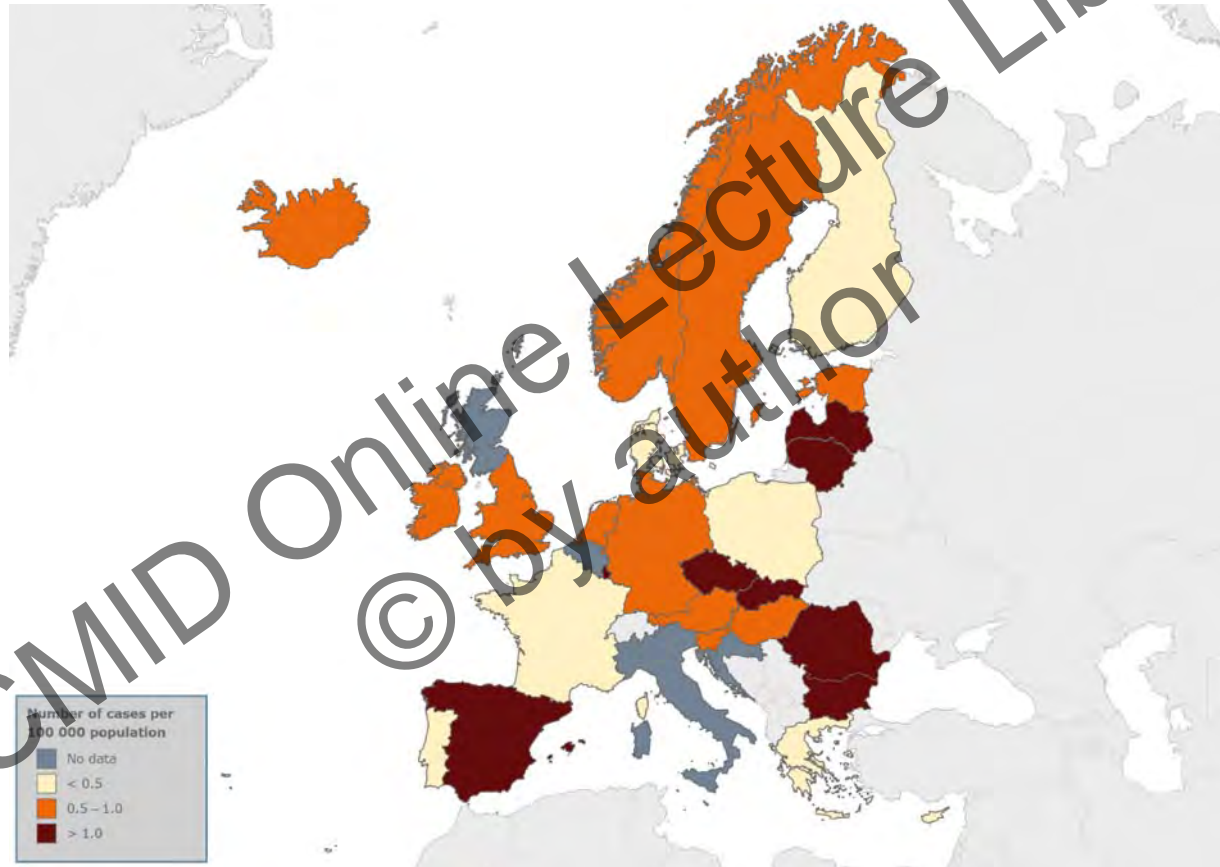
Country	Data source	Surveillance characteristics		Data reported by				Case definition used
				L	P	H	O	
Austria	AT-Epidemiegesetz	Co	C	Y	Y	Y	Y	EU-2008
Belgium	BE-LABNET	Se	C	Y	N	.	.	Other
Bulgaria	BG-NATIONAL_SURVEILLANCE	Co	A	Y	Y	Y	Y	EU-2008
Croatia	HR-CNIPH	Co	A	Y	Y	Y	Y	EU-2012
Cyprus	CY-NOTIFIED_DISEASES	Co	C	N	Y	N	N	EU-2008
Czech Republic	CZ-EPIDAT	Co	C	N	Y	Y	N	EU-2012
Denmark	DK-MIS	Co	C	N	Y	N	N	Other
Estonia	EE-NAKIS	Co	C	Y	Y	Y	N	EU-2012
Finland	FI-NIDR	Co	C	Y	Y	N	N	EU-2012
France	FR-MANDATORY_INFECTIOUS_DISEASES	Co	C	Y	Y	Y	Y	EU-2012
Germany	DE-SURVNET@RKI-7.1/6	Co	C	Y	Y	Y	Y	Other
Greece	EL-NOTIFIABLE_DISEASES	Co	C	Y	Y	Y	N	EU-2008
Hungary	HU-EFRIR	Co	C	Y	Y	Y	N	EU-2012
Iceland	IS-SUBJECT_TO_REGISTRATION	Co	C	Y	Y	Y	N	EU-2012
Ireland	IE-CIDR	Co	C	Y	Y	Y	N	EU-2012
Italy	IT-NRS	Co	C	N	Y	Y	N	Other
Italy	IT-SEIEVA	Se	C	N	Y	Y	N	EU-2012
Latvia	LV-BSN	Co	C	Y	Y	Y	Y	EU-2012
Lithuania	LT-COMMUNICABLE_DISEASES	Co	C	N	Y	N	N	EU-2012
Luxembourg	LU-SYSTEM1	Co	C	N	Y	N	N	Other
Malta	MT-DISEASE_SURVEILLANCE	Co	C	Y	Y	Y	Y	EU-2012
Netherlands	NL-OSIRIS	Co	C	Y	Y	N	N	EU-2012
Norway	NO-MSIS_A	Co	C	Y	Y	Y	N	EU-2012
Poland	PL-NATIONAL_SURVEILLANCE	Co	C	N	Y	Y	N	EU-2008
Portugal	PT-HEPATITISB	Co	C	N	Y	N	N	Other
Romania	RO-RNSSy	Co	C	Y	N	Y	N	Other
Slovakia	SK-EPIS	Co	C	Y	Y	Y	N	EU-2012
Slovenia	SI-SURVIVAL	Co	C	Y	Y	Y	N	EU-2012
Spain	ES-STATUTORY_DISEASES	Co	C	N	Y	Y	N	EU-2012

Surveillance characteristics: compulsory (Cp), comprehensive (co), voluntary (V), other (O), active (A), passive (P), case-based (C), aggregated (A)
 Data reported by: laboratories (L), physicians (P), hospitals (H), other (O)

Country	2012		2013	
	Cases	Rate	Cases	Rate
Austria	832	9,9	670	7,9
Belgium				
Bulgaria	322	4,4	302	4,1
Croatia	136	3,2	136	3,2
Cyprus	14	1,6	9	1
Czech Republic	154	1,5	133	1,3
Denmark	298	5,3	283	5,1
Estonia	51	3,8	36	2,7
Finland	249	4,6	268	4,9
France	100	0,2	83	0,1
Germany	686	0,8	684	0,8
Greece	50	0,5	32	0,3
Hungary	53	0,5	62	0,6
Iceland	20	6,3	16	5
Ireland	571	12,5	429	9,3
Italy	561	0,9	505	0,8
Latvia	329	16,1	303	15
Lithuania	23	0,8	35	1,2
Luxembourg	26	5	38	7,1
Malta	18	4,3	17	4
Netherlands	1525	9,1	1305	7,8
Norway	706	14,2	738	14,6
Poland	78	0,2	1541	4
Portugal	28	0,3	24	0,2
Romania	361	1,8	302	1,5
Slovakia	159	2,9	194	3,6
Slovenia	41	2	52	2,5
Spain	525	1,1	645	1,4
Sweden	1606	16,9	1673	17,5
United Kingdom**	8761	15	9149	15,6
Total EU/EEA	18283	3,7	19664	4

Acute Hepatitis B in Europe

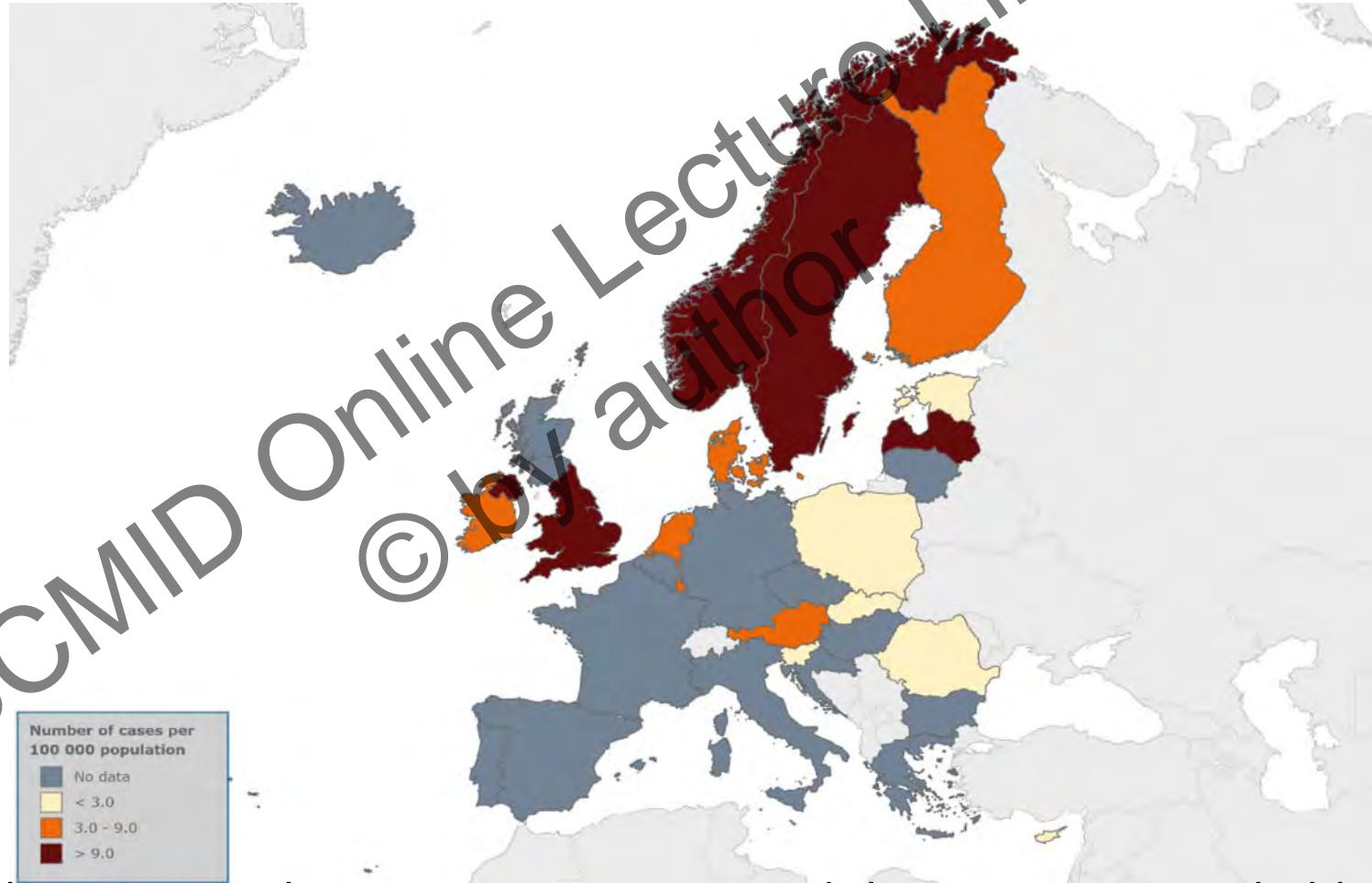
Figure 1. Rate of acute* hepatitis B per 100 000 population in EU/EEA countries, 2013



Steady decline in the reported rate of acute cases since 2006, which is most likely related to the impact of national vaccination programmes.

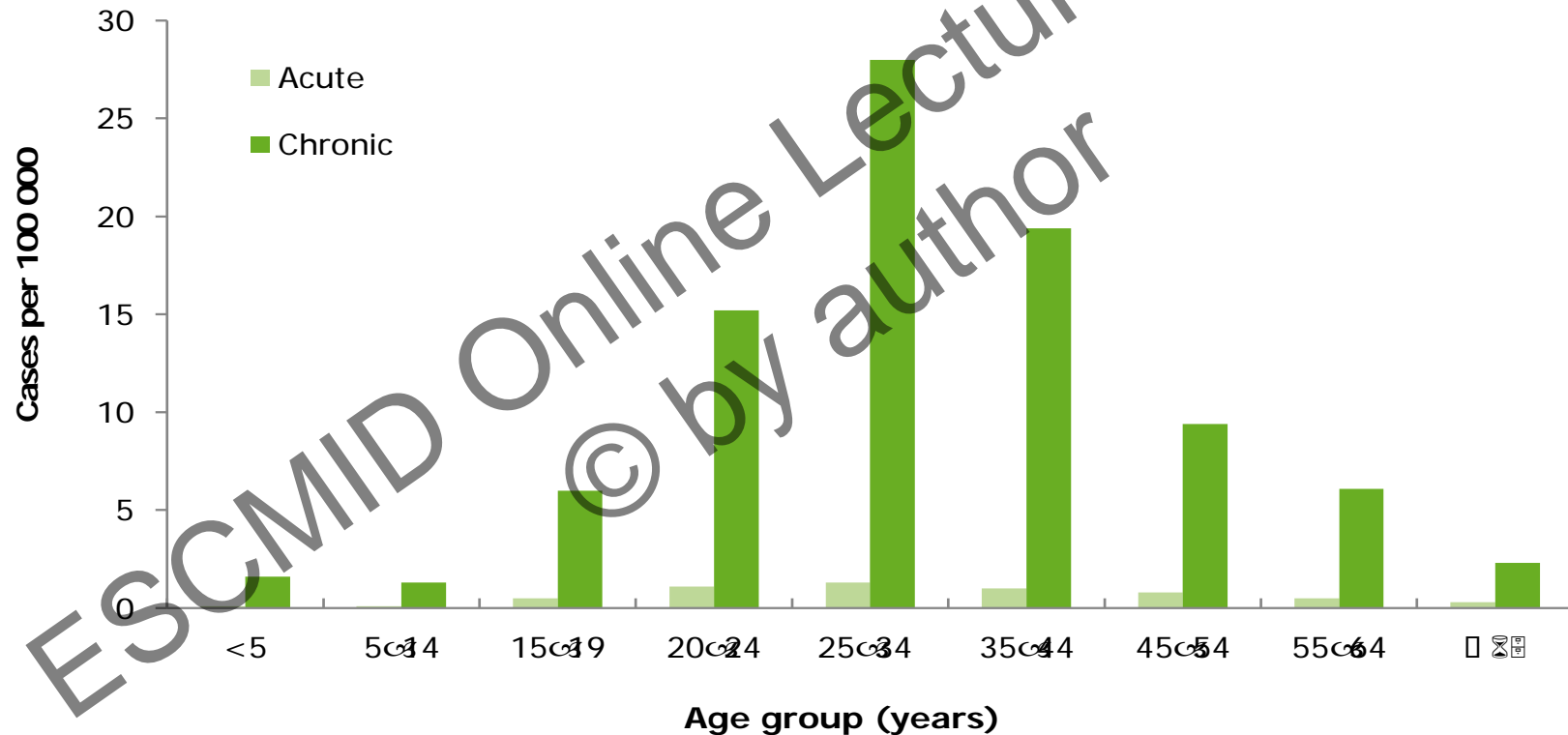
Chronic Hepatitis B in Europe

Figure 2. Rate of chronic hepatitis B per 100 000 population in EU/EEA countries, 2013



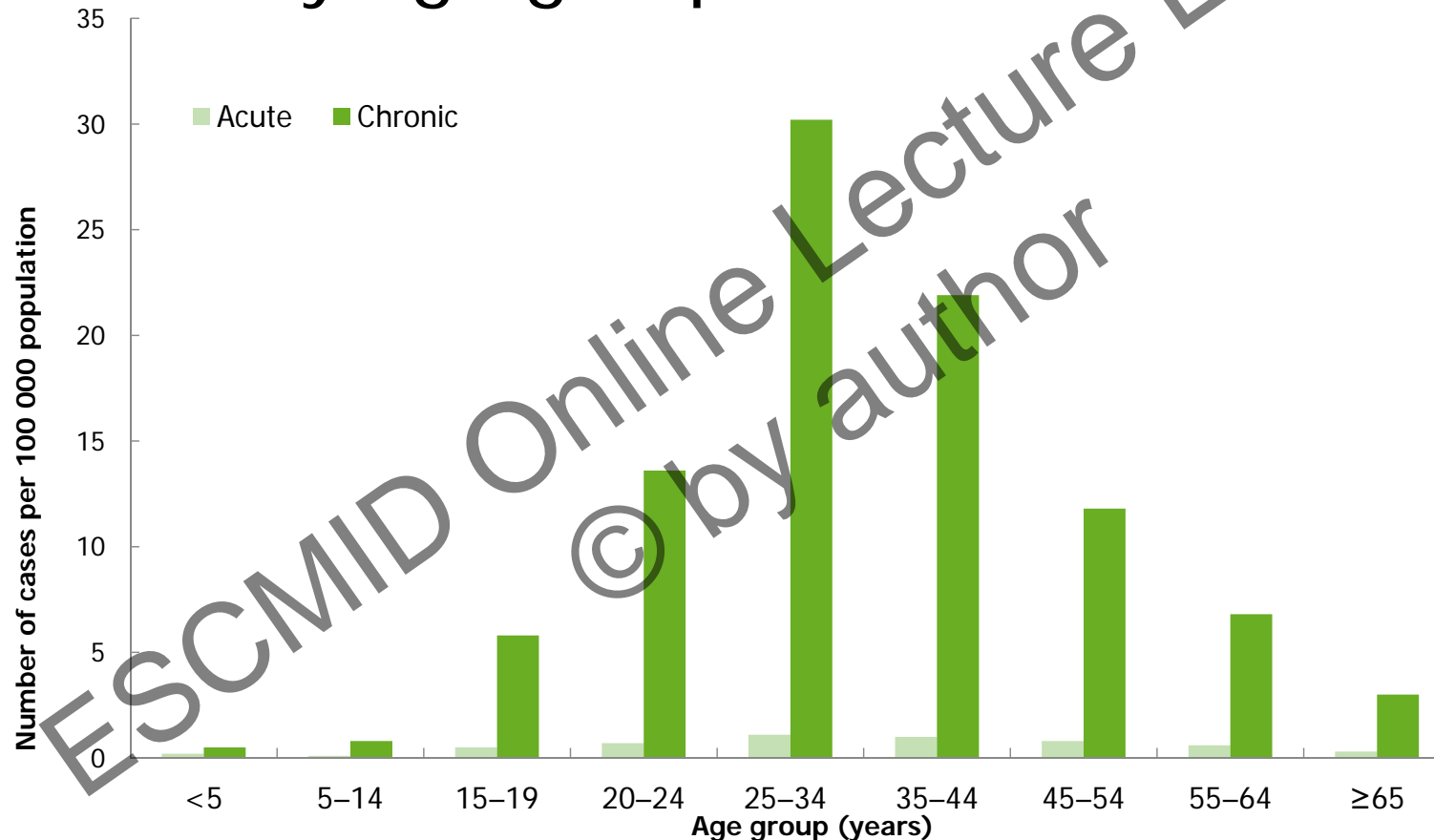
Rates of chronic cases have risen over time, and this increase is probably due to changes in reporting methods as well as increases in local testing practices.

Age group for acute and chronic B hepatitis in Europe



The most affected age group : 25–34-year-olds accounting for 33.8% of cases; Overall male-to-female ratio was 1.5 to 1..

Rate of reported acute and chronic hepatitis B cases per 100 000 population, by age group, EU/EEA, 2014

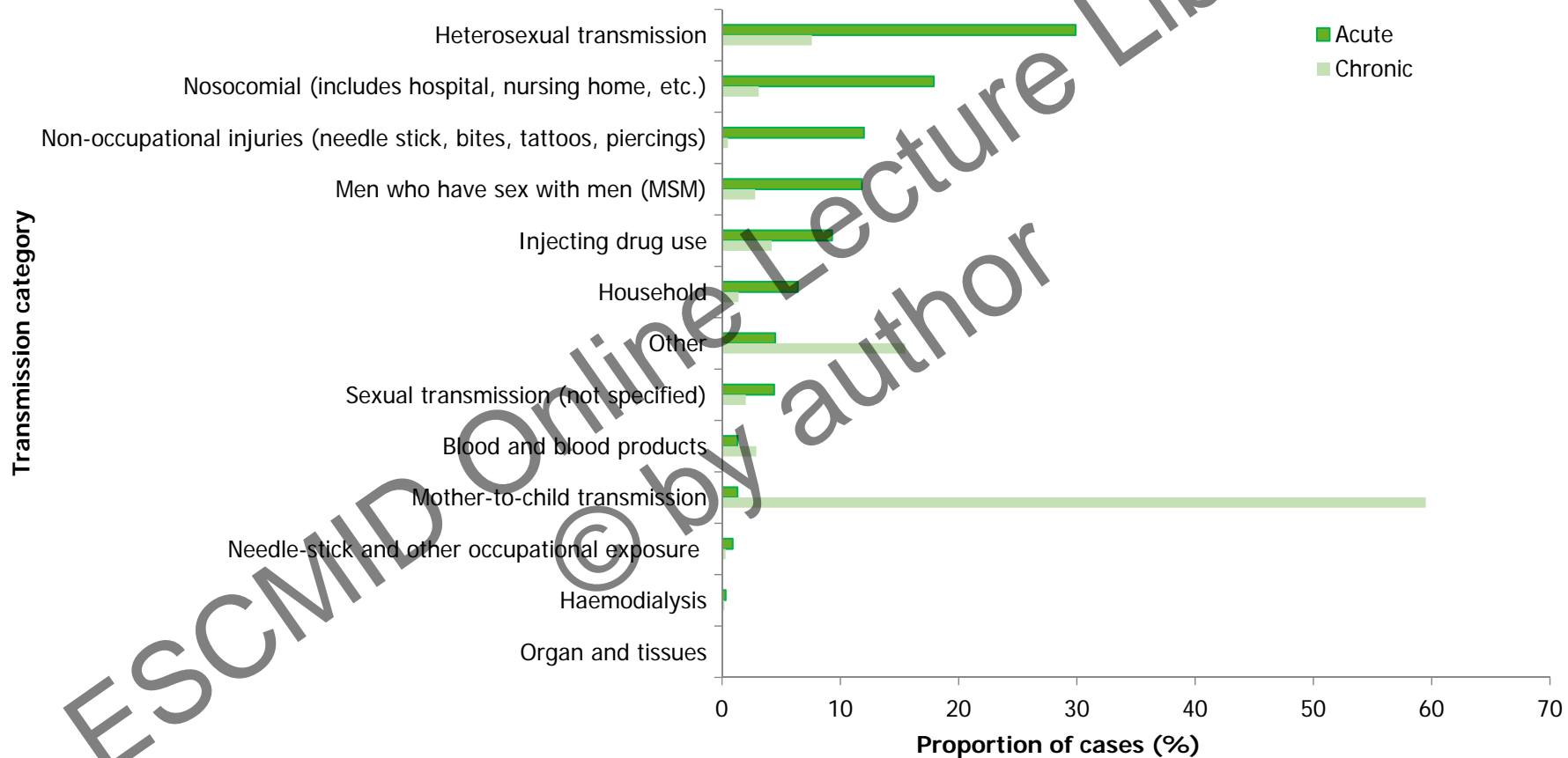


Source: Country reports from Austria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France*, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, and the United Kingdom**.

* Underreporting of acute hepatitis B in France was estimated at 76.5% in 2013.

** UK data exclude Scotland

Transmission category of hepatitis B cases by acute and chronic disease status, EU/EEA, 2014*



Source: Country reports from Austria, Denmark, Estonia, Finland, France, Germany, Hungary, Ireland, Italy, Latvia, Lithuania, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Sweden, and the United Kingdom**.

* Among cases where transmission status is known

** UK data exclude Scotland

Suggested citation: European Centre for Disease Prevention and Control. Annual epidemiological report 2015. Hepatitis B. Stockholm: ECDC; 2016.

Rate of acute and chronic hepatitis B cases per 100 000 population, EU/EEA, 2006–2014



Country reports from Austria, Bulgaria, Cyprus, 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 was estimated at 76.5% in 2013.

** UK data exclude Scotland.

Conclusion

- Hepatitis B : wide geographical disparity
- In Europe, ongoing transmission of cases and diversity in the reported routes of transmission
 - Strong influence of migration especially for chronic infections.
- This highlights the need for countries to continue to improve the quality of surveillance data and to maintain
 - prevention (vaccination coverage)
 - Screening
 - Education of population and Health professionals

ECDC

