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Supplementary appendix

This appendix formed part of the original submission and has been peer reviewed. We post it as supplied by the authors.

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Supplementary appendix

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Supplementary Table 1: Medline search strategy for the systematic review on cirrhosis, 1993-2021. Similar search strategy was used for EMBASE, Web of Science, and Scielo

(HBV+HCV+cirr) OR (HBV+cirr+etiology) OR (HCV+cirr+etiology)	
#28	#25 OR #26 OR #27
Hepatitis C AND cirrhosis AND etiology	
#27	#17 AND #24 AND #3
Hepatitis B AND cirrhosis AND etiology	
#26	#10 AND #24 AND #3
Hepatitis B AND Hepatitis C AND cirrhosis	
#25	#10 AND #17 AND #24
Cirrhosis: MeSh + keywords	
#24	#18 OR #19 OR #20 OR #21 OR #22 OR #23
#23	(decompensat*[tiab] AND (hepatitis[tiab] OR hepatic[tiab] OR liver[tiab] OR cirrhotic[tiab] OR cirrhosis[tiab]))
#22	"End Stage Liver Disease" [MeSH]
#21	"chronic liver"[tiab]
#20	"liver"[tiab] AND "cirrhosis"[tiab]
#19	"liver cirrhosis"[tiab]
#18	"Liver Cirrhosis"[MeSH]
Hepatitis C: MeSh + keywords	
#17	#11 OR #12 OR #13 OR #14 OR #15 OR #16
#16	"hcv"[tw]
#15	"hepatitis c"[tw]
#14	"hep c"[tw]
#13	"hepatitis c antibodies"[MeSH]
#12	"hepacivirus"[MeSH]
#11	"hepatitis c"[MeSH]
Hepatitis B: MeSh + keywords	
#10	#4 OR #5 OR #6 OR #7 OR #8 OR #9
#9	"hbv"[tw]
#8	"hepatitis b"[tw]
#7	"hep b"[tw]
#6	"hepatitis b antigens"[MeSH]
#5	"hepatitis b virus"[MeSH]
#4	"hepatitis b"[MeSH]
Etiology	
#3	#1 OR #2
#2	etiology[tiab]
#1	aetiology[tiab]

tiab=title/abstract=words and numbers included in a citation's title, collection title, abstract, other abstract and keywords. English language abstracts are taken directly from the published article. If an article does not have a published abstract, NLM does not create one.

tw=text words=includes all words and numbers in the title, abstract, other abstract, MeSH terms, MeSH subheadings, publication types, substance names, personal name as subject, corporate author, secondary source, comment/correction notes, and other terms (see Other Term [OT] above) typically non-MeSH subject terms (keywords), including NASA Space Flight Mission, assigned by an organization other than NLM.

Mesh=MeSH term=The NLM Medical Subject Headings controlled vocabulary of biomedical terms that is used to describe the subject of each journal article in MEDLINE.

HBV=hepatitis B virus. HCV=hepatitis C virus.

Supplementary Table 2: Inclusion and exclusion criteria, and scoring system – systematic-review on cirrhosis, 1993-2021

Inclusion criteria:

- Series of patients with cirrhosis from an unselected, assumed to be representative, population (e.g. all consecutive patients hospitalized at a given care centre for a specified period)
- Patients with cirrhosis diagnosed with compensated or decompensated cirrhosis, on waiting list for transplantation* or undergoing transplantation.*
- Series of at least 20 patients with cirrhosis
- Studies reporting on both HBV and HCV infection prevalence among patients with cirrhosis, preferably providing results of serological testing using hepatitis B surface antigen (HBsAg) and antibodies against HCV (anti-HCV)

Exclusion criteria:

- Selection of patients based on aetiological diagnosis (e.g. selective inclusion or exclusion of patients with HBV, HCV, alcohol consumption, or NALFD)
- Non-representative group of patients (e.g. veterans, patients living with HIV infection, injecting drug users, migrants, prisoners, patients matched to a comparison group based on demographic data or other variables that could introduce a selection bias, etc..)
- Patients with cirrhosis and liver cancer (if HCC was diagnosed in >25% of the study population)
- Estimates provided as a result of modelled data (in contrast to observed empirical data)
- Unclear selection criteria resulting in a likely biased group (e.g., the proportion of patients with HBV or HCV adds up to 100%, or each etiological group has the same size)
- First generation enzyme-linked immunosorbent assay (ELISA) test used for HCV diagnosis or patients tested for HCV before 1992.

Quality score of 10 items relevant to our research question that covers various methodological aspects of data collection:

1. the aim of the study was to report on the underlying etiology of cirrhosis in a group of patients (Yes/No)
2. the study population was an unselected population (e.g. all patients, all consecutive patients, randomized patients) (Yes/No)
3. the inclusion and exclusion criteria of the patients in the study were described (Yes/No)
4. the definition† of cirrhosis was described (Yes/No)
5. the numerator(s) added up correctly to the denominator defined by the authors (Yes/No)
6. the geographical location of the patients was explicitly identified in the main text (Yes/No)
7. the study recruitment period was mentioned (Yes/No)
8. the data-source of the population was described (Yes/No)
9. the tests used for detecting HBV and HCV infection were mentioned (Yes/No)
10. collection of patient data was prospective or cross-sectional (in contrast to retrospective) (Yes/No)

HBV=hepatitis B virus. HCC=hepatocellular carcinoma. HCV=hepatitis C virus. NALFD=non-alcoholic fatty liver disease.

*Transplant populations were included if all aetiologies were clearly identified and the group identified as ‘others’ was not >15% and the HCC group was identified as a separate group such that this group could be excluded from the denominator and numerator. We then subsequently extracted data on all aetiologies identified to be associated with cirrhosis of the liver.

†Under definition of cirrhosis we considered the study’s description or mentioning of the following items: development of clinical cirrhosis-related clinical complications, liver histology, liver imaging and/or non-invasive measurements of liver fibrosis stage (e.g. liver stiffness or other validated scoring systems).

Supplementary table 3: Pooled prevalence of HBV or HCV infection among patients with cirrhosis by country / territory, using fixed effect approach – systematic-review, 1993-2021

Country / Territory	HBV (%)	(95%CI)	HCV (%)	(95%CI)	REF
Oceania					
Australia	4%	(4% — 5%)	23%	(22% — 24%)	1-6
New Zealand	15%	(11% — 19%)	31%	(25% — 36%)	1
Northern Europe					
Denmark	1%	(0% — 3%)	4%	(2% — 6%)	7,8
Estonia	4%	(2% — 10%)	24%	(17% — 34%)	9
Finland	1%	(0% — 2%)	5%	(3% — 8%)	7
Iceland	3%	(1% — 5%)	16%	(11% — 20%)	10,11
Lithuania	5%	(3% — 8%)	36%	(31% — 41%)	12
Norway	5%	(4% — 7%)	18%	(15% — 21%)	7,13
Sweden	3%	(2% — 3%)	28%	(27% — 29%)	7,11,14-17
United Kingdom	3%	(3% — 4%)	18%	(17% — 19%)	18-22
Western Europe					
Austria	4%	(3% — 6%)	37%	(33% — 41%)	23,24
Belgium	4%	(3% — 5%)	17%	(15% — 19%)	25-27
France (metropolitan)	7%	(5% — 8%)	25%	(22% — 27%)	28-36
Germany	9%	(8% — 10%)	19%	(18% — 21%)	37-51
Switzerland	11%	(5% — 26%)	37%	(23% — 54%)	52
the Netherlands	8%	(5% — 14%)	9%	(5% — 15%)	53
Central and Eastern Europe					
Bulgaria	20%	(18% — 23%)	20%	(17% — 23%)	13,54
Czech republic	6%	(5% — 8%)	16%	(14% — 19%)	55-57
Hungary	6%	(3% — 9%)	25%	(20% — 31%)	58,59
Poland	18%	(17% — 19%)	24%	(23% — 25%)	60-65
Romania	28%	(25% — 30%)	26%	(24% — 29%)	66-69
Russian Federation	9%	(8% — 10%)	27%	(25% — 29%)	70-73
Slovakia	2%	(2% — 3%)	4%	(3% — 5%)	74
Ukraine	6%	(2% — 18%)	25%	(14% — 41%)	75
Southern Europe					
Albania	47%	(42% — 51%)	6%	(4% — 8%)	76,77
Bosnia and Herzegovina	36%	(29% — 44%)	20%	(14% — 26%)	78,79
Greece	21%	(19% — 24%)	31%	(28% — 34%)	58,80-83
Italy	14%	(13% — 14%)	55%	(54% — 56%)	84-118
North Macedonia	16%	(9% — 26%)	9%	(4% — 17%)	119
Portugal	1%	(1% — 1%)	6%	(6% — 6%)	9,13,120,121
Serbia	23%	(15% — 35%)	11%	(5% — 21%)	122
Spain	9%	(8% — 10%)	36%	(34% — 37%)	123-133
Caribbean and Central America					
Cuba	13%	(9% — 17%)	44%	(38% — 51%)	134,135
Guatemala	7%	(3% — 14%)	3%	(1% — 8%)	136
Mexico	2%	(2% — 3%)	33%	(31% — 34%)	137-145
South America					
Argentina	3%	(2% — 4%)	31%	(27% — 34%)	146,147
Brazil	11%	(10% — 12%)	37%	(36% — 38%)	148-165
Colombia	8%	(4% — 15%)	8%	(4% — 15%)	166
Peru	17%	(14% — 20%)	12%	(10% — 15%)	167-169
Uruguay	2%	(0% — 11%)	27%	(16% — 40%)	170
Northern America					
Canada	6%	(5% — 6%)	13%	(13% — 13%)	171-178
United States of America	3%	(3% — 3%)	31%	(31% — 31%)	179-214
South-Central Asia					
Bangladesh	66%	(56% — 76%)	7%	(2% — 14%)	215,216
India	16%	(16% — 17%)	14%	(14% — 15%)	217-258
Islamic Republic of Iran	32%	(31% — 34%)	11%	(9% — 12%)	259-267
Kazakhstan	57%	(46% — 67%)	14%	(8% — 24%)	268
Nepal	17%	(14% — 21%)	11%	(8% — 14%)	269-271
Pakistan	20%	(19% — 21%)	68%	(66% — 69%)	272-314
Sri Lanka	2%	(1% — 7%)	0%	(0% — 3%)	315
Western Asia					
Israel	11%	(9% — 13%)	42%	(39% — 45%)	316
Kuwait	8%	(4% — 14%)	48%	(39% — 57%)	224,317

Qatar	18%	(12% — 24%)	31%	(24% — 38%)	318,319
Saudi Arabia	23%	(20% — 26%)	52%	(49% — 56%)	320-323
Turkey	38%	(37% — 40%)	18%	(17% — 19%)	324-342
South-Eastern Asia					
Cambodia	45%	(33% — 59%)	34%	(23% — 47%)	343
Indonesia	24%	(17% — 31%)	54%	(47% — 62%)	344,345
Malaysia	25%	(15% — 36%)	20%	(11% — 30%)	346,347
Myanmar	27%	(19% — 38%)	41%	(31% — 52%)	348
Singapore	40%	(36% — 43%)	15%	(12% — 18%)	224,349-351
Thailand	29%	(25% — 33%)	28%	(25% — 32%)	352-361
Viet Nam	34%	(28% — 40%)	23%	(18% — 29%)	362-364
Eastern Asia					
China	71%	(71% — 72%)	4%	(3% — 4%)	224,365-402
Hong Kong, China	64%	(59% — 68%)	10%	(8% — 13%)	403
Taiwan, China	29%	(29% — 30%)	19%	(19% — 20%)	404-416
Japan	8%	(8% — 9%)	35%	(35% — 35%)	417-453
Mongolia	51%	(48% — 54%)	47%	(44% — 50%)	454,455
Republic of Korea	50%	(49% — 51%)	7%	(7% — 8%)	224,456-482
Sub-Saharan Africa					
Burkina Faso	76%	(70% — 82%)	15%	(10% — 20%)	483
Burundi	29%	(20% — 39%)	55%	(44% — 65%)	484
Cameroon	53%	(37% — 67%)	30%	(18% — 45%)	485
Democratic People Republic of Congo	35%	(28% — 42%)	11%	(7% — 16%)	486
Ethiopia	33%	(26% — 40%)	32%	(25% — 39%)	487,488
Gabon	33%	(23% — 45%)	36%	(25% — 48%)	489
Ghana	47%	(41% — 52%)	5%	(3% — 8%)	490,491
Kenya	27%	(14% — 44%)	0%	(0% — 11%)	492
Mali	53%	(40% — 66%)	15%	(8% — 27%)	493
Nigeria	49%	(41% — 56%)	5%	(2% — 9%)	494,495
Rwanda	16%	(10% — 26%)	48%	(37% — 59%)	496
Senegal	84%	(65% — 94%)	0%	(0% — 13%)	497
South Africa	19%	(12% — 30%)	23%	(15% — 34%)	498
The Gambia	59%	(49% — 68%)	9%	(5% — 17%)	499
Uganda	13%	(8% — 18%)	5%	(2% — 9%)	500,501
Northern Africa					
Egypt	3%	(3% — 4%)	92%	(91% — 94%)	198,502-515
Morocco	26%	(22% — 31%)	60%	(55% — 65%)	516
Sudan	56%	(43% — 67%)	2%	(0% — 9%)	517
Tunisia	36%	(30% — 43%)	32%	(26% — 39%)	518-520

CI=confidence interval. HBV=hepatitis B virus. HCV=hepatitis C virus.

Studies were included if they reported the number of patients with HBV and HCV in the population.

Many studies did not report on HBV and HCV co-infection. For those that did, we reassigned patients with dual infections to only HBV or only HCV according to a ratio equivalent to the overall prevalence of the two viruses in the corresponding study. For example, in a population of 100 patients, 20 patients had an HBV infection, 40 patients had an HCV infection, and six patients had a dual infection. In total 22 (=20+6*[20/(20+40)]) patients were assigned to the HBV group and 44 (=40+6*[40/(20+40)]) to the HCV group.

Supplementary table 4.a: Regional and global pooled prevalence of HBV and HCV infection among patients with cirrhosis weighted by different (burden) indicators

	Pooled prevalence of HBV (%)							Pooled prevalence of HCV (%)							HBV/HCV
	Weighting indicators*							Weighting indicators*							
	Pop.	Cirrhosis†					Cancer‡	Pop.	Cirrhosis†					Cancer‡	
	Size of population	Nr. cirrhosis death	DALY related to cirrhosis	Nr. decompensated cirrhosis	Nr. compensated cirrhosis	Nr. new liver cancer	Diff (max-min)	Size of population	Nr. cirrhosis death	DALY related to cirrhosis	Nr. decompensated cirrhosis	Nr. compensated cirrhosis	Nr. new liver cancer	Diff (max-min)	Range HBV/HCV ratio (min-max)
Oceania	7%	6%	6%	6%	7%	6%	1%	28%	28%	28%	28%	28%	28%	0%	(0.2 — 0.3)
Northern Europe	3%	3%	3%	3%	3%	3%	0%	20%	20%	20%	19%	20%	20%	1%	(0.2 — 0.2)
Western Europe	8%	9%	9%	8%	9%	8%	1%	21%	21%	21%	21%	21%	22%	1%	(0.4 — 0.4)
Central and Eastern Europe	12%	12%	11%	12%	12%	13%	2%	24%	25%	25%	24%	24%	24%	1%	(0.4 — 0.5)
Southern Europe	15%	14%	14%	15%	15%	14%	1%	38%	39%	38%	39%	40%	40%	2%	(0.4 — 0.4)
Caribbean and Central America	3%	2%	2%	2%	2%	3%	1%	25%	24%	24%	25%	25%	23%	2%	(0.1 — 0.1)
South America	9%	9%	9%	8%	9%	9%	1%	25%	27%	27%	24%	25%	26%	3%	(0.3 — 0.4)
North America	4%	4%	4%	4%	4%	4%	0%	36%	36%	36%	36%	36%	36%	0%	(0.1 — 0.1)
South-Central Asia	23%	23%	23%	24%	24%	23%	1%	20%	22%	23%	18%	19%	19%	5%	(1.0 — 1.3)
Western Asia	32%	31%	31%	31%	30%	35%	5%	27%	28%	29%	28%	30%	23%	7%	(1.0 — 1.5)
South-Eastern Asia	28%	28%	28%	29%	29%	30%	2%	41%	43%	43%	37%	38%	34%	9%	(0.7 — 0.9)
Eastern Asia	62%	58%	60%	58%	61%	61%	4%	11%	14%	12%	14%	11%	12%	3%	(4.1 — 5.6)
Sub-Saharan Africa	39%	40%	41%	41%	40%	41%	2%	14%	13%	13%	14%	14%	13%	1%	(2.8 — 3.2)
Northern Africa	22%	9%	10%	20%	18%	8%	14%	60%	80%	79%	63%	66%	83%	23%	(0.1 — 0.4)
Global	31%	26%	27%	32%	37%	42%	16%	22%	27%	26%	22%	20%	21%	7%	(1.0 — 2.0)

HBV=hepatitis B virus. HCV=hepatitis C virus. Nr=number. Pop.=population. Diff.=difference. Max=maximum.

Min=minimum. DALY=Disability-Adjusted Life Year.

*Weighting indicator used to weigh country-level data to obtain regional and global estimate.

†Cirrhosis related indicators were extracted from GBD 2017, Lancet 2020.

‡Liver related indicator was extracted from GLOBOCAN 2020.

Supplementary table 4.b: Weight of a region for different (burden) indicators

	Population	Cirrhosis*			Cancer†	
	Size of population	Nr. cirrhosis death	DALY related to cirrhosis	Nr. decompensated cirrhosis	Nr. compensated cirrhosis	Nr. new liver cancer
Oceania	<1%	<1%	<1%	<1%	<1%	<1%
Northern Europe	1%	1%	1%	2%	1%	1%
Western Europe	3%	3%	2%	5%	3%	3%
Central and Eastern Europe	4%	8%	8%	9%	7%	3%
Southern Europe	2%	2%	2%	4%	3%	3%
Caribbean and Central America	3%	4%	4%	4%	4%	2%
South America	5%	5%	4%	5%	2%	5%
Northern America	6%	5%	5%	6%	5%	3%
South-Central Asia	26%	25%	27%	11%	12%	6%
Western Asia	4%	2%	2%	4%	3%	1%
South-Eastern Asia	9%	13%	13%	3%	4%	11%
Eastern Asia	22%	15%	14%	35%	39%	54%
Sub-Saharan Africa	14%	12%	13%	9%	12%	4%
Northern Africa	3%	4%	4%	3%	4%	4%

Nr.=number. DALY=Disability-Adjusted Life Year.

*Cirrhosis related indicators were extracted from GBD 2017, Lancet 2020.

†Liver related indicators were extracted from GLOBOCAN 2020.

Due to rounding percentages do not always sum up to 100%.

Supplementary table 5: Sensitivity analyses: impact of different sensitivity analyses on regional and global prevalence – systematic-review on cirrhosis, 1993-2021

Complete dataset					
	Nr. Studies	Nr. Patients	HBV (%)	HCV (%)	Viral (%)
Oceania	9	13 316	6%	28%	34%
Northern Europe	22	14 905	3%	20%	23%
Western Europe	32	5 330	8%	22%	30%
Central and Eastern Europe	23	11 472	13%	24%	37%
Southern Europe	64	77 180	14%	40%	54%
Caribbean and Central America	12	3 873	3%	23%	26%
South America	26	6 431	9%	26%	35%
Northern America	52	1 030 895	4%	36%	40%
South-Central Asia	102	25 302	23%	19%	42%
Western Asia	28	6 479	35%	23%	58%
South-Eastern Asia	23	1 903	30%	34%	64%
Eastern Asia	126	175 293	61%	12%	73%
Sub-Saharan Africa	19	1 801	41%	13%	54%
Northern Africa	20	2 323	8%	83%	91%
World	558	1 376 503	42%	21%	63%
Scenario 1 - excluding studies with a score of <6					
	Nr. Studies	Nr. Patients	HBV (%)	HCV (%)	Viral (%)
Oceania	7	13 262	6%	29%	35%
Northern Europe	13	6 433	3%	23%	26%
Western Europe	12	2 587	6%	17%	23%
Central and Eastern Europe	9	4 925	9%	29%	38%
Southern Europe	36	72 675	13%	44%	57%
Caribbean and Central America	11	3 773	2%	28%	30%
South America	14	5 210	10%	28%	38%
Northern America	25	844 390	4%	34%	38%
South-Central Asia	67	18 773	23%	19%	42%
Western Asia	14	3 861	31%	26%	57%
South-Eastern Asia	13	1 230	29%	28%	57%
Eastern Asia	58	159 709	57%	11%	68%
Sub-Saharan Africa	15	1 516	39%	14%	53%
Northern Africa	7	970	6%	85%	91%
World	301	1 139 314	39%	20%	59%

Scenario 2 - excluding studies based on patients with 'compensated cirrhosis' only					
	Nr. Studies	Nr. Patients	HBV (%)	HCV (%)	Viral (%)
Oceania	9	13 316	6%	28%	34%
Northern Europe	22	14 905	3%	20%	23%
Western Europe	29	4 851	9%	22%	31%
Central and Eastern Europe	23	11 472	13%	24%	37%
Southern Europe	62	76 778	15%	40%	55%
Caribbean and Central America	11	3 757	3%	22%	25%
South America	25	5 619	9%	25%	34%
Northern America	50	1 030 436	4%	36%	40%
South-Central Asia	99	24 865	23%	19%	42%
Western Asia	28	6 479	35%	23%	58%
South-Eastern Asia	20	1 487	30%	34%	64%
Eastern Asia	119	174 067	61%	12%	73%
Sub-Saharan Africa	19	1 801	41%	13%	54%
Northern Africa	20	2 323	8%	83%	91%
World	536	1 372 156	42%	21%	63%
Scenario 3 - excluding studies based on 'waiting list patients' or 'transplant patients'					
	Nr. Studies	Nr. Patients	HBV (%)	HCV (%)	Viral (%)
Oceania	5	10 859	5%	22%	27%
Northern Europe	15	5 571	8%	22%	30%
Western Europe	19	3 290	6%	19%	25%
Central and Eastern Europe	19	8 048	13%	25%	38%
Southern Europe	46	71 018	14%	43%	57%
Caribbean and Central America	12	3 873	3%	23%	26%
South America	20	5 663	10%	26%	36%
Northern America	34	869 323	3%	34%	37%
South-Central Asia	91	23 157	24%	19%	43%
Western Asia	23	5 333	33%	23%	56%
South-Eastern Asia	19	1 667	30%	33%	63%
Eastern Asia	110	171 364	60%	12%	72%
Sub-Saharan Africa	19	1 801	41%	13%	54%
Northern Africa	18	2 194	8%	83%	91%
World	450	1 183 161	41%	20%	61%

HBV=hepatitis B virus. HCV=hepatitis C virus. Nr=number.

Supplementary table 6: Pooled prevalence of heavy alcohol consumption and non-alcoholic fatty liver disease among patients with cirrhosis by country / territory – systematic-review, 1993-2021

Country / Territory	Heavy alcohol use					NAFLD				
	Nr. of studies (n)	Nr. of patients (n)	Heavy alcohol consumption (%)	(95%CI)	REF†	Nr. of studies (n)	Nr. of patients (n)	NAFLD (%)	(95%CI)	REF†
Oceania										
Australia	8	13 044	37%	(31% — 42%)	1-6	7	13 016	10%	(6% — 16%)	1-5
New Zealand	1	272	15%	(12% — 20%)	1	1	272	18%	(14% — 23%)	1
Northern Europe										
Denmark	2	366	39%	(34% — 44%)	7,8	1	90	2%	(1% — 8%)	8
Estonia	1	98	40%	(31% — 50%)	9	1	98	0%	(0% — 4%)	9
Finland	1	296	24%	(20% — 30%)	7					
Iceland	2	255	40%	(34% — 46%)	10,11	1	157	22%	(16% — 29%)	10
Lithuania	1	334	51%	(46% — 57%)	12					
Norway	1	422	16%	(13% — 20%)	7					
Sweden	8	5203	41%	(27% — 56%)	7,11,14-17	4	3207	8%	(5% — 13%)	14,16
United Kingdom	5	7497	41%	(33% — 50%)	18-22	3	1048	13%	(11% — 15%)	19-21
Western Europe										
Austria	2	577	35%	(31% — 39%)	23,24	1	209	9%	(6% — 13%)	23
Belgium	4	950	65%	(62% — 68%)	25-27	2	434	9%	(6% — 12%)	25
France (metropolitan)	9	1363	65%	(53% — 76%)	28-36	2	232	4%	(2% — 7%)	30,33
Germany	15	2250	42%	(31% — 52%)	37-51	2	161	12%	(7% — 17%)	37,39
Switzerland	1	35	20%	(10% — 36%)	52					
The Netherlands	1	155	39%	(31% — 47%)	53	1	155	7%	(4% — 12%)	53
Central and Eastern Europe										
Czech republic	3	917	40%	(29% — 52%)	55-57					
Hungary	1	238	76%	(70% — 81%)	58	1	238	0%	(0% — 2%)	58
Poland	4	3 375	29%	(20% — 38%)	60,62-64					
Romania	4	1048	39%	(16% — 65%)	66-69					
Russian Federation	4	2592	40%	(32% — 49%)	70-73	1	1512	6%	(5% — 7%)	70
Slovakia	1	1383	61%	(59% — 64%)	74	1	1383	8%	(7% — 10%)	74
Ukraine	1	36	78%	(62% — 88%)	75					
Southern Europe										
Albania	4	581	40%	(17% — 65%)	76,77	3	325	5%	(3% — 8%)	76
Bosnia and Herzegovina	2	160	28%	(21% — 35%)	78,79					

Greece	5	1084	31%	(19% — 44%)	58,80-83	4	1038	4%	(0% — 17%)	58,80,82,83
Italy	31	10 984	22%	(18% — 27%)	84,85,87-90,93-101,103-117	10	5215	6%	(3% — 11%)	84,85,87-90,95,102,106
North Macedonia	1	70	51%	(40% — 63%)	119					
Portugal	3	58 810	59%	(30% — 85%)	9,120,121	1	59	7%	(3% — 16%)	9
Serbia	1	65	49%	(37% — 61%)	122					
Spain	11	2891	54%	(46% — 61%)	123-132					
Caribbean and Central America										
Cuba	2	237	17%	(12% — 22%)	134,135	1	116	9%	(5% — 15%)	134
Guatemala	1	100	52%	(42% — 62%)	136					
Mexico	9	3536	45%	(33% — 59%)	137-145	3	1537	10%	(1% — 26%)	137,139,142
South America										
Argentina	3	650	39%	(27% — 52%)	146,147	1	138	4%	(2% — 8%)	147
Brazil	17	4985	48%	(38% — 57%)	148-153,155-165	7	2480	2%	(1% — 3%)	148,151,153,155-158
Colombia	1	89	44%	(34% — 54%)	166					
Peru	3	593	32%	(24% — 40%)	167-169	1	475	3%	(1% — 4%)	168
Uruguay	1	49	31%	(20% — 45%)	170	1	49	16%	(9% — 29%)	170
Northern America										
Canada	8	164 085	27%	(20% — 36%)	171-178	7	164 015	18%	(3% — 41%)	171-177
United States of America	44	866 810	29%	(26% — 32%)	179-210,212-214	29	824 336	13%	(10% — 15%)	180-190,192-194,196,197,200-204,210
South-Central Asia										
Bangladesh	1	50	2%	(0% — 10%)	216	1	35	3%	(1% — 15%)	215
India	34	12 919	41%	(36% — 47%)	217-225,227- 244,248,249,251,252,254,256	15	8867	9%	(5% — 14%)	218,220,222-227,230,233,234,237,239,241
Islamic Republic of Iran	4	368	5%	(0% — 15%)	261,262,266,267					
Nepal	3	366	67%	(31% — 95%)	269-271					
Pakistan	16	2487	3%	(2% — 5%)	274,276,281-283,286,288- 290,293,298,301,305,307,308,312	5	1083	8%	(2% — 18%)	272,276,282,288,289
Sri Lanka	1	107	30%	(22% — 39%)	315					
Western Asia										
Israel	1	1048	18%	(16% — 21%)	316	1	1048	18%	(15% — 20%)	316
Kuwait	1	100	7%	(3% — 14%)	224	2	124	18%	(12% — 26%)	224,317
Qatar	2	171	33%	(26% — 40%)	318,319					
Saudi Arabia	2	521	2%	(1% — 3%)	321,323					
Turkey	19	4292	7%	(5% — 10%)	324-342	4	1151	8%	(1% — 20%)	324,325,327,336
South-Eastern Asia										
Indonesia	1	86	0%	(0% — 4%)	345					
Malaysia	2	75	10%	(4% — 18%)	346,347	2	75	13%	(6% — 21%)	346,347
Singapore	4	663	7%	(1% — 18%)	224,349-351	2	255	18%	(13% — 23%)	224,349
Thailand	9	552	28%	(14% — 46%)	352-360	8	497	5%	(3% — 7%)	352-359
Viet Nam	2	127	26%	(19% — 34%)	362,363	1	80	6%	(3% — 14%)	362
Eastern Asia										
China	32	17 411	11%	(7% — 15%)	224,365-371,373,374,376,377,379- 388,390-395,397-400	2	1682	2%	(1% — 3%)	224,386
Hong Kong, China	1	466	5%	(3% — 7%)	403	1	466	18%	(14% — 21%)	403
Taiwan, China	11	22 290	26%	(18% — 35%)	404,405,407-409,411-413,415,416					

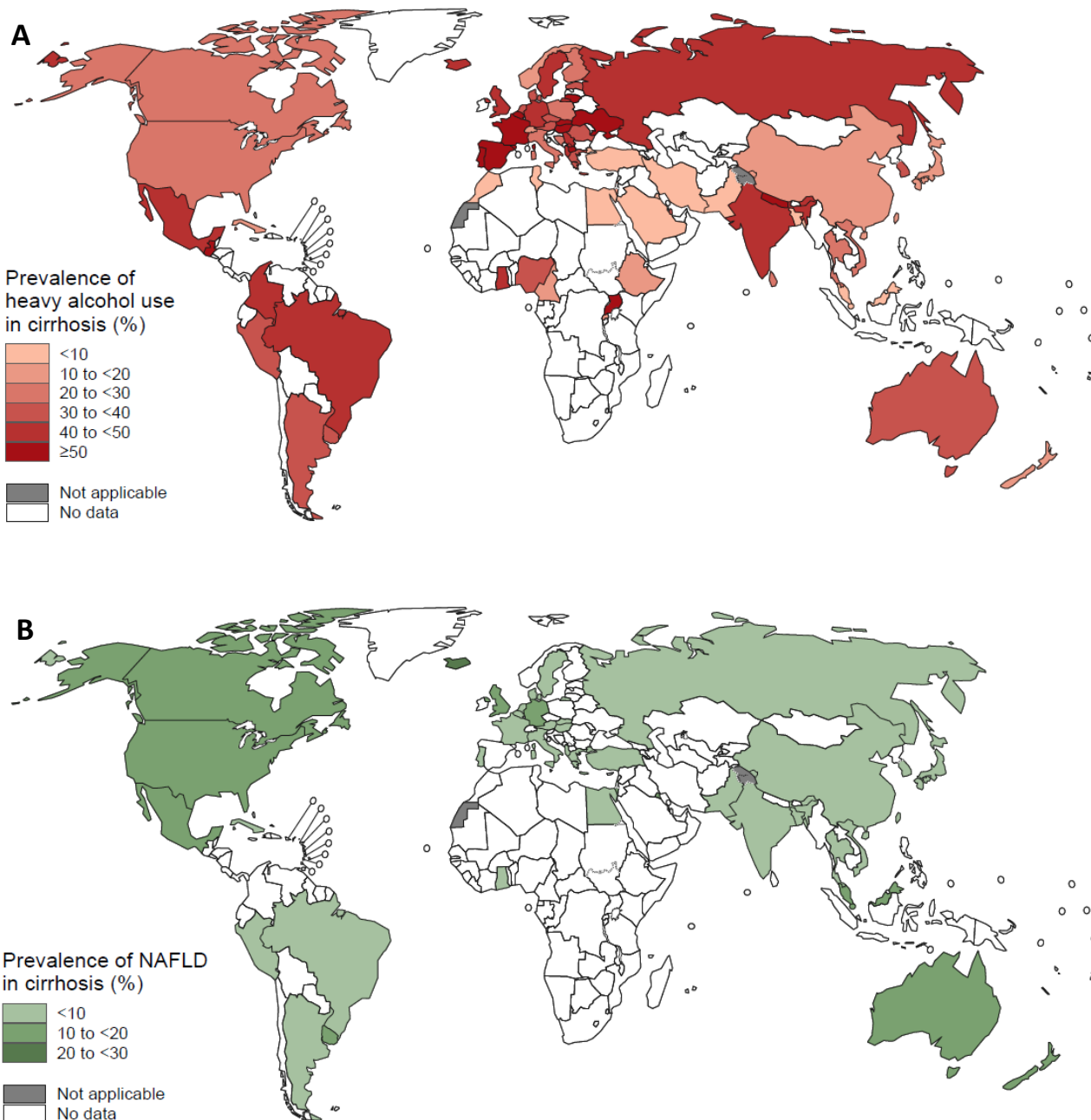
Japan	32	103 866	18%	(16% — 20%)	417-419,421,423-439,441,442,444-448,451,452	14	34 985	8%	(6% — 10%)	418,420,423-427,431,436-439
Republic of Korea	27	21 884	33%	(28% — 38%)	224,456-467,470-472,474-481	6	17 013	2%	(0% — 4%)	224,456,472,477
Sub-Saharan Africa										
Cameroon	1	40	18%	(9% — 32%)	485					
Ethiopia	1	24	17%	(7% — 36%)	487					
Ghana	2	335	42%	(37% — 48%)	490,491	2	335	2%	(0% — 3%)	490,491
Nigeria	1	40	38%	(24% — 53%)	495					
Rwanda	1	79	16%	(10% — 26%)	496					
Uganda	1	85	55%	(45% — 65%)	501					
Northern Africa										
Egypt	2	165	3%	(1% — 7%)	502,514	1	322	2%	(1% — 4%)	508
Morocco	1	360	1%	(0% — 2%)	516					
Tunisia	2	81	5%	(1% — 11%)	518,519					

NAFLD=Non-Alcoholic Fatty Liver Disease. CI=confidence interval. Nr=number. REF=reference.

†Listed references are cited under the corresponding number in Appendix 1.

Studies were only included if they reported the number of patients with HBV and HCV in the population. The etiologies of heavy alcohol consumption and NAFLD were extracted when this information was also reported, as a result not all countries have data on these etiologies and the number of studies and patients on which these estimates are based is lower than for HBV and HCV.

Empty cells mean that this information was not available for NAFLD.



Supplementary Figure 1: Country specific pooled prevalence of heavy alcohol use (A) and NAFLD (B) among patients with cirrhosis – systematic-review, 1993-2021

NAFLD=Non-Alcoholic Fatty Liver Disease.

The designations used and the presentation of the material in this Article do not imply the expression of any opinion whatsoever on the part WHO and the IARC about the legal status of any country, territory, city, or area, or of its authorities, or concerning the delimitation of its frontiers or boundaries.

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