
Supporting Information for: Medical Claims Data Characterizes Heat Health Risk for Low-Income and Agricultural Communities in California

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Table S1: BYM2 Smoothing Model Parameter Summary

Parameter	Mean	SD	HDI 3%	HDI 97%	ESS _{bulk}	ESS _{tail}	\hat{R}
β_0	-0.112	0.020	-0.149	-0.073	3,578	11,226	1.00
σ	4.557	0.335	3.940	5.194	1,669	4,200	1.00
ρ	0.988	0.003	0.982	0.994	1,678	3,621	1.00
α	12.438	3.200	7.284	18.598	1,078	2,711	1.00

Notes: Bayesian spatial smoothing model (BYM2) with Negative Binomial likelihood for heat-related claim counts by ZIP code. β_0 = log-relative risk intercept; σ = overall spatial standard deviation; ρ = proportion of variance that is spatially structured (ICAR component); α = Negative Binomial overdispersion parameter. HDI = Highest Density Interval. ESS = Effective sample size. \hat{R} = Gelman-Rubin convergence diagnostic. Model based on 4 chains of 10,000 post-warmup draws each.

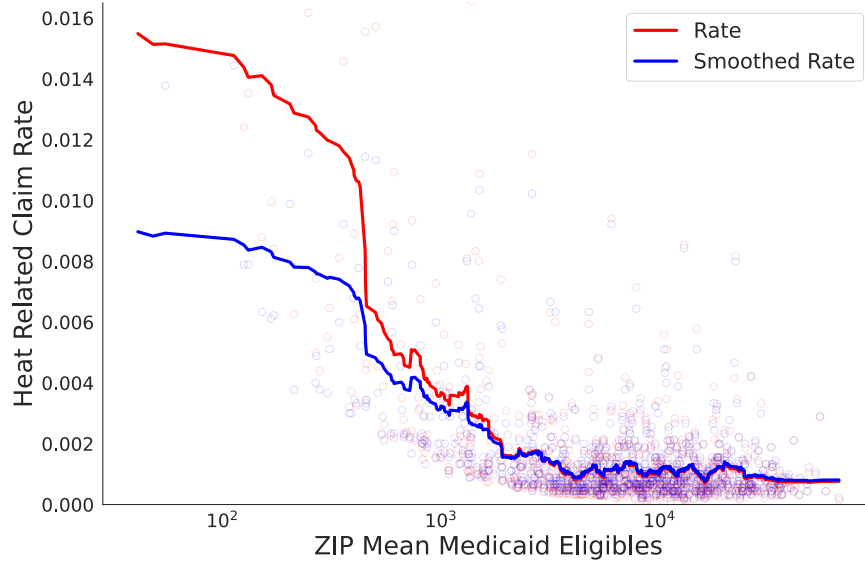


Figure S1: Effect of BYM Smoothing on annual rates of ZIP-code level heat-related illness claims between 2011-2019 based on the count of ZIP mean monthly Medicaid eligibles. Lines represent moving averages with a window of 50 points.

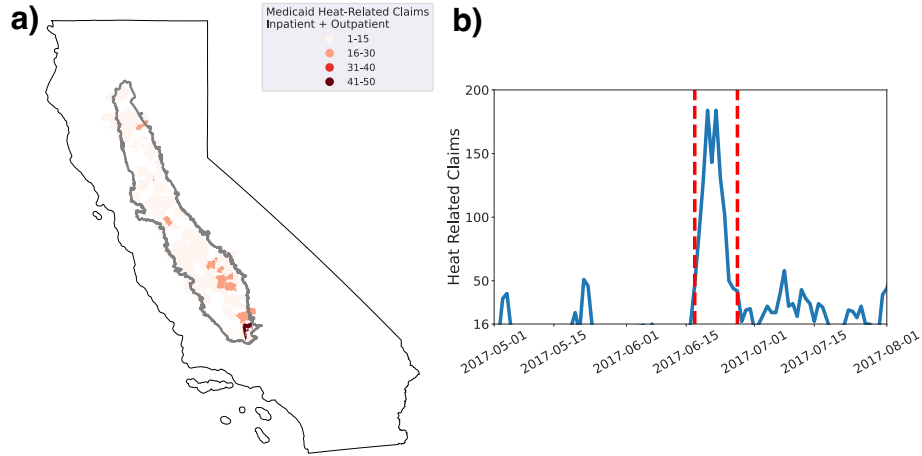


Figure S2: A) Counts of inpatient and outpatient heat-related illness claims by ZIP code during the 2017 Central Valley Heat Wave. Grey lines indicate the bounds of the Central Valley. B) Inpatient and outpatient heat-related illness claims by day across the Central Valley during the heat wave.

Table S2: OLS Regression Results for Temperature Effects on Heat-Related Claims by Land Use Type

Variable	Coefficient	Std. Error	<i>t</i> -statistic	<i>p</i> -value
Intercept	−18.282***	(0.102)	−178.38	< 0.001
Cropland	−0.793***	(0.255)	−3.106	0.002
Temperature	0.187***	(0.003)	57.334	< 0.001
Temperature × Cropland	0.031***	(0.008)	3.834	< 0.001
<i>Model Statistics</i>				
Observations	114			
R-squared	0.978			
Adjusted R-squared	0.977			
F-statistic	1403 ($p < 0.001$)			
<i>Diagnostic Tests</i>				
Durbin-Watson	1.760			
Jarque-Bera	145.3 ($p < 0.001$)			
Skewness	−1.035			
Kurtosis	8.129			

Notes: Dependent variable is log(heat-related claim counts per person-day). Built-up areas are the reference category. Standard errors in parentheses are heteroscedasticity-robust (HC3). *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.