

SUPPLEMENTARY TABLES.

Table S1: The categories and neighborhood-level variables included in analysis as explanatory variables

Categories	Neighborhood-level variables	ADI indicators
1. Race / Ethnicity	% Non-Hispanic White	
	% Non-Hispanic Black or African American	
	% Non-Hispanic American Indian and Alaska Native	
	% Non-Hispanic Asian	
	% Non-Hispanic Native Hawaiian, Pacific Islander	
	% Non-Hispanic Other + 2 or more races	
	% Hispanic or Latino	
2. Citizenship	% Population; not a US Citizen	
	% Population; foreign-born	
	% of Foreign-born; born in Latin America	
3. Age and Sex	% of Population; 50 to 59 y.o.	
	% of Population; 60 y.o. and above	
	% of Population; Male	
4. Socioeconomic Status	% of 18 to 34 years with no health insurance	
	% of 35 to 64 years with no health insurance	
	% of 65 years and over with no health insurance	
	Area Deprivation Index ^a	
	Poverty	
	Median family income, \$	(1)
	Income disparity	(2)
	Families below poverty level	(3)
	% Population below 150% poverty threshold	(4)
	% Single parent households with dependents <18	(5)
	% Households without a motor vehicle	(6)
	% Households without a telephone	(7)
	% Occupied housing units without complete plumbing	(8)
	Housing	
	% Owner occupied housing units	(9)
	% Households with > 1 person per room	(10)
	Median monthly mortgage, \$	(11)
Median gross rent, \$	(12)	
Median home value, \$	(13)	
Employment		
% Employed person 16+ in white collar occupation	(14)	
% Civilian labor force unemployed (age 16+)	(15)	
Education		
% Population aged 25+ with <9yr education	(16)	
% Population aged 25+ with at least a high school education	(17)	
5. Industry	% in Agriculture, forestry industry	
	% in Construction industry	
	% in Manufacturing category	
	% in Transportation and warehousing etc.	
	% in Professional, scientific etc.	
	% in Educational services, and health care etc. category	
	% in Other services, except public administration	

^a. ADI indicators. A total 17 census variables drawn from four categories, including poverty, housing, employment, and education.

Table S2. Census indicators (mean values) organized by age-adjusted HCC incidence rate quartiles^a for Texas census tracts (N=5,205).

	No HCC Cases (n=1026)	Quartile 1 (n=1051)	Quartile 2 (n=1067)	Quartile 3 (n=1030)	Quartile 4 (n=1031)
Age-adjusted HCC incidence rate: Mean (Min, Max)	0.0 (0, 0)	5.6 (1.0, 8.0)	11.7 (9.0, 15.0)	20.3 (16.0, 26.0)	46.6 (27, 208)
Race / Ethnicity: Mean (SD)					
% Non-Hispanic White	53.50 (25.13)	56.13 (25.9)	48.22 (26.92)	39.88 (27.33)	25.45 (23.51)
% Non-Hispanic Black or African American	10.22 (13.67)	9.54 (12.41)	10.56 (14.49)	12.53 (17.34)	15.26 (20.41)
% Non-Hispanic American Indian and Alaska Native	0.29 (0.71)	0.28 (0.58)	0.25 (0.49)	0.27 (0.57)	0.19 (0.55)
% Non-Hispanic Asian	5.39 (8.15)	4.20 (7.09)	3.58 (6.04)	2.83 (5.35)	2.34 (5.14)
% Non-Hispanic Native Hawaiian, Pacific Islander	0.07 (0.32)	0.08 (0.58)	0.07 (0.37)	0.07 (0.37)	0.06 (0.34)
% Non-Hispanic Other + 2 or more races	3.72 (3.75)	3.36 (3.12)	3.23 (3.17)	2.88 (3.1)	2.30 (3.03)
% Hispanic or Latino	28.60 (23.65)	28.03 (23.58)	35.64 (25.92)	42.93 (28.1)	55.49 (29.15)
Citizenship: Mean (SD)					
% Population; not a US Citizen	9.70 (9.73)	8.08 (8.36)	9.57 (8.64)	11.57 (9.82)	14.17 (10.3)
% Population; foreign-born	14.80 (11.69)	13.39 (11.04)	14.82 (11.25)	16.85 (12.19)	19.67 (12.36)
% of Foreign-born; born in Latin America	56.75 (32.37)	60.03 (30.06)	67.38 (28.11)	73.86 (27.21)	82.18 (23.3)
Age and Sex: Mean (SD)					
% of Population; 50 to 59 y.o.	12.35 (4.54)	13.85 (3.69)	13.15 (3.55)	12.51 (3.47)	11.73 (3.47)
% of Population; 60 y.o. and above	16.79 (9.15)	19.78 (8.39)	18.15 (7.76)	17.25 (7.25)	15.02 (6.19)
% of Population; Male	50.10 (5.56)	49.26 (3.96)	49.24 (3.49)	49.73 (4.29)	49.75 (5.04)
Socioeconomic Status: Mean (SD)					
Area Deprivation Index (decile)	4.71 (2.95)	4.52 (2.58)	5.12 (2.71)	6.16 (2.68)	7.05 (2.64)
Area Deprivation Index (score)	92.29 (26.02)	94.11 (21.41)	98.39 (18.88)	103.93 (17.07)	108.22 (14.35)
% of 18 to 34 years with no health insurance	28.66 (17.99)	30.24 (15.95)	33.30 (16.4)	38.76 (16.61)	43.17 (16.5)
% of 35 to 64 years with no health insurance	21.57 (14.55)	20.71 (13.05)	23.30 (13.28)	28.39 (13.74)	33.00 (13.77)
% of 65 years and over with no health insurance	2.12 (5.55)	1.88 (4.69)	2.03 (4.51)	2.57 (5.09)	3.00 (5.87)
Industry: Mean (SD)					
% in Agriculture, forestry industry	4.66 (7.07)	4.09 (4.99)	3.64 (4.96)	3.71 (5.33)	2.85 (4.57)
% in Construction industry	6.50 (5.35)	7.41 (4.76)	8.04 (5.18)	8.97 (5.92)	10.52 (6.76)
% in Manufacturing category	8.47 (5.23)	9.42 (4.81)	9.24 (5.06)	9.03 (4.96)	8.62 (5.05)
% in Transportation and warehousing etc.	5.08 (3.4)	5.38 (3.06)	5.52 (3.25)	5.51 (3.28)	5.72 (3.55)
% in Professional, scientific etc.	11.52 (6.87)	10.88 (5.65)	10.42 (5.27)	10.01 (4.99)	9.90 (4.85)
% in Educational services, and health care etc.	22.09 (7.86)	22.19 (6.51)	21.70 (6.65)	21.42 (7.35)	20.91 (7.6)
% in Other services, except public administration	4.99 (3.07)	5.19 (2.59)	5.42 (2.67)	5.64 (2.91)	5.94 (3.12)

^a After separating out the census tracts that had no HCC (i.e., age-adjusted rate = 0) into a separate group, we categorized the rest of the census tracts into four groups using a quartile classification method. Descriptive data for each explanatory variable were computed across 5 HCC groups.

Table S3: Bivariate analysis of neighborhood-level explanatory variables and incidence of HCC in Texas (N census tracts = 5,205).

	Coeff	95% CI		IRR	95% CI		P value
		Lower	Upper		Lower	Upper	
Race / Ethnicity							
% Non-Hispanic White	-0.104	-0.113	-0.096	0.901	0.893	0.909	< 0.00
% Non-Hispanic Black or African American	0.062	0.047	0.076	1.064	1.048	1.079	< 0.00
% Non-Hispanic American Indian and Alaska Native	-0.675	-1.157	-0.193	0.509	0.315	0.824	< 0.01
% Non-Hispanic Asian	-0.398	-0.443	-0.353	0.672	0.642	0.702	< 0.00
% Non-Hispanic Native Hawaiian, Pacific Islander	-0.538	-1.194	0.118	0.584	0.303	1.126	< 0.11 †
% Non-Hispanic Other + 2 or more races	-0.580	-0.661	-0.499	0.560	0.517	0.607	< 0.00
% Hispanic or Latino	0.097	0.089	0.105	1.102	1.093	1.111	< 0.00
Citizenship							
% Population; not a US Citizen	0.088	0.062	0.114	1.092	1.064	1.120	< 0.00
% Population; foreign-born	0.043	0.022	0.063	1.044	1.022	1.065	< 0.00
% of Foreign-born; born in Latin America	0.114	0.106	0.123	1.121	1.112	1.131	< 0.00
Age and Sex							
% of Population; 50 to 59 y.o.	0.059	-0.008	0.127	1.061	0.992	1.135	< 0.08
% of Population; 60 y.o. and above	0.102	0.070	0.134	1.108	1.073	1.144	< 0.00
% of Population; Male	0.003	-0.049	0.054	1.003	0.953	1.056	< 0.91 †
Socioeconomic Status							
Area Deprivation Index (decile)	1.231	1.150	1.312	3.425	3.159	3.714	< 0.00
% of 18 to 34 years with no health insurance	0.173	0.159	0.187	1.189	1.173	1.205	< 0.00
% of 35 to 64 years with no health insurance	0.184	0.168	0.201	1.202	1.182	1.222	< 0.00
% of 65 years and over with no health insurance	0.007	-0.042	0.055	1.007	0.959	1.057	< 0.78 †
Industry							
% in Agriculture, forestry industry	-0.083	-0.133	-0.032	0.921	0.875	0.968	< 0.00
% in Construction industry	0.355	0.314	0.395	1.426	1.369	1.485	< 0.00
% in Manufacturing category	-0.042	-0.091	0.008	0.959	0.913	1.008	< 0.10
% in Transportation and warehousing etc.	0.179	0.105	0.253	1.196	1.111	1.288	< 0.00
% in Professional, scientific etc.	-0.255	-0.302	-0.208	0.775	0.739	0.812	< 0.00
% in Educational services, and health care etc. category	-0.031	-0.066	0.004	0.970	0.936	1.004	< 0.08
% in Other services, except public administration	0.371	0.286	0.456	1.449	1.331	1.577	< 0.00

The coefficient values were exponentiated; expressed in terms of relative risk (RR). Explanatory variables were rescaled in order to interpret results as increase or decrease in the risk of HCC incidence associated with a 10-unit change in predictor variable.

† Variables with P value > 0.10 in bivariate analysis.

Table S4: Multivariable analysis of neighborhood-level SDOH and incidence of HCC in Texas (N census tracts = 5,205). Effect estimates shown are from running a series of multivariable models where variables that represent each category were entered into the model together. Variables across categories were not included in any single model. Only variables significant at $p \leq 0.10$ during the bivariate analysis were used.

	Coeff	95% CI		IRR	95% CI		P value
		Lower	Upper		Lower	Upper	
Race / Ethnicity							
% Non-Hispanic White							
% Non-Hispanic Black or African American	0.105	0.092	0.119	1.111	1.096	- 1.127	< 0.00
% Non-Hispanic American Indian and Alaska Native	0.291	-0.148	0.730	1.338	0.862	- 2.076	< 0.19
% Non-Hispanic Asian	-0.259	-0.304	-0.215	0.772	0.738	- 0.807	< 0.00
% Non-Hispanic Native Hawaiian, Pacific Islander							
% Non-Hispanic Other + 2 or more races	-0.152	-0.234	-0.070	0.859	0.792	- 0.932	< 0.00
% Hispanic or Latino	0.093	0.084	0.102	1.098	1.088	- 1.108	< 0.00
Citizenship							
% Population; not a US Citizen	-0.090	-0.172	-0.007	0.914	0.842	- 0.993	< 0.03
% Population; foreign-born	0.054	-0.010	0.118	1.056	0.990	- 1.126	< 0.10
% of Foreign-born; born in Latin America	0.120	0.110	0.129	1.127	1.117	- 1.138	< 0.00
Age and Sex							
% of Population; 50 to 59 y.o.	-0.036	-0.110	0.038	0.964	0.896	- 1.038	< 0.34
% of Population; 60 y.o. and above	0.110	0.074	0.145	1.116	1.077	- 1.156	< 0.00
% of Population; Male							
Socioeconomic Status							
Area Deprivation Index (decile)	1.021	0.902	1.141	2.777	2.464	- 3.130	< 0.00
% of 18 to 34 years with no health insurance	0.076	0.054	0.098	1.079	1.055	- 1.104	< 0.00
% of 35 to 64 years with no health insurance	-0.031	-0.058	-0.003	0.970	0.944	- 0.997	< 0.03
% of 65 years and over with no health insurance							
Industry							
% in Agriculture, forestry industry	-0.100	-0.153	-0.047	0.905	0.858	- 0.954	< 0.00
% in Construction industry	0.361	0.312	0.409	1.434	1.366	- 1.505	< 0.00
% in Manufacturing category	-0.055	-0.108	-0.003	0.946	0.897	- 0.997	< 0.04
% in Transportation and warehousing etc.	0.181	0.105	0.256	1.198	1.111	- 1.292	< 0.00
% in Professional, scientific etc.	-0.143	-0.200	-0.086	0.866	0.818	- 0.917	< 0.00
% in Educational services, and health care etc. category	0.099	0.054	0.144	1.104	1.055	- 1.155	< 0.00
% in Other services, except public administration	0.274	0.187	0.362	1.315	1.205	- 1.436	< 0.00

The coefficient values were exponentiated; expressed in terms of relative risk (RR). Explanatory variables were rescaled in order to interpret results as increase or decrease in the risk of HCC incidence associated with a 10-unit change in predictor variable.

Table S5: Multivariable analysis of neighborhood-level SDOH and incidence of HCC in Texas (N census tracts = 5,205). Effect estimates shown are from running a series of multivariable models where variables were added across categories. Only variables significant at $p < 0.05$ during category-specific models (Table S3) and those not affected by multicollinearity were allowed into models.

	Coeff	95% CI		IRR	95% CI		P value
		Lower	Upper		Lower	Upper	
Race / Ethnicity							
% Non-Hispanic White							
% Non-Hispanic Black or African American	0.105	0.092	0.119	1.111	1.096	- 1.127	< 0.00
% Non-Hispanic American Indian and Alaska Native							
% Non-Hispanic Asian							
% Non-Hispanic Native Hawaiian, Pacific Islander							
% Non-Hispanic Other + 2 or more races							
% Hispanic or Latino	0.093	0.084	0.102	1.098	1.088	- 1.108	< 0.00
Citizenship							
% Population; not a US Citizen							
% Population; foreign-born							
% of Foreign-born; born in Latin America							
Age and Sex							
% of Population; 50 to 59 y.o.							
% of Population; 60 y.o. and above	0.110	0.074	0.145	1.116	1.077	- 1.156	< 0.00
% of Population; Male							
Socioeconomic Status							
Area Deprivation Index (decile)	1.021	0.902	1.141	2.777	2.464	- 3.130	< 0.00
% of 18 to 34 years with no health insurance							
% of 35 to 64 years with no health insurance							
% of 65 years and over with no health insurance							
Industry							
% in Agriculture, forestry industry	-0.100	-0.153	-0.047	0.905	0.858	- 0.954	< 0.00
% in Construction industry	0.361	0.312	0.409	1.434	1.366	- 1.505	< 0.00
% in Manufacturing category							
% in Transportation and warehousing etc.							
% in Professional, scientific etc.							
% in Educational services, and health care etc. category							
% in Other services, except public administration	0.274	0.187	0.362	1.315	1.205	- 1.436	< 0.00

The coefficient values were exponentiated; expressed in terms of relative risk (RR). Explanatory variables were rescaled in order to interpret results as increase or decrease in the risk of HCC incidence associated with a 10-unit change in predictor variable.