Burden of illness dell'epatite C

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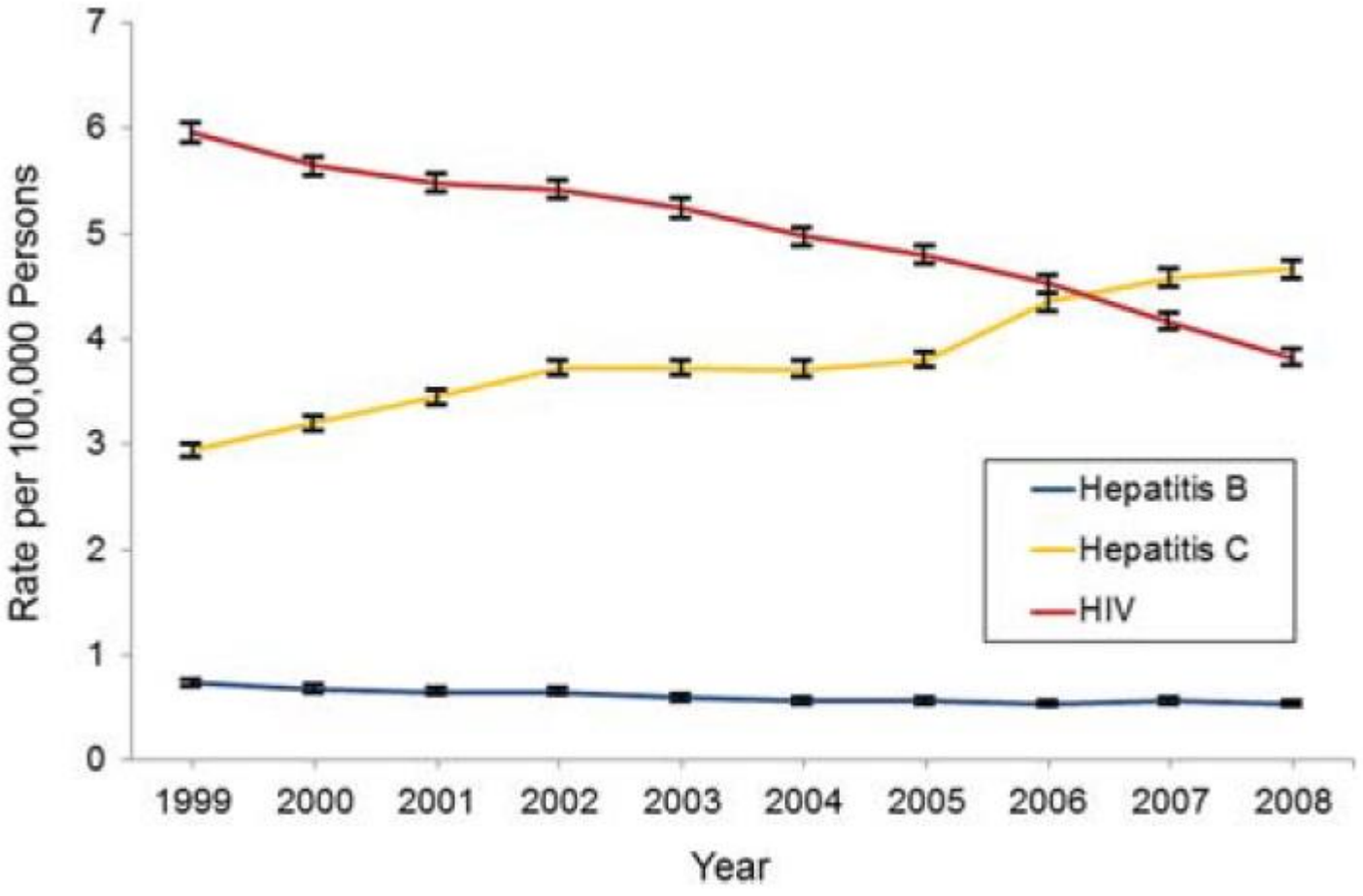
Gastroenterologia ASL2

Current Burden of the HCV Epidemic

- ✓ Estimated 140-170 million persons with HCV infection worldwide [1]
  - 3-4 million newly infected each year worldwide
- ✓ At least 3.9 million people in United States infected with HCV [2]
  - Causes ~ 12,000 deaths annually
- ✓ ~ 7.3-8.8 million people infected with HCV in study of 22 European focus countries [3]
  - 86,000 deaths estimated to be caused by HCV in Europe in 2002

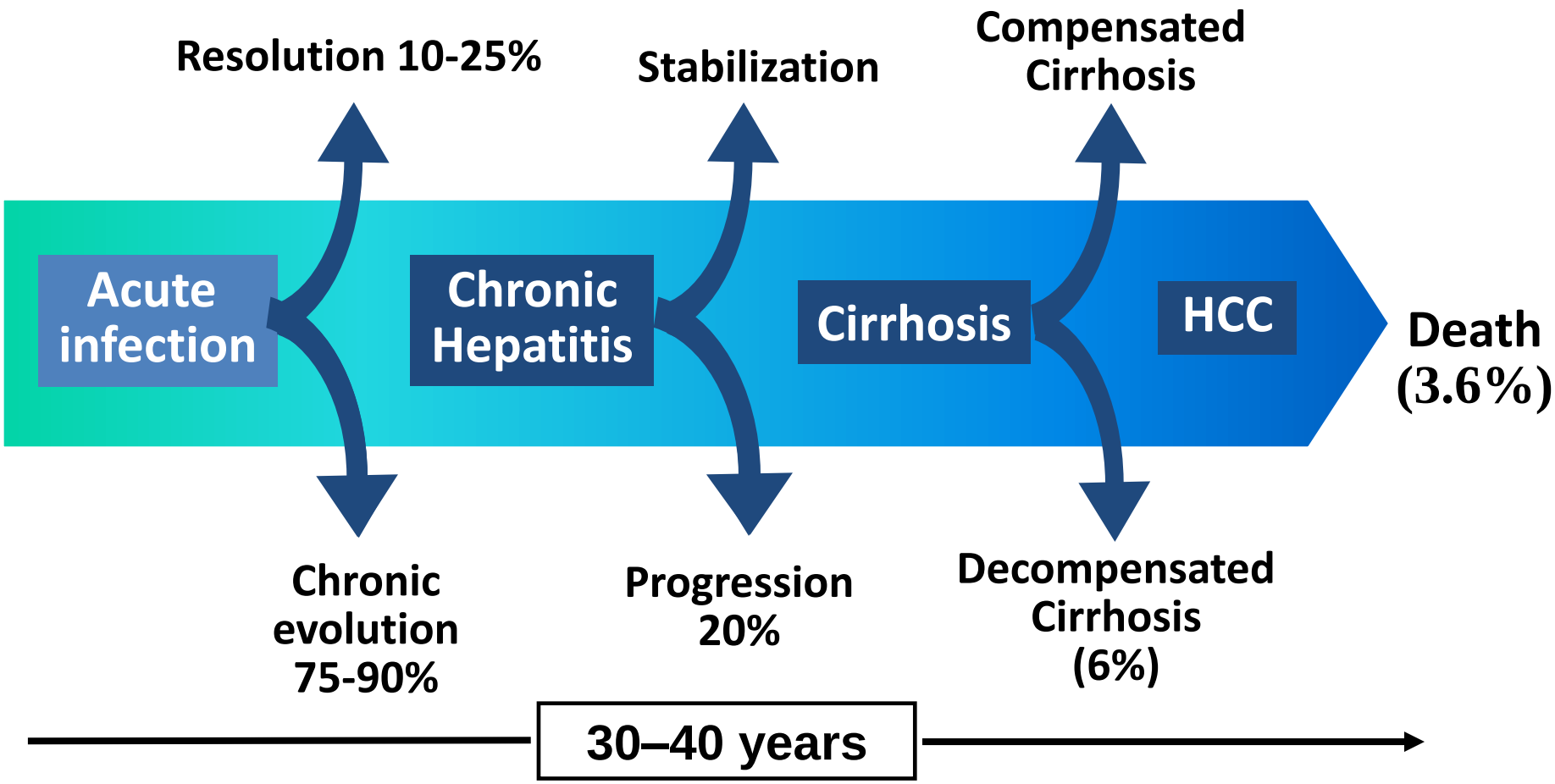
1. WHO. 2. NIH Consens State Sci Statements. 2002;19:1-46. 3. Mühlberger N, et al. BMC Public Health. 2009;9:34.

Annual age-adjusted rates of mortality for HCV, HBV and HIV in USA, 1999–2008



Ly KN et al Ann Int Med 2012

Natural history of HCV infection

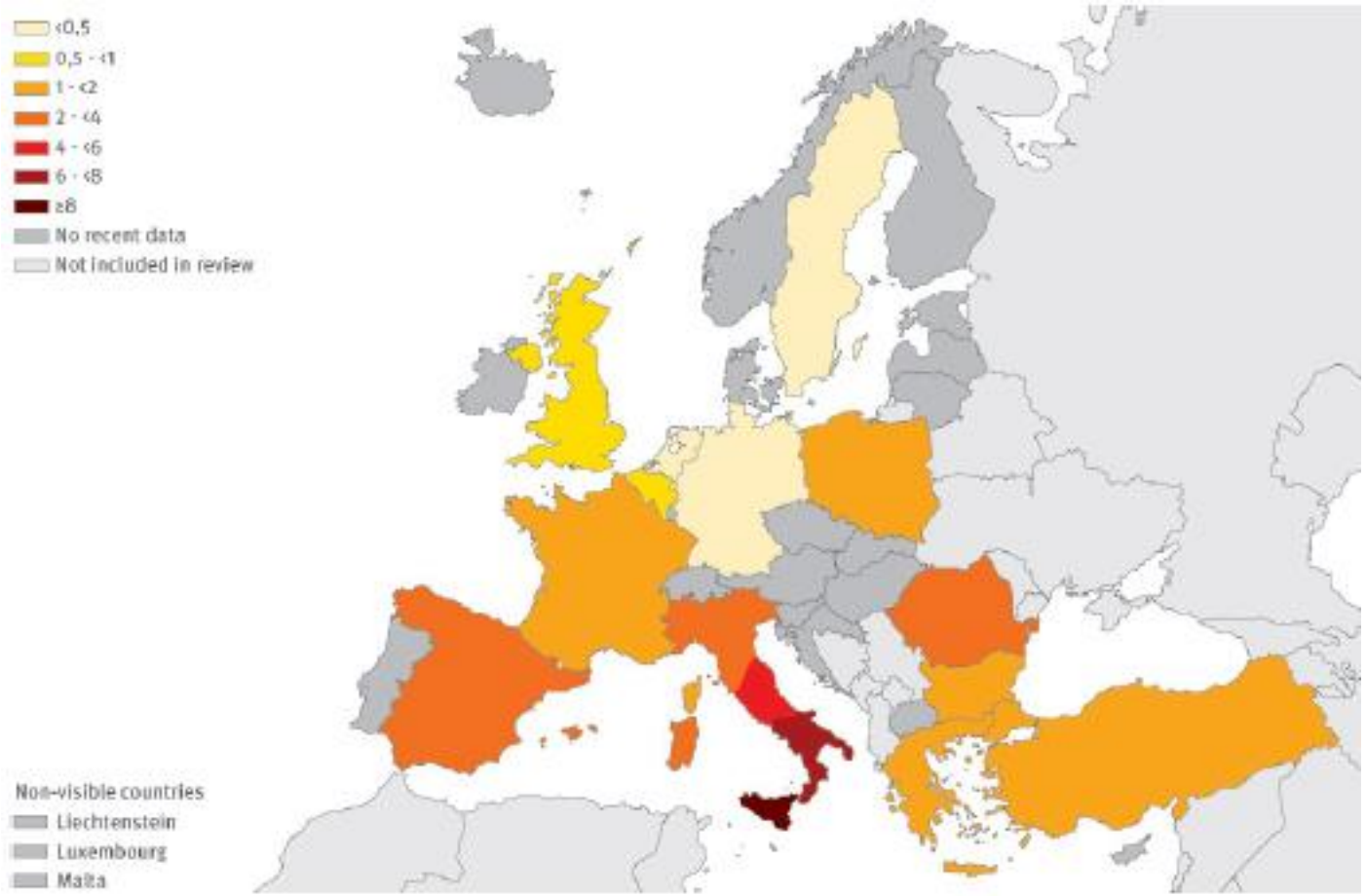


Strong evidence to support associations of HCV with many clinical outcomes

- Liver-related mortality → -Decompens. cirrhosis -HCC
- Non Liver-related mortality → -Type 2 diabetes mellitus -Cryo-related NHL -Cardiovascular? -Cerebrovascular?
- Quality of life impairments

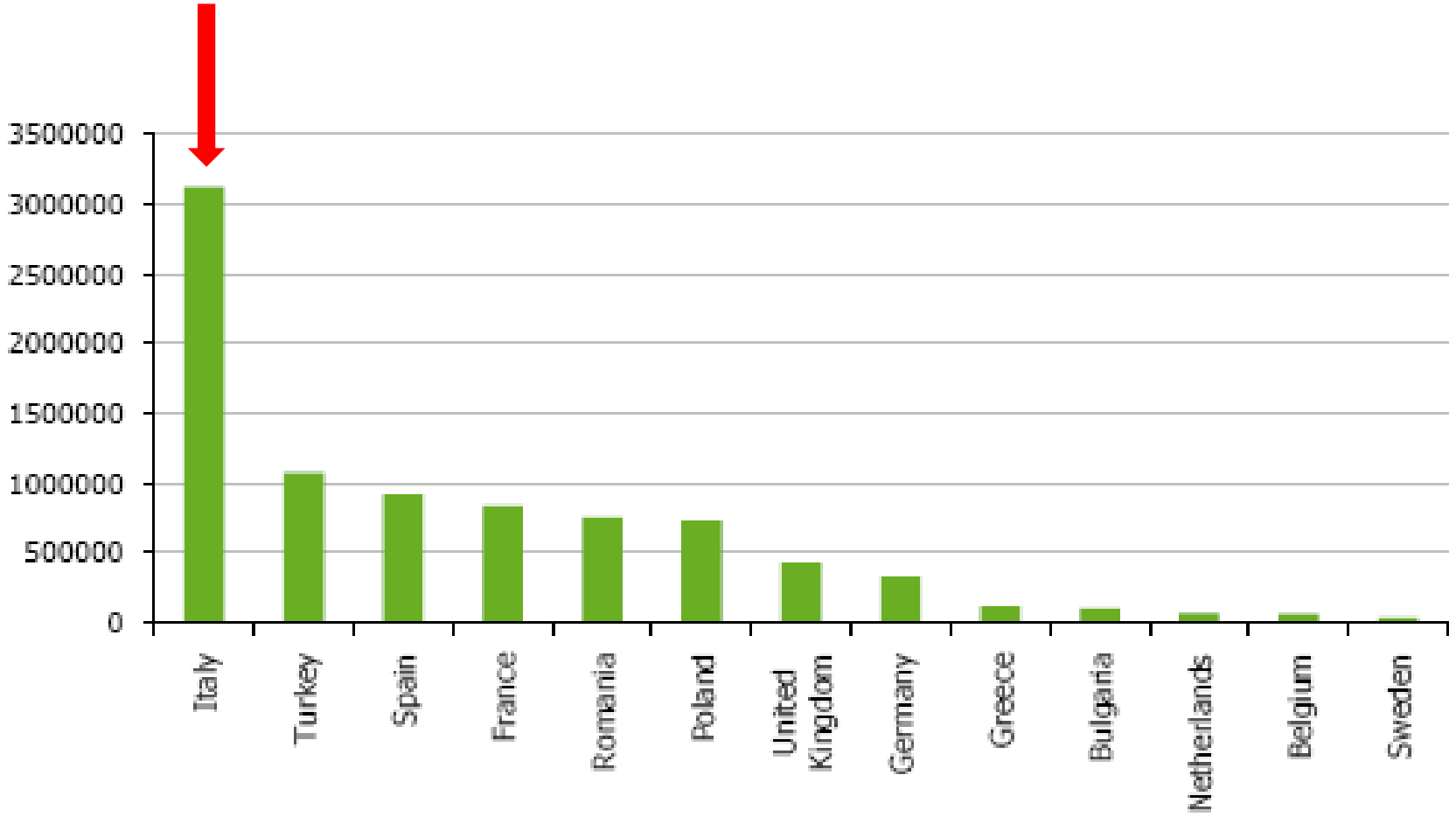
Yaounossi ZM et al. Aliment Pharm Ther 2014

Hepatitis C prevalence in the general population: anti-HCV



European Centre for Disease Prevention and Control 2010

Estimated number of anti-HCV-positive individuals by country, based on general population prevalence estimates

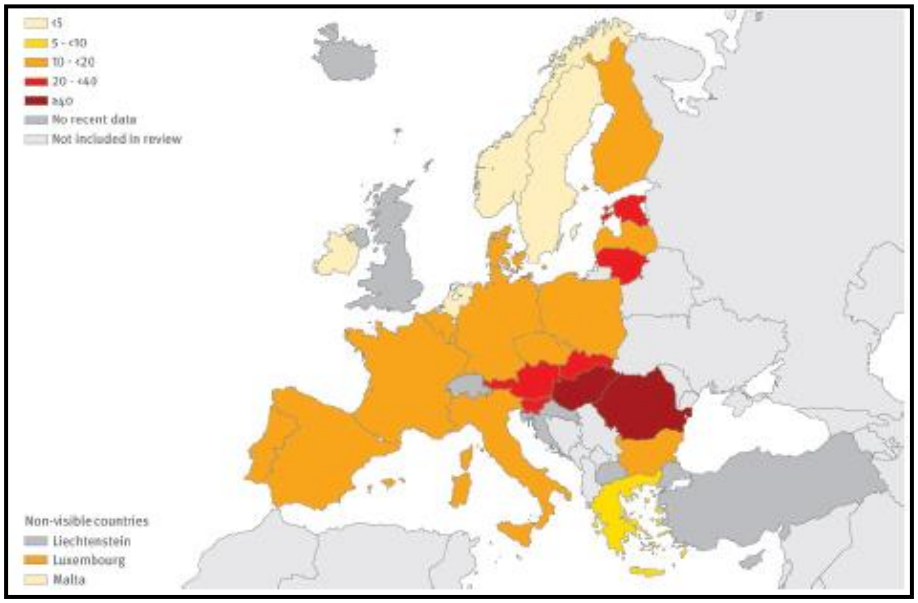


European Centre for Disease Prevention and Control 2010

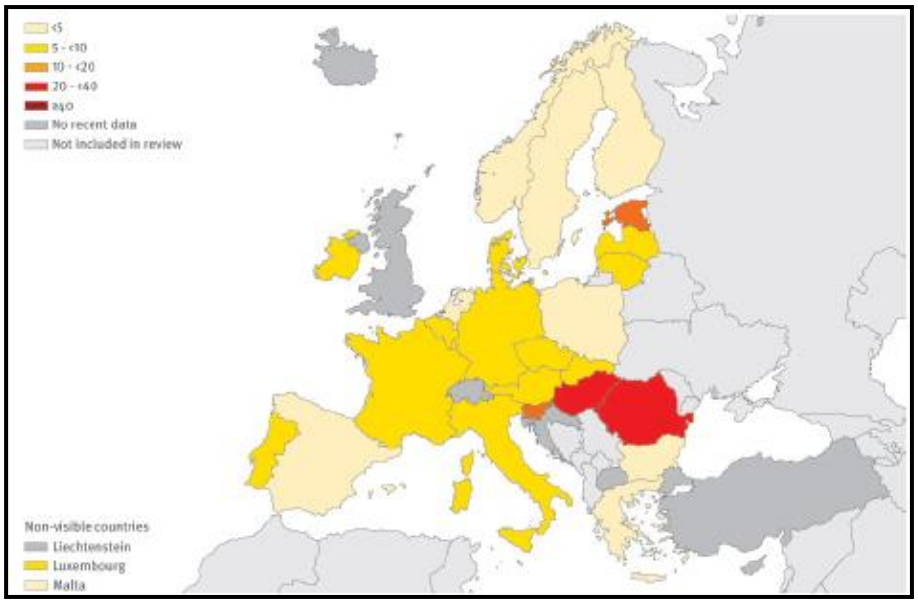
Cirrhosis related mortality per 100.000 population

10% to 20% of patients with chronic HCV infection will develop cirrhosis over 10-20 yrs

Males



Females

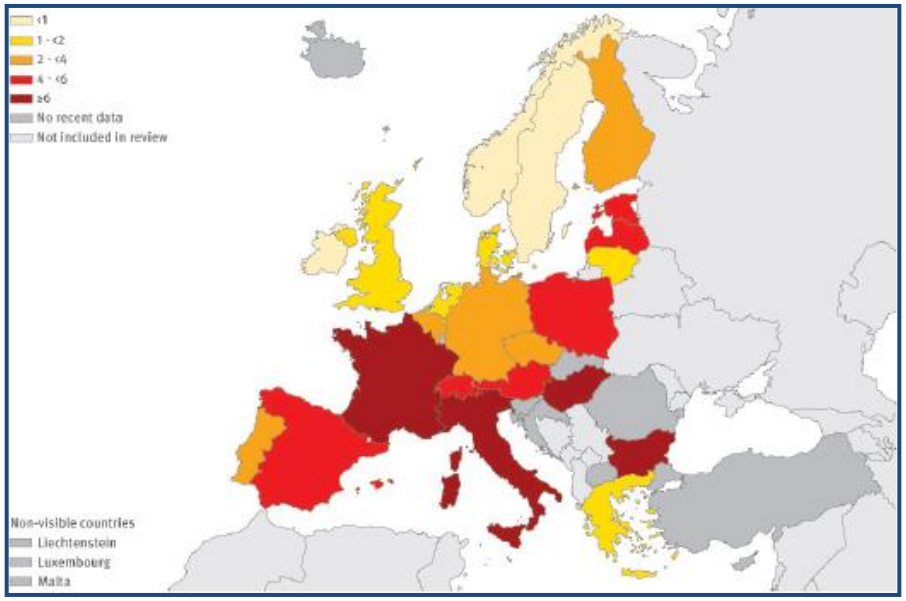


European Centre for Disease Prevention and Control 2010

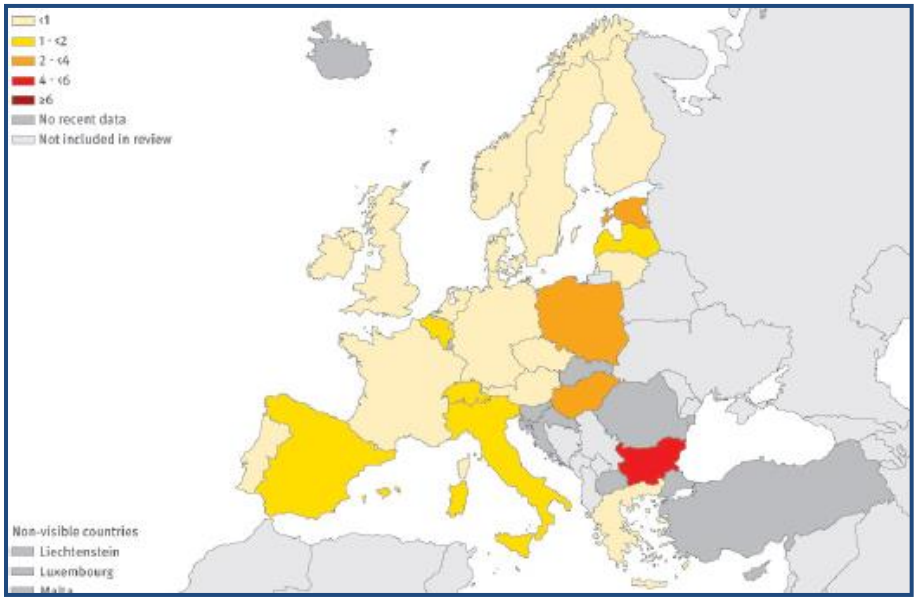
Hepatocellular carcinoma related mortality per 100.000 population

1% to 5% of patients with HCV cirrhosis will develop HCC

Males

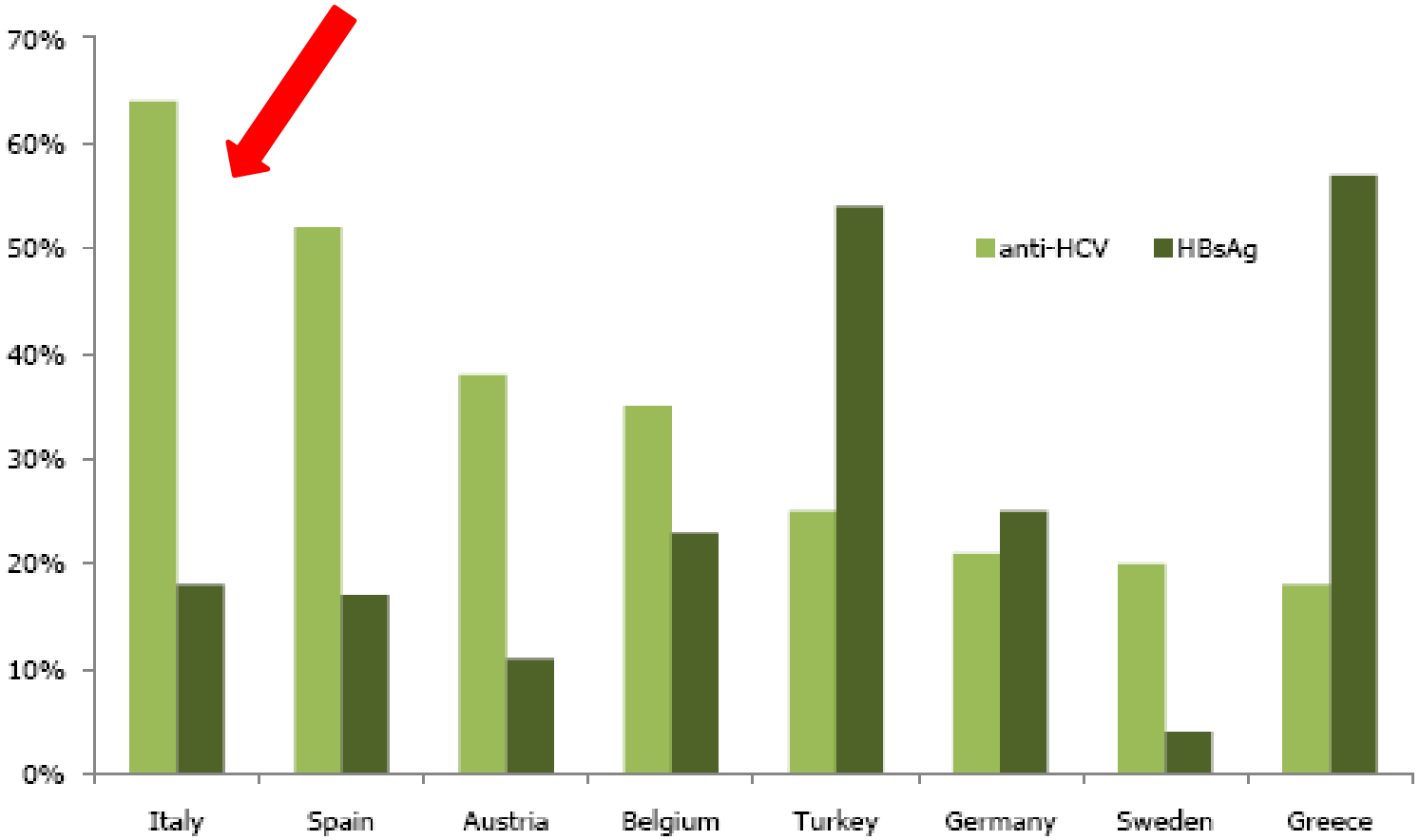


Females



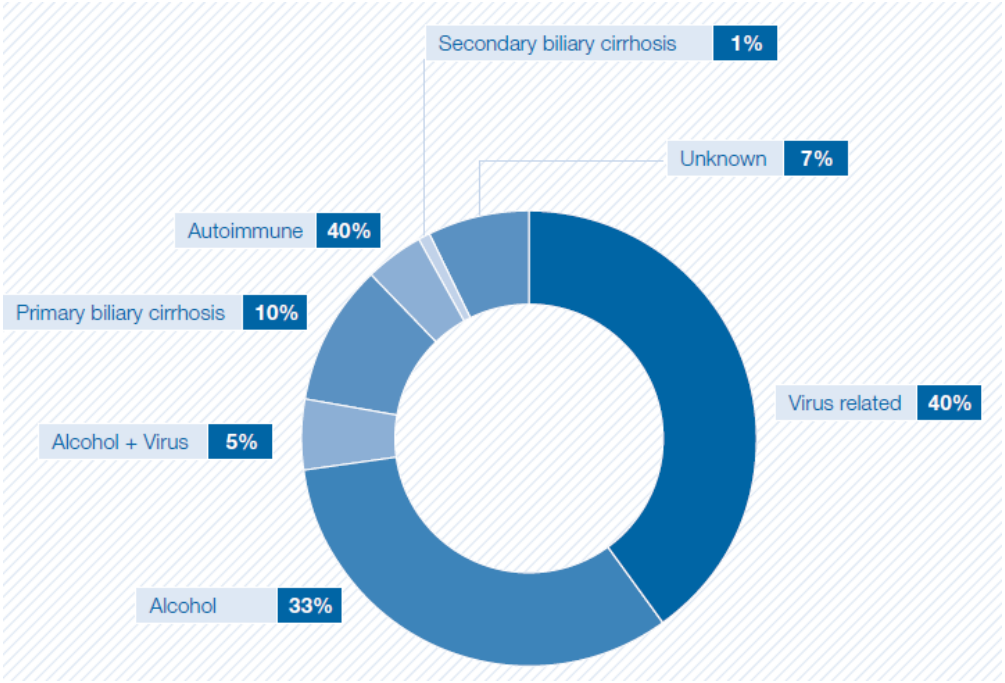
European Centre for Disease Prevention and Control 2010

Estimated HBsAg and anti-HCV prevalence in HCC patients by country



European Centre for Disease Prevention and Control 2010

Primary indications for liver transplantation in Europe among patients with cirrhosis



All causes

The Burden of Liver Disease in Europe – EASL Report 2013

Health outcomes and costs among HCV European patients and controls

Total sample 57,166	**HCV Group** (n= 286)		**Matched controls** (n= 286)		
	mean	**SD**	**mean**	**SD**	***P* value**
Work Impairment (1)	30.45%	31.42%	18.30%	27.47%	<.001
Annual Physician visit	19.80	23.93	13.26	19.21	<.001
Annual Hospitalization	0.52	1.59	0.27	0.98	.073
Indirect costs (2)	7.532.54	9.879.57	4.576.29	7.375.19	0.002
Direct costs (3)	1.147.06	2.265.46	652.07	1.373.94	<.001

(1) Absenteeism, Presenteeism

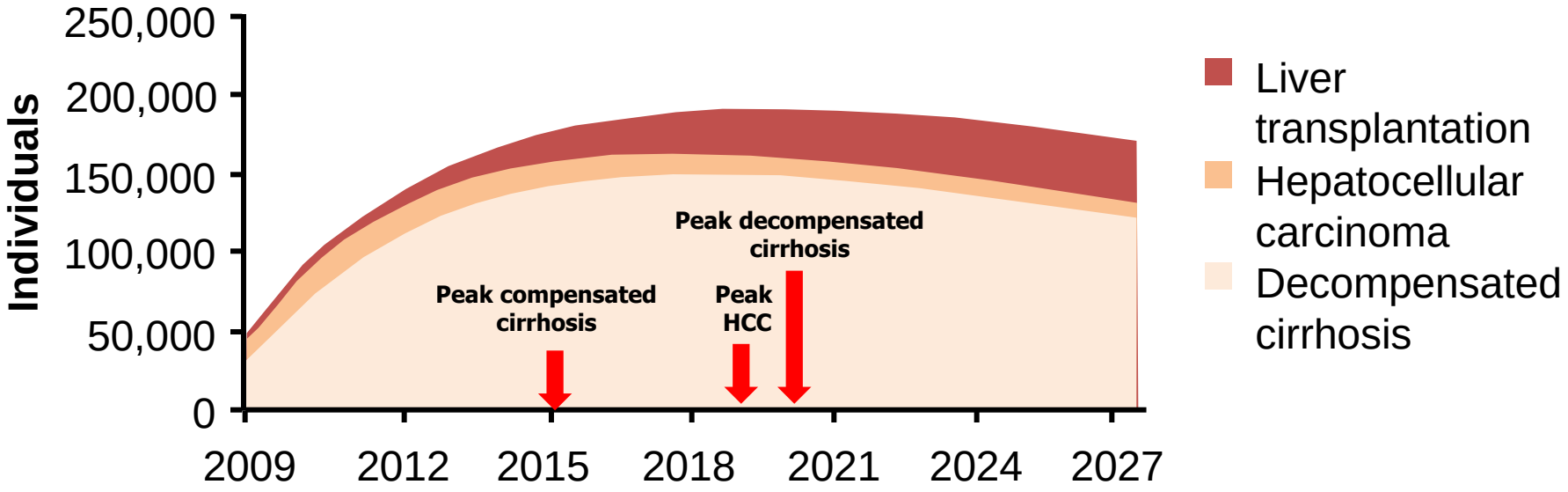
(2) Absenteeism and presenteeism costs (in Euros)

(3) Physician visits; ER visits; Hospitalizations (in Euros)

Vietri J et al, BMC Gastroent 2013

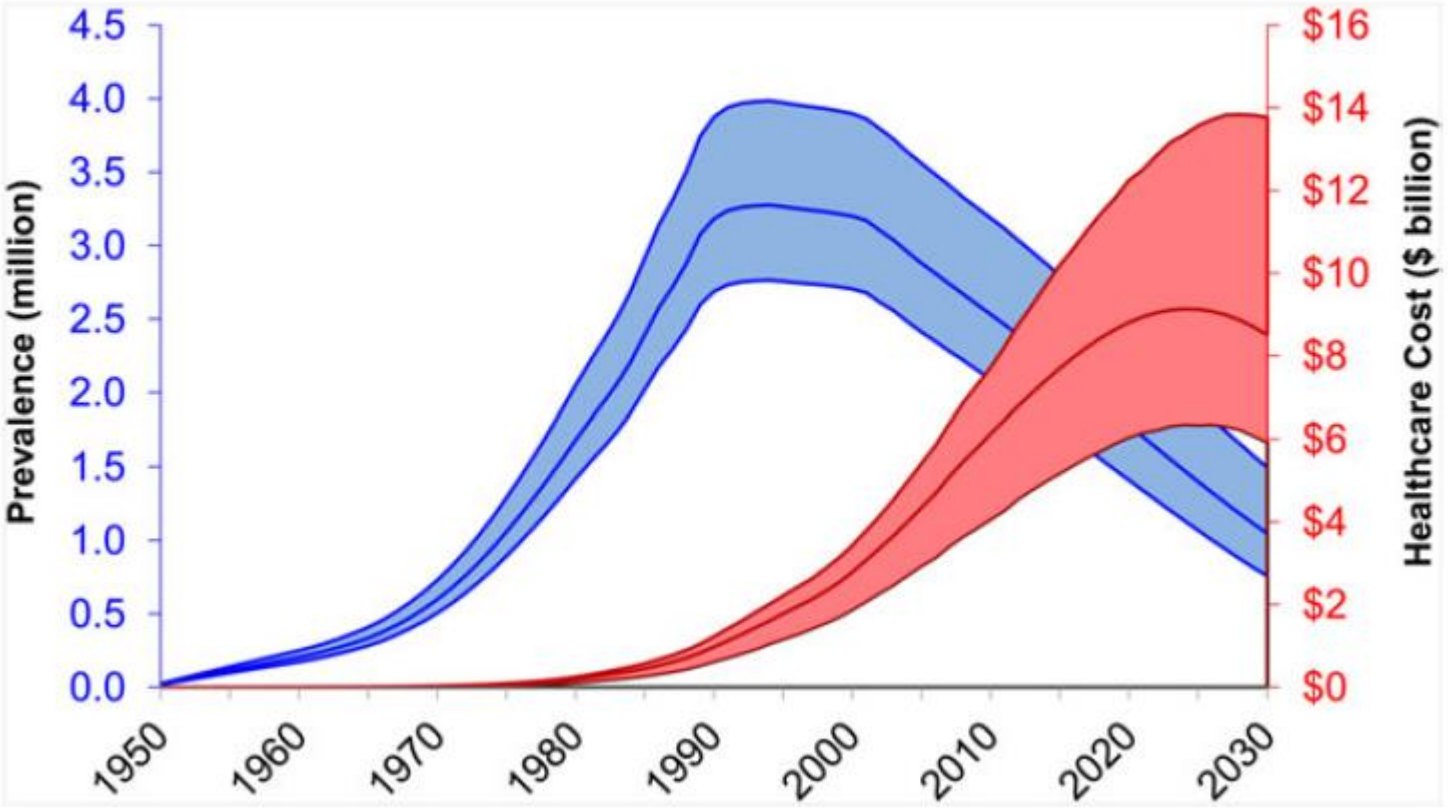
Advanced Liver disease in chronic HCV-Infected US Population: 2009-2028

Assuming no changes in standard of care (2009)



- Total number of patients with advanced liver disease in 20 yrs projected to be > 4-fold higher than 2009

Total prevalence and healthcare costs for chronic HCV infection in USA (up to 2030)



Rszawi H et al, Hepatology 2013

Major drivers of HCV prevalence

	Resource-rich settings	Resource-poor settings
Old infections	**Iatrogenic** (Blood transfusions, unsafe medical procedures)	**Iatrogenic** (Unsafe injections during mass parenteral therapies)
New infections	**IVDU** Immigration from resource-poor settings	**Iatrogenic** (IVDU)

HCV prevalence and Age

Age range (years)	Population	HCV test			
		Subjects with at least one HCV test		Subjects with HCV infection	
		No.	(%)	No.	(Prevalence %)
0–24	23,449	2894	(12.3)	16	(0.1)
25–34	13,016	6732	(51.7)	116	(0.9)
35–44	16,178	9379	(58.0)	418	(2.6)
45–54	14,690	7549	(51.4)	423	(2.9)
55–64	13,010	7070	(54.3)	520	(4.0)
65+	19,433	11914	(61.3)	1707	(8.8)
Total	99,776	45538	(45.6)	3200	(3.2)

Zani C et al. Dig Liver Dis 2011

HCV transmission in the Community

	Adjusted OR (95% CI)
Blood Transfusion	2.9 (1.9-4.4)
Hospitalization before 1970	2.1 (1.4-3.1)
IVDU	112 (14.6-860)
Non-disposable needles within the family	1.6 (1.1-2.1)
Non-disposable needles outside the family	3.8 (2.7-5.3)
Previous tuberculosis	3.4 (1.8-6.2)

Chiaramonte M et al. J Hepatol 1996

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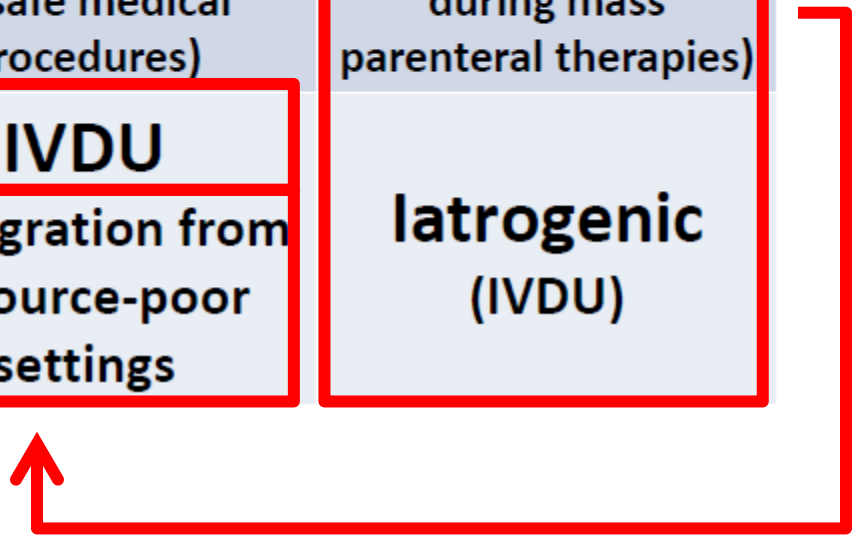
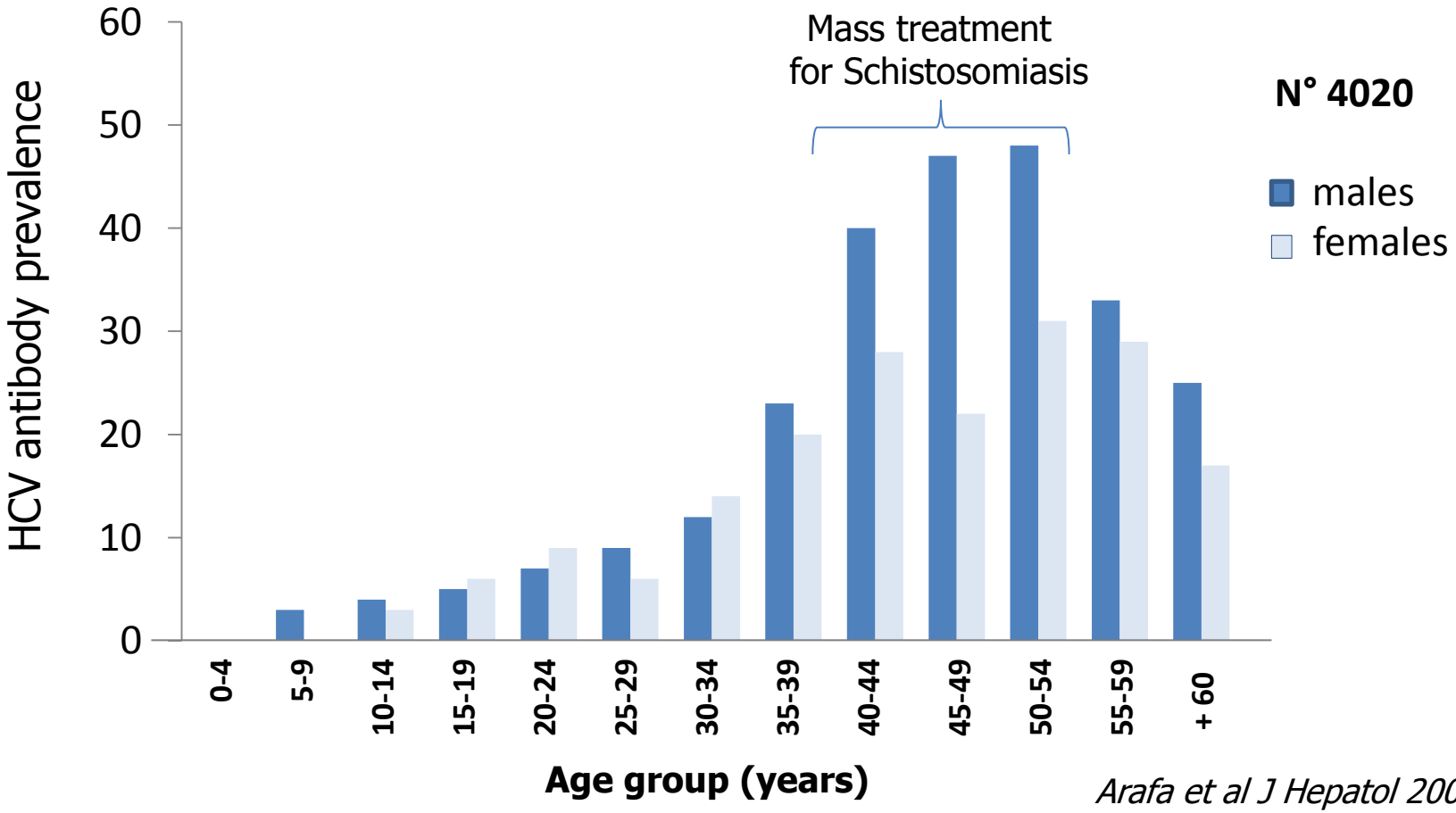


Mass treatment for Schistosoma contributed to the spread of HCV in Egypt until the mid 1980's

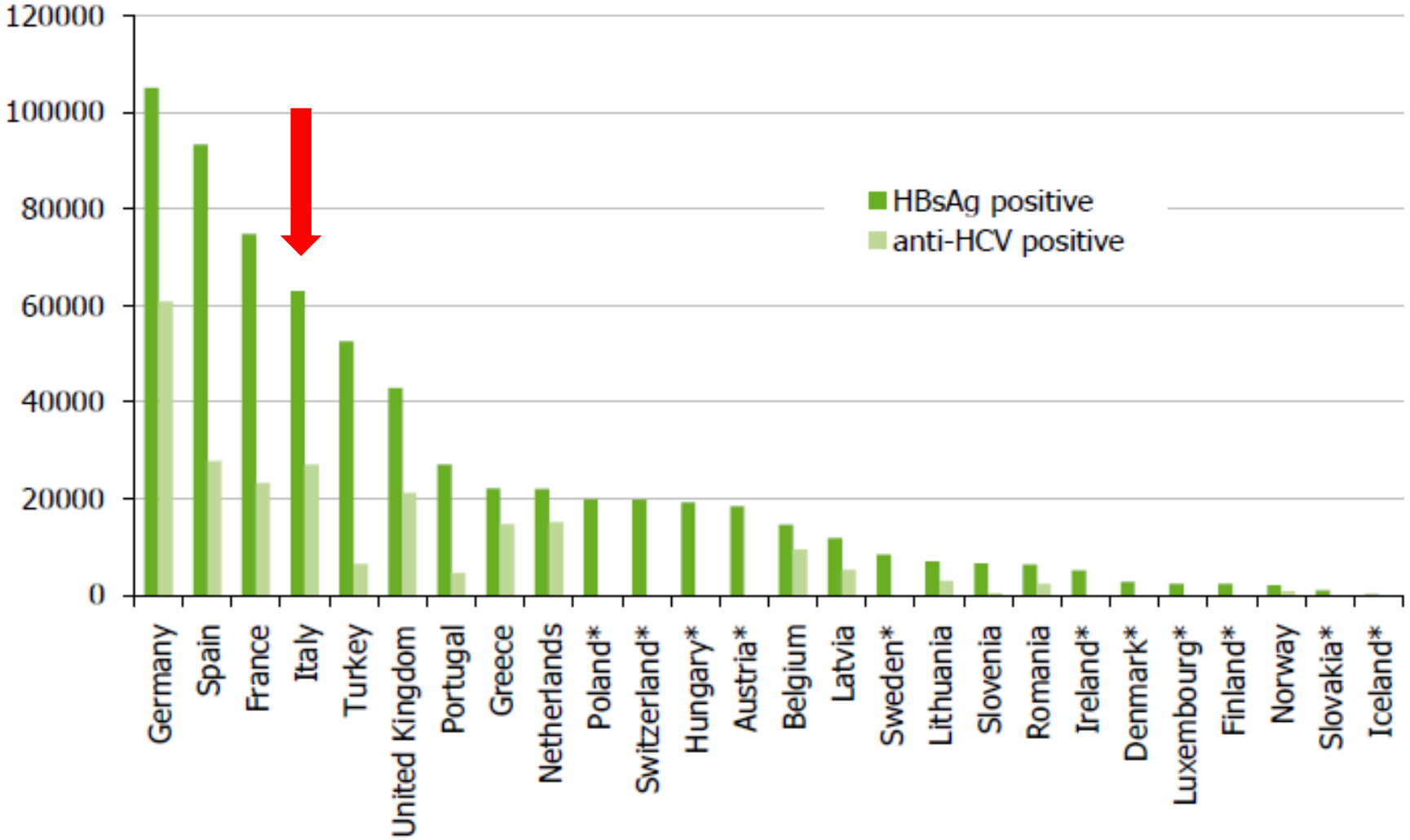
Zwyat Razin Cohort 2002

"Tartar emetic", or potassium antimony tartrate, given IV



Arafa et al J Hepatol 2005

Estimated number of HBsAg- and anti-HCV-positive individuals in the three largest migrants groups, by country



European Centre for Disease Prevention and Control 2010

Estimated proportion of anti-HCV+ migrants vs total anti-HCV+ in selected European countries

	Anti-HCV prevalence (%)	Anti-HCV (Numbers)	Migrants three largest groups	Anti-HCV + migrants	Average HCV prevalence in migrants	Anti-HCV + migrants/tot anti-HCV +
France	1.3	836.563	1.871.000	23.290	1.2	2.8
Germany	0.4	328.200	2.626.700	60.839	2.3	18.5
Greece	1.0	112.573	553.093	14.718	2.7	13.1
Italy	5.2	3.122.779	1.061.375	27.031	2.5	0.9
Netherlands	0.5	65.946	551.155	15.106	2.7	22.9
Spain	2-0	916.563	1.566.951	27.761	1.8	3.0
UK	0.7	431.442	1.073.000	21.187	2.0	4.9

HCV in Intravenous Drug Users (IVDU)

- ✓ IVDU accounts for 20-50% of all chronic hepatitis C
- ✓ Overall prevalence of anti-HCV and/or RNA positivity among IVDUs → 71%
- ✓ High variability among studies → 30-98%
- ✓ Prevalence according with age → ≥80% in aged ≥50 y
  ≈ 25% in aged ≤40 y
- ✓ Most IVDUs apparently acquire HCV infection during their first years of injection

Pollini RA et al, Substance Abuse and Rehabilitation 2011
Hagan H et al, J Infect Dis 2010

Roy K et al, Epidemiol Infect 2002
Mathei C et al, J Viral Hepat 2002

Nonhospital health care-associated hepatitis B and C virus transmission: United States, 1998-2008

- Private physician offices
- Pain remediation clinics Hematology/oncology clinics
- Endoscopy clinics
- Nuclear imaging facilities
- Chelation therapy units
- Alternative medicine clinics
- Anesthesiologist offices
- Hemodialysis centers

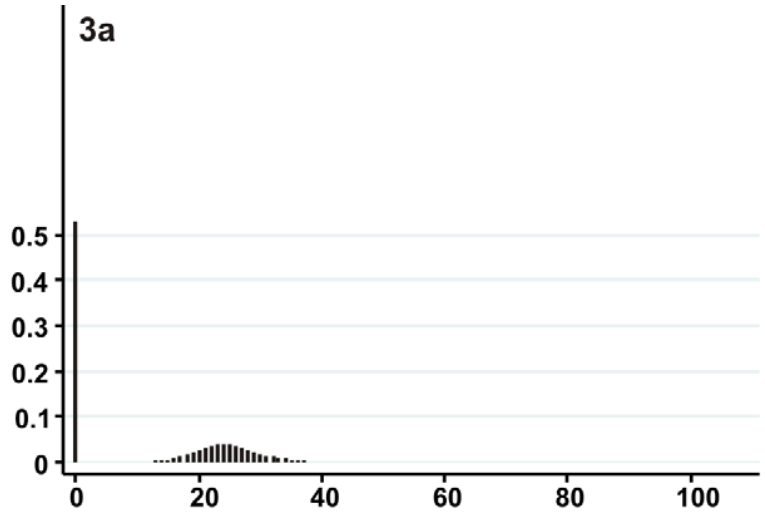
- Reuse of syringes resulting in contamination of multi-use vials
- Contaminated environments
- Contamination of shared saline bags
- Poor hand hygiene
- Failure to use gloves
- Use of mobile carts to transport clean and used supplies among multiple patients

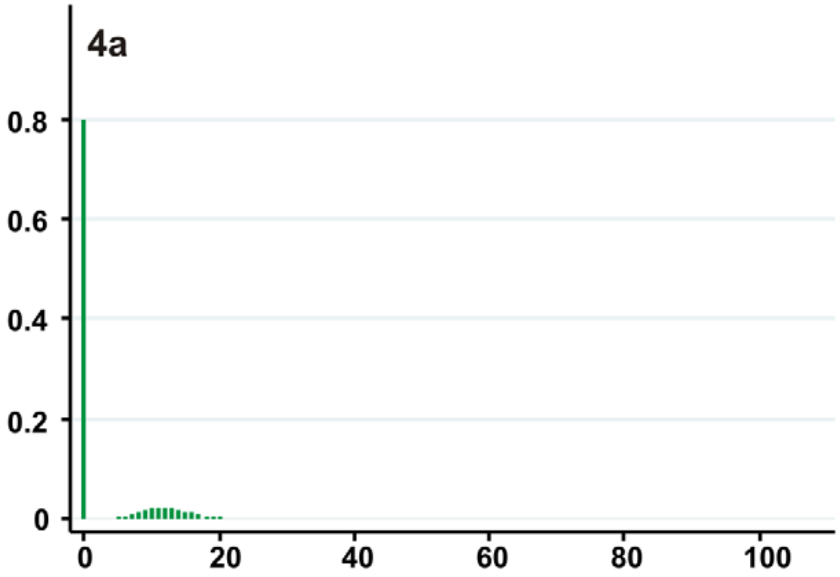
16 HCV outbreaks 275 incident cases out of 16,236 screened (range 0.04-47%)

Thompson ND et al Ann Intern Med 2009

Target 'super-spreaders' to stop hepatitis C

Cumulative distribution of the secondary infections generated from a Greek HCV epidemics



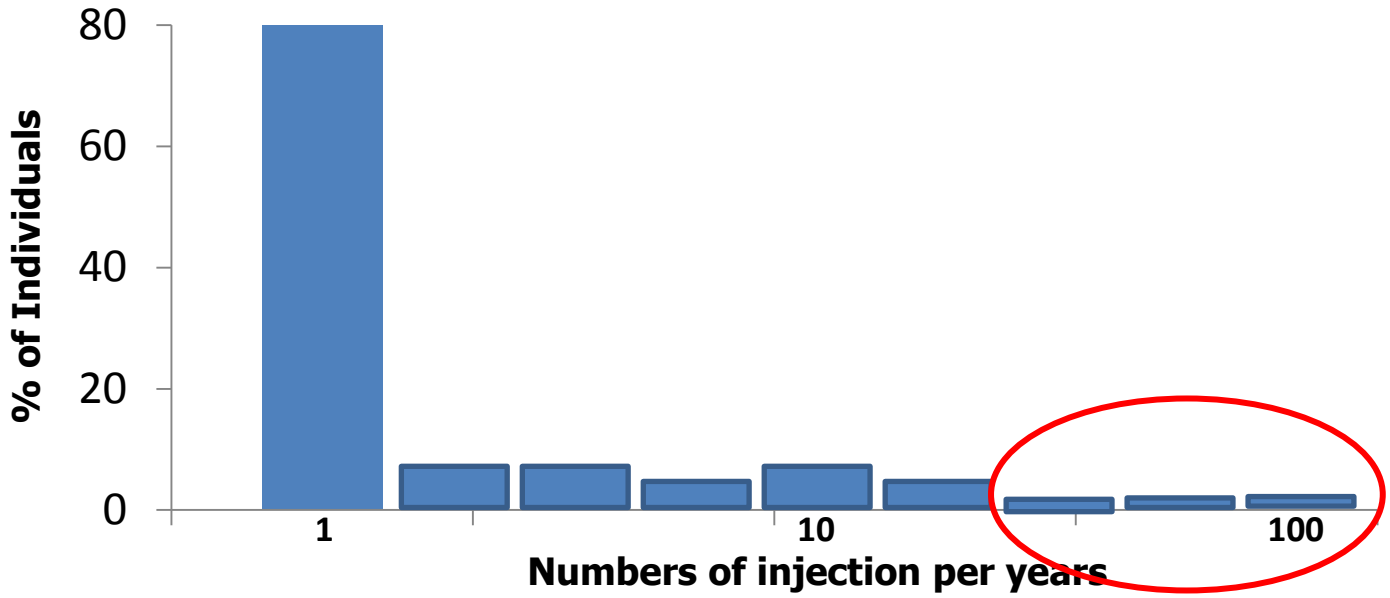


- ✓ Each intravenous drug user contracting hepatitis C is likely to infect around 20 other people with the virus
- ✓ Half of these transmissions occurring in the first two years after the user is first infected

Magoirkinis G et al. PLoS Computational Biology 2013

Target 'super-spreaders' to stop hepatitis C

Zwyat Razin, 2002, n=4020



- ✓ The hypermedicalized 5% of the population receives >50% of all injections:
- ✓ They are the first ones to be infected and the first ones to transmit

Breban R et al. EASL 2013 abs 53

How to transfer epidemiological data in interventional strategies in the DAA's era?

- ✓ Treatment as prevention in selected groups (super-spreaders, IVDU, MSM..)?

- ✓ Extension of the indication to eradicate infection and prevent hepatic and extrahepatic morbidity and mortality?