

APPENDIX MATERIAL

Supplementary Table 1. Univariable multinomial regression of sociodemographic and clinical parameters with healthy liver, steatosis, and liver fibrosis, adjusted for age and sex, Cameron County Hispanic Cohort

	Steatosis vs Healthy		Fibrosis vs Healthy		Fibrosis vs Steatosis	
	OR (95% CI)	<i>p</i> -value	OR (95% CI)	<i>p</i> -value	OR (95% CI)	<i>p</i> -value
Age (years)	1.0 (0.8 - 1.3)	0.8145	0.8 (0.6 - 1.0)	0.0865	0.8 (0.6 - 1.0)	0.0694
Male Sex	0.9 (0.5 - 1.7)	0.7444	1.6 (0.8 - 3.5)	0.1970	1.8 (0.8 - 4.3)	0.1671
Diabetes ^c	1.9 (0.9 - 4.0)	0.0750	1.9 (0.7 - 5.1)	0.1998	0.5 (0.3 - 1.1)	0.0750
Fasting Glucose (10 mg/dL)	1.1 (1.0 - 1.2)	0.0131	1.1 (1.0 - 1.2)	0.2512	1.0 (0.9 - 1.1)	0.4920
Hemoglobin A1c (%)	1.2 (0.9 - 1.6)	0.3003	1.2 (0.9 - 1.5)	0.2615	1.0 (0.9 - 1.1)	0.9888
Insulin (10 mg/dL)	2.8 (1.6 - 4.8)	0.0001*	1.5 (0.7 - 2.9)	0.2749	0.5 (0.2 - 1.1)	0.1004
HOMA-IR	1.5 (1.2 - 1.7)	<0.0001*	1.2 (0.9 - 1.5)	0.1983	0.8 (0.6 - 1.1)	0.1405
Diastolic BP (mmHg) ^d	1.5 (1.1 - 2.0)	0.0172	1.1 (0.6 - 2.0)	0.8302	0.7 (0.4 - 1.4)	0.3163
Hypertension ^e	1.1 (0.5 - 2.6)	0.7799	1.6 (0.6 - 4.8)	0.3772	1.4 (0.5 - 4.6)	0.5361
Triglycerides (50 mg/dL)	1.5 (1.1 - 1.9)	0.0029*	1.2 (0.7 - 1.9)	0.5709	0.8 (0.5 - 1.3)	0.3575
HDL Cholesterol 10 (mg/dL)	0.5 (0.4 - 0.7)	0.0001*	1.0 (0.6 - 1.5)	0.8665	1.8 (1.1 - 2.9)	0.0110
AST (10 units/L)	1.4 (1.1 - 1.9)	0.0208	1.5 (1.1 - 2.0)	0.0118	1.0 (0.9 - 1.2)	0.4262
ALT (10 units/L)	1.5 (1.2 - 1.9)	0.0003*	1.4 (1.1 - 1.8)	0.0050*	0.9 (0.8 - 1.1)	0.3408
AST/ALT Ratio	0.4 (0.0 - 3.4)	0.3766	3.2 (0.8 - 13.1)	0.0993	8.8 (0.7 - 106)	0.0858
Obese ^f	3.1 (1.7 - 5.6)	0.0001*	1.7 (0.8 - 3.9)	0.1816	0.6 (0.2 - 1.3)	0.1871
Waist Circumference (10 cm)	1.0 (1.0 - 1.1)	<0.0001*	1.0 (1.0 - 1.1)	0.2972	1.0 (0.9 - 1.0)	0.1389
Platelets (50×10 ³ /μL)	1.1 (0.8 - 1.4)	0.5610	0.8 (0.5 - 1.2)	0.2567	0.7 (0.5 - 1.1)	0.1171
Anti-HCV	8.4 (0.9 - 81.5)	0.0676	19.4 (2.1 - 181.4)	0.0094	2.3 (0.5 - 11.9)	0.3139
Drinks per week	1.0 (0.9 - 1.1)	0.6097	1.1 (1.0 - 1.2)	0.1163	1.0 (1.0 - 1.1)	0.2225
Heavy Drinking ^g	0.8 (0.1 - 8.4)	0.7726	3.8 (0.3 - 45.1)	0.4104	4.8 (0.6 - 41.2)	0.1542

Abbreviations: OR, Odds Ratio; CI, confidence interval; HOMA-IR, homeostasis model of insulin resistance ; BP, blood pressure; LDL, low-density lipoprotein; HDL, high-density lipoprotein; AST, aspartate aminotransferase; ALT, alanine aminotransferase

Note. Statistical tests significant at the 5% level after correction for false discovery rate are marked with an asterisk.

^a Healthy indicates no evidence of steatosis and liver stiffness ≤ 1.34 ; steatosis indicates evidence of steatosis and liver stiffness ≤ 1.34 m/s; fibrosis indicates liver stiffness > 1.34 m/s

^b OR, 95% CI and *P*-value obtained from survey-based multinomial logistic regression

^c According to American Diabetes 2010 Diagnostic Guidelines

^d Blood pressure analyses are adjusted for self-reported use of antihypertensive medication

^e Systolic Blood Pressure > 135 or Diastolic Blood Pressure > 85 or taking antihypertensive medication

^f Body Mass Index ≥ 30 kg/m²

^g For men, greater than 21 self-reported drinks per week; for women, greater than 14 drinks per week.

Supplementary Table 2. Univariable multinomial regression of sociodemographic and clinical parameters with healthy liver, steatosis, and liver fibrosis, excluding participants with viral hepatitis and self-reported heavy alcohol consumption, Cameron County Hispanic Cohort

	Steatosis vs Healthy ^a		Fibrosis vs Healthy		Fibrosis vs Steatosis	
	OR (95% CI) ^b	p-value	OR (95% CI)	p-value	OR (95% CI)	p-value
Age (years)	1.1 (0.9 - 1.3)	0.4712	0.8 (0.6 - 1.0)	0.0791	0.7 (0.5 - 1.0)	0.0268
Male Sex	0.8 (0.4 - 1.7)	0.6386	1.3 (0.6 - 3.1)	0.5313	1.6 (0.6 - 4.2)	0.3794
Diabetes ^c	2.1 (1.0 - 4.3)	0.0397	1.5 (0.5 - 4.3)	0.4694	0.7 (0.3 - 1.9)	0.4809
Fasting Glucose (10 mg/dL)	1.1 (1.0 - 1.2)	0.0161	1.0 (0.9 - 1.2)	0.5309	1.0 (0.8 - 1.1)	0.5050
Hemoglobin A1c (%)	1.2 (0.9 - 1.6)	0.3267	1.1 (0.8 - 1.5)	0.4267	1.0 (0.8 - 1.2)	0.7430
Insulin (10 mg/dL)	2.6 (1.5 - 4.4)	0.0008*	1.5 (0.7 - 3.1)	0.3018	0.6 (0.2 - 1.4)	0.2267
HOMA-IR	1.4 (1.2 - 1.7)	0.0001*	1.1 (0.9 - 1.5)	0.3570	0.8 (0.6 - 1.1)	0.2098
Diastolic BP (mmHg) ^d	1.5 (1.0 - 2.1)	0.0361	1.2 (0.6 - 2.4)	0.6225	0.8 (0.4 - 1.6)	0.5194
Hypertension ^e	1.2 (0.5 - 2.5)	0.7237	1.1 (0.4 - 3.1)	0.8024	1.0 (0.3 - 3.0)	0.9778
Triglycerides (50 mg/dL)	1.5 (1.1 - 1.9)	0.0033*	1.2 (0.7 - 2.1)	0.5440	0.8 (0.4 - 1.5)	0.5090
HDL Cholesterol 10 (mg/dL)	0.6 (0.4 - 0.8)	0.0017*	0.9 (0.6 - 1.4)	0.5613	1.4 (0.9 - 2.3)	0.1144
AST (10 units/L)	1.4 (1.0 - 1.9)	0.0483	1.5 (1.1 - 2.2)	0.0193	1.1 (1.0 - 1.2)	0.1268
ALT (10 units/L)	1.5 (1.1 - 1.9)	0.0028*	1.5 (1.1 - 1.9)	0.0021*	1.0 (0.9 - 1.2)	0.9911
AST/ALT Ratio	0.5 (0.1 - 4.6)	0.5275	2.9 (0.8 - 10.3)	0.1016	6.0 (0.5 - 76.7)	0.1683
Obese ^f	2.6 (1.4 - 4.7)	0.0022*	1.5 (0.6 - 3.7)	0.4199	0.6 (0.2 - 1.2)	0.2628
Waist Circumference (10 cm)	1.5 (1.2 - 1.9)	0.0008*	1.1 (0.7 - 1.6)	0.8143	0.7 (0.4 - 1.1)	0.1386
Platelets (50x10 ³ /μL)	1.1 (0.9 - 1.5)	0.3005	0.7 (0.5 - 1.1)	0.1417	0.6 (0.4 - 1.0)	0.0300
Anti-HCV	-	-	-	-	-	-
Drinks per week	0.9 (0.8 - 1.1)	0.4516	1.1 (1.0 - 1.3)	0.1476	1.2 (1.0 - 1.4)	0.0854
Heavy Drinking ^g	-	-	-	-	-	-

Abbreviations: OR, Odds Ratio; CI, confidence interval; HOMA-IR, homeostasis model of insulin resistance; BP, blood pressure; LDL, low-density lipoprotein; HDL, high-density lipoprotein; AST, aspartate aminotransferase; ALT, alanine aminotransferase

Note. Statistical tests significant at the 5% level after correction for false discovery rate are marked with an asterisk.

^a Healthy indicates no evidence of steatosis and liver stiffness ≤ 1.34 ; steatosis indicates evidence of steatosis and liver stiffness ≤ 1.34 m/s; fibrosis indicates liver stiffness > 1.34 m/s

^b OR, 95% CI and *P*-value obtained from survey-based multinomial logistic regression

^c According to American Diabetes 2010 Diagnostic Guidelines

^d Blood pressure analyses are adjusted for self-reported use of antihypertensive medication

^e Systolic Blood Pressure > 135 or Diastolic Blood Pressure > 85 or taking antihypertensive medication

^f Body Mass Index ≥ 30 kg/m²

^g For men, greater than 21 self-reported drinks per week; for women, greater than 14 drinks per week.

Supplementary Table 3. Univariable multinomial regression of sociodemographic and clinical parameters with healthy liver, steatosis, and liver fibrosis, excluding F4 fibrosis, Cameron County Hispanic Cohort

	Steatosis vs Healthy		Fibrosis vs Healthy		Fibrosis vs Steatosis	
	OR (95% CI)	<i>p</i> -value	OR (95% CI)	<i>p</i> -value	OR (95% CI)	<i>p</i> -value
Age (years)	1.0 (0.8 - 1.3)	0.7975	0.7 (0.6 - 1.0)	0.0425	0.7 (0.5 - 1.0)	0.0302
Male Sex	0.9 (0.5 - 1.7)	0.7313	2.0 (0.8 - 5.0)	0.1210	2.3 (0.8 - 6.2)	0.1046
Diabetes ^c	1.9 (1.0 - 3.8)	0.0655	1.1 (0.4 - 3.4)	0.8606	0.6 (0.2 - 1.6)	0.2984
Fasting Glucose (10 mg/dL)	1.1 (1.0 - 1.2)	0.0155	1.1 (0.9 - 1.2)	0.3289	1.0 (0.9 - 1.1)	0.6070
Hemoglobin A1c (%)	1.2 (0.9 - 1.5)	0.3107	1.1 (0.9 - 1.5)	0.3854	1.0 (0.8 - 1.1)	0.7832
Insulin (10 mg/dL)	2.7 (1.6 - 4.6)	0.0002*	1.3 (0.6 - 2.9)	0.4641	0.5 (0.2 - 1.2)	0.1305
HOMA-IR	1.4 (1.2 - 1.7)	0.0001*	1.1 (0.9 - 1.5)	0.3416	0.8 (0.6 - 1.1)	0.1686
Diastolic BP (mmHg) ^d	1.4 (1.0 - 2.0)	0.0381	1.2 (0.5 - 2.6)	0.7028	0.8 (0.4 - 1.7)	0.5996
Hypertension ^e	1.1 (0.5 - 2.4)	0.7585	0.9 (0.3 - 2.6)	0.9125	0.8 (0.3 - 2.5)	0.7556
Triglycerides (50 mg/dL)	1.4 (1.1 - 1.8)	0.0034*	1.1 (0.6 - 2.1)	0.8072	0.8 (0.4 - 1.6)	0.4603
HDL Cholesterol 10 (mg/dL)	0.6 (0.4 - 0.8)	0.0004*	1.0 (0.6 - 1.5)	0.8346	1.7 (1.1 - 2.7)	0.0179
AST (10 units/L)	1.4 (1.1 - 1.9)	0.0139	1.4 (1.0 - 2.0)	0.0262	1.0 (0.8 - 1.2)	0.9713
ALT (10 units/L)	1.5 (1.2 - 1.9)	0.0004*	1.4 (1.1 - 1.7)	0.0030*	0.9 (0.8 - 1.1)	0.2370
AST/ALT Ratio	0.5 (0.1 - 3.5)	0.4609	1.5 (0.5 - 4.7)	0.4969	3.2 (0.3 - 29.2)	0.3061
Obese ^f	3.1 (1.7 - 5.5)	0.0001*	1.1 (0.4 - 2.9)	0.7951	0.4 (0.1 - 1.0)	0.0497
Waist Circumference (10 cm)	1.6 (1.3 - 2.1)	0.0002*	0.8 (0.6 - 1.1)	0.2506	0.5 (0.3 - 0.7)	0.0005*
Platelets (50×10 ³ /μL)	1.1 (0.8 - 1.4)	0.5597	0.7 (0.5 - 1.0)	0.0537	0.6 (0.5 - 0.9)	0.0120
Anti-HCV	8.4 (0.9 - 79.3)	0.0646	22.6 (2.2 - 236)	0.0091	2.7 (0.5 - 14.1)	0.2349
Drinks per week	1.1 (0.9 - 1.1)	0.7294	1.1 (1.0 - 1.2)	0.0617	1.1 (1.0 - 1.1)	0.0898
Heavy Drinking ^g	0.7 (0.1 - 7.6)	0.7915	6.7 (0.7 - 67.9)	0.1073	9.2 (1.1 - 74.4)	0.0377

Abbreviations: OR, Odds Ratio; CI, confidence interval; HOMA-IR, homeostasis model of insulin resistance; BP, blood pressure; LDL, low-density lipoprotein; HDL, high-density lipoprotein; AST, aspartate aminotransferase; ALT, alanine aminotransferase

Note. Statistical tests significant at the 5% level after correction for false discovery rate are marked with an asterisk.

^a Healthy indicates no evidence of steatosis and liver stiffness ≤ 1.34 m/s; steatosis indicates evidence of steatosis and liver stiffness ≤ 1.34 m/s; fibrosis indicates liver stiffness > 1.34 m/s

^b OR, 95% CI and *P*-value obtained from survey-based multinomial logistic regression

^c According to American Diabetes 2010 Diagnostic Guidelines

^d Blood pressure analyses are adjusted for self-reported use of antihypertensive medication

^e Systolic Blood Pressure > 135 or Diastolic Blood Pressure > 85 or taking antihypertensive medication

^f Body Mass Index ≥ 30 kg/m²

^g For men, greater than 21 self-reported drinks per week; for women, greater than 14 drinks per week.

Supplementary Table 4. Univariable binomial regression of sociodemographic and clinical parameters with significant liver fibrosis, Cameron County Hispanic Cohort

	Significant Fibrosis ^a	
	OR ^b (95% CI)	p-value
Age (years)	0.8 (0.6 – 1.0)	0.0247
Male Sex	1.8 (0.9 - 3.6)	0.1259
Diabetes ^c	0.9 (0.4 - 2.1)	0.8684
Fasting Glucose (10 mg/dL)	1.0 (0.9 - 1.1)	0.9908
Hemoglobin A1c (%)	1.0 (0.9 - 1.1)	0.7715
Insulin (10 mg/dL)	0.8 (0.4 - 1.5)	0.5531
HOMA-IR	0.9 (0.8 - 1.2)	0.5397
Diastolic BP (mmHg) ^d	1.0 (0.5 - 1.9)	0.9387
Hypertension ^e	0.9 (0.4 - 2.3)	0.8584
Triglycerides (50 mg/dL)	0.9 (0.6 - 1.6)	0.7864
HDL Cholesterol 10 (mg/dL)	1.1 (0.7 - 1.5)	0.7479
AST (10 units/L)	1.1 (1.0 - 1.3)	0.0524
ALT (10 units/L)	1.1 (1.0 - 1.2)	0.3253
AST/ALT Ratio	2.7 (0.8 - 8.6)	0.1017
Obese ^f	0.9 (0.4 - 1.8)	0.7375
Waist Circumference (10 cm)	0.9 (0.6 - 1.2)	0.3421
Platelets (50×10 ³ /μL)	0.8 (0.6 – 1.0)	0.0463
Anti-HCV	5.3 (1.1 - 24.8)	0.0359
Drinks per week	1.1 (1.0 - 1.1)	0.0145
Heavy Drinking ^g	3.2 (0.8 - 13.5)	0.1066

Abbreviations: OR, Odds Ratio; CI, confidence interval; HOMA-IR, homeostasis model of insulin resistance ; BP, blood pressure; LDL, low-density lipoprotein; HDL, high-density lipoprotein; AST, aspartate aminotransferase; ALT, alanine aminotransferase

Note. Statistical tests significant at the 5% level after correction for false discovery rate are marked with an asterisk.

^a Significant fibrosis indicates shear-wave velocity greater than 1.34 m/s

^b OR, 95% CI and *P*-value obtained from survey-based binomial logistic regression

^c According to American Diabetes 2010 Diagnostic Guidelines

^d Blood pressure analyses are adjusted for self-reported use of antihypertensive medication

^e Systolic Blood Pressure > 135 or Diastolic Blood Pressure > 85 or taking antihypertensive medication

^f Body Mass Index ≥ 30 kg/m²

^g For men, greater than 21 self-reported drinks per week; for women, greater than 14 drinks per week.

Supplementary Table 5. Multiple multinomial logistic regression associations of clinical parameters with healthy liver, steatosis, and liver fibrosis, Cameron County Hispanic Cohort.

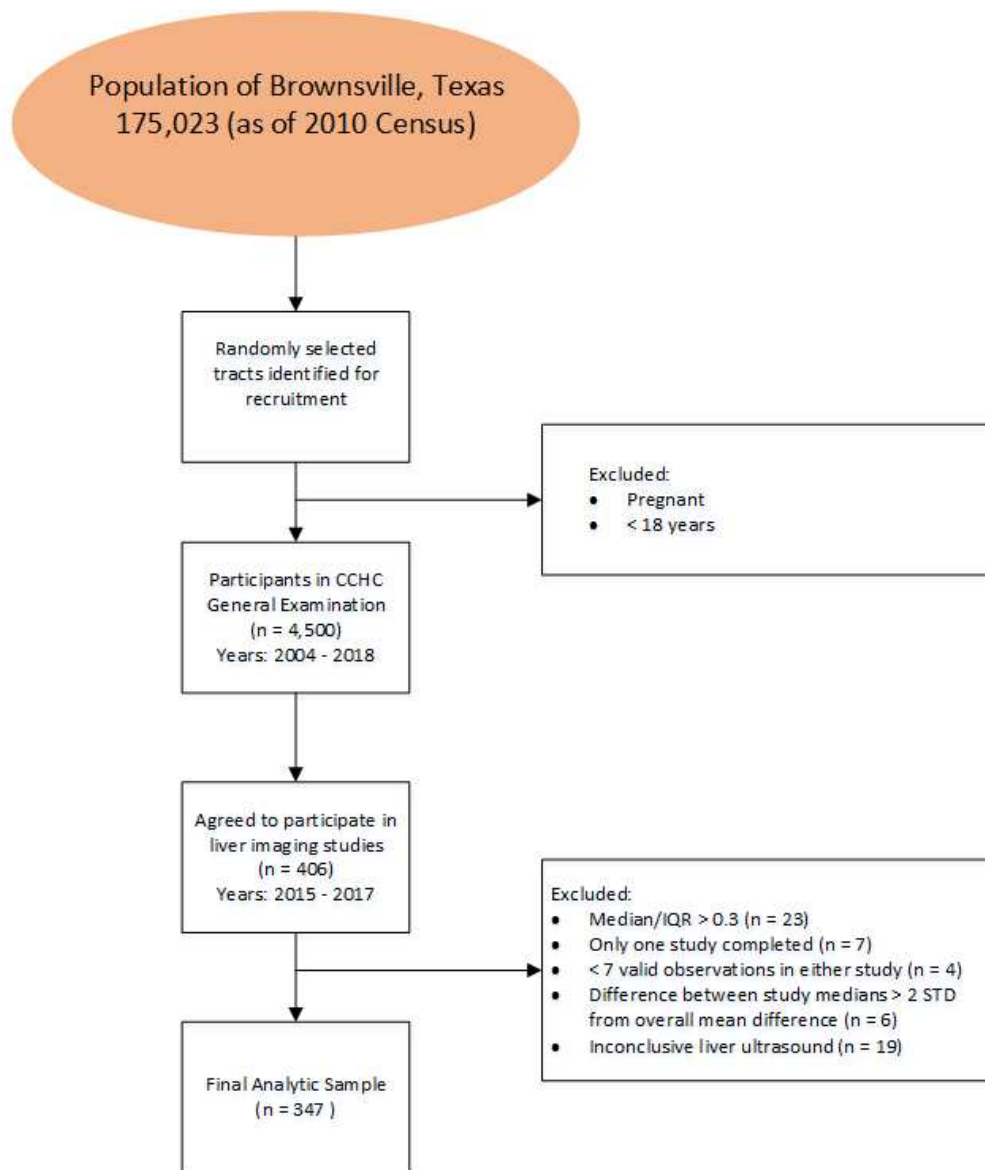
	Steatosis vs Healthy ^a		Fibrosis vs Healthy		Fibrosis vs Steatosis	
	OR (95% CI) ^b	p-value	OR (95% CI)	p-value	OR (95% CI)	p-value
Age (years)	1.0 (1.0 - 1.0)	0.9096	1.0 (0.9 - 1.0)	0.0545	1.0 (0.9 - 1.0)	0.0636
Male Sex	0.6 (0.2 - 1.9)	0.4003	1.3 (0.5 - 3.5)	0.5832	2.1 (0.6 - 7.2)	0.2365
Fasting Glucose (10 mg/dL)	1.0 (1.0 - 1.1)	0.3476	1.1 (1.0 - 1.2)	0.1157	1.1 (0.9 - 1.2)	0.3471
Triglycerides (50 mg/dL)	1.3 (1.0 - 1.7)	0.0327	1.1 (0.7 - 1.6)	0.7811	0.8 (0.5 - 1.2)	0.2496
AST (10 u/L)	0.8 (0.5 - 1.5)	0.5233	1.6 (0.6 - 4.0)	0.3150	1.9 (0.8 - 4.4)	0.1187
ALT (10 u/L)	1.5 (1.0 - 2.2)	0.0278	0.9 (0.6 - 1.5)	0.7123	0.6 (0.4 - 0.9)	0.0231
Waist Circumference (10 cm)	1.4 (1.1 - 1.8)	0.0129	1.2 (0.8 - 1.8)	0.4066	0.9 (0.6 - 1.4)	0.5584
Platelets (50×10 ³ /μL)	1.2 (0.9 - 1.6)	0.2869	0.8 (0.6 - 1.2)	0.2989	0.7 (0.5 - 1.0)	0.0519
Anti-HCV	9.1 (0.6 - 139.5)	0.1115	19.1 (1.9 - 197.9)	0.0132	2.1 (0.2 - 26.0)	0.5652
Drinks per week	1.0 (0.9 - 1.1)	0.6776	1.1 (1.0 - 1.2)	0.2251	1.1 (1.0 - 1.2)	0.1003

Abbreviations: OR, Odds Ratio; CI, confidence interval; AST, aspartate aminotransferase; ALT, alanine aminotransferase; HCV, hepatitis C Virus

^a Healthy indicates no evidence of steatosis and liver stiffness ≤ 1.34 ; steatosis indicates evidence of steatosis and liver stiffness ≤ 1.34 m/s; fibrosis indicates liver stiffness > 1.34 m/s

^b OR, 95% CI and *P*-value obtained from survey-based multinomial logistic regression

Figure S1. Recruitment Flow Chart



EDITOR'S NOTES**Background**

The burden of hepatocellular carcinoma is increasing among Mexican American Hispanics, but little is known about the burden and distribution of liver fibrosis in the population.

Findings

Using point shear-wave elastography in a Mexican American cohort in south Texas, we found a population prevalence of significant liver fibrosis equal to 13.8%, overwhelmingly attributable to non-viral, non-alcoholic disease.

Implications for Patient Care

The use of elastographic imaging is an important and practical method for screening and risk stratification to reduce the burden of hepatocellular carcinoma among Mexican Americans.