

Supplemental Online Content

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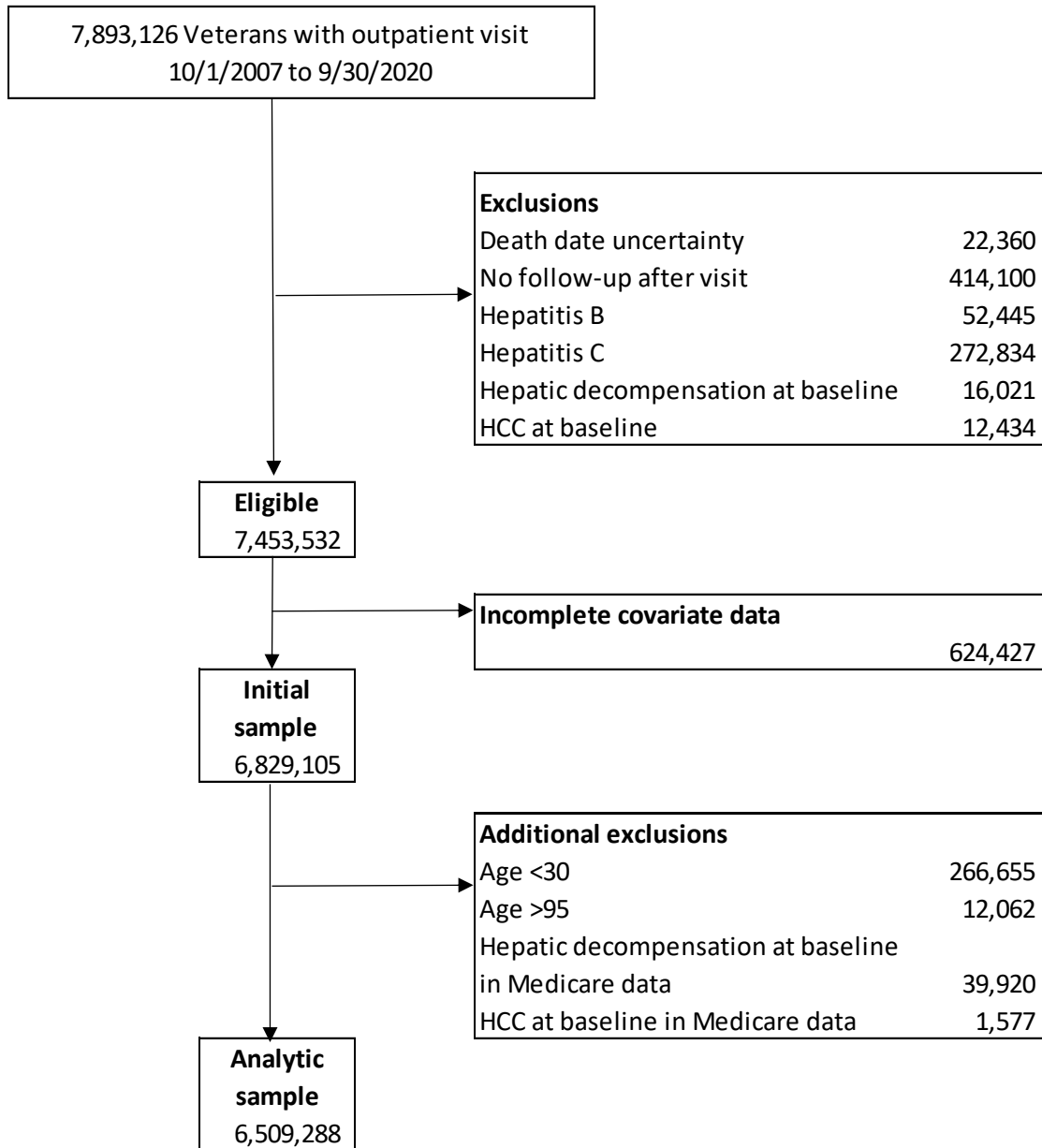
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This supplemental material has been provided by the authors to give readers additional information about their work.

eFigure 1. Patient flow chart



eTable 1. Cox models (1-5) fit to development sample of 5,119,775 veterans with 10,896 hepatocellular carcinoma events in a maximum of 10 years follow-up

Model	Predictor	χ^2 overall	Level or form	Events	PE	SE	χ^2	p	HR	LCL	Risk Score Points
1	FIB-4	13,645	<1.45	2,308							0
			1.45-3.25	5,279	1.247	0.025	2	<.0001	3.48 (3.31, 3.66)	40	
			>3.25	3,309	3.072	0.027	12,798	<.0001	21.6 (20.5, 22.8)	100	
2	FIB-4	17,926	<.9	520							0
			0.9 to <1.1	552	0.707	0.061	134	<.0001	2.03 (1.80, 2.29)	14	
			1.1 to <1.3	671	0.940	0.058	259	<.0001	2.56 (2.28, 2.87)	19	
			1.3 to <1.45	565	1.161	0.061	365	<.0001	3.19 (2.83, 3.60)	23	
			1.45 to <1.6	597	1.346	0.060	504	<.0001	3.84 (3.42, 4.32)	27	
			1.6 to <1.8	794	1.528	0.056	734	<.0001	4.61 (4.13, 5.15)	31	
			1.8 to <2.0	759	1.724	0.057	917	<.0001	5.61 (5.02, 6.27)	35	
			2.0 to <2.2	715	1.933	0.058	1,124	<.0001	6.91 (6.17, 7.73)	39	
			2.2 to <2.4	620	2.068	0.059	1,209	<.0001	7.91 (7.04, 8.88)	42	
			2.4 to <2.6	539	2.219	0.061	1,304	<.0001	9.20 (8.16, 10.4)	45	
			2.6 to <3.0	819	2.371	0.056	1,787	<.0001	10.71 (9.59, 11.9)	48	
			3.0 to <3.25	456	2.714	0.064	1,790	<.0001	15.09 (13.3, 17.1)	55	
			3.26 to <4.0	956	3.073	0.055	3,181	<.0001	21.6 (19.4, 24.1)	62	
			4.0 to <5.0	832	3.692	0.056	4,360	<.0001	40.1 (36.0, 44.8)	74	
			5.0 to <6.0	498	4.198	0.063	4,480	<.0001	66.5 (58.8, 75.2)	85	
6.0 to <7.0	311	4.543	0.072	4,013	<.0001	94.0 (81.6, 108)	92				
			≥ 7.0	692	4.964	0.058	7,302	<.0001	143.2 (128, 160)	100	
3	FIB-4	2,762	X=(FIB-4 - 1.33)		1.207	0.023	2,762	<.0001	3.34 (3.20, 3.50)		
			172 χ^2		-0.145	0.011	172	<.0001	0.87 (0.85, 0.88)		
			41 χ^3		0.008	0.001	41	<.0001	1.01 (1.01, 1.01)		
4	Age	899	<45	82	-2.05	0.12	307	<.0001	0.13 (0.10, 0.16)		-19
			45-49	109	-1.27	0.10	160	<.0001	0.28 (0.23, 0.34)		-12
			50-54	251	-0.84	0.07	152	<.0001	0.43 (0.38, 0.49)		-8
			55-59	709	-0.28	0.04	40	<.0001	0.75 (0.69, 0.82)		-3
			60-64	1,832					1.00		0
			65-69	2,316	0.08	0.03	6	0.0113	1.08 (1.02, 1.15)		1
			70-74	1,988	0.07	0.03	5	0.0303	1.08 (1.01, 1.15)		1
			75-79	1,730	0.02	0.04	0	0.5667	1.02 (0.95, 1.10)		0
			≥ 80	1,879	-0.42	0.04	132	<.0001	0.65 (0.61, 0.70)		-4
	Sex	65	Male	10,760					1.00		0
			Female	136	-0.70	0.09	65	<.0001	0.50 (0.42, 0.59)		-7
	Race	513	White	7,898					1.00 (0.00, 0.00)		0
			Black	734	-0.52	0.04	176	<.0001	0.60 (0.55, 0.64)		-5
			Hispanic	855	0.60	0.04	268	<.0001	1.81 (1.69, 1.95)		6
Other			519	0.05	0.05	1	0.2714	1.05 (0.96, 1.15)		0	
Unknown			890	0.17	0.04	22	<.0001	1.18 (1.10, 1.27)		2	

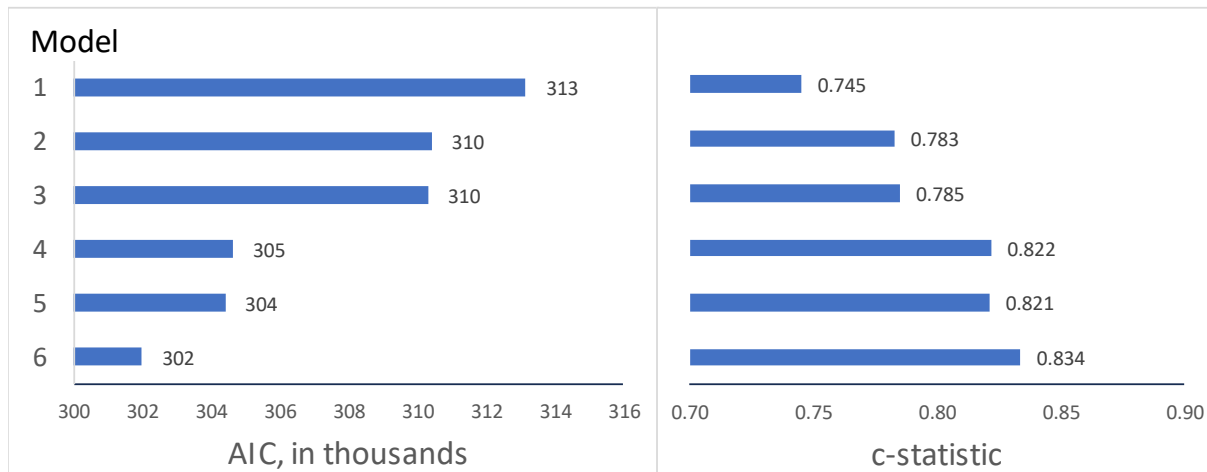
FIB4	14,967	<9	520				1.00		0	
		0.9 to <1.1	552	0.18	0.06	8	0.0038	1.20 (1.06, 1.35)	2	
		1.1 to <1.3	671	0.27	0.06	20	<.0001	1.31 (1.16, 1.47)	3	
		1.3 to <1.45	565	0.43	0.06	46	<.0001	1.54 (1.36, 1.74)	4	
		1.45 to <1.6	597	0.59	0.06	90	<.0001	1.81 (1.60, 2.04)	6	
		1.6 to <1.8	794	0.77	0.06	169	<.0001	2.16 (1.92, 2.43)	7	
		1.8 to <2.0	759	0.98	0.06	268	<.0001	2.67 (2.38, 3.01)	9	
		2.0 to <2.2	715	1.21	0.06	398	<.0001	3.37 (2.99, 3.80)	11	
		2.2 to <2.4	620	1.37	0.06	476	<.0001	3.94 (3.48, 4.45)	13	
		2.4 to <2.6	539	1.54	0.06	566	<.0001	4.67 (4.11, 5.30)	15	
		2.6 to <3.0	819	1.73	0.06	835	<.0001	5.63 (5.01, 6.34)	16	
		3.0 to <3.25	456	2.09	0.07	961	<.0001	8.12 (7.11, 9.27)	20	
		3.26 to <4.0	956	2.46	0.06	1,767	<.0001	11.7 (10.4, 13.1)	23	
		4.0 to <5.0	832	3.06	0.06	2,632	<.0001	21.3 (19.0, 24.0)	29	
	5.0 to <6.0	498	3.52	0.07	2,866	<.0001	33.9 (29.8, 38.6)	33		
	6.0 to <7.0	311	3.87	0.07	2,708	<.0001	47.8 (41.3, 55.3)	37		
	≥ 7.0	692	4.26	0.06	4,851	<.0001	70.5 (62.5, 79.4)	40		
Diabetes	2,010	No	6,203				1.00		0	
		Yes	4,693	0.91	0.02	2,010	<.0001	2.50 (2.40, 2.60)	9	
Smoking	487	Never	2,809				1.00 (0.00, 0.00)		0	
		Current	3,445	0.57	0.03	466	<.0001	1.78 (1.69, 1.87)	5	
		Former	4,642	0.20	0.02	66	<.0001	1.22 (1.16, 1.28)	2	
Alcohol	79	AUD	423	0.27	0.05	25	<.0001	1.31 (1.18, 1.46)	3	
		Abstinent	5,642	0.10	0.02	18	<.0001	1.10 (1.05, 1.15)	1	
		Lower risk	3,166				1.00		0	
		Moderate risk	1,305	0.14	0.03	17	<.0001	1.15 (1.08, 1.22)	1	
		High risk	360	0.43	0.06	57	<.0001	1.54 (1.38, 1.72)	4	
BMI	421	<20	219	0.10	0.07	2	0.1875	1.10 (0.95, 1.27)	1	
		20 to <25	1,472				1.00		0	
		25 to <30	3,702	0.23	0.03	55	<.0001	1.26 (1.19, 1.34)	2	
		30 to <35	3,210	0.48	0.03	219	<.0001	1.62 (1.52, 1.72)	5	
		35 to <40	1,524	0.63	0.04	273	<.0001	1.88 (1.74, 2.02)	6	
		≥ 40	769	0.65	0.05	195	<.0001	1.91 (1.75, 2.09)	6	
5	Age	377 X= (Age - 50)/5		0.624	0.032	377	<.0001	1.87 (1.75, 1.99)		
		97 X ²		-0.095	0.010	97	<.0001	0.91 (0.89, 0.93)		
		8 X ³		0.002	0.001	8	0.0037	1.00 (1.00, 1.00)		
	Sex	60	Male	10,760				1.00		
			Female	136	-0.674	0.087	60	<.0001	0.51 (0.43, 0.61)	
	Race	510	White	7,898				1.00 (0.00, 0.00)		
			Black	734	-0.511	0.039	170	<.0001	0.60 (0.56, 0.65)	
			Hispanic	855	0.597	0.036	270	<.0001	1.82 (1.69, 1.95)	
			Other	519	0.054	0.045	1	0.24	1.06 (0.97, 1.15)	
			Unknown	890	0.172	0.036	23	<.0001	1.19 (1.11, 1.27)	
	FIB4	1304 X= (FIB-4 - 1.33)/10			0.978	0.027	1304	<.0001	2.66 (2.52, 2.81)	
		11 X ²			-0.041	0.012	11	0.0007	0.96 (0.94, 0.98)	
		5 X ³			-0.003	0.001	5	0.0266	1.00 (0.99, 1.00)	
	Diabetes	1957	No	6,203				1.00		
		Yes	4,693	0.903	0.020	1957	<.0001	2.47 (2.37, 2.57)		
Smoking	489	Never	2,809							
		Current	3,445	0.575	0.027	466	<.0001	1.78 (1.69, 1.87)		
		Former	4,642	0.192	0.024	63	<.0001	1.21 (1.16, 1.27)		
Alcohol	79	AUD	423	0.100	0.022	20	<.0001	1.11 (1.06, 1.16)		
		Abstinent	5,642				1.00			
		Lower risk	3,166	0.138	0.033	17	<.0001	1.15 (1.08, 1.22)		
		Moderate risk	1,305	0.427	0.057	56	<.0001	1.53 (1.37, 1.71)		
		High risk	360	0.273	0.053	26	<.0001	1.31 (1.18, 1.46)		
BMI	97 X= (BMI - 25)/5			0.197	0.020	97	<.0001	1.22 (1.17, 1.27)		
	8 X ²			0.043	0.015	8	0.004	1.04 (1.01, 1.08)		
	22 X ³			-0.014	0.003	22	<.0001	0.99 (0.98, 0.99)		

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eFigure 2. Comparison of Cox models (1-6) fit to development sample of 5,119,775 veterans with 10,896 hepatocellular carcinoma events in a maximum of 10 years follow-up

Model	DF	AIC	c-statistic (95% CI)
1 FIB-4 alone, 3 categories	2	313,150	0.745 (0.729, 0.761)
2 FIB-4 alone, 17 categories	16	310,406	0.783 (0.767, 0.799)
3 FIB-4 alone, continuous	2	310,297	0.785 (0.769, 0.801)
4 Full model, categorical	41	304,630	0.822 (0.808, 0.836)
5 Full model, continuous	21	304,399	0.821 (0.807, 0.835)
6 Full model, continuous, FIB-4 components	27	301,992	0.834 (0.820, 0.847)

Using score	DF	c-statistic (95% CI)
Development sample	1	0.835 (0.827, 0.835)
Validation sample	1	0.823 (0.816, 0.823)



1 FIB-4, 3 categories (<1.45, 1.45-3.25, >3.25)

2 FIB-4, 17 categories

3 FIB-4, continuous

4 Multivariable* model, categorical

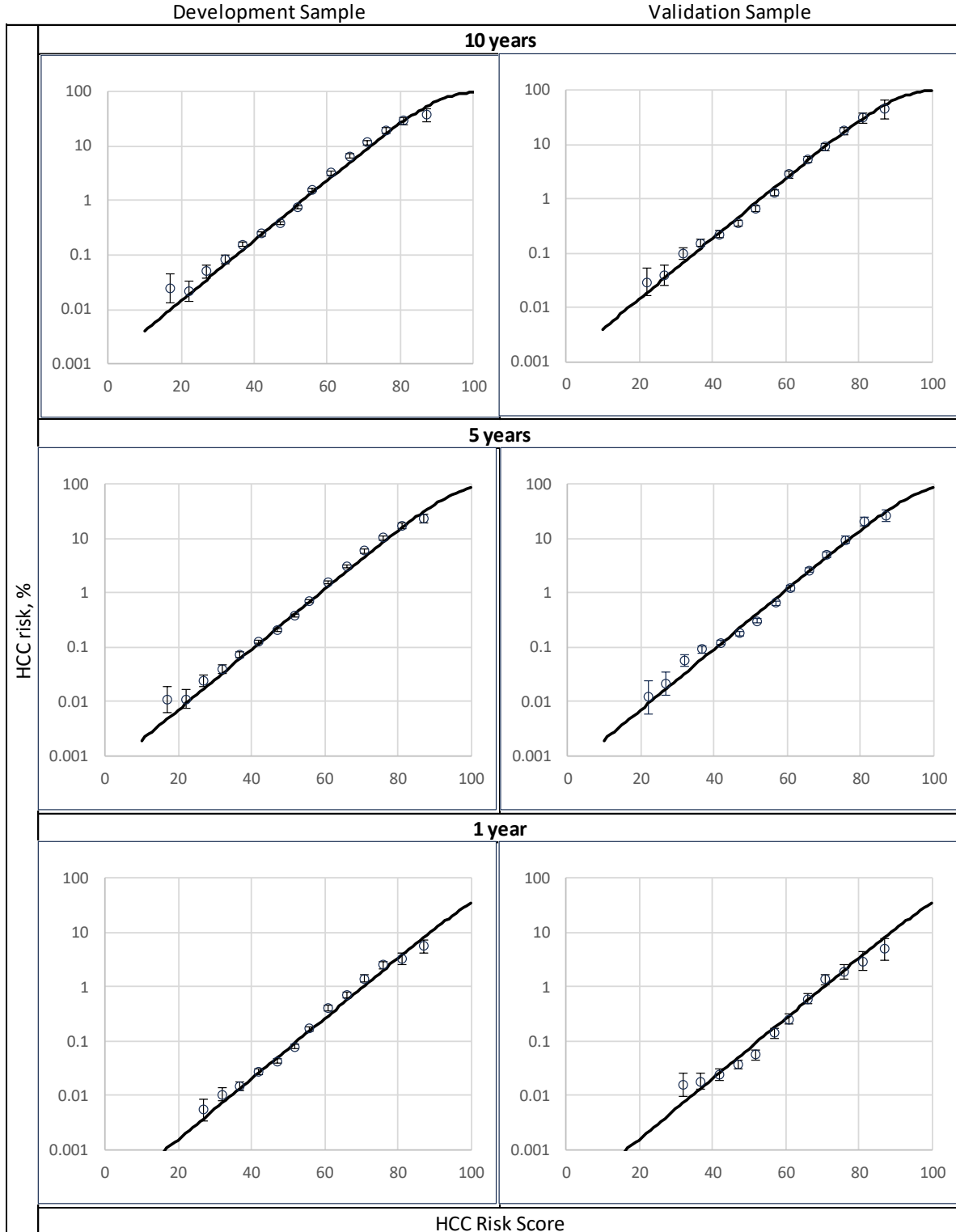
5 Multivariable model, continuous

6 Multivariable model, continuous, FIB-4 components

* Age, sex, race, FIB-4, diabetes, smoking, alcohol, BMI

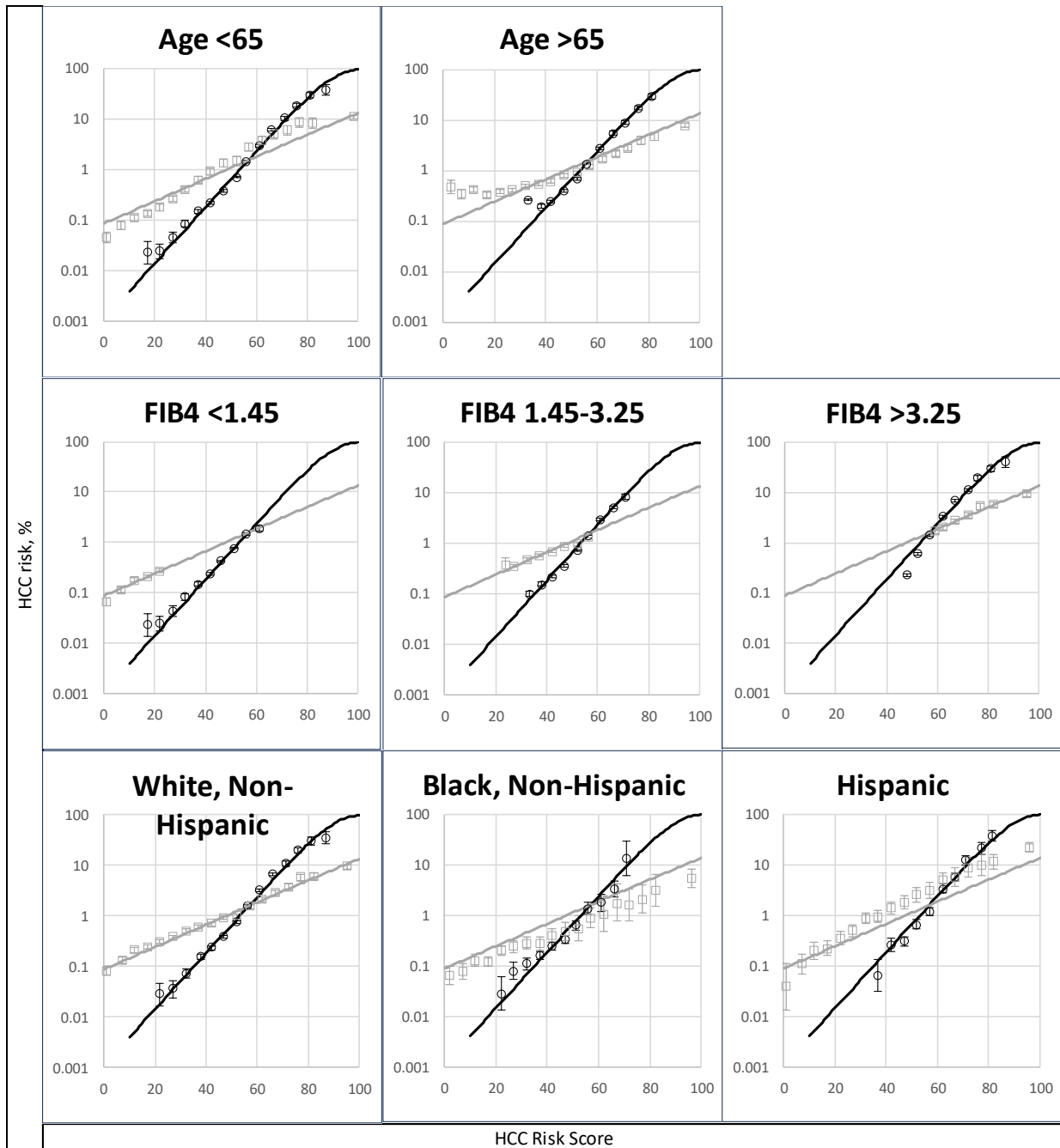
eFigure 3. Risk of hepatocellular carcinoma (HCC), as a function of HCC risk score

Lines are predicted using risk score obtained from development sample. Individual data points from Kaplan-Meier estimates, shown for minimum 10 HCC events and 5 remaining at risk at end of follow-up.



eFigure 4. 10-year risk of HCC

Lines are predicted using risk score obtained from development sample. Black: Multivariable model (age, sex, race, FIB-4 components, diabetes, smoking, alcohol, BMI); Gray: FIB-4, continuous. Subgroups overlaid on full sample. Subgroup data points from Kaplan-Meier estimates, shown for minimum 10 HCC events and 5 remaining at risk at end of follow-up. Circle: Multivariable model, Square: FIB-4 model.



eTable 2. Sensitivity Analysis Cox model (4) fit to subsets of development sample with maximum of 10 years follow-up

		Exclude visits in 2008			Restrict to AUDIT-C within one year			Restrict to BMI within one year			Expand outcome to include ICD codes 155.1, C22.7 and C22.9 (exclude 990 additional present at baseline)		
N		4,888,928			4,995,238			3,648,096			5,119,117		
HCC events		9,960			10,691			8,276			14,430		
c-statistic		0.829 (0.797, 0.861)			0.830 (0.800, 0.861)			0.827 (0.798, 0.855)			0.798 (0.769, 0.826)		
		χ^2	HR	(95% CI)	χ^2	HR	(95% CI)	χ^2	HR	(95% CI)	χ^2	HR	(95% CI)
Age	<45	288	0.13	(0.10, 0.16)	298	0.13	(0.10, 0.16)	244	0.13	(0.10, 0.16)	542	0.11	(0.10, 0.14)
	45-49	147	0.28	(0.23, 0.35)	157	0.28	(0.23, 0.34)	126	0.29	(0.23, 0.36)	253	0.28	(0.24, 0.33)
	50-54	143	0.42	(0.37, 0.49)	152	0.43	(0.37, 0.49)	113	0.45	(0.39, 0.52)	203	0.46	(0.41, 0.51)
	55-59	40	0.74	(0.68, 0.81)	39	0.75	(0.69, 0.82)	30	0.76	(0.69, 0.84)	57	0.75	(0.70, 0.81)
	60-64		1.00			1.00			1.00			1.00	
	65-69	7	1.09	(1.02, 1.16)	8	1.09	(1.03, 1.16)	4	1.07	(1.00, 1.15)	14	1.11	(1.05, 1.17)
	70-74	6	1.09	(1.02, 1.17)	6	1.09	(1.02, 1.16)	2	1.05	(0.98, 1.13)	13	1.11	(1.05, 1.18)
	75-79	1	1.04	(0.97, 1.12)	0	1.02	(0.95, 1.10)	0	0.98	(0.90, 1.06)	10	1.11	(1.04, 1.18)
≥80	117	0.66	(0.61, 0.71)	124	0.66	(0.61, 0.71)	115	0.64	(0.59, 0.70)	59	0.78	(0.73, 0.83)	
Sex	Male		1.00			1.00			1.00			1.00	
	Female	64	0.48	(0.40, 0.57)	65	0.49	(0.41, 0.58)	46	0.50	(0.41, 0.61)	59	0.61	(0.53, 0.69)
Race	White		1.00			1.00			1.00			1.00	
	Black	163	0.60	(0.55, 0.65)	163	0.60	(0.56, 0.65)	132	0.59	(0.54, 0.65)	137	0.70	(0.66, 0.74)
	Hispanic	245	1.81	(1.68, 1.95)	257	1.81	(1.68, 1.94)	207	1.83	(1.68, 1.98)	157	1.53	(1.43, 1.64)
	Other	1	1.05	(0.96, 1.15)	2	1.06	(0.97, 1.16)	0	1.03	(0.93, 1.15)	0	1.01	(0.94, 1.09)
	Unknown	14	1.15	(1.07, 1.25)	21	1.18	(1.10, 1.26)	27	1.23	(1.14, 1.32)	49	1.25	(1.17, 1.33)
FIB4	<.9		1.00			1.00			1.00			1.00	
	0.9 to <1.1	8	1.20	(1.06, 1.36)	9	1.21	(1.07, 1.37)	4	1.15	(1.00, 1.33)	3	1.09	(0.99, 1.20)
	1.1 to <1.3	18	1.31	(1.16, 1.48)	18	1.30	(1.15, 1.46)	17	1.32	(1.16, 1.51)	10	1.16	(1.06, 1.27)
	1.3 to <1.45	38	1.50	(1.32, 1.71)	43	1.52	(1.34, 1.72)	39	1.56	(1.36, 1.80)	32	1.31	(1.20, 1.45)
	1.45 to <1.6	71	1.74	(1.53, 1.98)	90	1.82	(1.61, 2.06)	80	1.88	(1.64, 2.16)	74	1.52	(1.38, 1.67)
	1.6 to <1.8	146	2.12	(1.87, 2.39)	164	2.16	(1.92, 2.42)	130	2.16	(1.89, 2.47)	137	1.72	(1.57, 1.88)
	1.8 to <2.0	235	2.62	(2.31, 2.96)	260	2.66	(2.36, 2.99)	211	2.70	(2.36, 3.09)	217	2.01	(1.83, 2.21)
	2.0 to <2.2	367	3.37	(2.98, 3.82)	389	3.36	(2.98, 3.79)	303	3.36	(2.93, 3.85)	323	2.40	(2.18, 2.64)
	2.2 to <2.4	434	3.92	(3.44, 4.45)	469	3.94	(3.48, 4.46)	366	3.95	(3.43, 4.55)	371	2.67	(2.42, 2.95)
	2.4 to <2.6	505	4.59	(4.02, 5.24)	543	4.61	(4.06, 5.24)	473	4.92	(4.26, 5.68)	486	3.20	(2.89, 3.55)
	2.6 to <3.0	762	5.61	(4.96, 6.34)	821	5.64	(5.01, 6.35)	669	5.81	(5.08, 6.64)	697	3.61	(3.28, 3.97)
	3.0 to <3.25	885	8.13	(7.08, 9.33)	932	8.05	(7.04, 9.20)	733	8.11	(6.97, 9.44)	817	5.06	(4.53, 5.66)
	3.26 to <4.0	1,602	11.5	(10.2, 13.0)	1,719	11.6	(10.3, 13.0)	1,359	11.7	(10.3, 13.4)	1,641	7.0	(6.3, 7.6)
	4.0 to <5.0	2,412	21.2	(18.8, 24.0)	2,576	21.3	(18.9, 24.0)	1,963	20.8	(18.2, 23.8)	2,557	12.3	(11.1, 13.5)
	5.0 to <6.0	2,682	34.4	(30.1, 39.4)	2,827	34.2	(30.0, 38.9)	2,184	33.8	(29.2, 39.2)	2,707	19.1	(17.1, 21.4)
6.0 to <7.0	2,473	47.4	(40.7, 55.2)	2,641	47.5	(41.0, 55.0)	2,135	49.4	(41.8, 58.2)	2,394	26.1	(22.9, 29.8)	
≥7.0	4,495	71.2	(62.8, 80.6)	4,783	71.0	(62.9, 80.2)	3,530	66.5	(57.9, 76.4)	4,970	38.7	(35.0, 42.9)	
Diabetes	No		1.00			1.00			1.00			1.00	
	Yes	1,813	2.49	(2.38, 2.59)	1,990	2.50	(2.41, 2.61)	1,577	2.52	(2.41, 2.64)	2,099	2.28	(2.20, 2.36)
Smoking	Never		1.00			1.00			1.00			1.00	
	Current	442	1.80	(1.70, 1.90)	455	1.78	(1.68, 1.87)	358	1.78	(1.68, 1.89)	760	1.88	(1.80, 1.97)
	Former	67	1.23	(1.17, 1.29)	64	1.22	(1.16, 1.27)	46	1.21	(1.14, 1.27)	80	1.21	(1.16, 1.26)
Alcohol	Abstinent	22	1.12	(1.07, 1.17)	19	1.10	(1.06, 1.15)	13	1.10	(1.04, 1.15)	39	1.13	(1.09, 1.17)
	Lower risk		1.00			1.00			1.00			1.00	
	Moderate ri	12	1.13	(1.05, 1.21)	18	1.15	(1.08, 1.23)	22	1.19	(1.11, 1.28)	14	1.11	(1.05, 1.18)
	High risk	53	1.55	(1.38, 1.74)	54	1.53	(1.37, 1.71)	41	1.51	(1.33, 1.71)	75	1.55	(1.40, 1.71)
	AUD	31	1.36	(1.22, 1.51)	27	1.32	(1.19, 1.47)	15	1.29	(1.14, 1.47)	2	1.07	(0.97, 1.17)
BMI	<20	3	1.14	(0.98, 1.32)	1	1.09	(0.94, 1.26)	3	1.16	(0.98, 1.36)	18	1.27	(1.14, 1.41)
	20 to <25		1.00			1.00			1.00			1.00	
	25 to <30	53	1.27	(1.19, 1.36)	57	1.27	(1.19, 1.35)	35	1.23	(1.15, 1.32)	20	1.12	(1.07, 1.18)
	30 to <35	198	1.62	(1.51, 1.73)	224	1.64	(1.53, 1.74)	156	1.59	(1.48, 1.71)	115	1.34	(1.27, 1.41)
	35 to <40	252	1.88	(1.74, 2.04)	276	1.90	(1.76, 2.05)	183	1.81	(1.66, 1.97)	153	1.50	(1.41, 1.60)
	≥40	193	1.96	(1.78, 2.15)	198	1.93	(1.76, 2.12)	118	1.80	(1.62, 2.00)	104	1.51	(1.40, 1.64)

eTable 3. ICD-9 and 10 codes used to define exclusions and covariate conditions

Condition	Description	ICD-9	ICD-10
Alcohol Use Disorder (AUD)			
	Nondependent alcohol abuse		
	Unspecified	305.00	
	Continuous	305.01	
	Episodic	305.02	
	In remission	305.03	
	Acute alcoholic intoxication		
	Unspecified	303.00	
	Continuous	303.01	
	Episodic	303.02	
	In remission	303.03	
	Other and unspecified alcohol dependence		
	Unspecified	303.90	
	Continuous	303.91	
	Episodic	303.92	
	In remission	303.93	
	Alcohol abuse, uncomplicated		F10.10
	Alcohol abuse with intoxication, uncomplicated		F10.120
	Alcohol abuse with intoxication delirium		F10.121
	Alcohol abuse with intoxication, unspecified		F10.129
	Alcohol abuse with alcohol-induced mood disorder		F10.14
	Alcohol abuse with alcohol-induced psychotic disorder with delusions		F10.150
	Alcohol abuse with alcohol-induced psychotic disorder with hallucinations		F10.151
	Alcohol abuse with alcohol-induced psychotic disorder, unspecified		F10.159
	Alcohol abuse with alcohol-induced anxiety disorder		F10.180
	Alcohol abuse with alcohol-induced sexual dysfunction		F10.181
	Alcohol abuse with alcohol-induced sleep disorder		F10.182
	Alcohol abuse with other alcohol-induced disorder		F10.188
	Alcohol abuse with unspecified alcohol-induced disorder		F10.19
	Alcohol dependence, uncomplicated		F10.20
	Alcohol dependence, in remission		F10.21
	Alcohol dependence with intoxication, uncomplicated		F10.220
	Alcohol dependence with intoxication delirium		F10.221
	Alcohol dependence with intoxication, unspecified		F10.229
	Alcohol dependence with withdrawal, uncomplicated		F10.230
	Alcohol dependence with withdrawal delirium		F10.231
	Alcohol dependence with withdrawal with perceptual disturbance		F10.232
	Alcohol dependence with withdrawal, unspecified		F10.239

Alcohol dependence with alcohol-induced mood disorder	F10.24
Alcohol dependence with alcohol-induced psychotic disorder with delusions	F10.250
Alcohol dependence with alcohol-induced psychotic disorder with hallucinations	F10.251
Alcohol dependence with alcohol-induced psychotic disorder, unspecified	F10.259
Alcohol dependence with alcohol-induced persisting amnesic disorder	F10.26
Alcohol dependence with alcohol-induced persisting dementia	F10.27
Alcohol dependence with alcohol-induced anxiety disorder	F10.280
Alcohol dependence with alcohol-induced sexual dysfunction	F10.281
Alcohol dependence with alcohol-induced sleep disorder	F10.282
Alcohol dependence with other alcohol-induced disorder	F10.288
Alcohol dependence with unspecified alcohol-induced disorder	F10.29

Diabetes

Diabetes mellitus without mention of complication	250.0x
Diabetes with ketoacidosis	250.1x
Diabetes with hyperosmolarity	250.2x
Diabetes with other coma	250.3x
Diabetes with other specified manifestations	250.8x
Diabetes with unspecified complication	250.9x
Diabetes with renal manifestations	250.4x
Diabetes with ophthalmic manifestations	250.5x
Diabetes with neurological manifestations	250.6x
Diabetes with peripheral circulatory disorders	250.7x
Type 1 diabetes mellitus with ketoacidosis	E10.1x
Type 1 diabetes mellitus with diabetic nephropathy	E10.21
Type 1 diabetes mellitus with diabetic chronic kidney disease	E10.22
Type 1 diabetes mellitus with other diabetic kidney complication	E10.29
Type 1 diabetes mellitus with diabetic retinopathy	E10.3x
Type 1 diabetes mellitus with diabetic neuropathy	E10.4x
Type 1 diabetes mellitus with diabetic peripheral angiopathy	E10.5x
Type 1 diabetes mellitus with diabetic arthropathy	E10.61x
Type 1 diabetes mellitus with skin complications	E10.62x
Type 1 diabetes mellitus with oral complications	E10.63x
Type 1 diabetes mellitus with hypoglycemia	E10.64x
Type 1 diabetes mellitus with hyperglycemia	E10.65
Type 1 diabetes mellitus with other specified complication	E10.69
Type 1 diabetes mellitus with unspecified complications	E10.8
Type 1 diabetes mellitus without complications	E10.9
Type 2 diabetes mellitus with hyperosmolarity	E11.0x
Type 2 diabetes mellitus with ketoacidosis	E11.1x
Type 2 diabetes mellitus with diabetic nephropathy	E11.21
Type 2 diabetes mellitus with diabetic chronic kidney disease	E11.22

Type 2 diabetes mellitus with other diabetic kidney complication	E11.29
Type 2 diabetes mellitus with diabetic retinopathy	E11.3x
Type 2 diabetes mellitus with diabetic neuropathy	E11.4x
Type 2 diabetes mellitus with diabetic peripheral angiopathy	E11.5x
Type 2 diabetes mellitus with diabetic arthropathy	E11.61x
Type 2 diabetes mellitus with skin complications	E11.62x
Type 2 diabetes mellitus with oral complications	E11.63x
Type 2 diabetes mellitus with hypoglycemia	E11.64x
Type 2 diabetes mellitus with hyperglycemia	E11.65
Type 2 diabetes mellitus with other specified complication	E11.69
Type 2 diabetes mellitus with unspecified complications	E11.8
Type 2 diabetes mellitus without complications	E11.9
Other specified diabetes mellitus with hyperosmolarity	E13.0x
Other specified diabetes mellitus with ketoacidosis	E13.1x
Other specified diabetes mellitus with diabetic nephropathy	E13.21
Other specified diabetes mellitus with diabetic chronic kidney disease	E13.22
Other specified diabetes mellitus with other diabetic kidney complication	E13.29
Other specified diabetes mellitus with diabetic retinopathy	E13.3x
Other specified diabetes mellitus with diabetic neuropathy	E13.4x
Other specified diabetes mellitus with diabetic peripheral angiopathy	E13.5x
Other specified diabetes mellitus with diabetic arthropathy	E13.61x
Other specified diabetes mellitus with skin complications	E13.62x
Other specified diabetes mellitus with oral complications	E13.63x
Other specified diabetes mellitus with hypoglycemia	E13.64x
Other specified diabetes mellitus with hyperglycemia	E13.65
Other specified diabetes mellitus with other specified complication	E13.69
Other specified diabetes mellitus with unspecified complications	E13.8
Other specified diabetes mellitus without complications	E13.9
Hepatitis B	
Chronic viral hepatitis B w/ hepatic coma w/o mention of hepatitis delta	070.22
Chronic viral hepatitis B w/ hepatic coma w/ hepatitis delta	070.23
Chronic viral hepatitis B w/o mention of hepatic coma w/o mention of hepatitis delta	070.32
Chronic viral hepatitis B w/o mention of hepatic coma w/ hepatitis delta	070.33
Chronic viral hepatitis B with delta-agent	B18.0
Chronic viral hepatitis B without delta-agent	B18.1
Hepatitis C	
Chronic hepatitis C w/ hepatic coma	070.44
Chronic hepatitis C w/o mention of hepatic coma	070.54
Chronic viral hepatitis C	B18.2

Hepatic decompensation defined by stand-alone condition(s) or ascites with a concurrent liver related disorder

Description	ICD-9	ICD-10
Stand-alone conditions		
Esophageal varices with bleeding	456.0	I85.01
Spontaneous bacterial peritonitis	567.23	K65.2
Other suppurative peritonitis	567.2	
Other specified peritonitis	567.8	
Alcoholic hepatitis with ascites		K70.11
Alcoholic cirrhosis of liver with ascites		K70.31
Alcoholic hepatic failure with coma		K70.41
Hepatic coma, (encephalopathy)	572.2	
Chronic hepatic failure without coma		K72.10
Chronic hepatic failure with coma		K72.11
Hepatic failure, unspecified, with coma		K72.91
Hepatic encephalopathy		K76.82
Ascites		
Ascites	789.5	
Other ascites	789.59	R18.8
Liver related disorders		
Esophageal varices without bleeding	456.1	I85.00
Esophageal varices in diseases classified elsewhere, without bleeding	456.21	
Secondary esophageal varices, without bleeding		I85.10
Esophageal varices in diseases classified elsewhere, with bleeding	456.20	
Secondary esophageal varices, with bleeding		I85.11
Alcoholic cirrhosis of liver	571.2	
Alcoholic cirrhosis of liver without ascites		K70.30
Cirrhosis of liver without mention of alcohol	571.5	
Unspecified cirrhosis of liver		K74.60
Other cirrhosis of liver		K74.69
Other chronic nonalcoholic liver disease	571.8	
Unspecified chronic liver disease w/o mention of alcohol	571.9	
Other chronic hepatitis	571.49	
Other sequelae of chronic liver disease	572.8	
Hepatitis, unspecified	573.3	
Unspecified disorder of liver	573.9	
Alcoholic hepatitis, without ascites		K70.10
Alcoholic hepatic failure, without coma		K70.40
Hepatic failure, unspecified, without coma		K72.90
Alcoholic liver damage, unspecified	571.3	
Alcoholic liver disease, unspecified		K70.9
Other specified diseases of liver		K76.89
Liver disease, unspecified		K76.9
Portal hypertension	572.3	K76.6
Hepatorenal syndrome	572.4	K76.7

Jaundice

782.4

R17.