Outcomes following SARS-CoV-2 infection in patients with chronic liver disease: An international registry study

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Fig. S1 – Non-CLD cohort selection

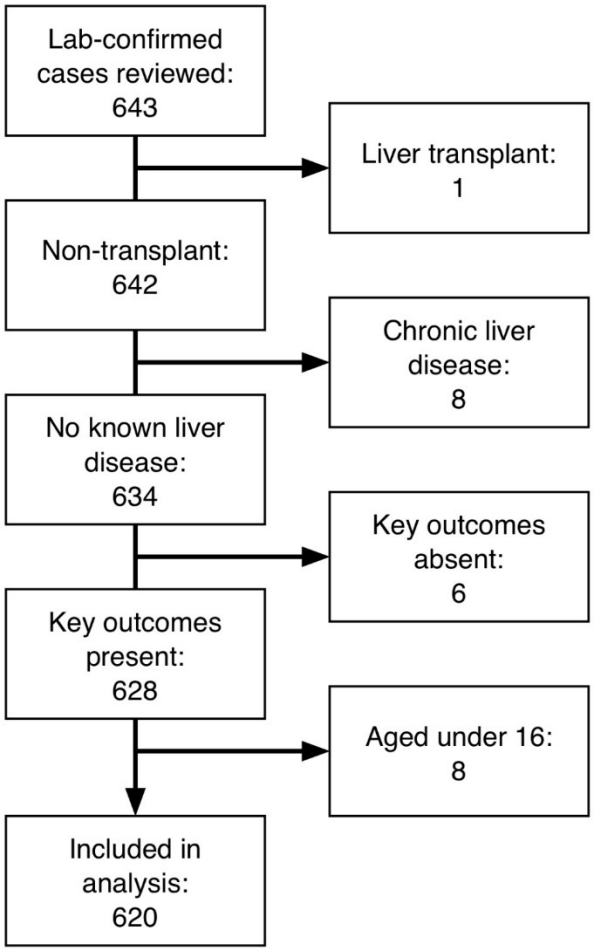

Fig. S1. Total submissions of consecutive patients testing positive for SARS-CoV-2 at Oxford University Hospitals NHS Foundation Trust and the number included in the final analysis after exclusions

Fig. S1 – Countries of origin of CLD cohort

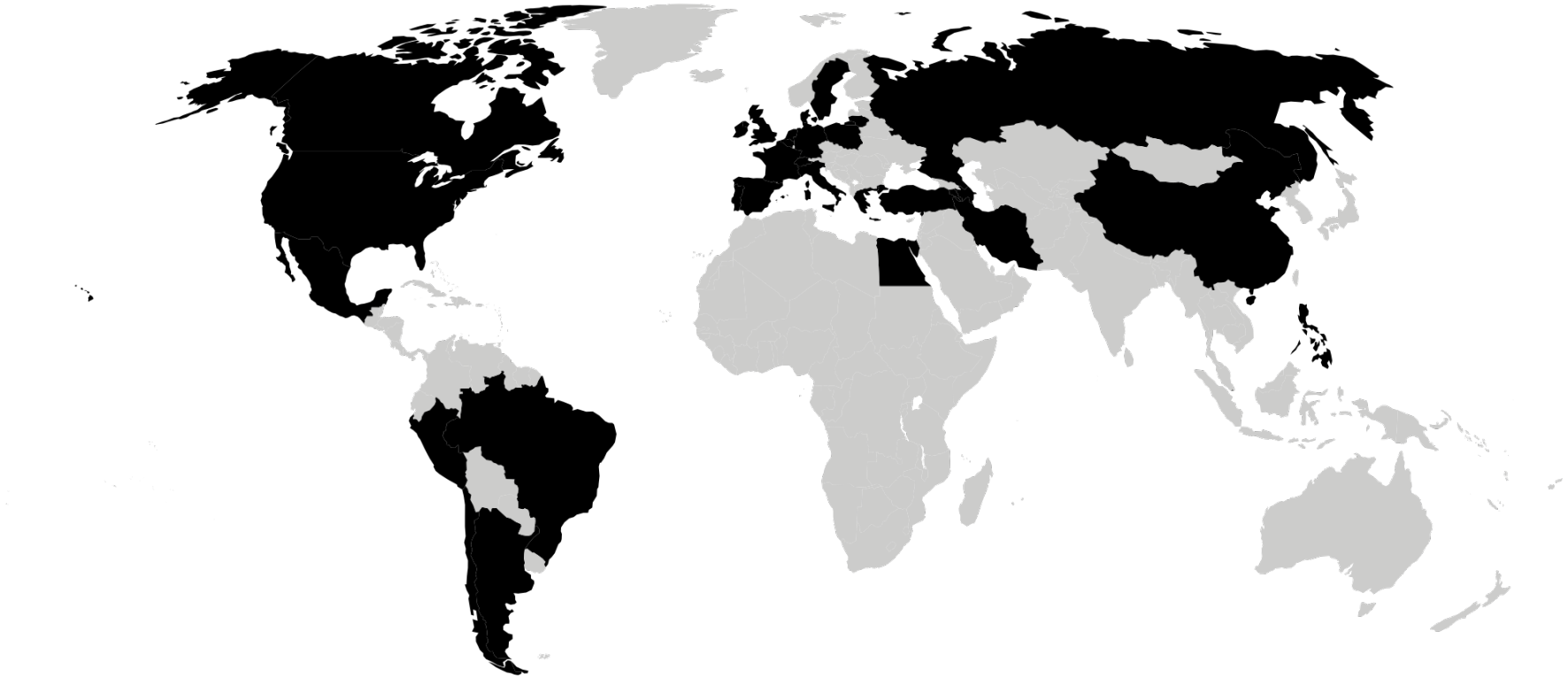

Fig. S2. World map showing countries contributing patients with CLD and SARS-CoV-2 infection between 25th March and 8th July 2020 which were included in the final analysis.

Fig. S3 – Accuracy of prognostic scores in predicting mortality in patients with cirrhosis

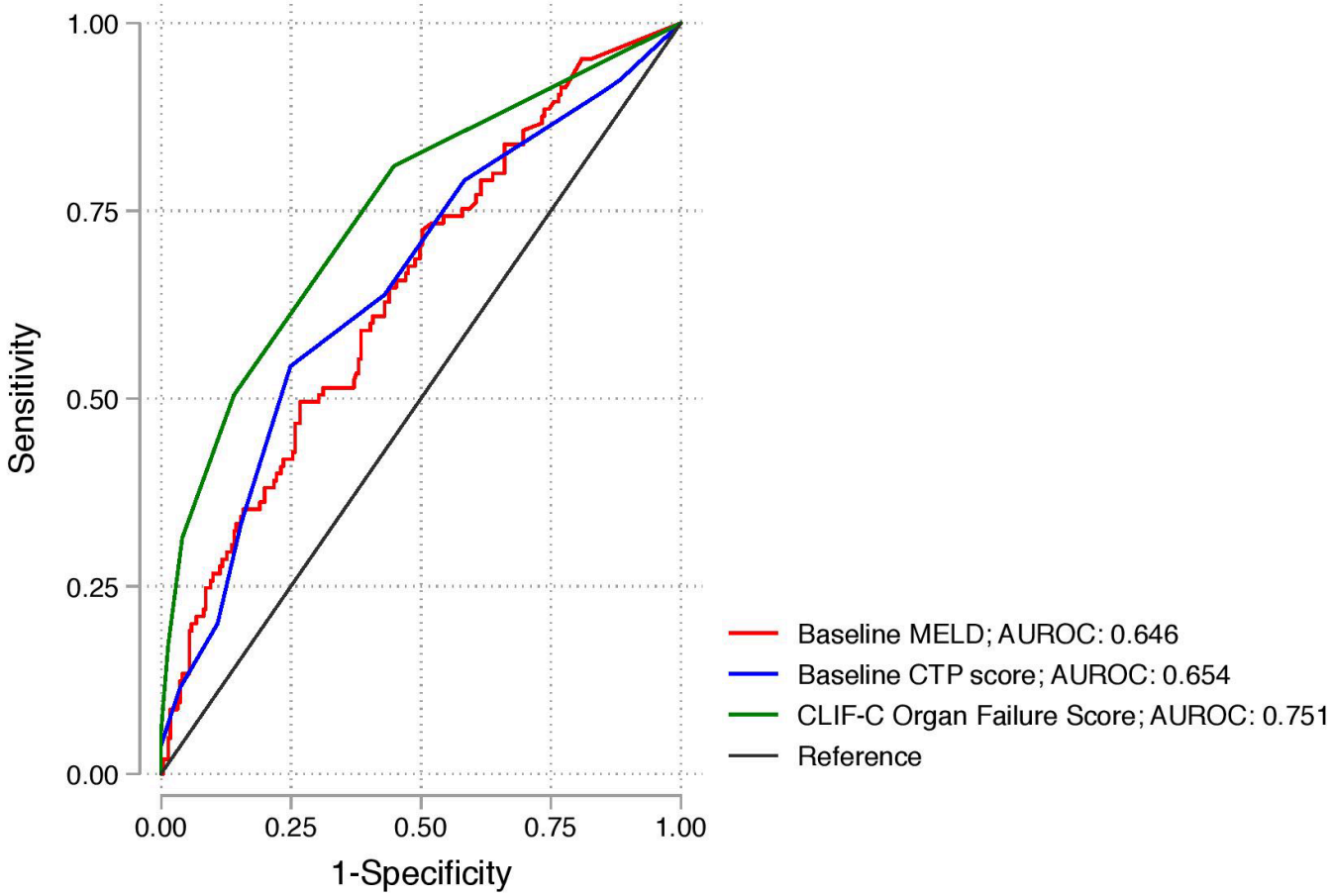

Fig. S3. Receiver operating characteristic (ROC) curves and the area under the curve (AUC) to determine the score accuracy of baseline CTP score, baseline MELD, and CLIF-C organ failure score as predictors of mortality following SARS-CoV-2 in patients with cirrhosis. AUC of baseline CTP score, baseline MELD, and CLIF-C organ failure score were 0.65, 0.64, and 0.75 respectively.

Table S1 – Submitting countries

Country	Submissions	Percentage
UK	184	24.7
USA	183	24.6
China	118	15.8
Spain	63	8.5
Singapore	30	4.0
Egypt	29	3.9
Mexico	27	3.6
Iran	18	2.4
Turkey	14	1.9
Italy	13	1.7
Sweden	11	1.5
Belgium	8	1.1
Germany	8	1.1
Canada	6	0.8
Azerbaijan	5	0.7
France	5	0.7
Peru	5	0.7
Lithuania	3	0.4
Argentina	2	0.3
Brazil	2	0.3
Ireland	2	0.3
Portugal	2	0.3
Armenia	1	0.1
Chile	1	0.1
Denmark	1	0.1
Greece	1	0.1
Philippines	1	0.1
Poland	1	0.1
Russia	1	0.1

Table S1. List of all countries contributing cases which were included in final analyses.

Table S2 – List of CLD aetiologies

Aetiology	Cases	Percentage
NAFLD	286	38.4
Alcohol	133	17.9
HBV	75	10.1
HCV	63	8.5
Other	43	5.8
AIH	42	5.6
Alcohol HCV	23	3.1
NAFLD Alcohol	15	2.0
NAFLD HBV	10	1.3
AIH PBC	7	0.9
PSC	7	0.9
HFE	6	0.8
PBC	5	0.7
Alcohol Other	4	0.5
NAFLD HCV	4	0.5
HCV HBV	3	0.4
AIH PSC	2	0.3
Alcohol HBV	2	0.3
HBV Other	2	0.3
NAFLD AIH	2	0.3
NAFLD Other	2	0.3
AIH PSC IGG4	1	0.1
Alcohol AIH	1	0.1
HCV HFE	1	0.1
HCV Other	1	0.1
NAFLD Alcohol Other	1	0.1
NAFLD HCV Other	1	0.1
NAFLD IGG4	1	0.1
PSC IGG4	1	0.1
Wilson	1	0.1

Table S2. List and relative proportions of CLD aetiologies (and combination of aetiologies) for cases included in the final analyses. NAFLD = non-alcoholic fatty liver disease; HBV = chronic hepatis B virus infection; HCV = chronic hepatitis C virus infection; AIH = autoimmune hepatitis; PSC = primary sclerosing cholangitis; HFE = HFE-related hereditary haeochromatosis; PBC = primary biliary cholangitis; IGG4 = IgG4 related disease

Table S3 – Patient characteristics of the total CLD cohort compared to the non-CLD cohort.

	CLD	Non-CLD	p value
	n = 745	n = 620	
Demographics			
Age (years)	59 (47-68)	73 (55-84)	**<0.001**
Sex (male)	465 (62%)	324 (52%)	**<0.001**
Ethnicity (white)	363 (49%)	426 (69%)	**<0.001**
Co-factors			
Smoker	51 (7%)	7 (1%)	**<0.001**
Obesity	207 (28%)	155 (25%)	0.268
Heart disease	146 (20%)	198 (32%)	**<0.001**
Diabetes mellitus	142 (23%)	274 (37%)	**<0.001**
Hypertension	303 (41%)	235 (38%)	0.317
COPD	56 (8%)	41 (7%)	0.528
Non HCC cancer	68 (11%)	42 (6%)	**<0.001**
HCC	48 (6%)	0 (0%)	**<0.001**
Creatinine (mg/dl)	0.9 (0.7-1.0)	0.9 (0.7-1.1)	**0.021**
Major outcomes			
Hospitalisation	668 (90%)	467 (75%)	**<0.001**
ICU requirement	235 (32%)	179 (29%)	0.288
ICU admission	177 (24%)	51 (8%)	**<0.001**
RRT	32 (4%)	2 (0%)	**<0.001**
Ventilation	132 (18%)	31 (5%)	**<0.001**
Death	150 (25%)	160 (26%)	**0.014**

Table S3. Demographics, co-factors and major outcomes for the total CLD and non-CLD cohorts. HCC = hepatocellular carcinoma; COPD = chronic obstructive pulmonary disease; ICU = intensive care unit; RRT = new requirement for renal replacement therapy.

Table S4 – Target antiviral treatments used in the CLD cohort.

	Total CLD cohort	CLD without cirrhosis	CLD with cirrhosis
Drug	**n=745**	**n=359**	**n=386**
Hydroxychloroquine	162 (22%)	78 (22%)	84 (22%)
Lopinovir/Ritonavir	114 (15%)	95 (26%)	19 (5%)
Interferon alpha	69 (9%)	64 (18%)	5 (1%)
Remdesivir	21 (3%)	8 (2%)	13 (3%)
Azithromycin	21 (3%)	15 (4%)	6 (2%)
Anti-IL6 therapy	17 (2%)	12 (3%)	5 (1%)
Umifenovir	16 (2%)	6 (2%)	10 (3%)
Oseltamivir	9 (1%)	1 (<1%)	8 (2%)
Corticosteroids	6 (1%)	6 (2%)	0
Convalescent plasma	6 (1%)	3 (1%)	3 (1%)
Favipiravir	6 (6%)	3 (1%)	3 (1%)
Ribavirin	3 (<1%)	2 (1%)	1 (<1%)
Interferon beta	3 (<1%)	3 (1%)	0
Darunavir/cobicistat	2 (<1%)	1 (<1%)	1 (<1%)
Dolutegravir	1 (<1%)	0	1 (<1%)
Anakinra	1 (<1%)	1 (<1%)	0
Any targeted COVID-19 treatment	315 (42%)	186 (52%)	129 (33%)

Table S4. List of all targeted antiviral treatments used in the total cohort of patients with CLD and laboratory proven SARS-CoV-2 infection separated into those with and without cirrhosis.

Table S5 – Patient characteristics separated by stage of liver disease

	CLD without cirrhosis	CTP-A	CTP-B	CTP-C
	n=359	n=171	n=124	n=91
Demographics				
Age (years)	55 (43-66)	64 (54-73)	62 (54-68)	58 (48-63)
Sex (male)	216 (60%)	104 (61%)	84 (68%)	61 (67%)
Ethnicity (white)	124 (35%)	98 (57%)	80 (65%)	61 (67%)
Aetiology				
NAFLD	220 (62%)	55 (32%)	32 (26%)	15 (16%)
ALD	21 (6%)	46 (27%)	58 (47%)	54 (59%)
HBV	55 (15%)	27 (16%)	5 (4%)	5 (5%)
HCV	24 (7%)	37 (22%)	25 (20%)	10 (11%)
Co-factors				
Smoker	15 (4%)	13 (8%)	11 (9%)	12 (13%)
Obesity	103 (29%)	48 (28%)	34 (27%)	22 (24%)
Heart disease	49 (14%)	49 (29%)	33 (27%)	15 (16%)
Diabetes mellitus	123 (34%)	76 (44%)	51 (41%)	24 (26%)
Hypertension	143 (40%)	75 (44%)	53 (43%)	32 (35%)
COPD	22 (6%)	12 (7%)	13 (10%)	9 (10%)
HCC	2 (1%)	30 (18%)	9 (7%)	7 (8%)
Non-HCC malignancy	15 (4%)	15 (9%)	8 (7%)	4 (4%)
Creatinine (mg/dl)	0.8 (0.7-1.0)	0.8 (0.6-1.0)	0.9 (0.7-1.4)	0.9 (0.7-1.2)
Major outcomes				
Hospitalisation	323 (90%)	150 (88%)	111 (90%)	84 (92%)
ICU requirement	80 (22%)	57 (33%)	48 (39%)	50 (55%)
ICU admission	69 (19%)	40 (23%)	34 (27%)	34 (37%)
RRT	11 (3%)	4 (2%)	6 (5%)	11 (12%)
Invasive ventilation	61 (17%)	27 (16%)	23 (19%)	21 (23%)
Death	27 (8%)	33 (19%)	44 (35%)	46 (51%)

Table S5. Demographics, liver disease aetiology, co-factors and major outcomes for all 745 CLD patients separated according to liver disease stage (CLD without cirrhosis, CTP-A, CTP-B and CTP-C cirrhosis). NAFLD = non-alcoholic fatty liver disease; ALD = alcohol related liver disease; HBV = chronic hepatis B virus infection; HCV = chronic hepatitis C virus infection; HCC = hepatocellular carcinoma; COPD = chronic obstructive pulmonary disease; RRT = new requirement for renal replacement therapy.

Table S6 – Patient characteristics of cirrhosis cohort and factors associated with death following SARS-CoV-2 infection

	Cohort		Survived		Died		Univariable		Multivariable 1		Multivariable 2	
	n=386		n=263		n=123							
Variable	n or median	% or IQR	n or median	% or IQR	n or median	% or IQR	OR (95%CI)	p	OR (95%CI)	p	OR (95%CI)	p
Age (years)	61	(53–70)	62	(50–70)	61	(54–71)	1.00 (0.99–1.02)	0.549	1.02 (0.99–1.04)	0.157	1.02 (0.99–1.04)	0.166
Sex (male)	239	59%	155	59%	84	68%	0.84 (0.54–1.31)	0.445	0.68 (0.40–1.15)	0.151	0.76 (0.44–1.29)	0.305
Ethnicity (white)	249	66%	173	66%	76	62%	0.84 (0.35–2.06)	0.708	1.31 (0.77–2.20)	0.317	1.39 (0.81–2.40)	0.238
CTP A	171	52%	138	52%	33	27%	1.00 (REF)	<0.001	1.00 (REF)	-	-	-
CTP B	124	30%	80	30%	44	36%	2.30 (1.36–3.90)	0.002	2.19 (1.21–3.96)	**0.009**	-	-
CTP C	91	17%	45	17%	46	37%	4.27 (2.44–7.48)	<0.001	4.60 (2.41–8.79)	**<0.001**	-	-
MELD	12	(8–19)	19	(7–17)	7	(9–23)	1.07 (1.03–1.10)	<0.001	-	-	1.07 (1.03–1.11)	**<0.001**
NAFLD	102	26%	69	26%	33	27%	1.03 (0.64–1.67)	0.902	0.99 (0.50–1.95)	0.966	0.81 (0.40–1.65)	0.570
ARLD	158	38%	99	38%	59	48%	1.53 (0.99–2.35)	0.055	1.51 (0.82–2.77)	0.184	1.41 (0.75–2.64)	0.281
HBV	72	21%	54	21%	18	15%	0.56 (0.25–1.27)	0.164	0.98 (0.36–2.69)	0.972	0.84 (0.31–2.27)	0.733
HCV	37	11%	29	11%	8	7%	0.66 (0.37–1.19)	0.168	0.84 (0.42–1.70)	0.631	0.75 (0.36–1.60)	0.463
Smoker	36	10%	27	10%	9	7%	0.69 (0.31–1.52)	0.355	0.60 (0.24–1.50)	0.278	0.71 (0.29–1.77)	0.467
Obesity	104	24%	64	24%	40	33%	1.50 (0.94–2.40)	0.092	1.54 (0.90–2.65)	0.116	1.55 (0.88–2.73)	0.129
Heart disease	97	26%	69	26%	28	23%	0.83 (0.50–1.37)	0.464	0.72 (0.39–1.32)	0.293	0.65 (0.34–1.23)	0.183
Diabetes mellitus	151	38%	100	38%	51	41%	1.15 (0.75–1.79)	0.519	1.23 (0.71–2.13)	0.456	1.27 (0.72–2.24)	0.418
Hypertension	160	40%	105	40%	55	45%	1.22 (0.79–1.88)	0.374	1.21 (0.71–2.06)	0.477	1.52 (0.88–2.64)	0.132
COPD	34	9%	24	9%	10	8%	0.88 (0.41–1.91)	0.748	0.79 (0.32–1.95)	0.612	0.71 (0.27–1.89)	0.496
Non-HCC cancer	70	18%	48	18%	22	18%	1.28 (0.57–2.89)	0.551	1.56 (0.64–3.82)	0.331	1.71 (0.69–4.19)	0.244
HCC	46	13%	33	13%	13	11%	0.82 (0.42–1.63)	0.577	1.21 (0.55–2.64)	0.638	1.13 (0.49–2.60)	0.774
Creatinine (mg/dl)	0.9	(0.7–1.1)	1.1	(0.7–1.1)	0.7	(0.7–1.3)	1.15 (0.95–1.37)	0.145	1.09 (0.89–1.34)	0.398	-	-

Table S6. Patient characteristics of patients with cirrhosis and laboratory-confirmed SARS-CoV-2 infection. Univariable associations with death and associated *p* values assessed by logistic regression. Multivariable analysis for association with death performed using logistic regression including all variables. Multivariable 1 includes CTP class, comparing with CTP-A as the reference. Multivariable 2 includes MELD and therefore excludes creatinine as an independent variable. No additional variables were significantly associated with death after

sensitivity analysis using stepwise backwards selection at $p<0.2$. CI = confidence interval; IQR = interquartile range; CTP = Child-Turcotte-Pugh; NAFLD = non-alcoholic fatty liver disease; ALD = Alcohol related liver disease; HBV = chronic hepatitis B virus infection; HCV = chronic hepatitis C virus infection; COPD = chronic obstructive pulmonary disease; HCC = hepatocellular carcinoma; MELD = model for end stage liver disease.

Table S7 - Patient characteristics after propensity score matching.

Total cohort

	CLD without cirrhosis		CTP-A cirrhosis		CTP-B cirrhosis		CTP-C cirrhosis	
	Disease	Matched non-CLD	Disease	Matched non-CLD	Disease	Matched non-CLD	Disease	Matched non-CLD
n	359	359	171	171	124	124	91	91
Demographics								
Age (years)	55 (43–67)	54 (53–64)	64 (54–73)	61 (52–74)	62 (54–68)	60 (54–69)	58 (48–63)	58 (48–65)
Sex (male)	216 (60%)	217 (60%)	104 (61%)	114 (67%)	84 (68%)	89 (72%)	61 (67%)	59 (65%)
Ethnicity (white)	124 (35%)	202 (56%)	98 (57%)	110 (64%)	80 (65%)	75 (60%)	61 (67%)	52 (57%)
Co-factors								
Smoker	15 (4%)	1 (0%)	13 (8%)	2 (1%)	11 (9%)	0 (0%)	12 (13%)	2 (2%)
Obesity	103 (29%)	93 (26%)	48 (28%)	54 (32%)	34 (27%)	34 (27%)	22 (24%)	24 (26%)
Heart disease	49 (14%)	39 (11%)	49 (29%)	49 (29%)	33 (27%)	30 (24%)	15 (16%)	14 (15%)
Diabetes mellitus	123 (34%)	105 (29%)	76 (44%)	73 (43%)	51 (41%)	41 (33%)	24 (26%)	28 (31%)
Hypertension	143 (40%)	113 (31%)	75 (44%)	60 (35%)	53 (43%)	33 (26%)	32 (35%)	35 (38%)
COPD	22 (6%)	10 (3%)	12 (7%)	8 (5%)	13 (10%)	15 (12%)	9 (10%)	8 (9%)
HCC	2 (1%)	0 (0%)	30 (18%)	0 (0%)	9 (7%)	0 (0%)	7 (8%)	0 (0%)
Non-HCC cancer	15 (4%)	28 (8%)	15 (9%)	14 (8%)	8 (6%)	13 (10%)	4 (4%)	7 (7%)
Creatinine (mg/dL)	0.8 (0.7–1.0)	0.8 (0.7–1.0)	0.8 (0.6–1.0)	0.9 (0.7–1.1)	0.9 (0.7–1.4)	0.9 (0.8–1.0)	0.9 (0.7–1.2)	0.9 (0.8–1.1)

UK cohort

	CLD without cirrhosis		CTP-A cirrhosis		CTP-B cirrhosis		CTP-C cirrhosis	
	Disease	Matched non-CLD	Disease	Matched non-CLD	Disease	Matched non-CLD	Disease	Matched non-CLD
n	81	81	38	38	37	37	28	28
Demographics								
Age (years)	62 (49–76)	61 (50–72)	63 (54–75)	64 (56–75)	66 (57–73)	65 (57–75)	58 (51–64)	59 (51–65)
Sex (male)	44 (54%)	41 (51%)	23 (61%)	26 (68%)	24 (65%)	22 (59%)	21 (75%)	22 (79%)
Ethnicity (white)	43 (53%)	53 (65%)	29 (79%)	24 (63%)	30 (81%)	22 (59%)	25 (89%)	14 (50%)
Co-factors								
Smoker	3 (4%)	1 (1%)	5 (13%)	1 (3%)	5 (14%)	0 (0%)	4 (14%)	0 (0%)
Obesity	20 (25%)	20 (25%)	13 (34%)	15 (39%)	11 (30%)	11 (30%)	6 (21%)	8 (29%)
Heart disease	23 (28%)	17 (21%)	15 (39%)	18 (47%)	12 (32%)	10 (27%)	3 (11%)	4 (14%)
Diabetes mellitus	37 (46%)	36 (44%)	21 (55%)	20 (53%)	15 (41%)	15 (41%)	6 (21%)	10 (36%)
Hypertension	34 (42%)	28 (35%)	12 (32%)	16 (42%)	12 (32%)	13 (35%)	9 (32%)	11 (39%)
COPD	10 (12%)	7 (9%)	5 (13%)	4 (11%)	3 (8%)	2 (5%)	5 (18%)	6 (21%)
HCC	0 (0%)	0 (0%)	6 (16%)	0 (0%)	2 (5%)	0 (0%)	0 (0%)	0 (0%)
Non-HCC cancer	3 (4%)	7 (9%)	4 (11%)	1 (3%)	3 (8%)	6 (16%)	1 (4%)	2 (7%)
Creatinine (mg/dL)	0.9 (0.7–1.0)	0.8 (0.7–1.0)	0.9 (0.7–1.0)	0.9 (0.7–1.1)	1.0 (0.7–1.4)	0.9 (0.7–1.3)	0.8 (0.6–1.1)	0.9 (0.8–1.0)

Table S7. Table shows the baseline patient characteristics for each liver disease stage after performing propensity score matching to non-CLD patients. Matching data is presented for both the total CLD cohort and when restricted to UK CLD cases. Variables selected for propensity score matching were age in years, interactions with age, sex, COPD, diabetes mellitus, and heart disease. HCC = hepatocellular carcinoma; COPD = chronic obstructive pulmonary disease; CTP = Child-Turcotte-Pugh

Table S8 – Full list of all contributing clinicians and centres of CLD patients included in final analysis

List of contributors, with thanks; (submitting clinician, responsible consultant, centre, country)

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Xavier Verhelst, Ghent University Hospital, Belgium
Xiaolong Qi & CHESS, CHESS, China
Xiaolong Qi & CHESS, Guangdong, China
Xiaolong Qi & CHESS, Guangxi, China
Xiaolong Qi & CHESS, Hubei, China
Xiaolong Qi & CHESS, Jiangsu, China
Xiaolong Qi & CHESS, Tianjin, China

Supplementary annex – COVID-Hep and SECURE-Cirrhosis case report form

Inclusion Criteria:

1) Chronic liver disease or post-liver transplantation AND

2) Laboratory confirmed COVID 19 infection

Ideally this form should be completed after the patient has had COVID 19 for a long enough duration to experience complete recovery, discharge, or death.

If you have any questions, please reach out to info@covid-hep.net

Reporter Information

Name of reporter	_____
Email address of reporter	_____
Name of lead physician providing care for liver disease/post-liver transplant	_____
Name of center providing care for liver disease/post-liver transplant	_____
Name of hospital where patient received care for COVID 19 (enter 'NA' if patient not hospitalized)	_____

Patient Information

Is the patient >90 years of age?	◯ Yes ◯ No
Age	Drop down options
Country of residence	Drop down options

State of residence	◯ ALABAMA ◯ ALASKA ◯ AMERICAN SAMOA ◯ ARIZONA ◯ ARKANSAS ◯ CALIFORNIA ◯ COLORADO ◯ CONNECTICUT ◯ DELAWARE ◯ DISTRICT OF COLUMBIA ◯ FLORIDA ◯ GEORGIA ◯ GUAM ◯ HAWAII ◯ IDAHO ◯ ILLINOIS ◯ INDIANA ◯ IOWA ◯ KANSAS ◯ KENTUCKY ◯ LOUISIANA ◯ MAINE ◯ MARYLAND ◯ MASSACHUSETTS ◯ MICHIGAN ◯ MINNESOTA ◯ MISSISSIPPI ◯ MISSOURI ◯ MONTANA ◯ NEBRASKA ◯ NEVADA ◯ NEW HAMPSHIRE ◯ NEW JERSEY ◯ NEW MEXICO ◯ NEW YORK ◯ NORTH CAROLINA ◯ NORTH DAKOTA ◯ OHIO ◯ OKLAHOMA ◯ OREGON ◯ PENNSYLVANIA ◯ PUERTO RICO ◯ RHODE ISLAND ◯ SOUTH CAROLINA ◯ SOUTH DAKOTA ◯ TENNESSEE ◯ TEXAS ◯ UTAH ◯ VERMONT ◯ VIRGIN ISLANDS ◯ VIRGINIA ◯ WASHINGTON ◯ WEST VIRGINIA ◯ WISCONSIN ◯ WYOMING
Gender	◯ Female ◯ Male ◯ Other
Race/Ethnicity (may check more than one)	☐ White ☐ Black or African American ☐ American Indian / Native Alaskan ☐ East Asian (incl. Chinese, Japanese, Korean) ☐ South / South-East Asian (incl. Bangladeshi, Indian, Pakistani, Sri Lankan) ☐ Native Hawaiian / Pacific Islander ☐ Arabic ☐ Other ☐ Unknown
Other race/ethnicity	_____
Hispanic ethnicity	◯ Hispanic/Latino ◯ Not Hispanic/Latino ◯ Unknown
Patient BMI category (in kg/m2)	◯ < 18.5 (Underweight) ◯ 18.5-24.9 (Normal weight) ◯ 25.0-29.9 (Pre-obesity) ◯ 30.0-34.9 (Obesity class I) ◯ 35.0-39.9 (Obesity class II) ◯ >39.9 (Obesity class III) ◯ Unknown

Liver transplantation questions

Has the patient had a liver transplantation?

◯ Yes
◯ No

What year was the liver transplantation performed?

- ◯ Unknown
- ◯ 2020
- ◯ 2019
- ◯ 2018
- ◯ 2017
- ◯ 2016
- ◯ 2015
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- ◯ 1965

Indication for liver transplant (select all that apply)

- ☐ Decompensated cirrhosis
- ☐ Hepatocellular carcinoma
- ☐ Acute liver failure
- ☐ Other

Other indication for liver transplantation	_____
Underlying aetiology of liver disease (select all that apply)	☐ Non-alcoholic fatty liver disease (NAFLD) ☐ Alcohol-related liver disease (ALD) ☐ Hepatitis C virus (HCV) ☐ Hepatitis B virus (HBV) ☐ Autoimmune hepatitis (AIH) ☐ IgG4-related disease ☐ Primary biliary cholangitis (PBC) ☐ Primary sclerosing cholangitis (PSC) ☐ Hemochromatosis ☐ Wilson's disease ☐ Other
Other aetiology	_____
Immunosuppression regimen at time of COVID 19 infection (select allthat apply)	☐ Prednisone ☐ Tacrolimus ☐ Sirolimus ☐ Everolimus ☐ Cyclosporine ☐ Mycophenolate mofetil (MMF) ☐ Azathioprine ☐ Cyclophosphamide ☐ Other ☐ Unknown
What other immunosuppression medication was used at the time of COVID 19infection?	_____
Current prophylactic antimicrobial regimen (select all that apply)	☐ Trimethoprim/sulfamethoxazole or Co-trimoxazole ☐ Dapsone ☐ Pentamidine ☐ Acyclovir/valacyclovir ☐ Fluconazole ☐ Ganciclovir/valganciclovir ☐ Foscarnet ☐ Other ☐ Unknown ☐ None
Other prophylactic antimicrobial regimen	_____

Does the patient have any of the following comorbidities (check all that apply)?	☐ Cardiovascular disease (coronary artery disease, heart failure, arrhythmia, etc.) ☐ Diabetes ☐ Asthma ☐ COPD ☐ Other Chronic Lung Disease (NOT asthma/COPD) ☐ Hypertension ☐ Non-HCC cancer ☐ History of stroke ☐ Chronic renal disease (CKD, etc.) ☐ Human immunodeficiency virus (HIV) infection ☐ Current cigarette smoker ☐ Current user of tobacco products other than cigarettes (vaping, etc) ☐ Current heavy alcohol use (>2 drinks/day for men, >1 drink/day for women) ☐ History of illicit drug use including injectable drugs or inhaled crack/cocaine but excluding marijuana

Chronic liver disease questions

Aetiology of liver disease (select all that apply)	☐ Non-alcoholic fatty liver disease (NAFLD) ☐ Alcohol-related liver disease (ALD) ☐ Hepatitis C virus (HCV) ☐ Hepatitis B virus (HBV) ☐ Autoimmune hepatitis (AIH) ☐ IgG4-related disease ☐ Primary biliary cholangitis (PBC) ☐ Primary sclerosing cholangitis (PSC) ☐ Hemochromatosis ☐ Wilson's disease ☐ Other
Other aetiology	_____
Does the patient have cirrhosis?	◯ Yes ◯ No ◯ Unknown
Child Pugh grade prior to COVID 19 diagnosis?	◯ A ◯ B ◯ C ◯ Unknown
Did the patient have ascites prior to COVID 19 diagnosis?	◯ None ◯ Mild/moderate (diuretic responsive) ◯ Severe (diuretic refractory) ◯ Unknown

What was the worst grade of hepatic encephalopathy patient developed prior to COVID 19 diagnosis?	◯ None ◯ Grade 1 (trivial lack of awareness, shortened attention span) ◯ Grade 2 (lethargy, minimal disorientation, subtle personality change) ◯ Grade 3 (somnolence to semi-stupor but responsive to verbal stimuli, gross disorientation) ◯ Grade 4 (coma - unresponsive to verbal or noxious stimuli) ◯ Unknown
Has the patient ever had hepatocellular carcinoma?	◯ Yes ◯ No ◯ Unknown
What immunosuppression was the patient taking for IgG4-related disease at time of COVID 19 diagnosis (may check more than one)?	☐ None ☐ Corticosteroids ☐ Azathioprine ☐ Rituximab ☐ Other ☐ Unknown
Other immunosuppression for IgG4-related disease	_____
Has the patient received steroids for alcoholic hepatitis recently (within 4 weeks of COVID 19 diagnosis)?	◯ Yes ◯ No ◯ Unknown
Treatment for primary biliary cholangitis (PBC) at time of COVID 19 diagnosis	☐ Ursodeoxycholic acid ☐ Obeticholic acid ☐ Fibrate ☐ Other ☐ No treatment ☐ Unknown
Other PBC treatments	_____
Does the patient have inflammatory bowel disease (IBD)?	◯ Yes ◯ No ◯ Unknown
Immunosuppression medication(s) patient was taking for IBD at time of COVID 19 diagnosis	☐ Prednisone/prednisolone ☐ Budesonide ☐ Azathioprine ☐ Methotrexate ☐ Mycophenolate ☐ Infliximab ☐ Adalimumab ☐ Ustekinumab ☐ Vedolizumab ☐ Other ☐ None ☐ Unknown
Other immunosuppression for IBD	_____

Treatment for autoimmune hepatitis (AIH) at time of COVID 19 diagnosis	☐ Prednisone/prednisolone ☐ Budesonide ☐ Azathioprine ☐ Mycophenolate ☐ Tacrolimus ☐ Other ☐ None ☐ Unknown
Other treatment for AIH	_____
Hepatitis B surface antigen (HBsAg) positive	◯ Yes ◯ No ◯ Unknown
Treatment for HBV at the time of COVID 19 diagnosis	◯ Tenofovir ◯ Entecavir ◯ Interferon ◯ None ◯ Unknown
Did the patient have detectable hepatitis C virus (HCV) RNA at the time of or prior to COVID 19 diagnosis?	◯ Yes ◯ No ◯ Unknown
HCV genotype	◯ 1 ◯ 2 ◯ 3 ◯ 4 ◯ 5 ◯ 6 ◯ 7 ◯ Unknown
Active treatment for HCV at the time of COVID 19 diagnosis	◯ Yes ◯ No ◯ Unknown
Does the patient have any of the following comorbidities (check all that apply)?	☐ Cardiovascular disease (coronary artery disease, heart failure, arrhythmia, etc.) ☐ Diabetes ☐ Asthma ☐ COPD ☐ Other Chronic Lung Disease (NOT asthma/COPD) ☐ Hypertension ☐ Non-HCC cancer ☐ History of stroke ☐ Chronic renal disease (CKD, etc.) ☐ Human immunodeficiency virus (HIV) infection ☐ Current cigarette smoker ☐ Current user of tobacco products other than cigarettes (vaping, etc) ☐ Current heavy alcohol use (>2 drinks/day for men, >1 drink/day for women) ☐ History of illicit drug use including injectable drugs or inhaled crack/cocaine but excluding marijuana

Laboratory data (leave fields blank if unknown)

• If COVID-19 suspected at presentation/admission then use recent pre-admission laboratory values as baseline.

• If hospital acquired COVID-19 suspected then please use first laboratory values obtained during hospitalisation as baseline.

Baseline serum sodium (mmol/L)	_____ (Before COVID 19 infection)
Nadir serum sodium (mmol/L)	_____ (During COVID 19 infection)
Creatinine units	◯ µmol/L ◯ mg/dl
Baseline serum creatinine	_____ (Before COVID 19 infection)
Peak serum creatinine	_____ (During COVID 19 infection)
Baseline prothrombin time (sec)	_____ (Before COVID 19 infection)
Peak prothrombin time (sec)	_____ (During COVID 19 infection)
Albumin units	◯ g/dl ◯ g/liter
Baseline albumin	_____ (Before COVID 19 infection)
Nadir albumin	_____ (During COVID 19 infection)
Total bilirubin units	◯ µmol/L ◯ mg/dl
Baseline total bilirubin	_____ (Before COVID 19 infection)
Peak total bilirubin	_____ (During COVID 19 infection)
Baseline alanine aminotransferase (ALT) (IU/L)	_____ (Before COVID 19 infection)

Peak alanine aminotransferase (ALT) (IU/L)	_____ (During COVID 19 infection)
Baseline alkaline phosphatase (IU/L)	_____ (Before COVID 19 infection)
Peak alkaline phosphatase (IU/L)	_____ (During COVID 19 infection)

COVID 19 questions

Was this lab confirmed COVID 19 infection?	◯ Yes ◯ No ◯ Unknown
What symptoms did the patient have at the time of COVID 19 diagnosis?	◯ GI symptoms (abdominal pain, diarrhea, nausea, vomiting) ◯ Respiratory symptoms (shortness of breath, cough) ◯ Both GI and respiratory symptoms ◯ Neither GI or respiratory symptoms ◯ Unknown
Did patient test positive for influenza at time of COVID 19 infection?	◯ Yes ◯ No ◯ Unknown
What complications did the patient develop during COVID 19 infection?	☐ New or worsening ascites ☐ Spontaneous bacterial peritonitis ☐ Hepatic encephalopathy ☐ Non-variceal upper GI bleeding ☐ Variceal upper GI bleeding ☐ New requirement for renal replacement therapy (e.g. hemodialysis) ☐ Other
Other complications of COVID 19 infection	_____
What was the grade of ascites during COVID 19 infection?	◯ Mild/moderate ◯ Severe ◯ Unknown
What was the worst grade of hepatic encephalopathy during COVID 19 infection (based on West Haven Criteria)?	◯ Grade 1 (trivial lack of awareness, shortened attention span) ◯ Grade 2 (lethargy, minimal disorientation, subtle personality change) ◯ Grade 3 (somnolence to semi-stupor but responsive to verbal stimuli, gross disorientation) ◯ Grade 4 (coma - unresponsive to verbal or noxious stimuli) ◯ Unknown
Did the patient receive specific antiviral treatment for COVID 19 infection?	◯ Yes ◯ No ◯ Unknown

Which of the following treatment(s) did patient receive for COVID 19 (select all that apply)?	☐ Remdesivir ☐ Tocilizumab ☐ Lopinovir/ritonavir ☐ Chloroquine/hydroxychloroquine ☐ Ribavirin ☐ Interferon-alpha ☐ Other ☐ Unknown
Other type of antiviral treatment(s) received for COVID-19	_____
What was the reason the patient did not receive COVID 19 antiviral treatment (select all that apply)?	☐ Elevated liver enzymes ☐ Underlying liver fibrosis/cirrhosis ☐ Other contraindication (eg AKI) ☐ Treatment not available ☐ Other ☐ Unknown
What was the reason the patient did not receive COVID 19 antiviral treatment?	_____
Did the patient die?	◯ Yes ◯ No ◯ Unknown
What was the primary cause of death?	◯ Liver-related complications ◯ COVID 19-related lung disease ◯ Cardiogenic shock ◯ Other
Other cause of death	_____
Has the patient been hospitalized?	◯ Yes ◯ No ◯ Unknown
Has the patient been discharged from the hospital?	◯ Yes ◯ No ◯ Unknown
Length of hospital stay (days)	_____
Did patient receive invasive ventilation?	◯ Yes ◯ No ◯ Unknown
Did the patient receive non-invasive ventilation?	◯ Yes ◯ No ◯ Unknown
Was the patient admitted to an intensive care unit?	◯ Yes ◯ No ◯ Unknown

Why was the patient not admitted to an intensive care unit?	◯ Disease not severe enough ◯ Disease was severe enough but limited availability of intensive care unit ◯ Disease was severe enough but escalation to intensive care unit not felt to be appropriate. ◯ Unknown