Civic Responses to Police Violence

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Online Appendix

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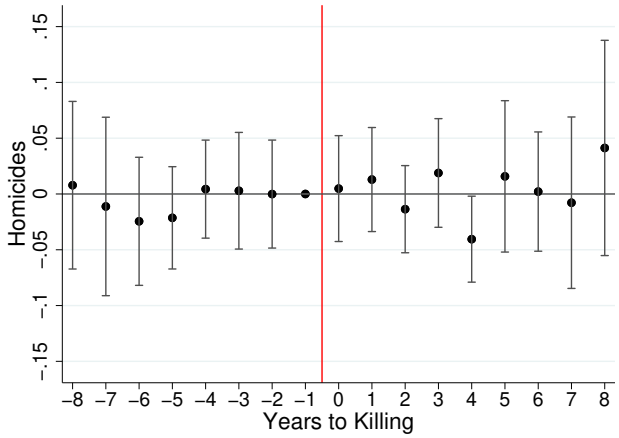
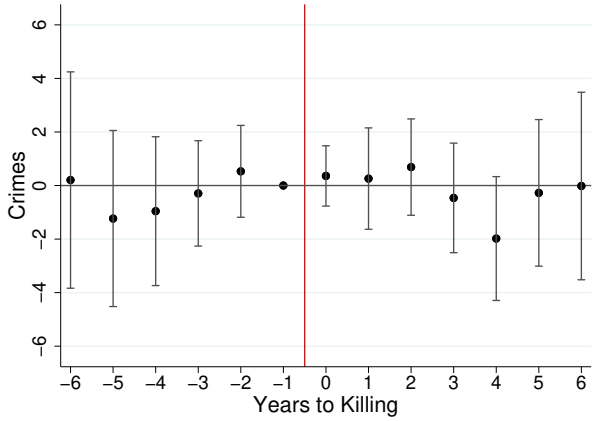
Supplementary Figures

FIGURE A.1. Effects on Local Crime and Arrests

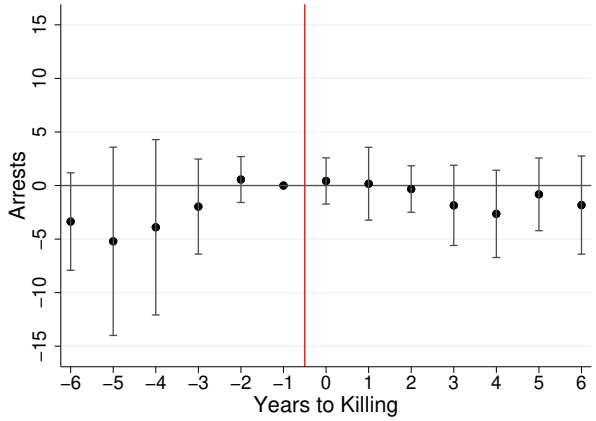
Panel A: Homicides



Panel B: Crimes



Panel C: Arrests



Notes: Figure shows coefficients and 95 percent confidence intervals from estimation of Equation 2 on homicides, total crimes, and arrests. Unit of observation is the Census block-year. Standard errors are clustered by Census block group. For Panel A, the sample spans the 2002 to 2010 elections and treatment is defined as blocks where police killings occurred during the sample period. As data on crimes and arrests is only available after 2010, for Panels B and C, the sample spans 2010 to 2016 and treatment is defined as blocks where police killings occurred from 2010 to 2016. The red vertical line marks when the police killing occurred. Full regression results are included in Table A.2.

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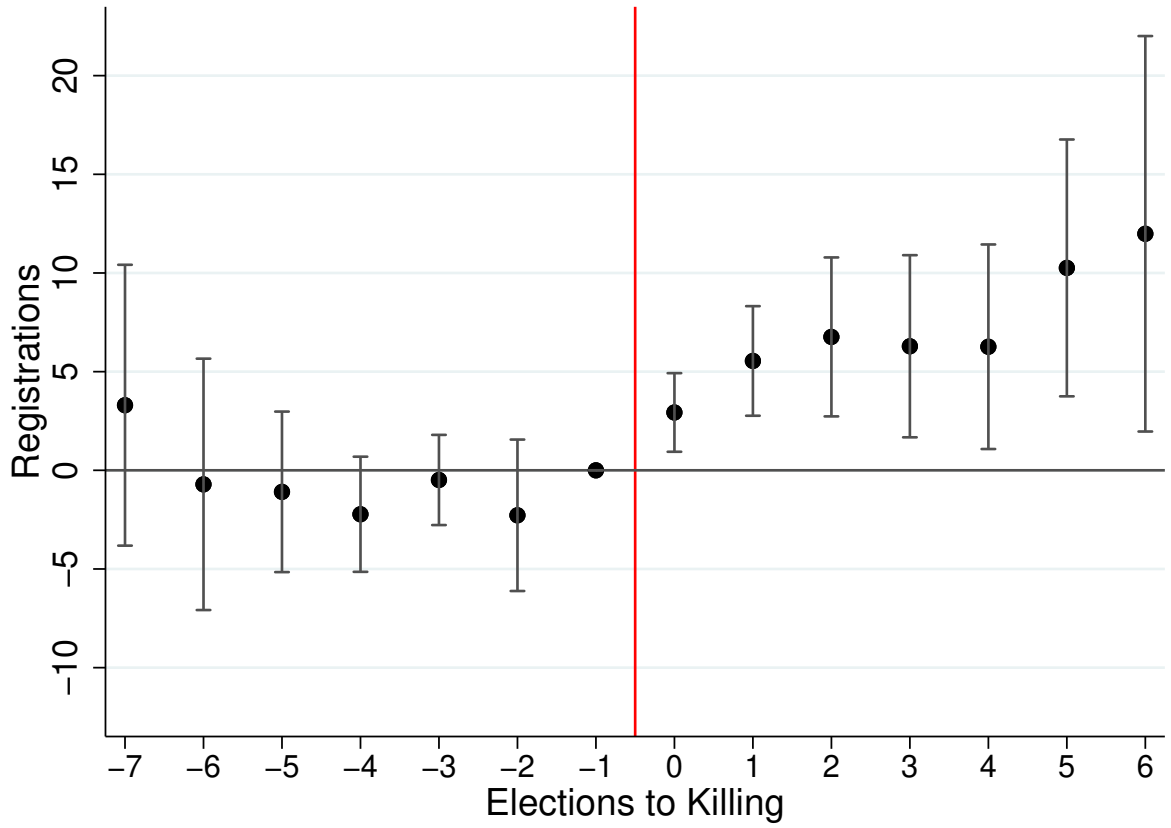
FIGURE A.2. Effects on Voter Registration (2002-2016)



Notes: Figure shows coefficients and 95 percent confidence intervals from estimation of Equation 2 on registrations (pre-treatment mean = 85.7) on the extended sample. Unit of observation is the Census block-election. Standard errors are clustered by Census block group. The sample spans general elections and police killings from 2002 to 2016 and treatment is defined as blocks where police killings occurred during this extended sample period. The red vertical line marks when the police killing occurred. Full regression results are included in Table A.4.

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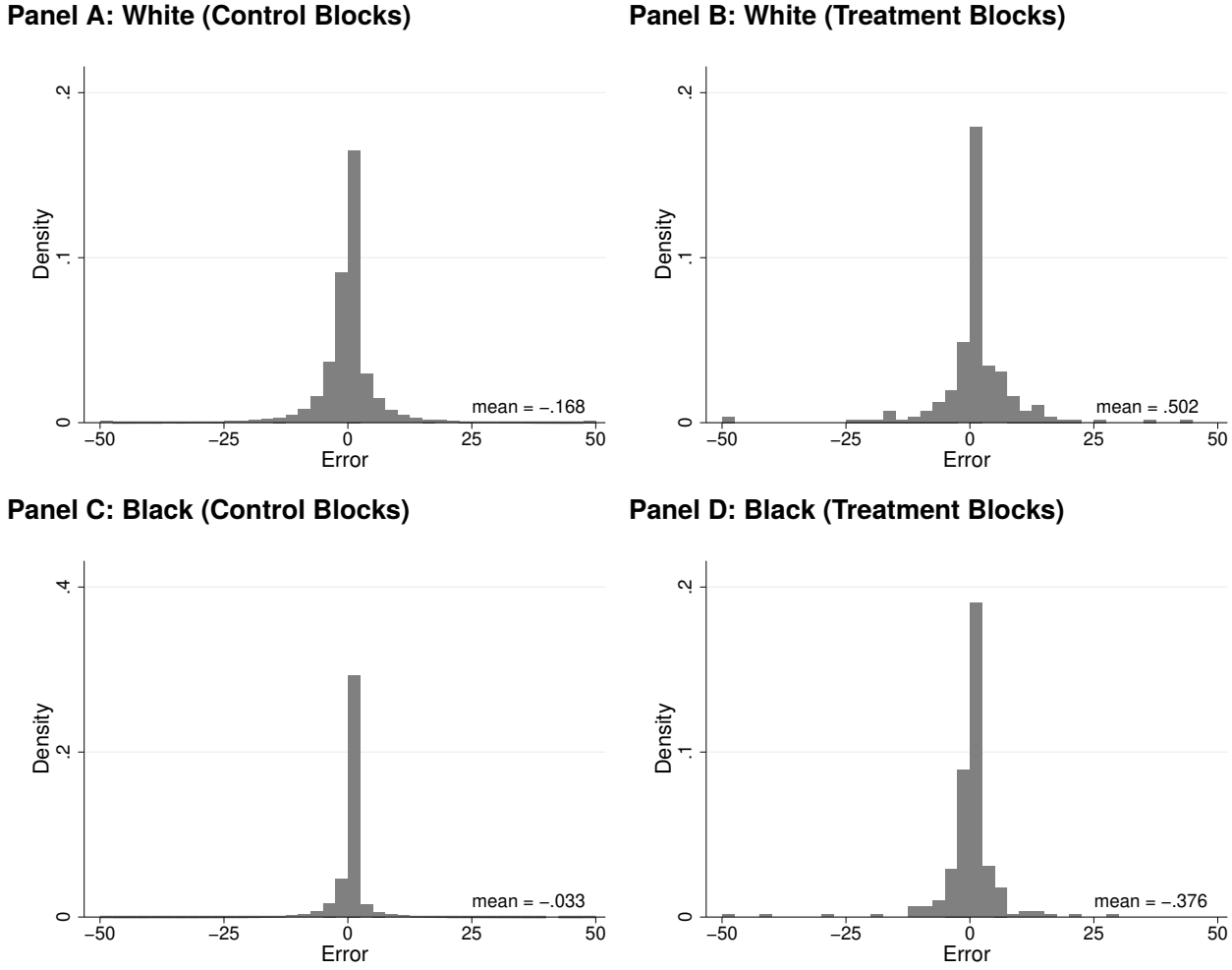
FIGURE A.3. Validation of Predicted Race Counts



Notes: Figure shows histograms validating estimated vote counts by race obtained from Equation 3 against estimates predicted from individual-level voter registration file extracted on February 4, 2011. Each voter's race is predicted from the registration file using surname and address based on the Consumer Financial Protection Bureau's Bayesian Improved Surname Geocoding method (Consumer Financial Protection Bureau 2014). A voter is classified as Black (white) if his/her predicted probability of being Black (white) exceeds that of any other race group. Vote counts are then aggregated to Census block. Histograms show the algebraic difference between 2010 estimates from Equation 3 and corresponding voter file estimates, separately for white and Black voters and Census blocks that did and did not experience a police killing during the sample period.

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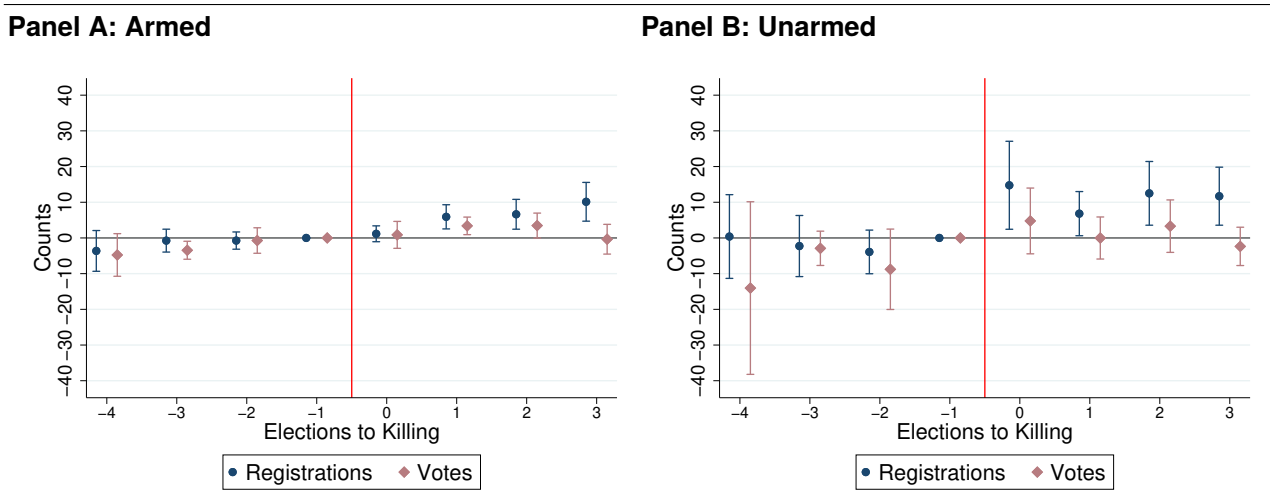
FIGURE A.4. Effects by Deceased Weapon without Population Controls



Notes: Figure shows coefficients and 95 percent confidence intervals from estimation of Equation 2 on registrations (pre-treatment mean = 81.6) and votes (pre-treatment mean = 42.9), excluding interactions between election fixed effects and deciles of estimated voting age population in 2002. Unit of observation is the Census block-election. Panel A restricts the treatment group to blocks with killings of individuals who were armed with a knife, gun, or other weapon. Panel B restricts treatment group to blocks with killings of individuals who were unarmed. Estimates are similar when including incidents with unknown weapon type. Standard errors are clustered by Census block group. The sample spans the 2002 to 2010 general elections. The red vertical lines mark when the police killing occurred. Full regression results are included in Table A.3, Columns 4 and 5.

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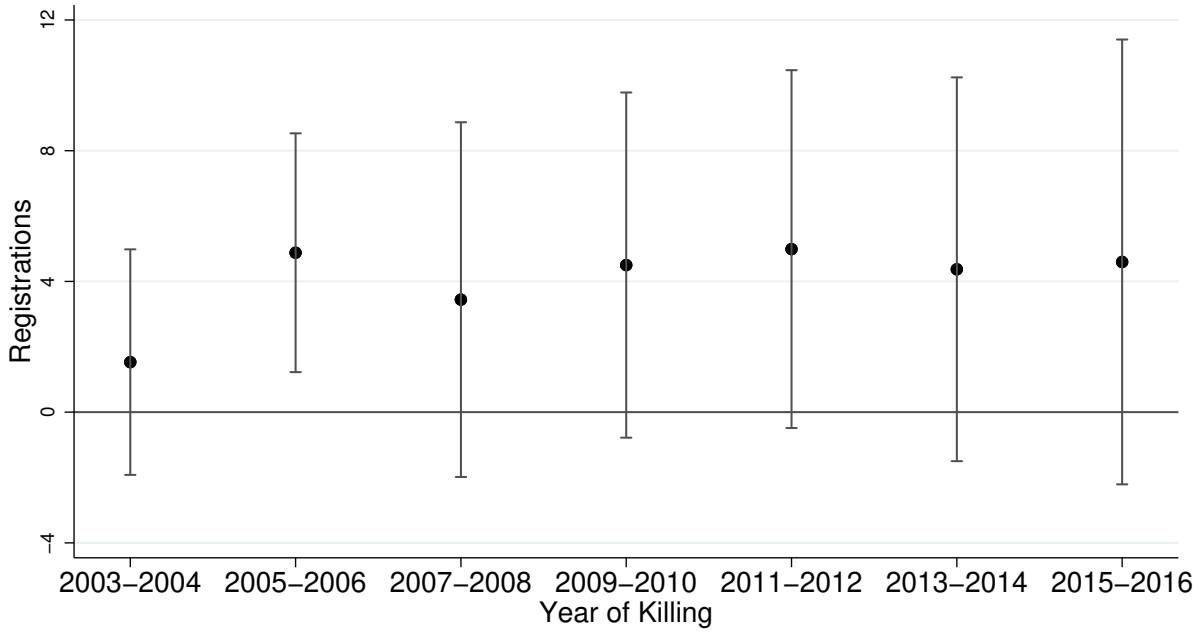
FIGURE A.5. Effects on Voter Registration by Year of Killing



Notes: Figure shows effects on voter registrations by year of police killing. Each point represents the average of β_τ for $0 \leq \tau \leq 1$ from separate estimations of Equation 2, including only those treatment blocks that experienced a killing in the corresponding time period. For example, the point at 2003-2004 represents the average effect of police killings that occurred between the 2002 and 2004 general elections on registrations in 2004 and 2006. The sample spans general elections and police killings from 2002 to 2016 and treatment is defined by blocks where police killings occurred. Unit of observation is the Census block-election. Standard errors are clustered by Census block group. Full regression results are included in Table A.6.

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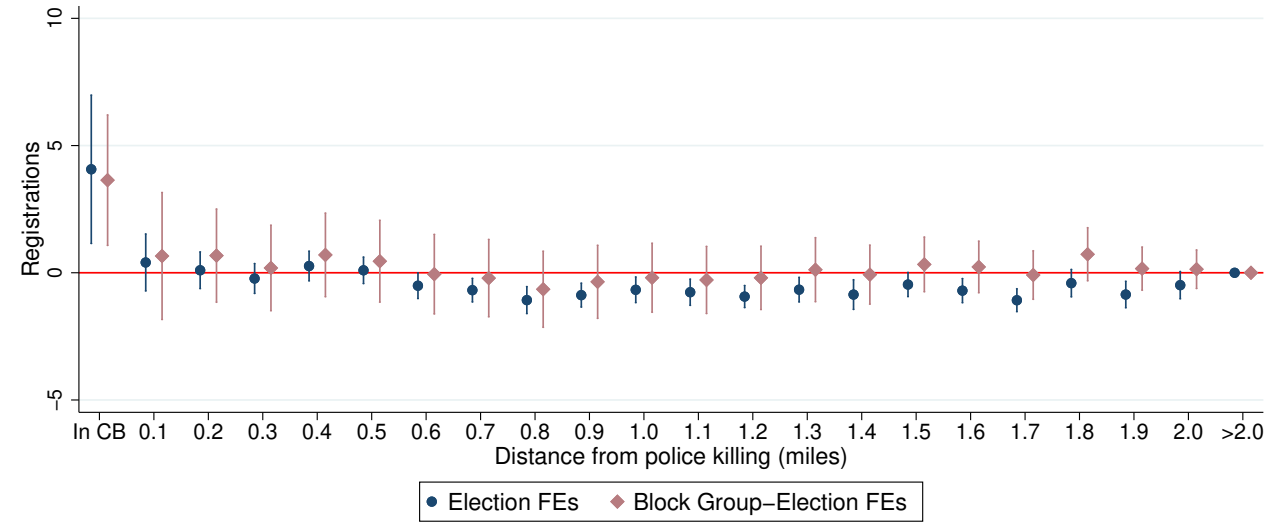
FIGURE A.6. Effects by Distance to Killing using Alternative Distance Measure



Notes: Figure shows coefficients and 95 percent confidence intervals from estimation of Equation 1 on registrations. This figure uses an alternative distance-to-killing measure: the geodetic distance from the centroid of the killing block to the centroid of a given Census block. Unit of observation is the Census block-election. Sample spans 2002 to 2010 general elections. Indicators are mutually-exclusive and track a Census block's minimum distance to police killings that occurred prior to a given election. "In CB" refers to blocks where killings occurred. Other blocks are partitioned into 0.1-mile bins. Blue dots include election fixed effects. Red diamonds include Census block group by election fixed effects. Standard errors are clustered at the Census block group-level.

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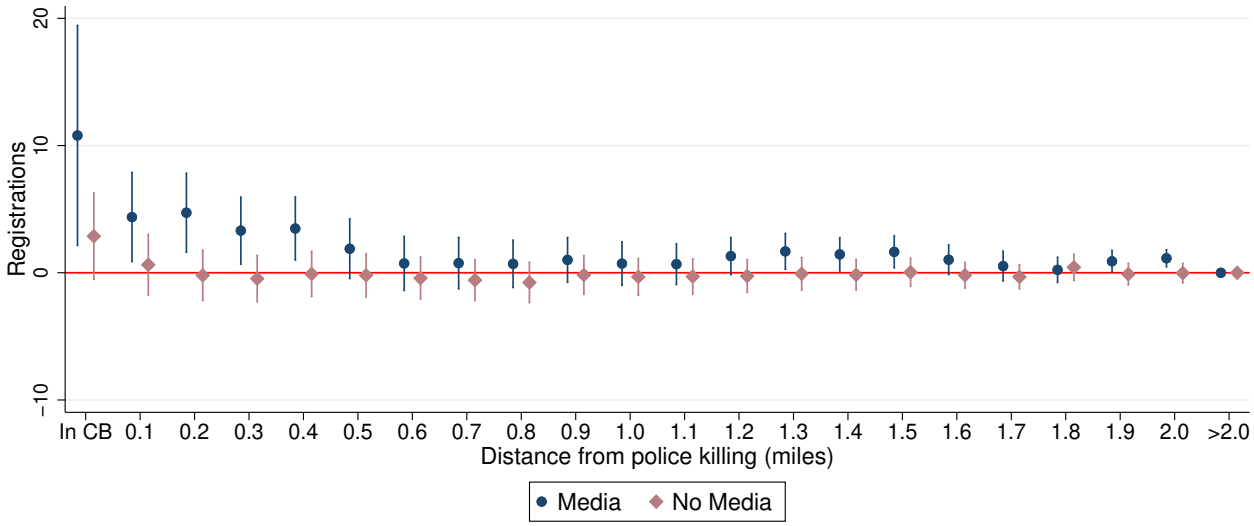
FIGURE A.7. Effects by Media Coverage using Alternative Distance Measure



Notes: Figure shows coefficients and 95 percent confidence intervals from estimation of Equation 1 on registrations, separately for killings that were and were not reported in local newspapers. This figure uses an alternative distance-to-killing measure: the geodetic distance from the centroid of the killing block to the centroid of a given Census block. Unit of observation is the Census block-election. Sample spans 2002 to 2010 general elections. Indicators are mutually-exclusive and track a Census block's minimum distance to police killings that occurred prior to a given election. "In CB" refers to blocks where killings occurred. Other blocks are partitioned into 0.1-mile bins. Blue dots include election fixed effects. Red diamonds include Census block group by election fixed effects. Standard errors are clustered at the Census block group-level.

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Supplementary Tables

TABLE A.1. Effects by Distance from Police Killing (Full Results)

	(1)		(2)		(3)		(4)	
Distance	*DV=Registrations*							
In Block	4.829***	(1.489)	4.482***	(1.500)	9.198**	(4.197)	3.094**	(1.488)
0.1 mi	0.410	(1.054)	-0.072	(2.433)	2.142	(4.677)	-0.846	(1.279)
0.2 mi	0.589	(0.470)	-0.314	(0.759)	1.930	(1.360)	0.441	(0.759)
0.3 mi	0.811**	(0.366)	0.029	(0.572)	3.278***	(1.103)	-0.206	(0.603)
0.4 mi	0.563	(0.359)	0.270	(0.460)	1.684*	(0.868)	-0.112	(0.514)
0.5 mi	1.000***	(0.308)	0.634*	(0.384)	1.735**	(0.712)	0.349	(0.423)
0.6 mi	0.780**	(0.356)	0.556	(0.382)	-0.347	(0.723)	0.816*	(0.422)
0.7 mi	0.064	(0.299)	-0.035	(0.319)	0.139	(0.569)	0.015	(0.335)
0.8 mi	-	-	-	-	-	-	-	-
0.9 mi	-0.129	(0.298)	-0.117	(0.330)	0.315	(0.632)	0.355	(0.342)
1.0 mi	0.026	(0.336)	0.107	(0.416)	0.199	(0.652)	0.476	(0.453)
1.1 mi	0.496	(0.387)	0.625	(0.478)	0.518	(0.799)	0.789	(0.515)
1.2 mi	-0.185	(0.328)	0.016	(0.459)	0.185	(0.783)	0.502	(0.500)
1.3 mi	-0.236	(0.307)	0.045	(0.503)	0.885	(0.789)	0.326	(0.551)
1.4 mi	0.199	(0.355)	0.754	(0.551)	1.172	(0.881)	1.113*	(0.605)
1.5 mi	0.153	(0.345)	0.695	(0.574)	0.702	(0.906)	0.988	(0.645)
1.6 mi	0.275	(0.359)	1.130*	(0.607)	0.782	(0.944)	1.300*	(0.665)
1.7 mi	0.135	(0.336)	1.091*	(0.631)	0.262	(0.935)	1.297*	(0.695)
1.8 mi	0.092	(0.329)	1.207*	(0.687)	-0.340	(0.945)	1.572**	(0.745)
1.9 mi	0.082	(0.380)	1.061	(0.736)	0.401	(0.971)	1.440*	(0.790)
2.0 mi	-0.107	(0.356)	0.809	(0.746)	0.283	(0.988)	1.290	(0.804)
≥2.0 mi	0.801**	(0.314)	0.848	(0.783)	-0.100	(1.041)	1.429*	(0.825)
Police Killings	All		All		w/ Media		w/o Media	
Fixed Effects	Election		Blk Grp x Election		Blk Grp x Election		Blk Grp x Election	
Obs.	341,630		341,420		341,420		341,420	

Table reports results from estimation of Equation 1 on registration counts. Sample spans 2002 to 2010 general elections. Indicators are mutually-exclusive and track a Census block's minimum distance to police killings that occurred prior to a given election. "In Block" refers to blocks where killings occurred. Other blocks are partitioned by 0.1-mile bins. Columns 1 and 2 examine all police killings in sample. Column 1 includes election fixed effects, Column 2 includes Census block group by election fixed effects. Columns 3 and 4 include Census block group by election fixed effects and examine only police killings that did and did not receive media coverage, respectively. Unit of observation is the Census block-election. Standard errors are clustered at the Census block group-level and shown in parentheses. Estimates from Column 1 and 2 are displayed visually in Figure 1. Estimates from Column 3 and 4 are plotted in Figure 4.

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TABLE A.2. Effects on Local Crime and Arrests (Full Results)

	(1)		(2)		(3)	
Years to Treat	*DV=Homicides*		*DV=Crimes*		*DV=Arrests*	
-8	0.008	(0.038)				
-7	-0.011	(0.041)				
-6	-0.024	(0.029)	0.205	(2.061)	-3.363	(2.322)
-5	-0.021	(0.023)	-1.233	(1.677)	-5.209	(4.484)
-4	0.004	(0.022)	-0.957	(1.418)	-3.899	(4.176)
-3	0.003	(0.027)	-0.294	(1.003)	-1.968	(2.264)
-2	-0.000	(0.025)	0.530	(0.875)	0.561	(1.093)
-1	-	-	-	-	-	-
0	0.005	(0.024)	0.358	(0.574)	0.425	(1.101)
1	0.013	(0.024)	0.259	(0.966)	0.169	(1.735)
2	-0.014	(0.020)	0.689	(0.918)	-0.326	(1.108)
3	0.019	(0.025)	-0.463	(1.044)	-1.854	(1.910)
4	-0.041**	(0.020)	-1.980*	(1.180)	-2.645	(2.079)
5	0.016	(0.035)	-0.274	(1.396)	-0.821	(1.732)
6	0.002	(0.027)	-0.018	(1.786)	-1.826	(2.338)
7	-0.008	(0.039)				
8	0.041	(0.049)				
Mean	0.06		13.84		8.28	
Sample	2002-2010		2010-2016		2010-2016	
Obs.	614,556		326,879		326,879	

Table reports results from estimating Equation 2 on homicides, crimes, and arrests. Unit of observation is the Census block-year. Standard errors are clustered by Census block group and shown in parentheses. For Column 1, the sample spans 2002 to 2010 and treatment is defined as blocks where police killings occurred during the sample period. As data on crimes and arrests from the Los Angeles Police Department are only available after 2010, Columns 2 and 3 span LAPD jurisdiction areas from 2010 to 2016 with treatment defined as blocks in those areas where police killings occurred from 2010 to 2016. Mean homicides, crimes, and arrests for treatment blocks during the year prior to the police killing are listed. Estimates are displayed visually in Figure A.1.

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TABLE A.3. Effects on Civic Engagement (Full Results)

	(1)		(2)		(3)		(4)		(5)	
Elections to Treat	***Panel A: DV=Registrations***									
-4	-1.460	(2.424)	-2.424	(2.763)	3.082	(5.982)	-3.633	(2.912)	0.398	(5.982)
-3	0.221	(1.548)	0.425	(1.581)	-0.091	(4.242)	-0.751	(1.635)	-2.269	(4.367)
-2	-0.471	(1.146)	-0.039	(1.165)	-2.041	(3.020)	-0.737	(1.233)	-3.918	(3.117)
-1	-	-	-	-	-	-	-	-	-	-
0	2.585*	(1.332)	0.534	(1.144)	13.427**	(6.292)	1.163	(1.134)	14.758**	(6.287)
1	4.369***	(1.281)	4.695***	(1.562)	4.571*	(2.722)	5.916***	(1.726)	6.811**	(3.155)
2	4.407***	(1.670)	4.546**	(1.921)	9.104**	(4.356)	6.630***	(2.132)	12.494***	(4.553)
3	3.640	(2.218)	6.418***	(2.478)	8.447**	(3.524)	10.129***	(2.769)	11.697***	(4.146)
Mean	81.59		80.16		102.79		80.16		102.79	
Elections to Treat	***Panel B: DV=Votes***									
-4	-1.294	(2.793)	-0.475	(2.456)	-4.023	(12.362)	-4.767	(3.044)	-14.038	(12.334)
-3	-1.813*	(1.014)	-2.182*	(1.151)	-0.285	(2.264)	-3.447***	(1.284)	-2.904	(2.450)
-2	-1.038	(1.371)	0.190	(1.323)	-5.668	(5.290)	-0.720	(1.821)	-8.780	(5.745)
-1	-	-	-	-	-	-	-	-	-	-
0	0.586	(1.398)	0.136	(1.742)	4.964	(3.902)	0.864	(1.923)	4.765	(4.699)
1	2.187**	(0.882)	3.056***	(1.074)	-0.057	(2.671)	3.385***	(1.255)	-0.015	(3.006)
2	1.133	(1.426)	1.684	(1.338)	2.570	(2.925)	3.467*	(1.782)	3.306	(3.749)
3	0.240	(1.399)	0.148	(2.050)	-1.882	(2.658)	-0.356	(2.125)	-2.363	(2.738)
Mean	42.87		43.48		55.52		43.48		55.52	
Model	Main		Main		Main		w/o Pop Ctrls		w/o Pop Ctrls	
Police Killings	All		Armed		Unarmed		Armed		Unarmed	
Obs.	341,420		340,990		340,195		340,990		340,195	

Table reports results from estimating Equation 2 on registrations (Panel A) and votes (Panel B). Unit of observation is the Census block-election. Standard errors are clustered by Census block group and shown in parentheses. Column 1 examines all police killings in sample. Columns 2 and 4 define treatment as blocks with killings of individuals armed with a knife, gun or other weapon. Columns 3 and 5 restricts the treatment group to blocks with killings of individuals who were unarmed. Columns 2 and 3 include interactions between election fixed effects and deciles of estimated voting age population in 2002, while Columns 4 and 5 drop those controls. The sample spans the 2002 to 2010 general elections. Mean registrations and votes are reported for treatment blocks during the election prior to the police killing. Estimates from Column 1 are displayed visually in Figure 2, from Columns 2 and 3 in Figure 5, and from Columns 4 and 5 in Figure A.4.

TABLE A.4. Effects on Voter Registration for 2002-2016 (Full Results)

	(1)	
Elections to Treat	*DV=Registrations*	
-7	3.299	(3.630)
-6	-0.711	(3.249)
-5	-1.092	(2.075)
-4	-2.227	(1.488)
-3	-0.489	(1.165)
-2	-2.279	(1.958)
-1	-	-
0	2.931***	(1.016)
1	5.543***	(1.416)
2	6.760***	(2.054)
3	6.287***	(2.354)
4	6.262**	(2.644)
5	10.257***	(3.320)
6	11.986**	(5.111)
Mean	93.53	
Obs.	546,272	

Table reports results from estimating Equation 2 on registrations. Unit of observation is the Census block-election. Standard errors are clustered by Census block group and shown in parentheses. The sample spans general elections and police killings from 2002 to 2016 and treatment is defined by blocks where police killings occurred during the sample period. Mean registrations are reported for treatment blocks during the election prior to the police killing. Estimates are displayed visually in Figure A.2.

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TABLE A.5. Heterogeneous Effects (Full Results)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	Panel A: DV=Registrations															
	Voter Race			Voter Age			Years Registered				Party			Voter Race		
	Black	Hisp	Wht/Asn	18-34	35-54	55+	0-3	4-7	8-11	12-15	Dem	Ind	Rep	Blk/Hsp	Wht/Asn	All
Treat x Post	1.751***	1.418**	0.338	1.740***	1.043*	0.746	2.823***	0.456	0.354	0.223	2.499***	0.544	0.592			
	(0.589)	(0.717)	(0.609)	(0.633)	(0.568)	(0.501)	(0.843)	(0.444)	(0.317)	(0.222)	(0.787)	(0.353)	(0.446)			
x Blk/Hisp Killing														3.604***	-0.165	
														(1.170)	(0.650)	
x Wht/Asn Killing														1.235	2.584*	
														(1.048)	(1.563)	
x Near Home																6.602**
																(2.837)
x Not Near Home																3.291**
																(1.649)
Mean	20.22	31.08	27.58	26.8	30.36	22.45	36.83	19.31	9.24	4.85	48.48	14.75	18.35	51.3	27.58	81.59
	Panel B: DV=Votes															
	Voter Race			Voter Age			Years Registered				Party			Voter Race		
	Black	Hisp	Wht/Asn	18-34	35-54	55+	0-3	4-7	8-11	12-15	Dem	Ind	Rep	Blk/Hsp	Wht/Asn	All
Treat x Post	1.021**	0.973**	-0.305	0.971***	0.594	0.080	1.460***	0.403	0.219	0.058	1.240**	0.235	0.267			
	(0.415)	(0.435)	(0.509)	(0.345)	(0.390)	(0.388)	(0.521)	(0.300)	(0.208)	(0.159)	(0.568)	(0.214)	(0.257)			
x Blk/Hisp Killing														2.163***	-0.590	
														(0.736)	(0.557)	
x Wht/Asn Killing														1.238	0.969	
														(0.825)	(1.191)	
x Near Home																4.511*
																(2.139)
x Not Near Home																1.466
																(1.043)
Mean	9.22	16.99	15.34	10.42	16.66	14.52	17.43	9.44	5.27	3.02	26.9	7.99	7.98	26.21	15.34	42.87
Obs.	341,420	341,420	341,420	341,420	341,420	341,420	341,420	341,420	341,420	341,420	341,420	341,420	341,420	341,420	341,420	341,420

Table reports results from estimating Equation 2 separately for each voter group (i.e., by race, age, registration length and party affiliation), replacing the time to treatment indicators with a single post-treatment indicator. Columns 14 to 16 include distinct post-treatment indicators corresponding to each incident type (i.e., by deceased race and by proximity to deceased home). Standard errors are clustered by Census block group. Unit of observation is the Census block-election. The sample spans the 2002 to 2010 general elections and treatment is defined as blocks where police killings occurred during the sample period. Mean registrations and votes are reported for treatment blocks during the election prior to the police killing. Estimates are displayed visually in Figure 3.

TABLE A.6. Effects on Voter Registration by Year of Killing (Full Results)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Elections to Treat	*DV=Registrations*						
-7							5.128
							(4.568)
-6						-4.626	4.260
						(3.868)	(6.078)
-5					-3.172	-0.726	2.900
					(3.816)	(2.518)	(3.919)
-4				-0.911	-2.335	-2.286	-0.014
				(2.707)	(2.642)	(2.579)	(2.704)
-3			-0.269	1.115	-3.327	2.879	-0.720
			(1.700)	(2.282)	(2.398)	(2.399)	(1.941)
-2		-0.127	-0.254	0.527	0.146	-8.440	-1.593
		(1.901)	(1.364)	(2.022)	(2.262)	(10.227)	(1.011)
-1	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
0 to 1	1.530	4.878***	3.443	4.500*	4.989*	4.372	4.596
	(1.760)	(1.864)	(2.768)	(2.694)	(2.793)	(2.995)	(3.472)
2 to 3	1.459	7.708***	2.235	8.694*	16.449**		
	(2.055)	(2.921)	(3.458)	(5.243)	(7.372)		
4 to 5	5.372	11.809***	1.361				
	(3.649)	(4.448)	(6.882)				
6	8.702						
	(5.423)						
Mean	74.40	78.65	97.21	77.36	101.19	123.57	99.73
Year of Killing	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
Obs.	542,736	542,672	542,640	542,640	542,736	542,728	542,728

Table reports results from estimating Equation 2 on registrations. Unit of observation is the Census block-election. Standard errors are clustered by Census block group and shown in parentheses. The sample spans general elections from 2002 to 2016. In each column, the treatment group is restricted to blocks where police killings occurred during the stated time period. For example, Column 1 examines police killings that occurred between the 2002 and 2004 general elections. Mean registrations are listed for treatment blocks during the election prior to the police killing. Estimates for β_τ for $0 \leq \tau \leq 1$ (i.e. Elections to Treat for "0 to 1") are displayed visually in Figure A.5.

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