Saving Lives with Indexed Disaster Funds: Evidence from Mexico - Online Appendix

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A Supplementary Tables and Figures

Table A1: Impact of Fonden on 24-month cause-specific mortality

	Transport fatalities	Self-harm inter-personal violence	Commu-nicable	Non-commu-nicable	Amenable	PHI covered
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. *FS*	0.235	0.226	0.227	0.230	0.231	0.235
p-value	$p < 0.001$	$p < 0.001$	$p < 0.001$	$p < 0.001$	$p < 0.001$	$p < 0.001$
CI 95 percent	[0.13,0.32]	[0.13,0.29]	[0.12,0.28]	[0.12,0.28]	[0.13,0.31]	[0.13,0.32]
Panel B. *ITT*	-0.033	0.035	0.007	-0.256	-0.296	-0.239
p-value	0.085	0.110	0.597	0.024	0.005	0.010
CI 95 percent	[-0.08,0.01]	[-0.01,0.10]	[-0.03,0.05]	[-0.53,-0.04]	[-0.58,-0.10]	[-0.49,-0.07]
Control Mean	0.031	0.021	-0.015	0.294	0.342	0.336
Panel C. *LATE*	-0.140	0.155	0.031	-1.110	-1.280	-1.018
p-value	0.091	0.100	0.573	0.019	0.007	0.014
CI 95 percent	[-0.37,0.03]	[-0.04,0.44]	[-0.13,0.24]	[-2.49,-0.23]	[-2.67,-0.42]	[-2.19,-0.24]
Placebo (p-value)	0.364	0.285	0.301	0.900	0.510	0.718
Bandwidth	38.0	55.7	59.2	61.9	45.3	40.5
Obs(left|right)	721|398	1010|523	1077|536	1122|556	848|433	756|414

Note: Panel A and B present estimates of equation 1 using a triangular kernel, a local linear polynomial, and a h_{MSE} optimal bandwidth. In panel A the dependent variable is an indicator for receiving Fonden. In panel B, the dependent variable is the cause-specific 24-month AMRD listed in the column title. Amenable refers to non-communicable conditions responsive to basic medical care. PHI covered refers to non-communicable amenable conditions for which interventions and medications are covered for free by public health insurance. All dependent variables are measured in deaths per 1,000 person-years. The control mean is the left-hand-side prediction of the nonparametric regression at the threshold. Panel C reports the LATE computed as the ratio of the ITT to the first stage. The Placebo row reports the LATE p-value when the outcome is the AMRD calculated using only pre-disaster data. The p-values and 95 percent confidence intervals reported are constructed using robust bias correction and clustering at the municipal level.

Table A2: Impact of Fonden on 24-month mortality by preexisting level of public medical infrastructure

Dep. variable:	All-cause		PHI covered	
Sample split:	Public doctors (per capita)			
	Above Median	Below Median	Above Median	Below Median
	(1)	(2)	(3)	(4)
Panel A. *FS*	0.221	0.235	0.214	0.240
p-value	0.005	0.001	0.015	0.001
CI 95 percent	[0.06,0.34]	[0.09,0.36]	[0.04,0.35]	[0.10,0.37]
Panel B. *ITT*	-0.675	0.140	-0.428	0.008
p-value	0.007	0.251	0.004	0.728
CI 95 percent	[-1.30,-0.21]	[-0.13,0.50]	[-0.84,-0.16]	[-0.12,0.17]
Control Mean	0.633	0.180	0.428	0.200
Panel C. *LATE*	-3.051	0.596	-1.999	0.032
p-value	0.019	0.246	0.018	0.727
CI 95 percent	[-6.81,-0.61]	[-0.56,2.18]	[-4.62,-0.43]	[-0.50,0.72]
Placebo (*p*-value)	0.046	0.193	0.405	0.113
Bandwidth	57.8	47.3	42.8	45.1
Obs(left|right)	573|288	396|199	432|236	381|190

Note: Panel A and B present estimates of equation 1 using a triangular kernel, a local linear polynomial, and a h_{MSE} optimal bandwidth. In panel A the dependent variable is an indicator for receiving Fonden. The dependent variable in panel B, columns 1 and 2, is the all-cause 24-month AMRD. In panel B, columns 3 and 4, the dependent variable is the PHI-covered 24-month AMRD, which refers to deaths caused by non-communicable amenable conditions covered for free by public health insurance. The dependent variables are measured in deaths per 1,000 person-years. The control mean is the left-hand-side prediction of the nonparametric regression at the threshold. Panel C reports the LATE computed as the ratio of the ITT to the first stage. The Placebo row reports the LATE p-value when the outcome is the AMRD calculated using only pre-disaster data. The p-values and 95 percent confidence intervals reported are constructed using robust bias correction and clustering at the municipal level. In columns 1 and 3, I restrict the sample to areas with above-median public doctors per capita (high health supply). In columns 2 and 4, I restrict the sample to areas with below-median public doctors per capita (low health supply). For all-cause mortality (columns 1 and 2), the p-value for the null hypothesis that the LATE for high and low health supply areas is equal is 0.009. For PHI-covered conditions (columns 3 and 4), the p-value for the null hypothesis that the LATE for high and low health supply areas is equal is 0.018.

Table A3: Impact of Fonden on night lights
by preexisting level of public medical infrastructure

Sample split:	Public doctors (per capita)	
	Above Median	Below Median
	(1)	(2)
Panel A. *FS*	0.233	0.211
p-value	0.001	0.002
CI 95 percent	[0.08,0.34]	[0.07,0.29]
Panel B. *ITT*	0.057	0.056
p-value	0.146	0.070
CI 95 percent	[-0.02,0.14]	[-0.01,0.14]
Control Mean	-0.077	-0.061
Panel C. *LATE*	0.244	0.265
p-value	0.143	0.059
CI 95 percent	[-0.10,0.66]	[-0.01,0.71]
Placebo (*p*-value)	0.528	0.844
Bandwidth	55.9	58.8
Obs(left|right)	542|277	474|245

Note: Panel A and B present estimates of equation 1 using a triangular kernel, a local linear polynomial, and a h_{MSE} optimal bandwidth. In panel A the dependent variable is an indicator for receiving Fonden. In panel B, the dependent variable is the night lights log difference between the 12 months before and the 12 months after a disaster. The control mean is the left-hand-side prediction of the nonparametric regression at the threshold. Panel C reports the LATE computed as the ratio of the ITT to the first stage. The Placebo row reports the p-value of the LATE when the outcome is calculated using only pre-disaster data. The p-values and 95 percent confidence intervals reported use robust bias correction and clustering at the municipal level. Public doctors per capita are observed in 2003; its median value is 0.45. The sample in columns 1 and 2 is the same as the one used for the analysis presented in table 4. I find no evidence of differential Fonden effects, the p-value for the null hypothesis that the LATE by the level of medical infrastructure is equal is 0.799.

Table A4: Impact of Fonden on 8-month mortality by preexisting level of storm drain infrastructure

Dep. variable:	All-cause		PHI covered	
Sample split:	Storm drain coverage (percent)			
	Above Median	Below Median	Above Median	Below Median
	(1)	(2)	(3)	(4)
Panel A. *FS*	0.232	0.202	0.238	0.236
p-value	0.001	0.003	0.001	0.001
CI 95 percent	[0.08,0.31]	[0.06,0.32]	[0.08,0.31]	[0.10,0.38]
Panel B. *ITT*	-0.586	-0.954	-0.096	-0.432
p-value	0.077	0.021	0.494	0.038
CI 95 percent	[-1.47,0.07]	[-1.97,-0.16]	[-0.65,0.31]	[-0.94,-0.03]
Control Mean	0.691	0.894	0.251	0.452
Panel C. *LATE*	-2.520	-4.726	-0.404	-1.828
p-value	0.064	0.051	0.454	0.075
CI 95 percent	[-6.98,0.20]	[-11.17,0.03]	[-2.80,1.25]	[-4.27,0.20]
Placebo (*p*-value)	0.732	0.150	0.631	0.177
Bandwidth	54.9	58.3	57.6	47.1
Obs(left|right)	479|273	549|249	499|283	457|205

Note: Panel A and B present estimates of equation 1 using a triangular kernel, a local linear polynomial, and a h_{MSE} optimal bandwidth. In panel A the dependent variable is an indicator for receiving Fonden. In panel B, the dependent variable is the 8-month AMRD listed in the column title. These variables are measured in deaths per 1,000 person-years. PHI covered refers to deaths caused by non-communicable amenable conditions covered for free by public health insurance. To proxy storm drain coverage, I use the percentage of dwellings connected to sewage measured in the most recent census that predates the natural disaster; its median value is 0.71. In columns 1 and 3, I restrict the sample to areas with above-median storm drain coverage. In columns 2 and 4, I restrict the sample to areas with below-median storm drain coverage. The control mean is the left-hand-side prediction of the nonparametric regression at the threshold. Panel C reports the LATE computed as the ratio of the ITT to the first stage. The Placebo row reports the p-value of the LATE when the outcome is calculated using only pre-disaster data. The p-values and 95 percent confidence intervals reported use robust bias correction and clustering at the municipal level. I find no evidence of differential Fonden effects. The p-value for the null hypothesis that the LATE on the all-cause AMRD by the level of storm drain coverage is equal is 0.520. The p-value for the null hypothesis that the LATE on the PHI-covered AMRD by the level of storm drain coverage is equal is 0.413.

Table A5: Impact of Fonden on 24-month mortality by preexisting level of storm drain infrastructure

Dep. variable:	All-cause		PHI covered	
Sample split:	Storm drain coverage (percent)			
	Above Median	Below Median	Above Median	Below Median
	(1)	(2)	(3)	(4)
Panel A. *FS*	0.251	0.226	0.250	0.242
p-value	$p < 0.001$	0.001	$p < 0.001$	0.001
CI 95 percent	[0.10,0.33]	[0.09,0.36]	[0.09,0.32]	[0.10,0.38]
Panel B. *ITT*	-0.235	-0.510	-0.158	-0.278
p-value	0.300	0.046	0.162	0.022
CI 95 percent	[-0.63,0.19]	[-1.17,-0.01]	[-0.45,0.07]	[-0.62,-0.05]
Control Mean	0.348	0.560	0.271	0.362
Panel C. *LATE*	-0.939	-2.255	-0.634	-1.152
p-value	0.244	0.087	0.122	0.041
CI 95 percent	[-2.70,0.69]	[-5.57,0.38]	[-1.94,0.23]	[-2.70,-0.06]
Placebo (*p*-value)	0.154	0.434	0.582	0.904
Bandwidth	59.2	49.9	58.9	45.8
Obs(left|right)	518|286	483|224	513|286	443|199

Note: Panel A and B present estimates of equation 1 using a triangular kernel, a local linear polynomial, and a h_{MSE} optimal bandwidth. In panel A the dependent variable is an indicator for receiving Fonden. In panel B, the dependent variable is the 24-month AMRD listed in the column title. These variables are measured in deaths per 1,000 person-years. PHI covered refers to deaths caused by non-communicable amenable conditions covered for free by public health insurance. To proxy storm drain coverage, I use the percentage of dwellings connected to sewage measured in the most recent census that predates the natural disaster; its median value is 0.71. In columns 1 and 3, I restrict the sample to areas with above-median storm drain coverage. In columns 2 and 4, I restrict the sample to areas with below-median storm drain coverage. The control mean is the left-hand-side prediction of the nonparametric regression at the threshold. Panel C reports the LATE computed as the ratio of the ITT to the first stage. The Placebo row reports the p-value of the LATE when the outcome is calculated using only pre-disaster data. The p-values and 95 percent confidence intervals reported use robust bias correction and clustering at the municipal level. I find no evidence of differential Fonden effects. The p-value for the null hypothesis that the LATE on the all-cause AMRD by the level of storm drain coverage is equal is 0.362. The p-value for the null hypothesis that the LATE on the PHI-covered AMRD by the level of storm drain coverage is equal is 0.550.

Table A6: Impact of Fonden on 24-month sex and age-specific mortality

	Male (1)	Female (2)	0-14 (3)	15-49 (4)	50 or older (5)
Panel A. *First Stage*	0.242	0.245	0.226	0.231	0.226
p-value	$p < 0.001$	$p < 0.001$	$p < 0.001$	$p < 0.001$	$p < 0.001$
CI 95 percent	[0.14,0.29]	[0.15,0.29]	[0.12,0.29]	[0.13,0.31]	[0.12,0.29]
Panel B. *ITT*	-0.405	-0.261	0.073	-0.201	-1.243
p-value	0.058	0.085	0.360	0.132	0.045
CI 95 percent	[-0.93,0.01]	[-0.65,0.04]	[-0.13,0.35]	[-0.55,0.07]	[-2.70,-0.03]
Control Mean	0.587	0.307	-0.086	0.265	1.952
Panel C. *LATE*	-1.674	-1.067	0.323	-0.870	-5.488
p-value	0.041	0.065	0.337	0.117	0.041
CI 95 percent	[-4.12,-0.08]	[-2.79,0.08]	[-0.54,1.56]	[-2.45,0.27]	[-12.70,-0.26]
Placebo (p-value)	0.053	0.816	0.852	0.269	0.154
Bandwidth	74.4	77.4	52.3	45.8	53.4
Obs(left|right)	1298|611	1347|627	954|500	865|436	959|502

Note: Panel A and B present estimates of equation 1 using a triangular kernel, a local linear polynomial, and a h_{MSE} optimal bandwidth. In panel A the dependent variable is an indicator for receiving Fonden. In panel B, the dependent variable corresponds to the age or gender-specific 24-month AMRD listed in the column title. The dependent variables are measured in deaths per 1,000 person-years. The control mean is the left-hand-side prediction of the nonparametric regression at the threshold. Panel C reports the LATE computed as the ratio of the ITT to the first stage. The Placebo row reports the LATE p-value when the outcome is the AMRD calculated using only pre-disaster data. The p-values and 95 percent confidence intervals reported are constructed using robust bias correction and clustering at the municipal level. The p-value for the null hypothesis that the LATE by gender is equal is 0.554. The p-values for the null hypotheses that the LATE for those 50 or older is equal to each of the younger groups are 0.030 and 0.097.

Table A7: Spillover Effects

Dep. Variable	8-month mortality		24-month mortality	
	neighbors within 15 km	neighbors 15-30 km	neighbors within 15 km	neighbors 15-30 km
	(1)	(2)	(3)	(4)
Panel A. *First Stage*	0.228	0.235	0.227	0.231
p-value	$p < 0.001$	$p < 0.001$	$p < 0.001$	$p < 0.001$
CI 95 percent	[0.11,0.30]	[0.14,0.29]	[0.10,0.30]	[0.13,0.28]
Panel B. *ITT*	-0.367	-0.145	-0.074	-0.002
p-value	0.025	0.109	0.341	0.979
CI 95 percent	[-0.80,-0.05]	[-0.38,0.04]	[-0.29,0.10]	[-0.09,0.09]
Control Mean	0.435	0.277	0.254	0.224
Panel C. *LATE*	-1.605	-0.617	-0.325	-0.011
p-value	0.031	0.093	0.304	0.975
CI 95 percent	[-3.84,-0.18]	[-1.71,0.13]	[-1.32,0.41]	[-0.41,0.40]
Placebo (p-value)	0.363	0.264	0.268	0.320
Bandwidth	49.2	75.1	55.2	68.4
Obs(left|right)	763|400	1227|585	827|443	1159|556

Note: Panel A and B present estimates of equation 1 using a triangular kernel, a local linear polynomial, and a h_{MSE} optimal bandwidth. In panel A the dependent variable is an indicator for receiving Fonden. In panel B, the dependent variable is the all-cause 8-month AMRD (columns 1 and 2) and the all-cause 24-month AMRD (columns 3 and 4). In both cases, the dependent variable is computed using only information from neighboring municipalities within the distance indicated in the column title. These variables are measured in deaths per 1,000 person-years. Panel C reports the LATE computed as the ratio of the ITT to the first stage. The Placebo row reports the p-value of the LATE when the outcome is the dependent variable calculated using only pre-disaster data. The p-values and 95 percent confidence intervals reported are constructed using robust bias correction and clustering at the municipal level.

Table A8: Robustness donut-hole analysis

Donut-hole Radius	Intention to Treat	p-value	CI 95%	Bandwidth	Obs	Excluded Obs Left	Excluded Obs Right
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
0.0	-0.816	0.002	[-1.48,-0.34]	51.4	1432	0	0
0.5	-0.711	0.006	[-1.36,-0.23]	55.5	1520	2	7
1.0	-0.945	0.001	[-1.70,-0.43]	49.6	1355	29	10
1.5	-0.830	0.001	[-1.51,-0.42]	61.8	1626	33	13
2.0	-1.067	0.001	[-1.89,-0.52]	48.1	1291	40	21
2.5	-0.570	0.057	[-1.28,0.02]	50.4	1337	61	26

Note: Estimates of equation 1 using a triangular kernel, a local linear polynomial, and a h_{MSE} optimal bandwidth. The dependent variable is the all-cause 8-month annualized mortality rate difference. The variable is measured in deaths per 1,000 person-years. Column 1 reports the excluded radius in mm, and columns 7 and 8 report the number of observations excluded on each side of the threshold. The p-values and 95% confidence intervals reported are constructed using robust bias correction and clustering at the municipal level.

Table A9: Robustness placebo thresholds

Alternative cutoff	ITT	*p*-value	CI 95%	Bandwidth	Obs Left	Obs Right
(1)	(2)	(3)	(4)	(5)	(6)	(7)
-46.2	-0.211	0.427	[-1.2,0.5]	18.4	307	329
-36.3	-0.068	0.855	[-0.9,0.8]	16.8	260	360
-27.1	-0.110	0.802	[-0.8,0.6]	12.5	220	261
-20.0	0.328	0.509	[-1.0,2.0]	8.6	200	135
-9.2	0.168	0.367	[-1.3,3.4]	10.1	157	173
0.0	-0.816	0.002	[-1.5,-0.3]	51.4	944	488
8.0	-0.102	0.801	[-1.7,1.3]	27.2	99	282
15.4	-0.760	0.269	[-2.1,0.6]	20.1	198	183
26.2	0.705	0.389	[-1.0,2.6]	22.7	261	167
38.1	-0.491	0.622	[-2.4,1.4]	15.7	129	115
52.2	-0.125	0.768	[-1.2,0.9]	15.9	115	82

Note: The dependent variable is the all-cause 8-month annualized mortality rate difference. The variable is measured in deaths per 1,000 person-years. The table presents estimates of the ITT at the true zero threshold and various placebo thresholds. The sample in the first five rows is restricted to negative values of the running variable. The placebo thresholds are given by the first five deciles. The sample in the last five rows is restricted to non-negative values of the running variable. The placebo thresholds are determined analogously. Estimates are derived using a triangular kernel, a local linear polynomial, and a h_{MSE} optimal bandwidth. The p-values and 95 percent confidence intervals reported are constructed using robust bias correction and clustering at the municipal level.

Table A10: Robustness tuning parameters

	Alternative bandwidths			Local Polynomial Degree		Kernel	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A. *First Stage*	0.233	0.221	0.242	0.209	0.250	0.213	0.219
p-value	$p < 0.001$	$p < 0.001$	$p < 0.001$	$p < 0.001$	$p < 0.001$	$p < 0.001$	$p < 0.001$
CI 95 percent	[0.13,0.32]	[0.13,0.30]	[0.14,0.34]	[0.11,0.30]	[0.14,0.36]	[0.11,0.26]	[0.11,0.29]
Panel B. *ITT*	-0.948	-0.879	-0.958	-0.929	-1.102	-0.636	-0.839
p-value	0.002	0.002	0.002	0.003	0.002	0.008	0.002
CI 95 percent	[-1.62,-0.37]	[-1.57,-0.36]	[-1.63,-0.37]	[-1.63,-0.32]	[-1.83,-0.41]	[-1.26,-0.18]	[-1.52,-0.34]
Control Mean	0.838	0.795	0.839	0.834	0.877	0.765	0.793
Panel C. *LATE*	-4.063	-3.972	-3.964	-4.445	-4.414	-2.982	-3.822
p-value	0.005	0.006	0.007	0.015	0.011	0.007	0.003
CI 95 percent	[-7.56,-1.31]	[-7.62,-1.27]	[-7.26,-1.12]	[-8.43,-0.91]	[-7.93,-1.04]	[-6.53,-1.01]	[-7.65,-1.52]
Placebo (p-value)	0.172	0.169	0.179	0.282	0.219	0.142	0.165
Bandwidth (left|right)	35.5|35.5	50.9|41.2	35.1|28.4	79.5|79.5	52.0|52.0	48.8|48.8	46.5|46.5
Obs (left|right)	683|381	942|417	679|328	1364|642	951|497	908|467	875|438
Bandwidth selection	$\hat{h}_{CER}$	$\hat{h}_{MSE2}$	$\hat{h}_{CER2}$	$\hat{h}_{CER}$	$\hat{h}_{MSE}$	$\hat{h}_{MSE}$	$\hat{h}_{MSE}$
Local Polynomial Degree	1	1	1	2	2	1	1

Note: Panel A and B present estimates of equation 1. In panel A the dependent variable is an indicator for receiving Fonden. In panel B, the dependent variable is the all-cause 8-month annualized mortality rate difference. The variable is measured in deaths per 1,000 person-years. Estimates are derived using a triangular kernel except for columns 6 (epanechnikov) and 7 (uniform). The local polynomial degree and optimal bandwidth selection algorithm used are indicated in each column. The $\hat{h}_{MSE}$ bandwidth selection algorithm is optimal for point estimation; the $\hat{h}_{CER}$ selection algorithm is optimal for inference of confidence intervals. The subscript 2 in the description of the bandwidth selection algorithm denotes that different bandwidth lengths have been selected on each side of the threshold. The control mean is the left-hand-side prediction of the nonparametric regression at the threshold. Panel C reports the LATE computed as the ratio of the ITT to the first stage. The Placebo row reports the LATE p-value when the outcome is the AMRD calculated using only pre-disaster data. The p-values and 95 percent confidence intervals reported are constructed using robust bias correction and clustering at the municipal level.

Table A11: Robustness various issues

	Alternative AMRD definitions		Calendar Month FE	Multiple exposure to Fonden		Extreme events	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A. *First Stage*	0.222	0.223	0.238	0.267	0.289	0.248	0.210
p-value	$p < 0.001$	$p < 0.001$	$p < 0.001$	$p < 0.001$	$p < 0.001$	$p < 0.001$	$p < 0.001$
CI 95 percent	[0.12,0.28]	[0.12,0.29]	[0.14,0.29]	[0.15,0.36]	[0.16,0.40]	[0.15,0.38]	[0.09,0.25]
Panel B. *ITT*	-0.469	-0.639	-0.695	-0.900	-1.062	-0.984	-0.706
p-value	0.010	0.002	0.002	0.010	0.006	0.003	0.005
CI 95 percent	[-0.90,-0.12]	[-1.16,-0.27]	[-1.32,-0.30]	[-1.77,-0.24]	[-2.00,-0.34]	[-1.81,-0.36]	[-1.38,-0.25]
Control Mean	0.541	0.678	0.782	0.917	1.061	0.876	0.854
Panel C. *LATE*	-2.115	-2.862	-2.925	-3.370	-3.683	-3.963	-3.365
p-value	0.009	0.002	0.002	0.015	0.011	0.020	0.003
CI 95%	[-4.44,-0.62]	[-5.68,-1.22]	[-6.00,-1.33]	[-7.12,-0.78]	[-7.41,-0.95]	[-7.63,-0.66]	[-7.57,-1.59]
Placebo (p-value)	0.100	.	0.222	0.217	0.247	0.233	0.066
Bandwidth	57.9	50.3	65.3	46.5	49.3	27.8	65.7
Obs (left|right)	1046|530	937|486	1185|562	663|314	497|252	519|323	1101|532

Note: Panel A and B present estimates of equation 1 using a triangular kernel, a local linear polynomial, and a h_{MSE} optimal bandwidth. In panel A the dependent variable is an indicator for receiving Fonden. In panel B, column 1, the dependent variable is the all-cause 8-month annualized and standardized (age-sex adjusted) mortality rate difference. In panel B, column 2, the dependent variable is the all-cause 8-month annualized mortality rate difference, where the AMR expected in the absence of a disaster is computed by averaging the 8-month annualized mortality rates observed in the four years before a disaster. In panel B, columns 3 to 7, the dependent variable is the 8-month all-cause annualized mortality rate difference used throughout the paper. The specification in column 3 includes calendar month fixed effects. Column 4 excludes observations with Fonden in the year before or after. Column 5 excludes observations with Fonden two years before or after. Column 6 excludes rainfall events ranked in the top decile. Column 7 excludes observations in the top decile of Fonden thresholds. All dependent variables are measured in deaths per 1,000 person-years. The control mean is the left-hand-side prediction of the nonparametric regression at the threshold. Panel C reports the LATE computed as the ratio of the ITT to the first stage. The Placebo row reports the p-value of the LATE when the outcome is the dependent variable calculated using only pre-disaster data. No placebo p-value is reported in column 2 because I use all the pre-disaster information to compute the expected annualized mortality rate. The p-values and 95 percent confidence intervals reported are constructed using robust bias correction and clustering at the municipal level.

Table A12: Additional datasets and Sources

Variable	**Source**
INEGI (The National Institute of Statistics and Geography)	
Municipal Identifiers	(INEGI, 2014*b*)
Population No. of dwellings Pop. with no health insurance Pop. 15 or older illiterate Pop. 15 or older with no schooling Dwellings with electricity Dwellings with piped water Dwellings connected to sewage Dwellings with a refrigerator Elevation	Census INEGI (2000*a*) INEGI (2005) INEGI (2010)
Revenue of municipal government Expenditures of municipal government Total transfers Revenue sharing transfers Conditional transfers	Public finances of municipalities INEGI (2014*a*)
Municipal boundaries Municipal surface area Centroid longitude Centroid latitude	Geostatistical datasets INEGI (2013*a*)
Urban boundaries	INEGI (2000*b*)
State level GDP	INEGI (2013*b*)
Fund for Natural Disasters Fonden	
Fonden expenditures Fonden disbursement times Fonden planned reconstruction times	Fonden administrative record Fonden (2015)
Public Medical infrastructure	
Health units per 1,000 persons Hospital beds per 1,000 persons Doctors offices per 1,000 persons Doctors per 1,000 persons	DGIS (2003*a*,*b*)
Other Datasets	
Migration rate difference (MRD) Net MRD inflow MRD outflow MRD inflow (men, women, 50 or older, low education) MRD outflow (men, women, 50 or older, low education)	Internal Migration IPUMS (2020) Jones et al. (n.d.)
MRD outflow US MRD outflow US (men, women, 50 or older, low education)	US Migration EMFI-North (2022)
Same local and federal political party	CIDAC (2015)
Same local and state political party	CIDAC (2015) and Wikipedia (2022)
Life expectancy by age and gender	WHO (2000)
Historic mean annual rainfall (20 years before Fonden)	Conagua (2015)
Infant mortality rate	CONAPO (2000)
Road intersection density (per 100 sq. km) Road density (per 100 sq. km)	USGS (2003)
GDP deflator	World Bank (2010*a*)
PPP exchange rates	World Bank (2010*b*)
Night lights	Del Valle, de Janvry and Sadoulet (2020)

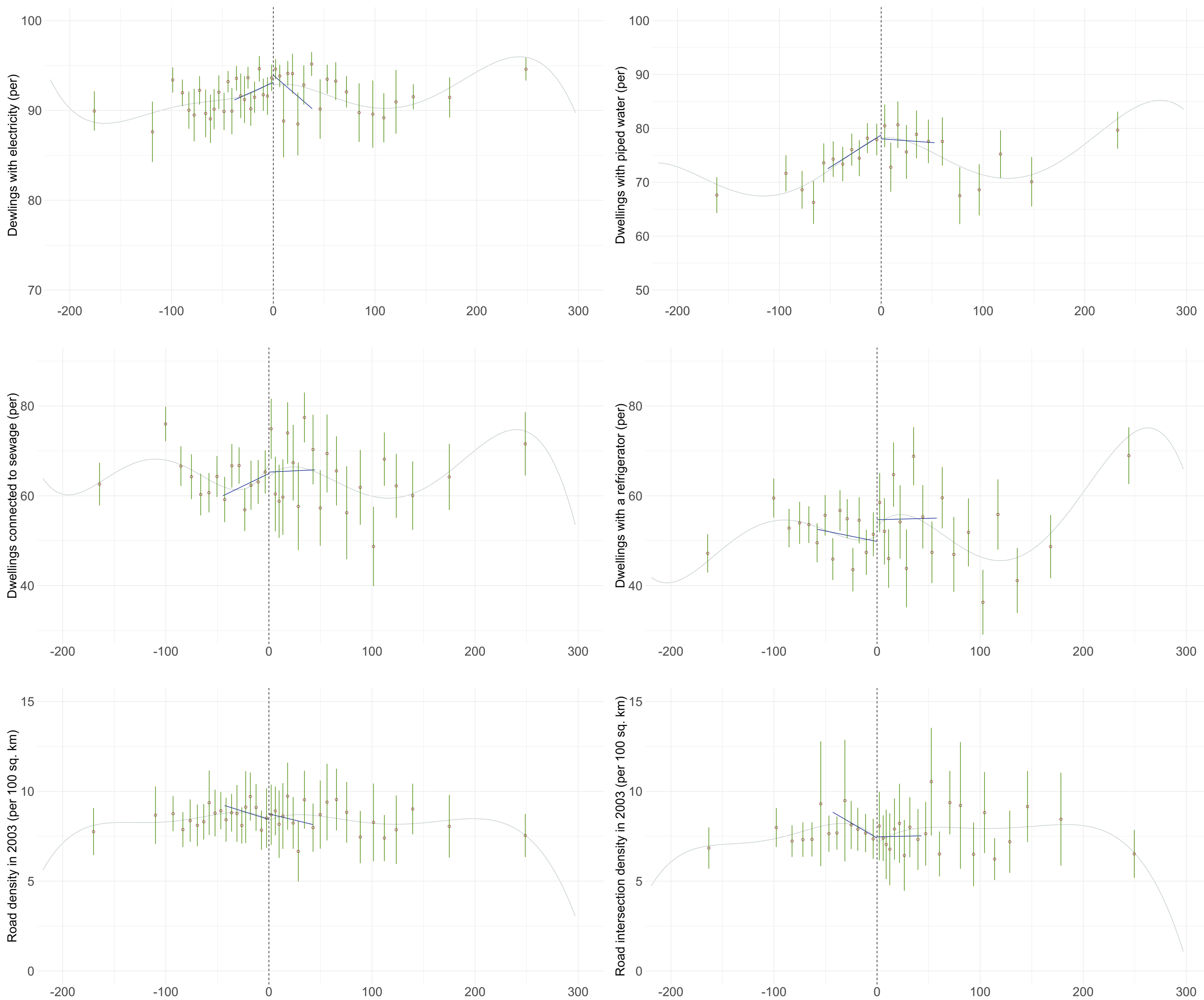

Figure A1: Predetermined Covariates I

Note: The abbreviation (per) denotes percent. Each graph plots the outcome labeled on the axis as a function of the running variable (rainfall minus threshold). Observations to the right of the threshold (black vertical dashed line) are eligible for Fonden under the heavy rainfall rule. The solid gray lines are global fourth-order polynomials fits estimated separately on each side of the threshold from raw data. The red circles represent the local means of the outcome. The error bars are the 95 percent confidence intervals of the local means. To compute the local means, I partition the support of the running variable into quantile spaced bins and calculate the mean for each bin. The number of bins is selected to minimize the integrated mean square error of the underlying regression function. The solid blue lines are local linear fits estimated separately on each side of the threshold from raw data in the neighborhood of the threshold. The bandwidth determining the neighborhood is chosen by minimizing the asymptotic mean squared error of the regression discontinuity estimate. The estimation of the local linear fits uses a triangular kernel.

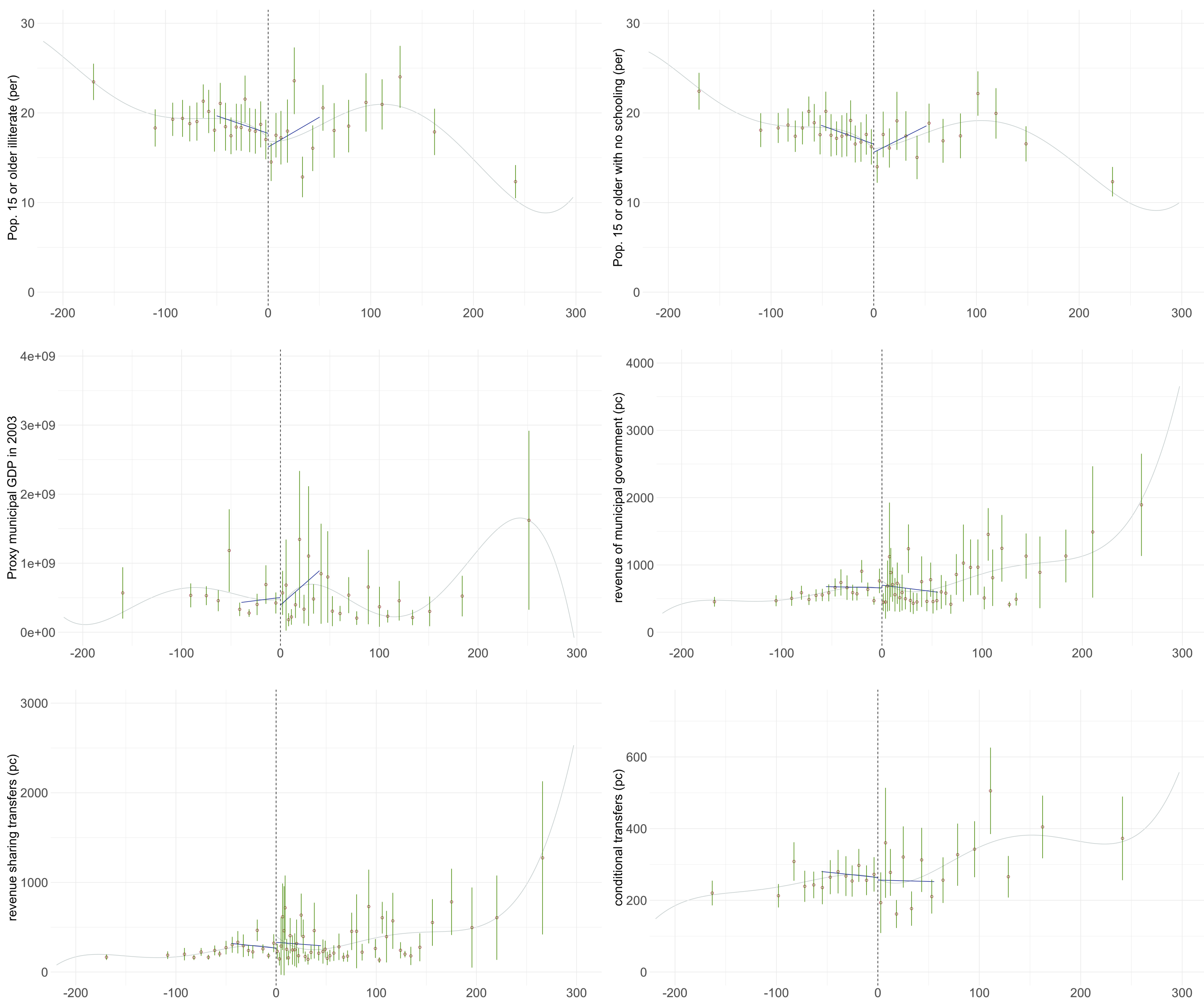

Figure A2: Predetermined Covariates II

Note: The abbreviation (per) denotes percent, and (pc) denotes per capita. Each graph plots the outcome labeled on the axis as a function of the running variable (rainfall minus threshold). Observations to the right of the threshold (black vertical dashed line) are eligible for Fonden under the heavy rainfall rule. The solid gray lines are global fourth-order polynomials fits estimated separately on each side of the threshold from raw data. The red circles represent the local means of the outcome. The error bars are the 95 percent confidence intervals of the local means. To compute the local means, I partition the support of the running variable into quantile spaced bins and calculate the mean for each bin. The number of bins is selected to minimize the integrated mean square error of the underlying regression function. The solid blue lines are local linear fits estimated separately on each side of the threshold from raw data in the neighborhood of the threshold. The bandwidth determining the neighborhood is chosen by minimizing the asymptotic mean squared error of the regression discontinuity estimate. The estimation of the local linear fits uses a triangular kernel.

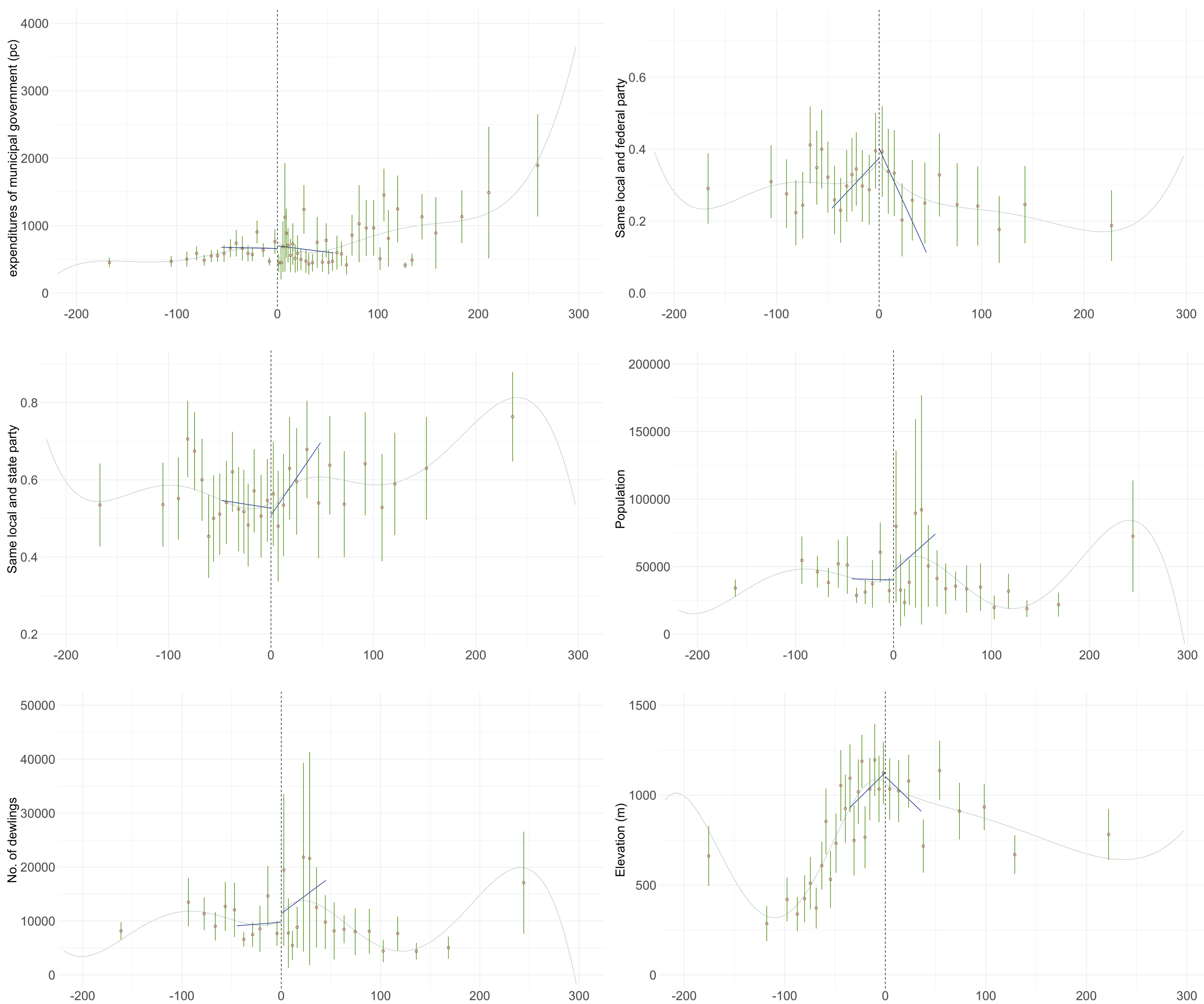

Figure A3: Predetermined Covariates III

Note: The abbreviation (pc) denotes per capita, and (m) denotes meters. Each graph plots the outcome labeled on the axis as a function of the running variable (rainfall minus threshold). Observations to the right of the threshold (black vertical dashed line) are eligible for Fonden under the heavy rainfall rule. The solid gray lines are global fourth-order polynomials fits estimated separately on each side of the threshold from raw data. The red circles represent the local means of the outcome. The error bars are the 95 percent confidence intervals of the local means. To compute the local means, I partition the support of the running variable into quantile spaced bins and calculate the mean for each bin. The number of bins is selected to minimize the integrated mean square error of the underlying regression function. The solid blue lines are local linear fits estimated separately on each side of the threshold from raw data in the neighborhood of the threshold. The bandwidth determining the neighborhood is chosen by minimizing the asymptotic mean squared error of the regression discontinuity estimate. The estimation of the local linear fits uses a triangular kernel.

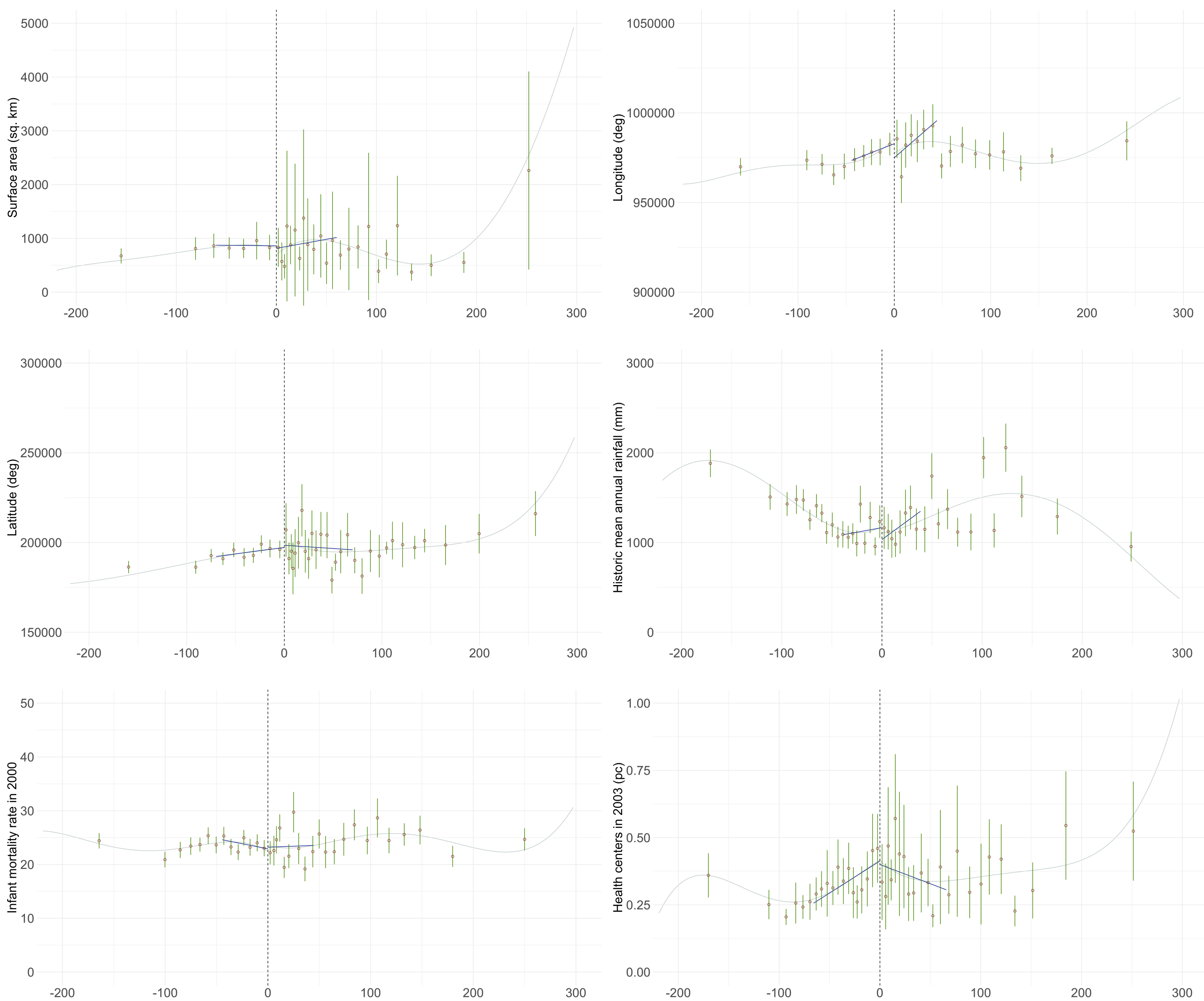

Figure A4: Predetermined Covariates IV

Note: The abbreviation (mm) denotes millimeters, and (pc) denotes per capita. Each graph plots the outcome labeled on the axis as a function of the running variable (rainfall minus threshold). Observations to the right of the threshold (black vertical dashed line) are eligible for Fonden under the heavy rainfall rule. The solid gray lines are global fourth-order polynomials fits estimated separately on each side of the threshold from raw data. The red circles represent the local means of the outcome. The error bars are the 95 percent confidence intervals of the local means. To compute the local means, I partition the support of the running variable into quantile spaced bins and calculate the mean for each bin. The number of bins is selected to minimize the integrated mean square error of the underlying regression function. The solid blue lines are local linear fits estimated separately on each side of the threshold from raw data in the neighborhood of the threshold. The bandwidth determining the neighborhood is chosen by minimizing the asymptotic mean squared error of the regression discontinuity estimate. The estimation of the local linear fits uses a triangular kernel.

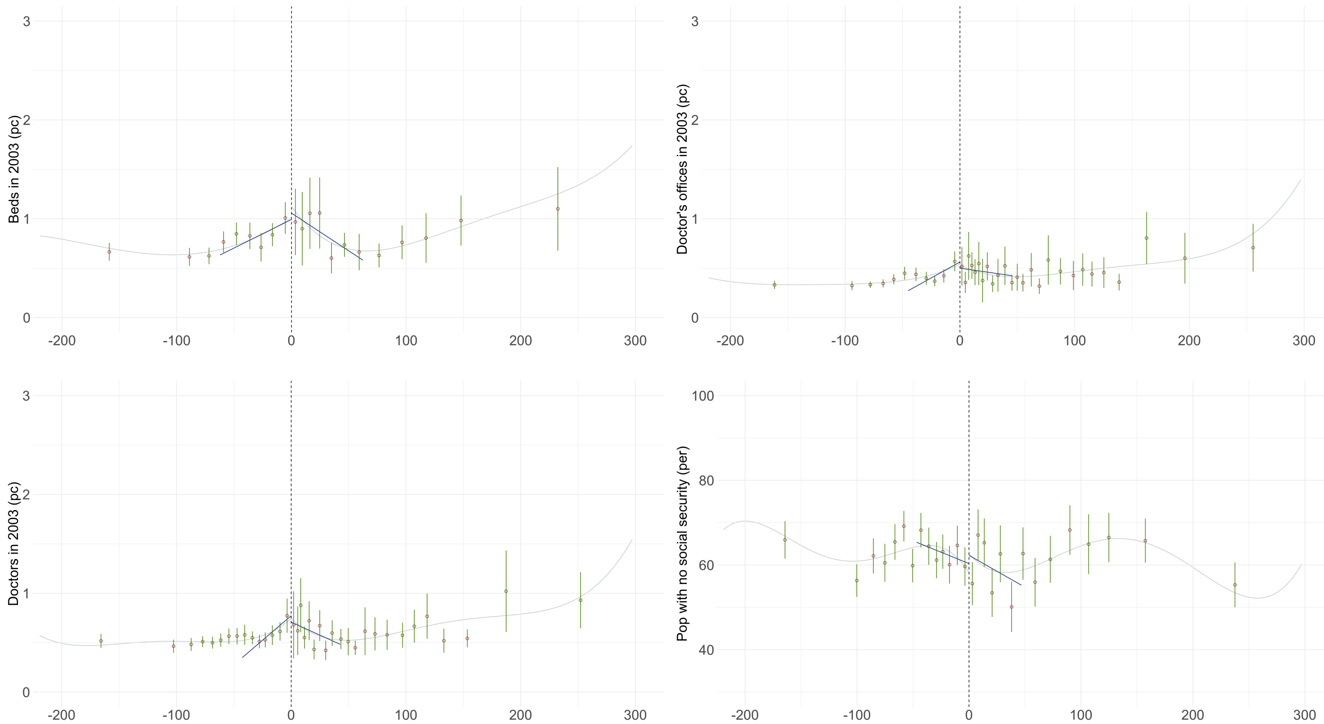

Figure A5: Predetermined Covariates V

Note: The abbreviation (per) denotes percent, and (pc) denotes per capita. Each graph plots the outcome labeled on the axis as a function of the running variable (rainfall minus threshold). Observations to the right of the threshold (black vertical dashed line) are eligible for Fonden under the heavy rainfall rule. The solid gray lines are global fourth-order polynomials fits estimated separately on each side of the threshold from raw data. The red circles represent the local means of the outcome. The error bars are the 95 percent confidence intervals of the local means. To compute the local means, I partition the support of the running variable into quantile spaced bins and calculate the mean for each bin. The number of bins is selected to minimize the integrated mean square error of the underlying regression function. The solid blue lines are local linear fits estimated separately on each side of the threshold from raw data in the neighborhood of the threshold. The bandwidth determining the neighborhood is chosen by minimizing the asymptotic mean squared error of the regression discontinuity estimate. The estimation of the local linear fits uses a triangular kernel.

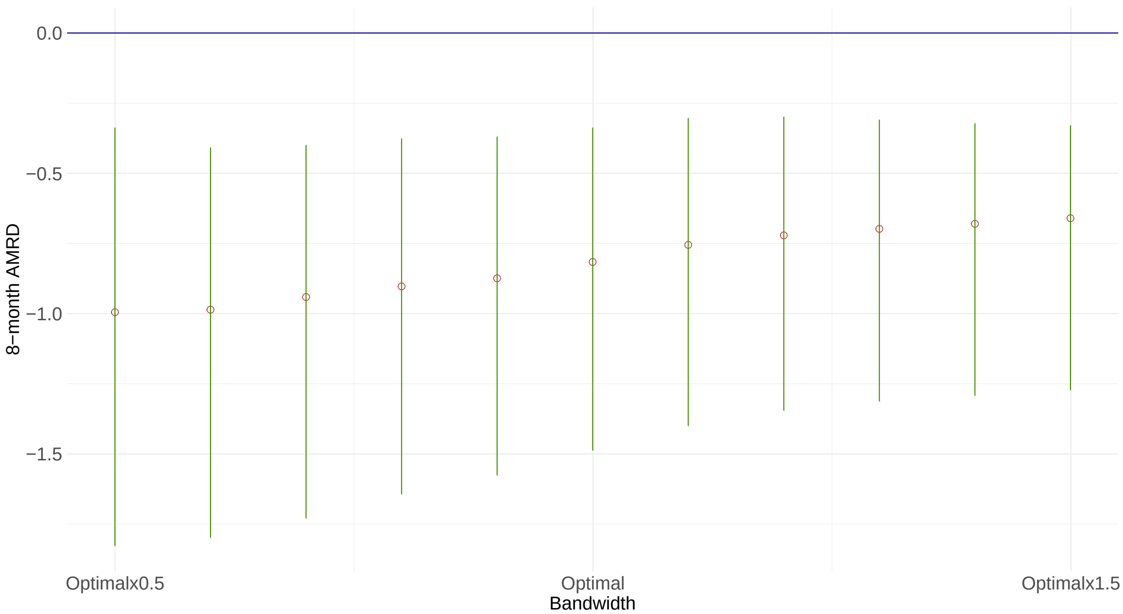

Figure A6: Fonden impact at various bandwidths

Note: Estimates of equation 1 at ten evenly spaced bandwidths. The smallest bandwidth, 25.72 mm, is 50 percent smaller than the optimal h_{MSE} bandwidth, and the largest, 77.17 mm, is 50 percent larger than the optimal h_{MSE}. The dependent variable is the all-cause 8-month annualized mortality rate difference. The variable is measured in deaths per 1,000 person-years. The circles represent point estimates constructed using a triangular kernel, a local linear polynomial, and the bandwidth indicated in the x-axis. The error bars represent robust 95 percent confidence intervals.

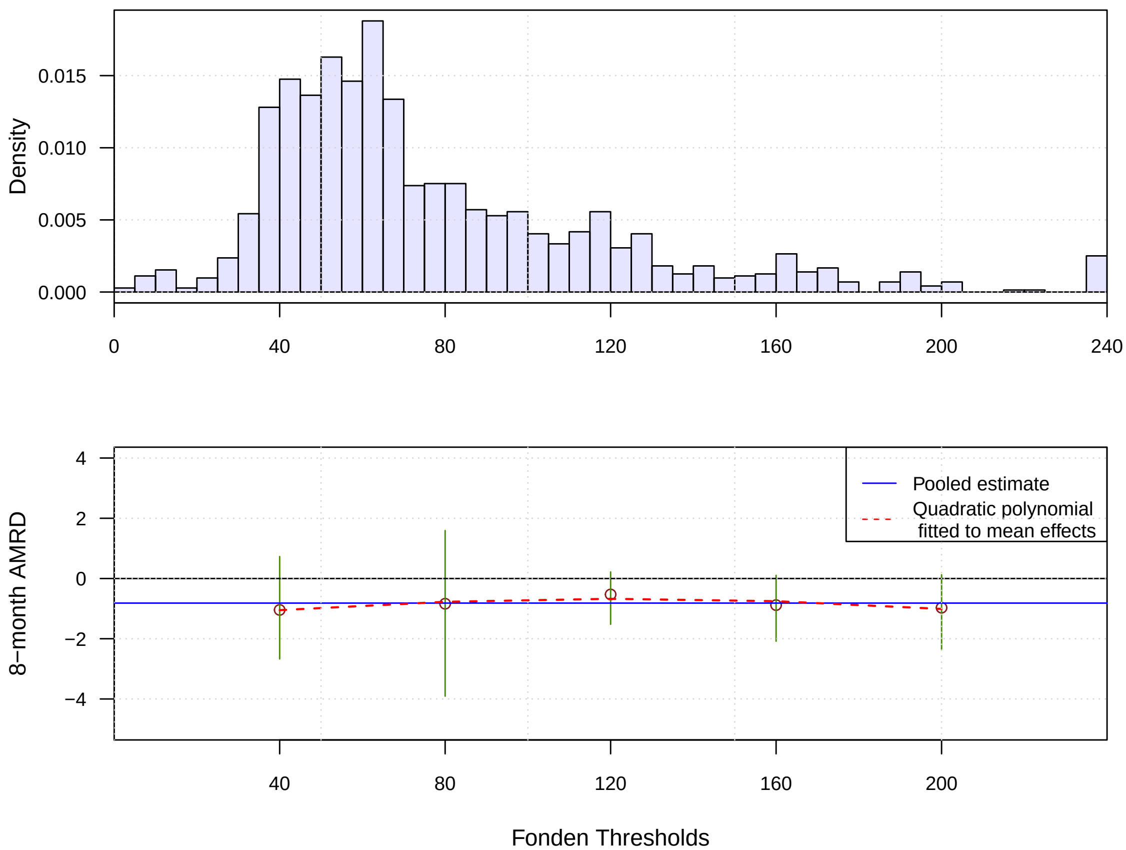

Figure A7: Fonden treatment effect curve

Note: The top panel plots the histogram of Fonden's heavy rainfall thresholds. The bottom panel plots thresholds-specific estimates of Fonden's ITT. Specifically, I estimate equation 1 using a triangular kernel, a local linear polynomial, and a h_{MSE} optimal bandwidth. The dependent variable is the all-cause 8-month annualized mortality rate difference. It is measured in deaths per 1,000 person-years. For each of the five threshold-specific estimates, the sample is given by the 400 observations with the closest Fonden thresholds. Point estimates are represented by red circles and 95 percent confidence intervals by green error bars). The reported confidence intervals are constructed using robust bias correction and clustering at the municipal level. The red dashed line is a quadratic polynomial fit of the five thresholds-specific estimates of Fonden's ITT. The solid blue line is Fonden's ITT estimate from table 2 column 2. This estimate is derived by normalizing and pooling the Fonden thresholds.

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