The Political Economy of Death: Do Coroners Perform as well as Medical Examiners in Determining Suicide?

Jose Fernandez

University of Louisville

AEA Meetings: Jan. 5, 2019

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NATIONAL
NEWSCAST   LIVE RADIO
Run For Coroner, No Medical Training Necessary

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November 3, 2013 · 4:30 AM ET
Heard on Weekend Edition Sunday
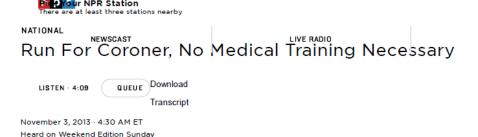
Figure 1:

Charlestown High School student now serving as Clark County Deputy Coroner

Still months away from graduating high school, one Charlestown senior already has a pretty grown up job.

Sunday, February 25th 2018, 9:34 AM EST
Updated: Sunday, February 25th 2018, 11:18 AM EST

By Kate Springer

Figure 2:

YOUNG CORONER SET TO TAKE OVER

By **Tribune News Services**
CHICAGO TRIBUNE

NOVEMBER 20, 2000 | ALBION, INDIANA

A t an age when many of his peers are studying for college exams, 20-year-old John Brazzell is preparing to take over the reigns of an unlikely post: county coroner.

Brazzell, who may be Indiana's youngest elected official, defeated Terry Gaff, a physician who had previously served as coroner, on Nov. 7 in the race for Noble County Coroner.

Figure 3:

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- Klugman et al. (2013) find the opposite in that medical examiners determine about 3 percent more suicides than coroners.
- Ruhm (Addiction, 2018) uses a correction method to identified under-reporting of drug poisoning deaths (20-35%)

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- Only 4 states require no felony convictions

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- The trend has since stopped and states have adopted alternative models.
  - Switching high population counties into Medical examiner counties
  - Requiring Death Investigation Training for elected coroners.

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- Coroner only states (11 States)
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- In states with Coroners, some require mandatory training (40 to 80 hours) - 14%

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- A 2004 Census of Coroner/ME offices finds 80% of offices are county coroners.
- 2/3 of these offices serve areas of 50,000 people or less.

Model (1)

$$ln(E[d/p]) = \beta_1 PctME + \beta_1 CoronerTrained + \beta_2 CentralizedME + \beta_3 StateME + \Gamma X + u_i + \omega_t \quad (1)$$

The death count is given by d and the population of interest is given p. The population of interest is the state population and the total number of violent deaths.

Treatment Variables

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- CentralizedME: A Centralized State Medical Examiner System
- StateME: State Medical Examiner present in Coroner State.

Model (2)

$$ln(E[d/p]) = \beta_1 PctME + \beta_1 CoronerTrained + \beta_2 CentralizedME + \beta_3 StateME + \Gamma X + u_i + \omega_t \quad (2)$$

Control Variables	
Pct White	Pct greater than 64 yrs
Pct Black	log state population
Pct Female	log state income per capita
Pct BA	Pct married
Pct HS Grad	Pct separated
Pct under 5 yrs	Pct widowed
Pct between 5-17 yrs	Pct divorced

We also control, but do not report if the coroner is required to be a physician.

Data

- Death Counts by State Compressed Mortality File 1968-2016

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  - Hanzlick (1998) and Hanzlick (2007)
  - CDC Public Health Law Program: Coroner/Medical Examiner Laws, by State database
  - Verified looking up state statues and calling municipalities

Why Fixed Effects Matter: Per Violent Death

Table 1: Rate of Suicide by Violent Death

VARIABLES	(1) Model 1	(2) Model 2	(3) Model 3
Pct of Pop. Covered by ME	0.1161*	0.1180*	0.0368
	(0.0592)	(0.0709)	(0.0479)
Coroner Required Training	0.0673**	-0.0076	-0.0298
	(0.0342)	(0.0306)	(0.0184)
State Level ME - Centralized	0.1125*	0.1835**	0.1602**
	(0.0613)	(0.0923)	(0.0653)
State Level ME - Coroner State	-0.1112**	0.1562***	0.1081***
	(0.0447)	(0.0431)	(0.0376)
Observations	2,433	2,433	2,433
Control Variables	No	No	Yes
State FE	No	Yes	Yes
Year FE	No	Yes	Yes
Number of fips		50	50

Primary Results: Per Capita

Table 2: Poisson Regression: Rate of Death Type by Population

VARIABLES	Accidents	Suicide	Homicide	Autopsy
Pct of Pop. Covered by ME	0.1060	0.1667	0.1341	0.0356
	(0.0392)***	(0.0480)***	(0.0972)	(0.0970)
	[0.0553]*	[0.0632]***	[0.1323]	[0.1675]
Coroner Required Training	0.0117	-0.0024	0.0938	0.0021
	(0.0206)	(0.0159)	(0.0485)*	(0.0552)
	[0.0324]	[0.0200]	[0.0659]	[0.0769]
State Level ME - Centralized	-0.0573	0.1421	0.0945	0.0744
	(0.0330)*	(0.0674)**	(0.0879)	(0.1031)
	[0.0499]	[0.0758]*	[0.1178]	[0.1479]
State Level ME - Coroner State	-0.0801	0.0246	0.0266	0.0852
	(0.0346)**	(0.0337)	(0.1008)	(0.0540)
	[0.0507]	[0.0529]	[0.1711]	[0.0917]
Observations	2,450	2,450	2,433	1,800
Number of fips	50	50	50	50
Control Variables	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

Primary Results: Per Violent Death

Table 3: Poisson Regression: Rate of Death Type by Total Violent Deaths

VARIABLES	Accidents	Suicide	Homicide	Autopsy
Pct of Pop. Covered by ME	-0.0213	0.0345	0.0197	-0.1288
	(0.0160)	(0.0474)	(0.0715)	(0.0997)
	[0.0208]	[0.0675]	[0.0990]	[0.1860]
Coroner Required Training	-0.0047	-0.0230	0.0687	-0.0240
	(0.0084)	(0.0188)	(0.0387)*	(0.0635)
	[0.0103]	[0.0272]	[0.0510]	[0.0893]
State Level ME - Centralized	-0.0429	0.1609	0.1185	0.0538
	(0.0223)*	(0.0660)**	(0.0757)	(0.1022)
	[0.0267]	[0.0790]**	[0.0974]	[0.1542]
State Level ME - Coroner State	-0.0283	0.0861	0.0663	0.1349
	(0.0145)*	(0.0329)***	(0.0771)	(0.0608)**
	[0.0222]	[0.0450]*	[0.1226]	[0.1068]
Observations	2,433	2,433	2,433	1,789
Number of fips	50	50	50	50
Control Variables	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

Female - Male

Table 4: Rate of Death Type by Total Violent Deaths: Female - Male

VARIABLES	Female		Male	
	Accidents	Suicide	Accidents	Suicide
Pct of Pop. Covered by ME	-0.0192	0.0035	-0.0225	0.0510
	(0.0131)	(0.0512)	(0.0177)	(0.0469)
	[0.0199]	[0.0789]	[0.0224]	[0.0644]
Coroner Required Training	0.0019	-0.0259	-0.0051	-0.0296
	(0.0062)	(0.0276)	(0.0099)	(0.0177)*
	[0.0079]	[0.0379]	[0.0124]	[0.0261]
State Level ME - Centralized	-0.0543	0.2283	-0.0334	0.1351
	(0.0172)***	(0.0725)***	(0.0247)	(0.0658)**
	[0.0229]**	[0.1002]**	[0.0293]	[0.0774]*
State Level ME - Coroner State	-0.0149	0.0800	-0.0333	0.0851
	(0.0097)	(0.0402)**	(0.0169)**	(0.0323)***
	[0.0146]	[0.0604]	[0.0272]	[0.0470]*
Observations	2,234	2,234	2,387	2,387
Number of fips	50	50	50	50
Control Variables	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes

Black - White

Table 5: Rate of Death Type by Total Violent Deaths: Black - White

VARIABLES	Black		White	
	Accidents	Suicide	Accidents	Suicide
Pct of Pop. Covered by ME	0.0239	0.1100	-0.0239	0.0240
	(0.0297)	(0.0800)	(0.0129)*	(0.0459)
	[0.0740]	[0.1605]	[0.0176]	[0.0639]
Coroner Required Training	-0.0358	-0.1131	-0.0012	-0.0125
	(0.0237)	(0.0446)**	(0.0067)	(0.0179)
	[0.0285]	[0.0681]*	[0.0085]	[0.0243]
State Level ME - Centralized	-0.1734	0.2602	-0.0392	0.1414
	(0.0482)***	(0.1183)**	(0.0178)**	(0.0555)**
	[0.0693]**	[0.1975]	[0.0225]*	[0.0695]**
State Level ME - Coroner State	-0.0079	0.0449	-0.0300	0.0769
	(0.0380)	(0.0434)	(0.0134)**	(0.0336)**
	[0.0500]	[0.1140]	[0.0214]	[0.0498]
Observations	1,749	1,749	2,389	2,389
Number of fips	45	45	50	50
Control Variables	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes

Robustness Results: Firearms

Table 6: Poisson Regression: Suicide Rate by Firearm Use

VARIABLES	Suicide w/o Firearms	Suicide w/ Firearms
Pct of Pop. Covered by ME	0.0141	0.0907
	(0.0864)	(0.0431)**
	[0.1136]	[0.0668]
Coroner Required Training	0.0044	-0.0443
	(0.0326)	(0.0183)**
	[0.0478]	[0.0252]*
State Level ME - Centralized	0.2478	0.0948
	(0.0923)***	(0.0553)*
	[0.1098]**	[0.0659]
State Level ME - Coroner State	0.1795	0.0205
	(0.0587)***	(0.0348)
	[0.0816]**	[0.0486]
Observations	2,433	2,326
Number of fips	50	50
Control Variables	Yes	Yes
State FE	Yes	Yes
Year FE	Yes	Yes

Robustness Results: Unemployment

Table 7: Rate of Death Type by Total Violent Deaths: Unemployment

VARIABLES	Accidents	Suicide	Homicide	Autopsy
Unemployment Rate	-0.0040	0.0172	-0.0092	0.0130
	(0.0014)***	(0.0036)***	(0.0079)	(0.0077)*
	[0.0016]**	[0.0039]***	[0.0081]	[0.0086]
Pct of Pop. Covered by ME	-0.0199	0.0492	0.0188	-0.1316
	(0.0251)	(0.0793)	(0.0756)	(0.1981)
	[0.0515]	[0.1357]	[0.1674]	[0.3915]
Coroner Required Training	-0.0127	-0.0148	0.0943	-0.0461
	(0.0071)*	(0.0161)	(0.0282)***	(0.0615)
	[0.0085]	[0.0229]	[0.0378]***	[0.0870]
State Level ME - Centralized	-0.0721	0.1838	0.1895	-0.0119
	(0.0381)*	(0.1156)	(0.0675)***	(0.2031)
	[0.0544]	[0.1415]	[0.1123]*	[0.2883]
State Level ME - Coroner State	-0.0240	0.0691	0.0084	0.1325
	(0.0133)*	(0.0293)**	(0.0508)	(0.0670)**
	[0.0226]	[0.0429]	[0.0932]	[0.1200]
Observations	2,033	2,033	2,033	1,589
Number of fips	50	50	50	50
Control Variables	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes

Robustness Results: Murder

Table 8: Rate of Death Type by Total Violent Deaths: Murder

VARIABLES	Accidents	Suicide	Murder	Autopsy
Pct of Pop. Covered by ME	-0.0014	0.0540	-0.1209	-0.0907
	(0.0146)	(0.0489)	(0.0794)	(0.1008)
Coroner Required Training	-0.0055	-0.0227	0.0841**	-0.0237
	(0.0083)	(0.0193)	(0.0401)	(0.0641)
State Level ME - Centralized	-0.0246	0.1787***	-0.0594	0.0853
	(0.0223)	(0.0660)	(0.0863)	(0.1046)
State Level ME - Coroner State	-0.0275**	0.0847***	0.0432	0.1303**
	(0.0134)	(0.0320)	(0.0682)	(0.0617)
Observations	2,450	2,450	2,450	1,800
Number of fips	50	50	50	50
Control Variables	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

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- Drug related death differences (similar to Ruhm 2018)

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- There exist a misclassification of suicides as accidents among coroners.
- The measurement error is mitigated when a state level medical examiner is available.
- The measurement error is more pronounced for non-firearm deaths.

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https://twitter.com/UofLEcon