Supplementary Online Content

Hirode G, Saab S, Wong RJ. Trends in the burden of chronic liver disease among hospitalized US adults. *JAMA Netw Open*. 2020;3(4):e201997. doi:10.1001/jamanetworkopen.2020.1997
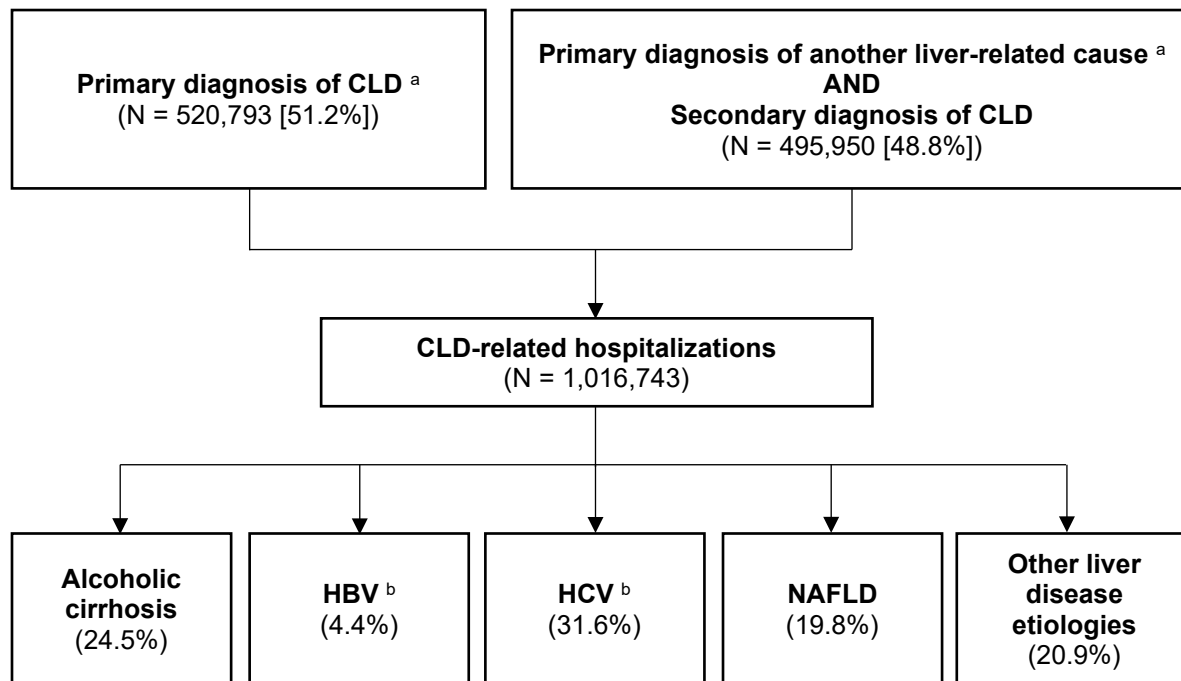
This supplementary material has been provided by the authors to give readers additional information about their work.

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│  Primary diagnosis of CLD ᵃ │   │ Primary diagnosis of another liver-related cause ᵃ │
│  (N = 520,793 [51.2%])      │   │                    AND                            │
│                             │   │        Secondary diagnosis of CLD                 │
│                             │   │        (N = 495,950 [48.8%])                      │
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Primary diagnosis of CLD [a]
(N = 520,793 [51.2%])

Primary diagnosis of another liver-related cause [a]
AND
Secondary diagnosis of CLD
(N = 495,950 [48.8%])

CLD-related hospitalizations
(N = 1,016,743)

Alcoholic cirrhosis
(24.5%)

HBV [b]
(4.4%)

HCV [b]
(31.6%)

NAFLD
(19.8%)

Other liver disease etiologies
(20.9%)

eFigure. Flow diagram for the identification of CLD-related hospitalizations and categorization into the etiologies of interest for trends analysis.
[a] See eTable 1 and eTable 2 for ICD codes.
[b] 12,910 hospitalizations were co-infected with HBV and HCV, and were included in both sub-cohorts.

eTable 1. List of ICD codes used in CLD definition.

	ICD-9-CM	ICD-10-CM
Definition of chronic liver disease-related diagnosis		
Acute and subacute necrosis of liver	570	K72.0x, K76.2
Chronic liver disease and cirrhosis	571.xx	K70.xx, K72.1x, K73.x, K74.xx, K75.4, K75.8x, K76.0, K76.89, K76.9
Liver abscess and sequelae of chronic liver disease	572.x	K72.9x, K75.0-1, K76.6-7
Malignant neoplasm of liver and intrahepatic bile duct	155.x	C22.0-2, C22.7-9
Other disorders of the liver	573.x	K71.0-1x, K71.3-9, K72, K75, K75.3, K75.9, K76.1, K76.8x, K76.9, K77
Viral hepatitis	070.xx, V02.6x	B15.x - B19.xx
Diagnosis of another liver-related cause		
Acute kidney injury	593.9	N17.9, N28.9
Ascites	789.5x	K70.11, K70.31, K71.51, R18.x
Cellulitis	681.xx, 682.x	K12.2, L03.01x, L03.03x, L03.11x, L03.211, L03.213, L03.221, L03.31x, L03.81x, L03.90
Cholangitis	576.1	K83.0x
Encephalopathy	348.3x, 572.2	G93.4x, K72.xx
Esophageal varices	456.0-2x	I85.xx
Gastrointestinal hemorrhage	578.x	K92.0-2
Hepatorenal syndrome	572.4	K76.7
Hydrothorax	511.89	J90, J94.8
Hyponatremia	276.1	E87.1
Infection (including sepsis, pneumonia)	008.xx, 009.x, 038.xx, 041.xx, 480.x - 487.x	A04.xx, A08.xx, A09, A40.x, A41.x, A48.1, A48.3, A48.8, A49.0x, A49.1, A49.8-9, B25.0, B44.0, B44.1, B49, B95.xx, B96.xx, J10.0x, J11.0x, J12.xx, J13, J14, J15.xx, J16.x, J17, J18.0-1, J18.9
Jaundice	782.4	R17
Liver failure	570	K70.4x, K72.xx
Peritonitis	567.xx	K65.x, K67, K68.12, K68.19, K68.9
Portal hypertension	572.3	K76.6
Portal vein thrombosis or deep vein thrombosis	451.xx - 454.x	I80.1x - I80.9, I81, I82.0 - I82.70x, I82.72x, I82.Axx - I82.Cxx, I82.89x, I82.9x
Renal failure	585.x, 586, 794.4	N18.x, N19, R94.4
Sepsis	038.xx, 785.52, 995.91, 995.92	A40.x, A41.x, R65.2x
Volume overload or dehydration	276.51, 276.6x, 782.3	E86.0, E87.7x, R60.x

eTable 2. List of ICD codes used for other definitions.

	ICD-9-CM	ICD-10-CM
Autoimmune hepatitis	571.42	K75.4
Alcohol use disorder	291.xx, 303.xx, 305.0x, 357.5, 425.5, 571.0-3, V11.3	F10.xxx, G62.1, I42.6, K70.xx
Budd-Chiari syndrome	453.0	I82.0
Coronary artery disease	414.xx	I25.xxx
Congestive heart failure	398.91, 402.01, 402.11, 402.91, 404.01, 404.03, 404.11, 404.13, 404.91, 404.93, 428.xx, 429.4, 997.1	I09.81, I11.0, I13.0, I13.2, I50.xxx, I97.0, I97.110, I97.130, I97.190, I97.710, I97.790, I97.88, I97.89
Chronic liver disease with mention of alcohol	571.0-3	K70.xx
Chronic passive congestion of liver	573.0	K76.1
Cirrhosis	571.2, 571.5, 567.23, 572.2, 572.4, 456.0-2x, 789.5x	I85.xx, K65.2, K70.11, K70.2-4x, K71.51, K71.7, K72.xx, K74.0-2, K74.6x, K76.7, R18.x
Chronic kidney disease	585.x, 586, 794.4	N18.x, N19, R94.4
Clonorchiasis	121.1	B66.1
Diabetes	250.xx	E10.xxxx - E11.xxxx
Disorders of porphyrin and bilirubin metabolism	277.1, 277.4	E80.xx
Dyslipidemia	272.0-4	E78.0x-5
Echinococcus of liver	122.0, 122.5, 122.8	B67.0, B67.5, B67.8
Fascioliasis	121.3	B66.3
Gaucher disease	272.7	E75.21-22, E75.249, E77.0-1
Hemachromatosis	275.0x	E83.1xx
Hepatitis A virus	070.0, 070.1	B15.x
Hepatitis B virus	070.2x, 070.3x, V02.61	B16.x, B18.0-1, B19.1x
Hepatitis C virus	070.41, 070.44, 070.51, 070.54, 070.7x, V02.62	B17.1x, B18.2, B19.2x
Hepatic encephalopathy	572.2	K72.xx
Hepatocellular carcinoma	155.0	C22.0, C22.7, C22.8
Hypertension	401.x	I10, I16.xx
Lysosomal acid lipase deficiency and other lipoid disorders	272.8-9	E78.8x, E78.9
Obesity	278.00, 278.01, 278.03, V85.3x, V85.4x	E66.0x-2, E66.8-9, Z68.3x-4x
Opisthorchiasis	121.0	B66.0
Other amyloidosis	277.3x	E85.xx
Other deficiencies of circulating enzymes	277.6	D84.1

Other specified/unspecified disorders of the liver	573.1-3, 573.8-9	K71.xx, K74.4, K75.0-4, K76.2-5
Other viral hepatitis	070.4, 070.42, 070.43, 070.49, 070.5, 070.52, 070.53, 070.59, 070.6, 070.9, 571.4, 571.40, 571.41, 571.49, V02.6, V02.60, V02.69	B17.0, B17.2, B17.8-9, B18.8-9, B19.0, B19.9, K71.6, K73.x
Pneumonia	480.x - 486, 487.0	A37.01, A37.11, A37.81, A37.91, A48.1, B25.0, B44.0, B44.1, J10.0x, J11.0x, J12.xx, J13, J14, J15.xx, J16.x, J17, J18.0-1, J18.9
Primary biliary cholangitis	571.6	K74.3, K74.5
Primary sclerosing cholangitis	576.1	K83.01
Stroke	430 - 438.xx	G45.x, G46.x, I60.xx - I69.xx
Syphilis of the liver	095.3	A52.74
Wilson's disease	275.1	E83.0x

eTable 3. Regression models for trends in in-hospital mortality and mean hospitalization costs among CLD-related hospitalizations[a].

	In-hospital mortality		Mean hospitalization costs	
	OR (95% CI)	P	% change (95% CI)	P
Year	0.96 (0.95-0.96)	<0.001	0.62% (0.07% - 1.18%)	0.028

[a] Adjusted for demographic (age, sex, race and insurance status), etiologies (presence of hepatitis B virus, hepatitis C virus, alcoholic cirrhosis, nonalchoholic fatty liver disease), presence of hepatocellular carcinoma, presence of cirrhosis and complications (0, 1, ≥2), and comorbidities (coronary artery disease, congestive heart failure, chronic kidney disease, diabetes, dyslipidemia, hypertension, obesity, pneumonia, stroke).