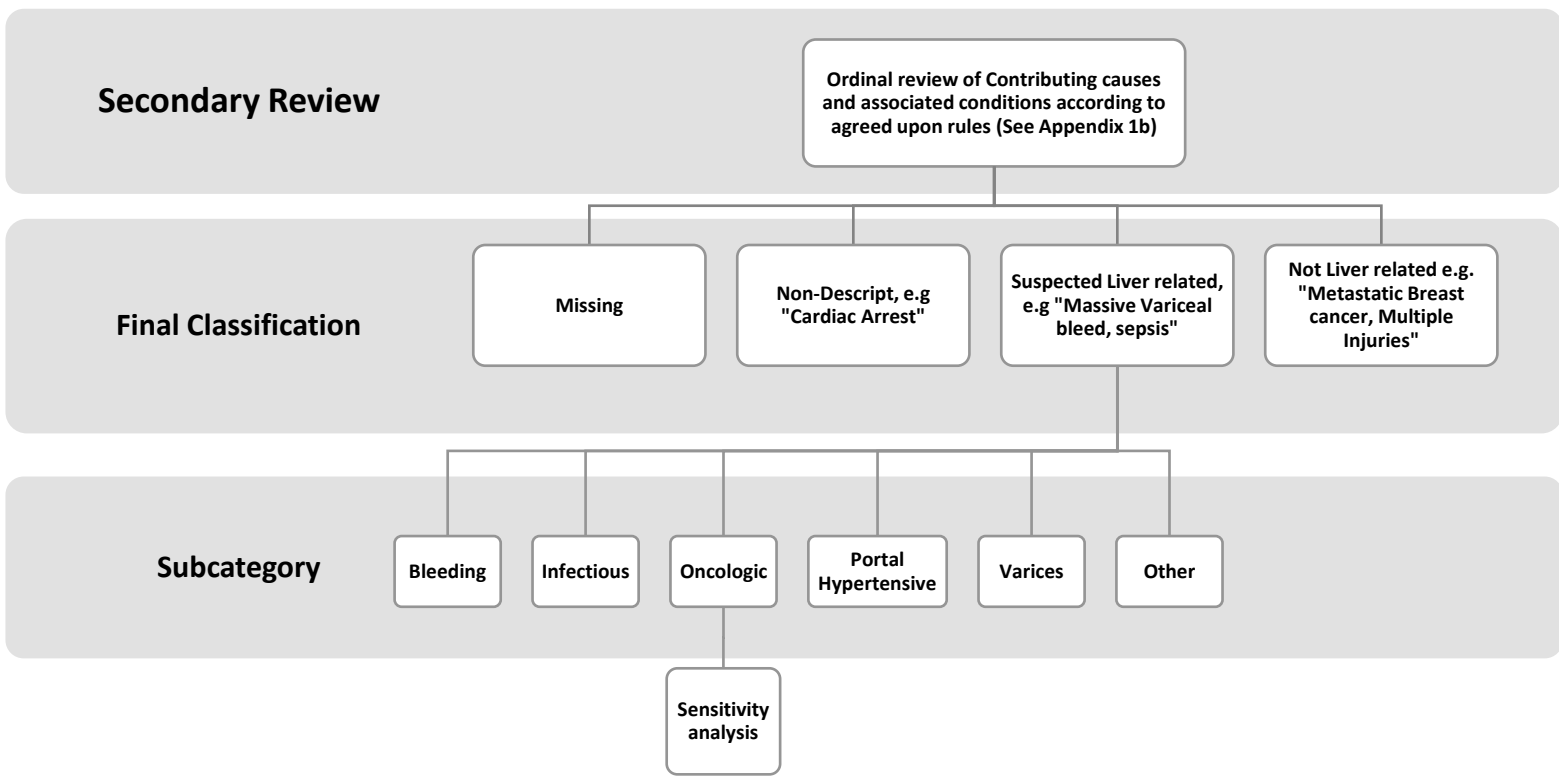
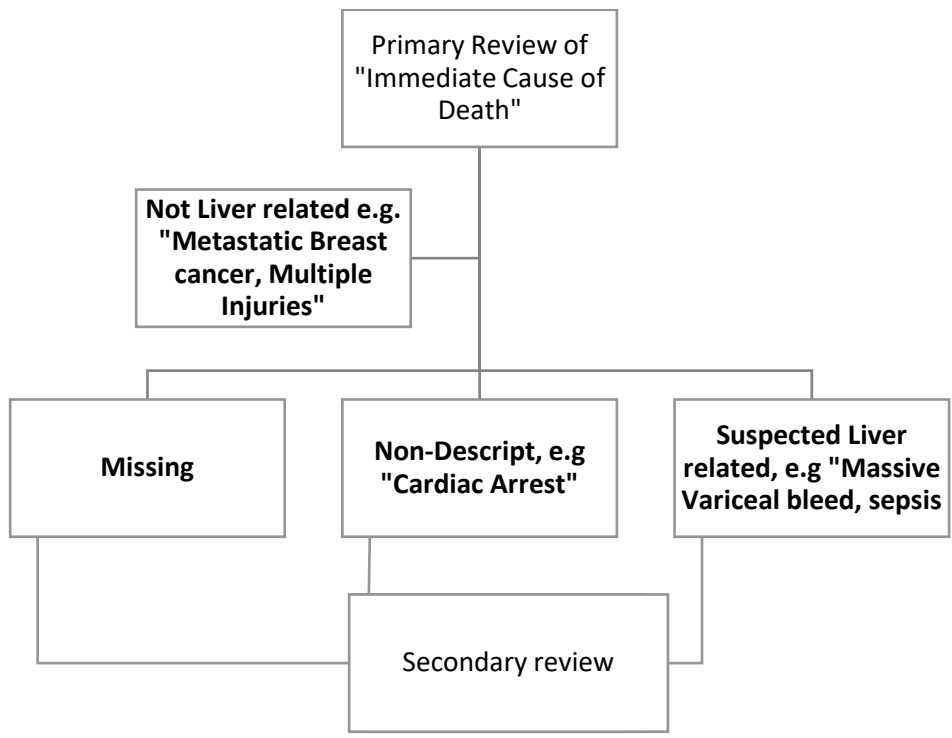


SDC Materials and Methods: Screening protocol for Death Certificates

Immediate cause of death was screened for obvious causes of death not related to liver disease. All other cases were referred for secondary review



Rules for Death certificate review^{6,13}

Inclusion criteria for the study were a diagnosis code of cirrhosis, so all patients were assumed to have cirrhosis. Items in quotations represent the exact wording of the diagnosis while non-quoted are a summary term.

Category	Contains:	But NOT	Most common examples
Liver Attributable			
Infectious	Infections (sepsis, ARDS, pneumonia, urosepsis, peritonitis, meningitis, cholangitis) as a liver attributable cause of death	listed with another non-liver immunosuppressive condition such as AIDS, leukemia, etc	<ol style="list-style-type: none"> 1. "Sepsis" 2. "Septic Shock" 3. "Pneumonia" 4. "ARDS"
Hemorrhagic	Non-specific bleeding events (hemorrhagic shock, hemoperitoneum). Non-traumatic cerebral hemorrhage IF listed with cirrhosis related coagulopathy or a cirrhosis related diagnosis	Listed with a clearly non-liver condition (e.g. Multiple gun shot wounds)	<ol style="list-style-type: none"> 1. Intracranial hemorrhage 2. Hemoperitoneum 3. "Hemorrhagic shock"
Varices	Mention of massive GI bleeding, or explicit mention of varices	Listed with an alternative source of GI bleeding	<ol style="list-style-type: none"> 1. Acute variceal bleed 2. Severe Upper GI bleed 3. Massive GI bleed
Portal Hypertensive	Hepatic encephalopathy, acute renal failure, or other portal hypertensive complications	Chronic kidney disease	<ol style="list-style-type: none"> 1. Hepatic encephalopathy 2. Acute renal failure 3. Hepatorenal syndrome
Other	Mention of cirrhosis	Any other details	<ol style="list-style-type: none"> 1. "Cirrhosis" 2. "Liver Failure" 3. "End stage liver disease"
Oncologic	Mention of liver cell carcinoma or cholangiocarcinoma	Metastatic disease or tumors in the liver without mention of origin	<ol style="list-style-type: none"> 1. "Liver Cancer" 2. "Hepatocellular Carcinoma" 3. "Cholangiocarcinoma"
Non-Liver	Non-liver diagnosis listed in Immediate cause of death or more highly in contributing conditions		<ol style="list-style-type: none"> 1. Congestive Heart Failure 2. Atherosclerotic Heart Disease 3. Hypertensive crisis 4. Myocardial Infarction
Non-descript	Missing		

Table S1. Death certificate analysis stratified by presence of complication in EHR

		No Complications	1+ Complication	
n		2963	4959	
Age (mean (SD))		55.08 (11.56)	55.05 (11.10)	0.903
Female (%)		1332 (45.0)	1980 (40.0)	<0.001
Race n (%)				<0.001
	White	1075 (36.3)	2144 (43.2)	
	Black	765 (25.8)	942 (19.0)	
	Hispanic	563 (19.0)	1127 (22.7)	
	Asian	80 (2.7)	102 (2.1)	
	Other	480 (16.2)	644 (13.0)	
Insurance (%)				<0.001
	Medicare/Medicaid	1123 (37.9)	2258 (45.5)	
	Private	1030 (34.8)	1491 (30.1)	
	Other	810 (27.3)	1210 (24.4)	
MELD-Na<16		2269 (76.6)	1730 (34.9)	<0.001
Time at risk in days (mean (SD))		1040 (732)	901(755)	<0.001
Deaths n (%)		374 (12.6)	1763 (35.6)	<0.001
Death Certificate review n (%)				<0.001
	Liver-related	169 (45.2)	1213 (68.8)	
	Non-descript	11 (2.9)	70 (4.0)	
	Non-Liver	194 (51.9)	480 (27.2)	
Subclassification n(%)				0.134
	Bleeding	10 (5.7)	44 (3.5)	
	Infectious	58 (33.3)	342 (27.4)	
	Other	79 (44.9)	711 (56.9)	
	Portal HTN	17 (9.7)	90(7.2)	
	Varices	12 (6.8)	62 (5.0)	

Table S2. Death certificate analysis stratified by presence of varices in chart review

		No EV	Varices without bleeding	Varices with bleeding	p
n		5022	2115	785	
Age (mean (SD))		55.36 (11.56)	55.32 (10.86)	52.40 (10.12)	<0.001
Female (%)		2166 (43.2)	859 (40.7)	287 (36.6)	0.001
Race n (%)					<0.001
	White	1971 (39.2)	979 (46.3)	269 (34.3)	
	Black	1247 (24.8)	319 (15.1)	141 (18.0)	
	Hispanic	897 (17.9)	511 (24.2)	282 (35.9)	
	Asian	112 (2.2)	56 (2.6)	14 (1.8)	
	Other	795 (15.8)	250 (11.8)	79 (10.1)	
Insurance (%)					<0.001
	Medicare/Medicaid	2055 (40.9)	1003 (47.4)	323 (41.1)	
	Private	1632 (32.5)	657 (31.1)	232 (29.6)	
	Other	1335 (26.6)	455 (21.5)	230 (29.3)	
MELD-Na<16		3214 (64.7)	974 (47.4)	299 (39.9)	<0.001
Time at risk in days (mean (SD))		899.64 (734.71)	1041.80 (769.76)	1056.42 (762.33)	<0.001
Deaths n (%)		1268 (25.2)	603 (28.5)	266 (33.9)	<0.001
Death Certificate review n (%)					<0.001
	Liver-related	721 (56.9)	452 (75.0)	209 (78.6)	
	Non-descript	44 (3.5)	27 (4.5)	10 (3.8)	
	Non-Liver	503 (39.7)	124 (20.6)	47 (17.7)	
Subclassification n(%)					<0.001
	Bleeding	29 (3.9)	17 (3.7)	8 (3.7)	
	Infectious	232 (31.1)	120 (25.8)	48 (22.4)	
	Other	396 (53.1)	275 (59.1)	119 (55.6)	
	Portal HTN	58 (7.8)	37 (8.0)	12 (5.6)	
	Varices	31 (4.2)	16 (3.4)	27 (12.6)	