

Managers and Public Hospital Performance

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 1. identification: shortage of quasi-experimental variation
 2. measurement: lack of objective performance outcomes

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 - public hospitals are important for healthcare access and equity → 75% of medical beds

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 - hospitals cannot choose (reject) patients

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 - CEO transitions from no mgmt. training to mgmt. training predict a drop in mortality
4. Conditional on being selected, financial incentives in the reform do not drive results
 - performance pay was a extremely small part of compensation + poorly designed
 - no effects of CEO higher wages on performance

Contributions to the literature

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 - consider improving CEO recruitment

Outline

1. Setting, data, and descriptive evidence
2. Reform impact on hospital performance
3. Recruitment effects of the reform
4. CEO management training and performance
5. Role of financial incentives included in the reform
6. Concluding thoughts

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- timing of adoption of the reform
- CEOs performance score

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 1. regress hospital mortality on explanatory variables
 2. examine change in adjusted R^2 after including CEO fixed effects
 3. test null hypothesis that all the CEO effects are zero

Hospital mortality and CEO performance

- Main measure of output-based hospital performance: hospital mortality rate ➔ Computation
(Gaynor et al. 2013; Bloom et al. 2015; Doyle et al. 2015; Gupta 2021; Chan et al. 2022)
 - include hospital-level case mix controls
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(Abowd et al., 1999; Card et al., 2013)
 - exploit rotation of CEOs to identify the model (Fenizia 2022)
 - allows to compute measures of CEO managerial talent and decompose variance

Individual CEOs explain relevant share of hospital performance

	Ln Death Rate					
	(1)	(2)	(3)	(4)	(5)	(6)
R^2	.41	.42				
Adj. R^2	.40	.41				
Observations	6,712	6,712	6,712	6,712	6,712	6,712
Case Mix Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	No	Yes	Yes	Yes	Yes	Yes
Hospital FE	No	No	Yes	Yes	No	No
CEO FE	No	No	No	Yes	Yes	No
CEO-by-hospital FE	No	No	No	No	No	Yes
F-statistic for CEO FEs	-	-	-			-

Individual CEOs explain relevant share of hospital performance

	Ln Death Rate					
	(1)	(2)	(3)	(4)	(5)	(6)
R^2	.41	.42	.67			
Adj. R^2	.40	.41	.66			
Observations	6,712	6,712	6,712	6,712	6,712	6,712
Case Mix Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	No	Yes	Yes	Yes	Yes	Yes
Hospital FE	No	No	Yes	Yes	No	No
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	(1)	(2)	(3)	(4)	(5)	(6)
R^2	.41	.42	.67	.76	.73	
Adj. R^2	.40	.41	.66	.73	.69	
Observations	6,712	6,712	6,712	6,712	6,712	6,712
Case Mix Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	No	Yes	Yes	Yes	Yes	Yes
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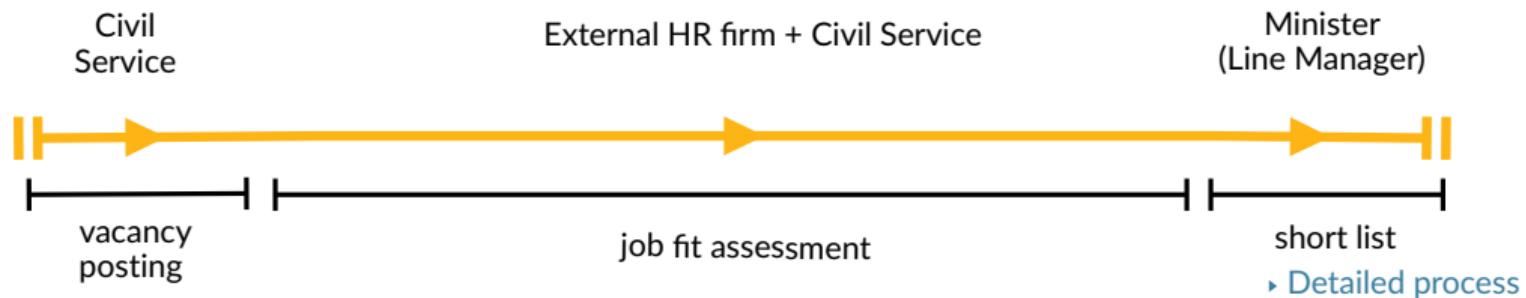
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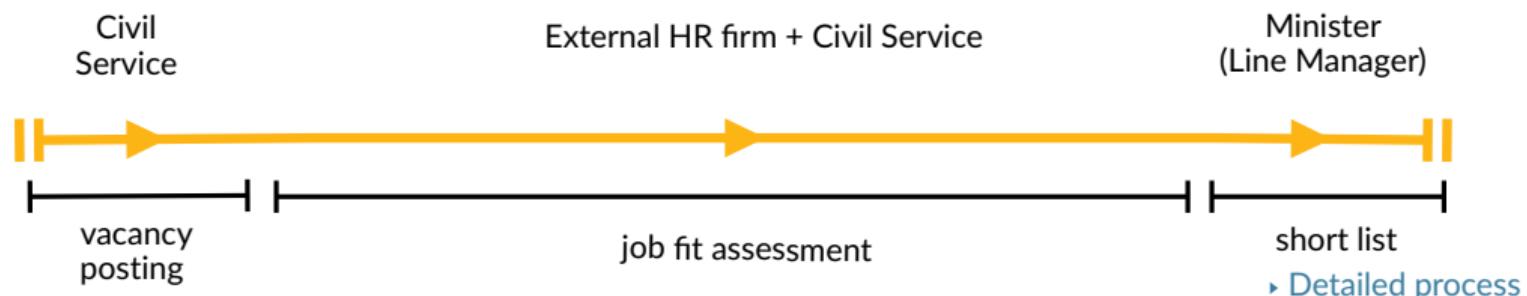
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- Reform also included financial incentives: performance pay & higher unconditional wages

▶ Details

Public agencies gradually adopted selection reform

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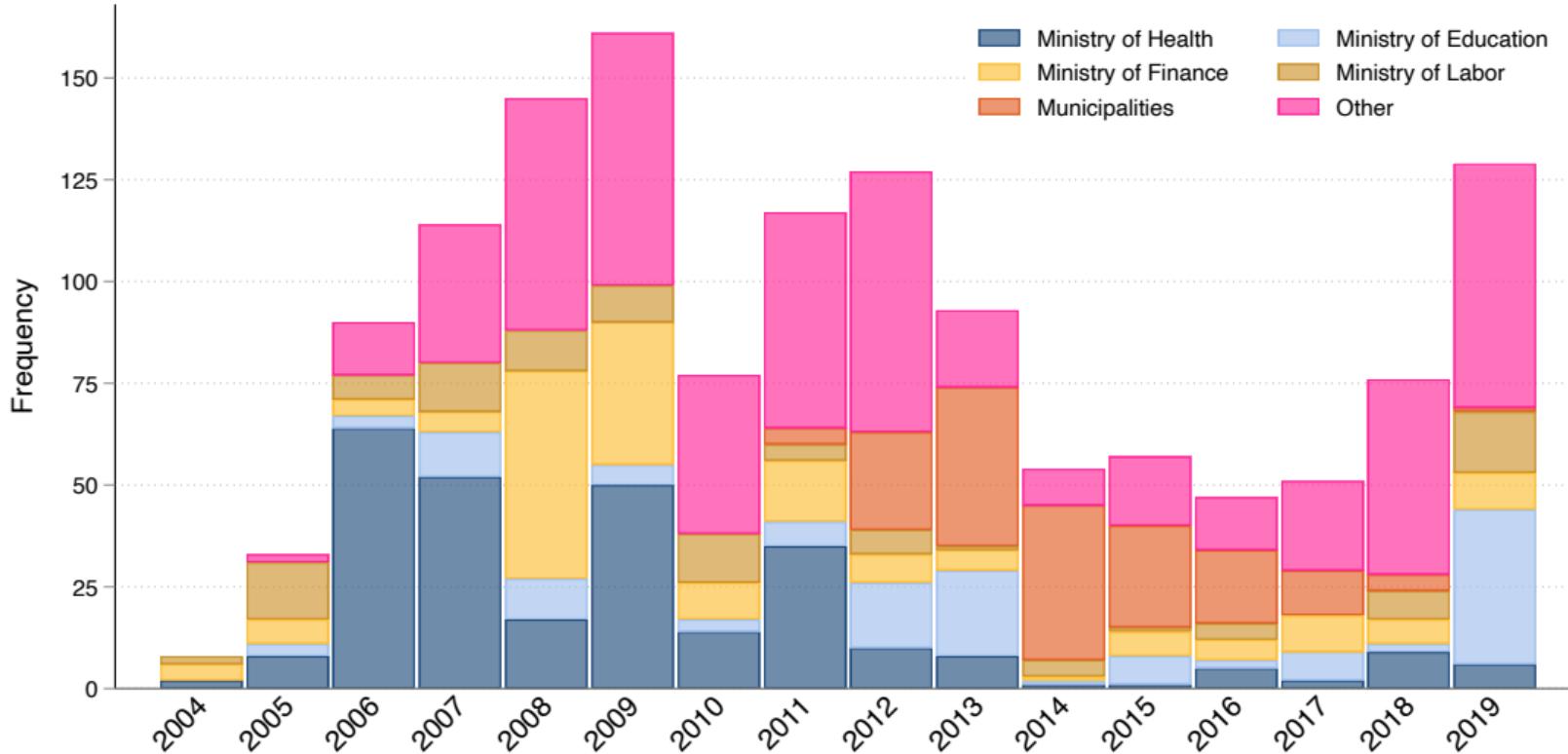
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- Once a position adopts the reform, has to select all future appointees by new process
 - ⇒ treatment is an absorbing state
- Agencies created after 2003 have to hire top executives with new selection process
- For existing agencies:
 - law mandated the Executive to pick at least 100 positions before 2010
 - including other agencies requires an executive order
 - new selection process requires turnover of incumbent manager

Public agencies gradually adopted selection reform

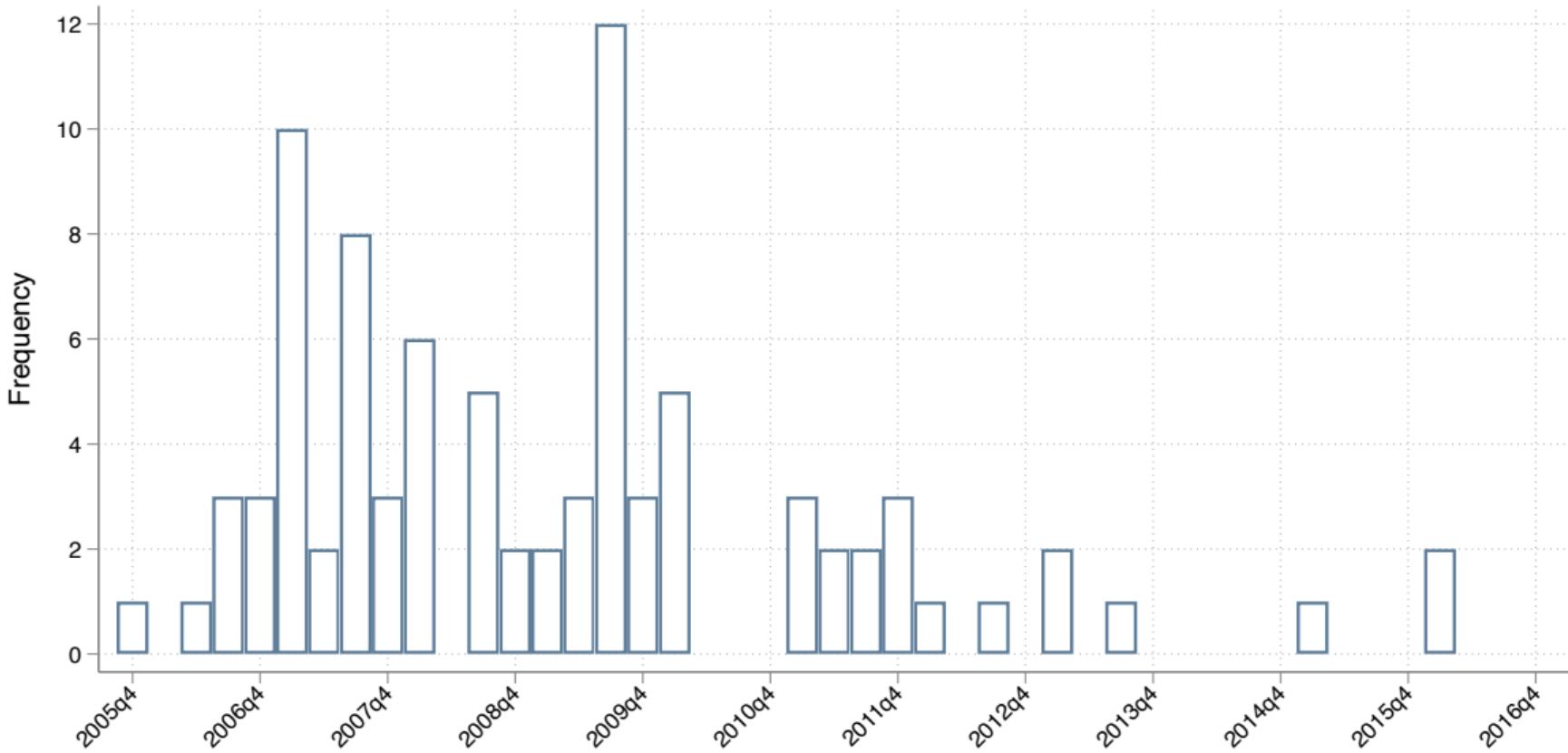
► # by year



Number of public agencies using the new recruitment process for the **first time**

Public hospitals adopting the reform

► CDF ► By hospital size



Outline

1. Setting, data, and descriptive evidence
2. Reform impact on hospital performance
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4. CEO management training and performance
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Impact on hospital performance

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$$y_{ht} = \alpha_h + \gamma_t + \sum_{k=-6}^{12} \beta_k D_{ht}^k + X'_{ht} \Delta + \epsilon_{ht},$$

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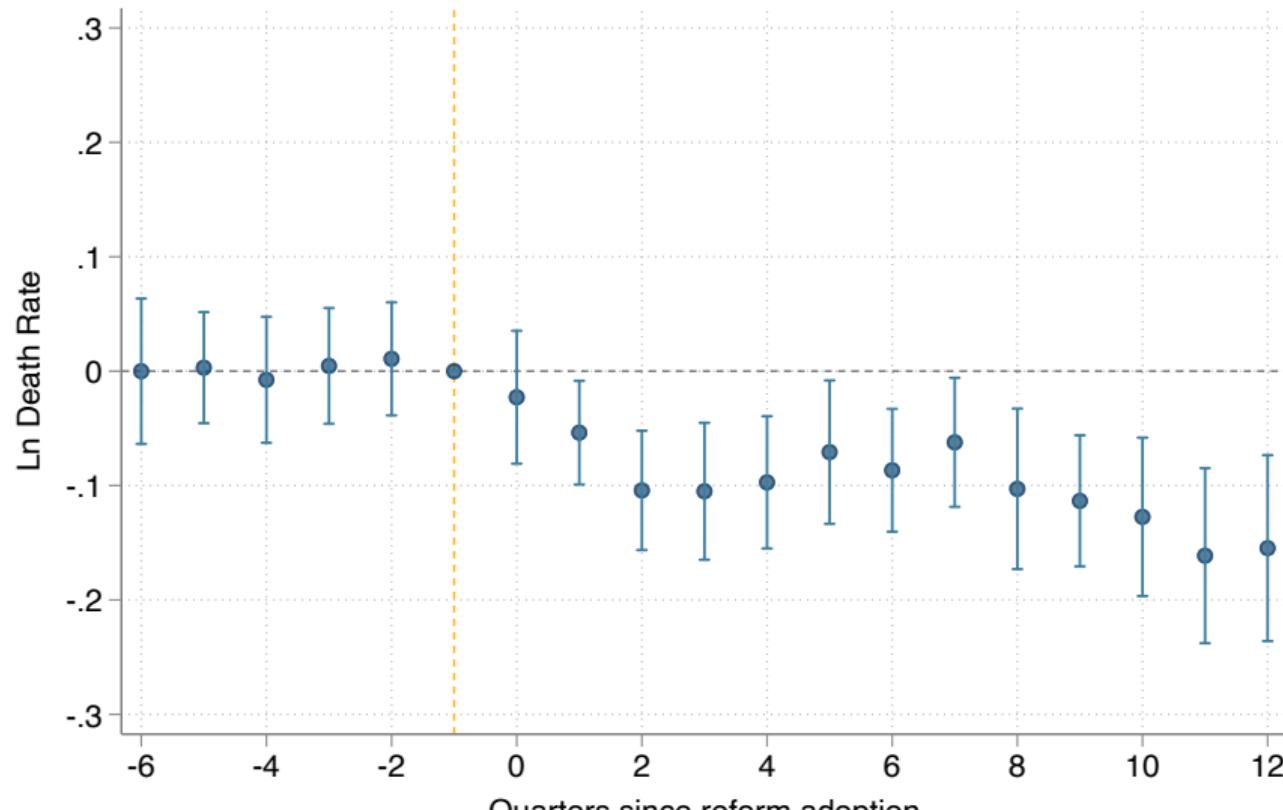
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- Identifying assumption: parallel trends in absence of the policy ▶ Supporting evidence

Impact on hospital performance



► Treatment effect hetero.

► Other outcomes

► Poisson

► CEO transition

► Other policies

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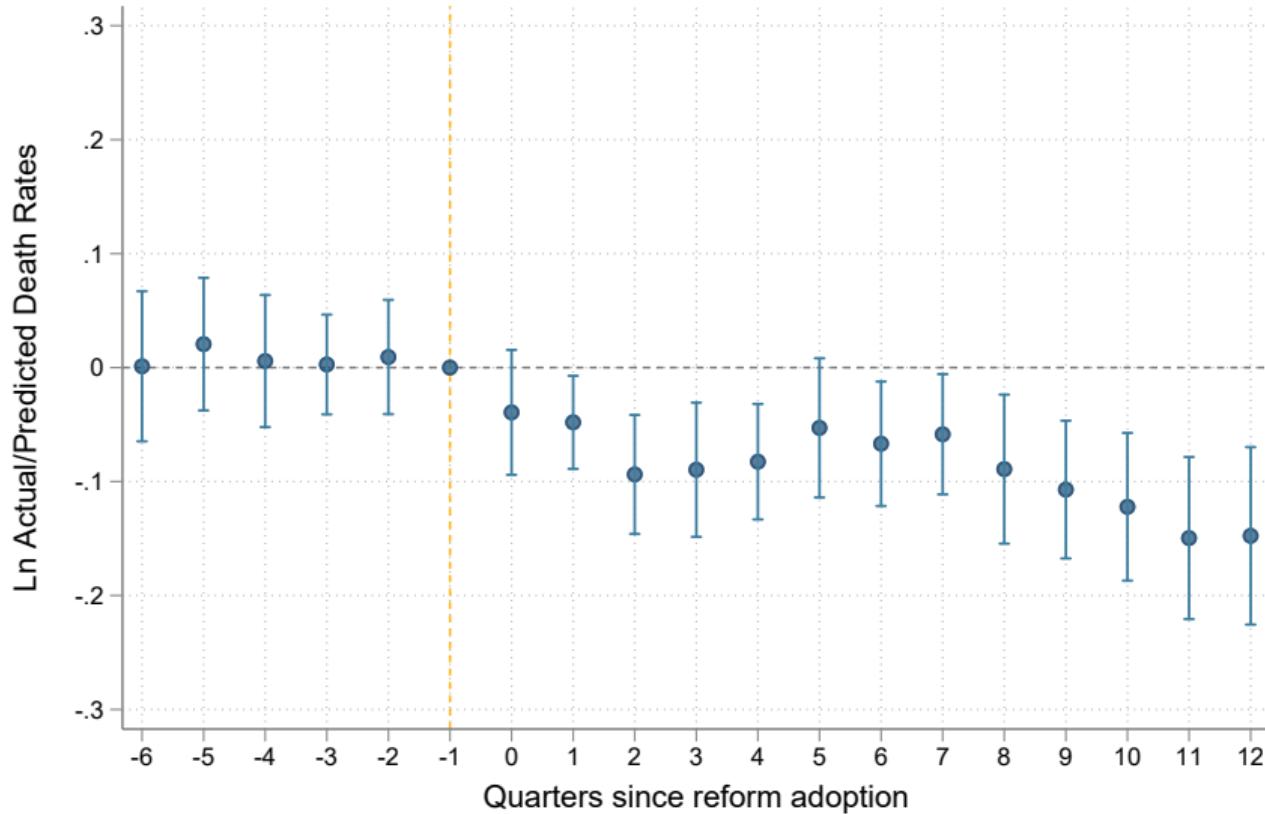
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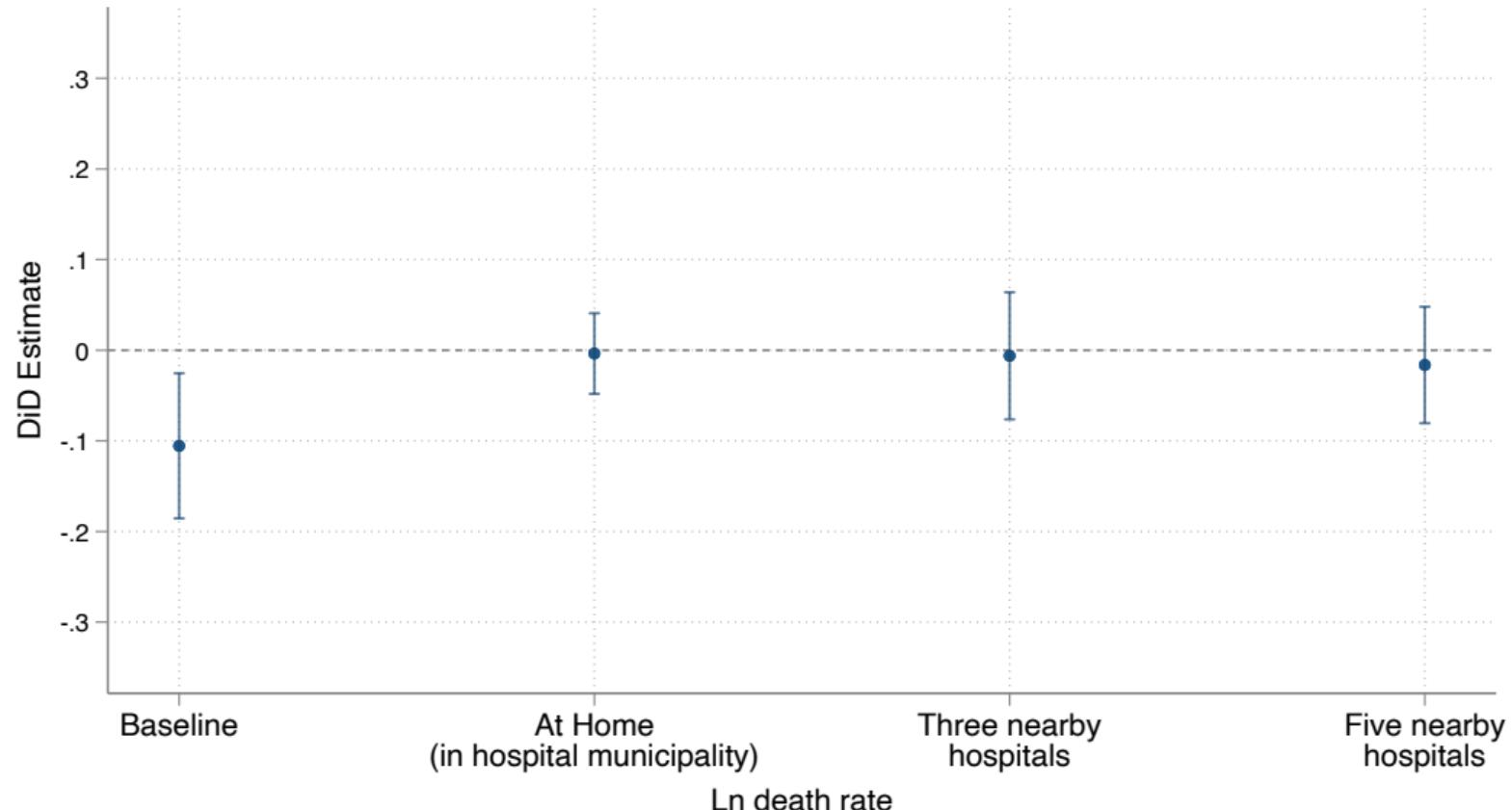
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 4. Risk-adjusted mortality is $y_{ht} - \bar{y}_{ht}$

Results are not explained by a change in patient composition

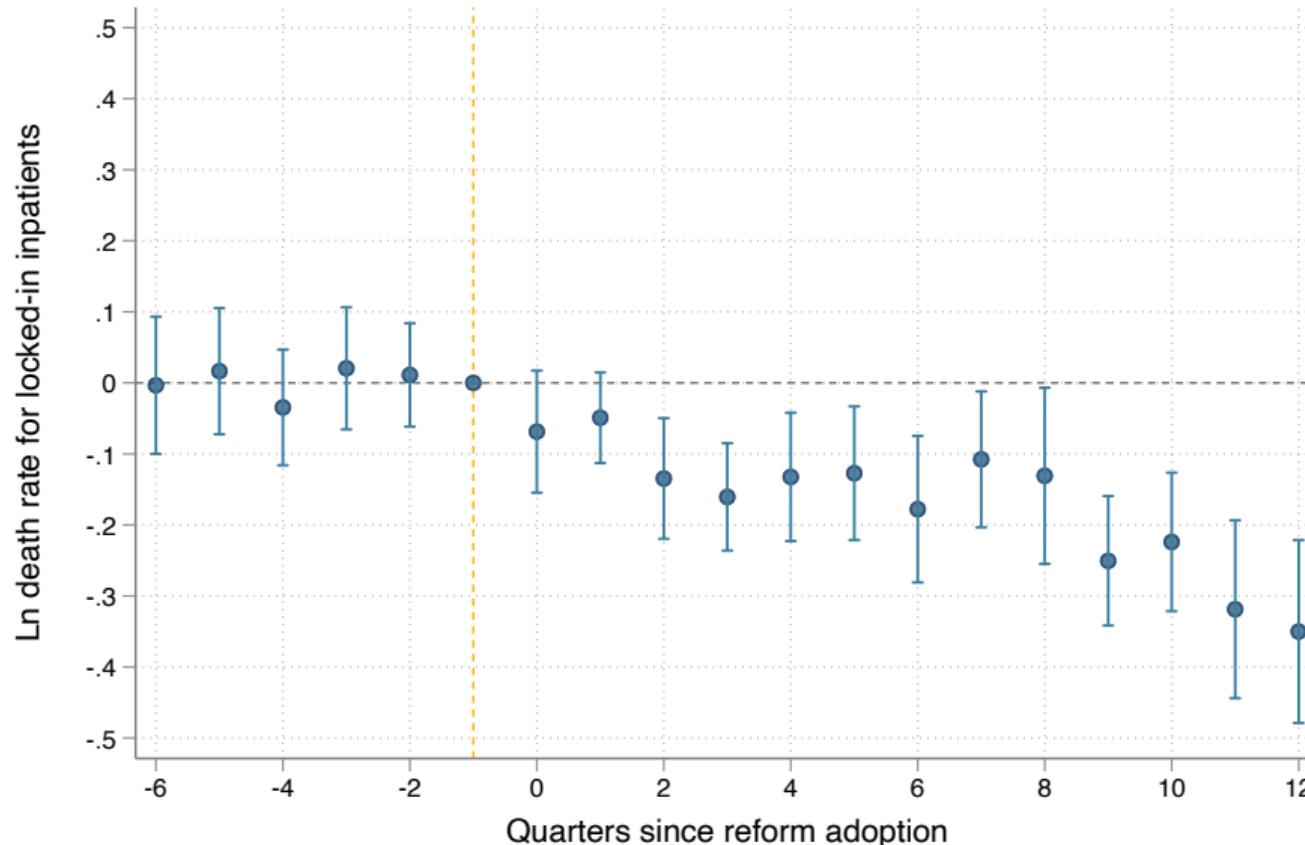


► Table ► Emergent cases ► Risk score

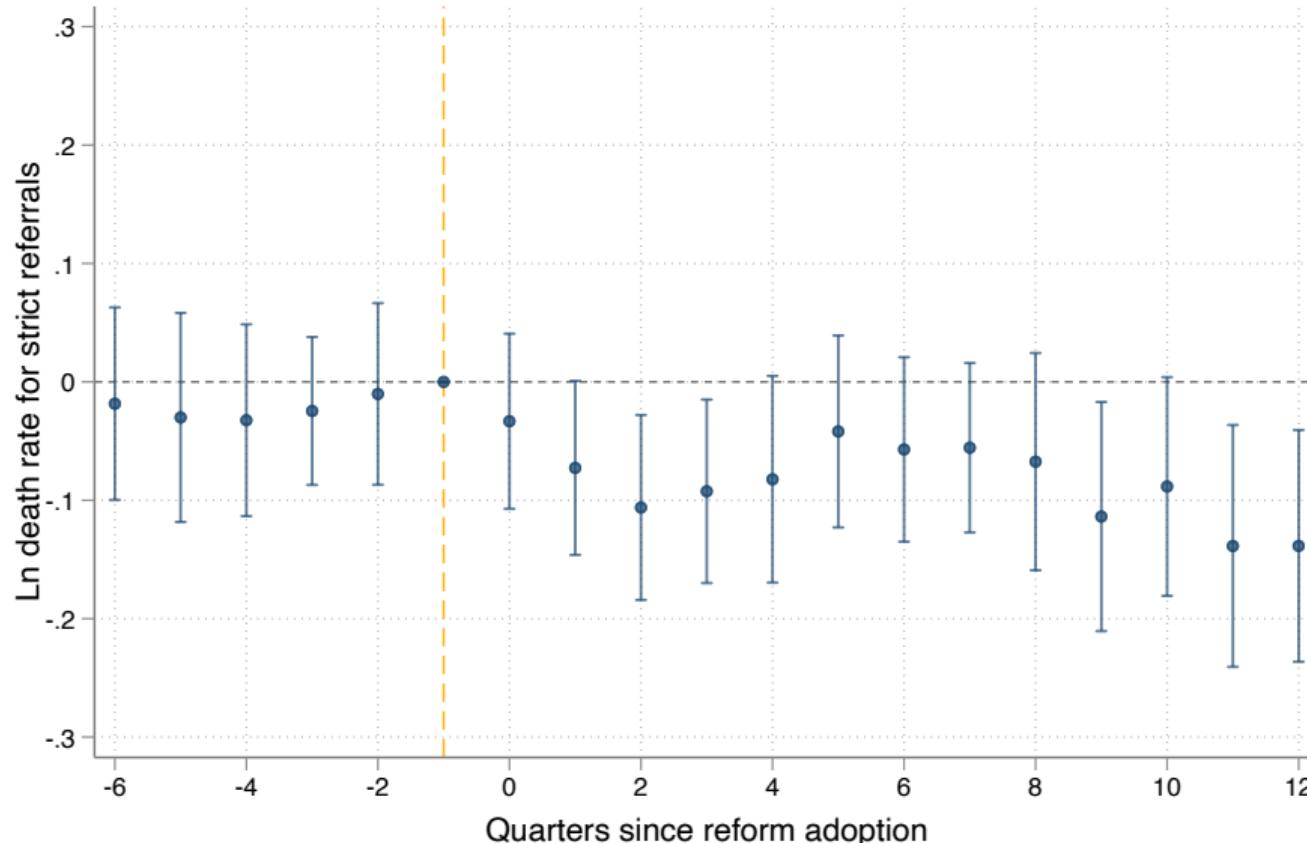
No evidence of supply-side unobserved selection



No evidence of unobserved patient sorting: locked-in patients



No evidence of unobserved patient sorting: strict referrals



What practices may explain the reduction in hospital mortality?

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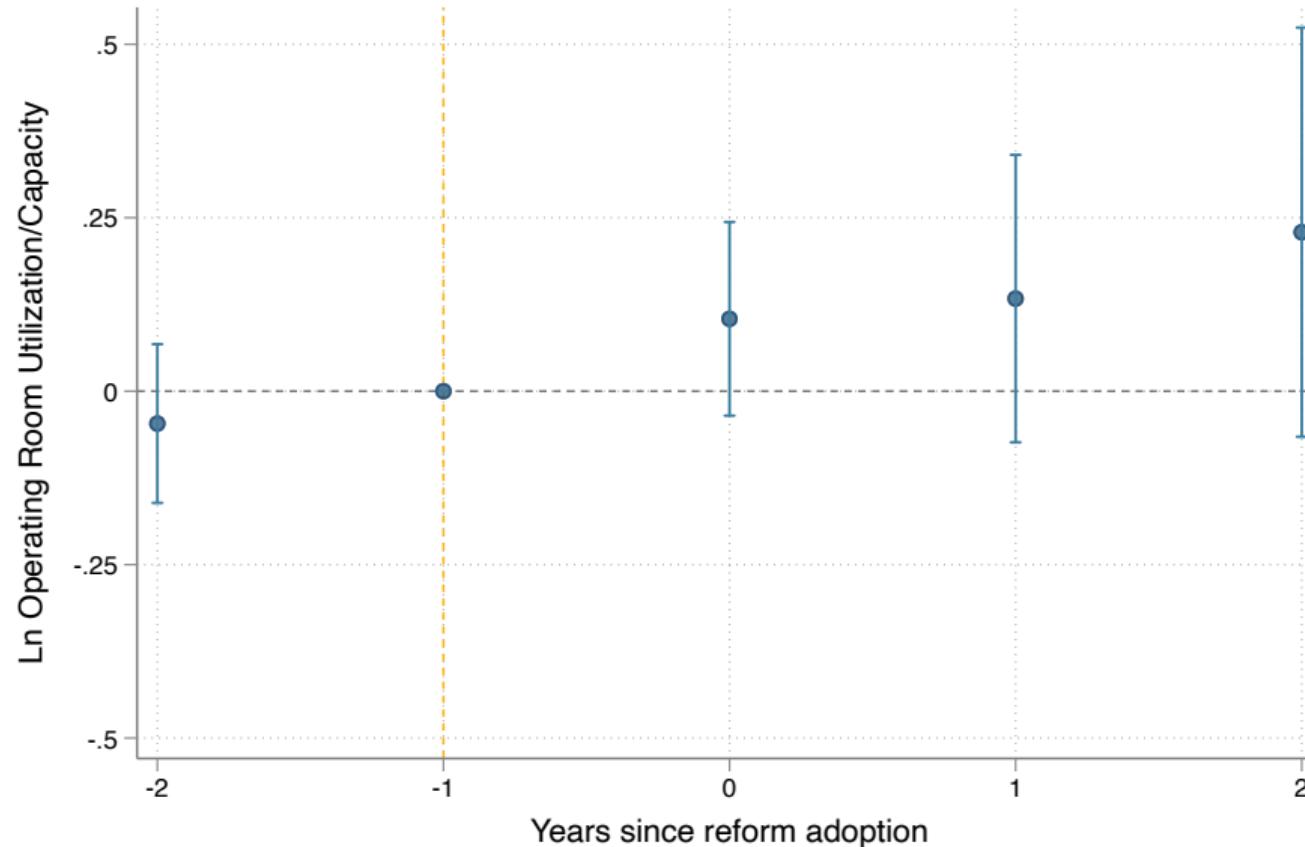
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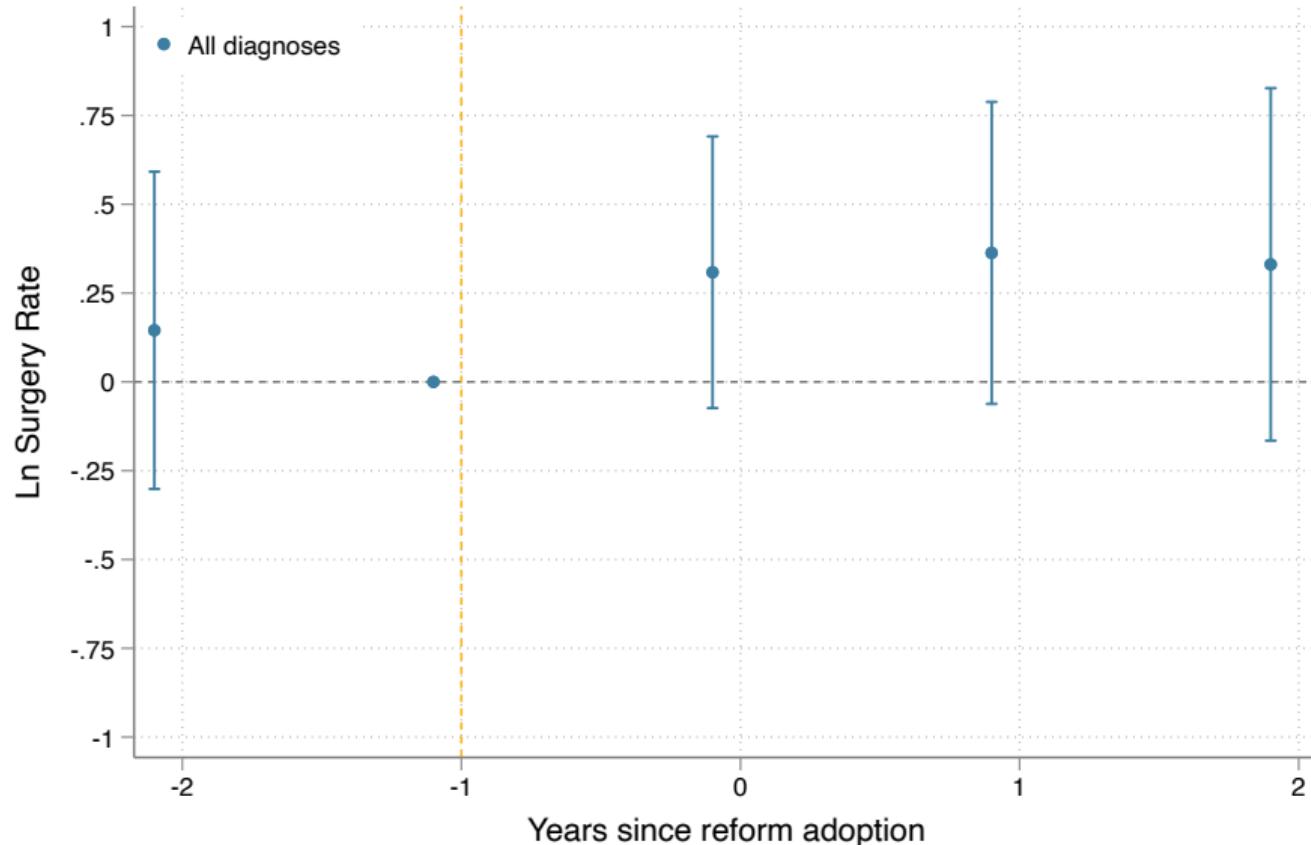
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 - lower waiting times
 - reduced staff turnover

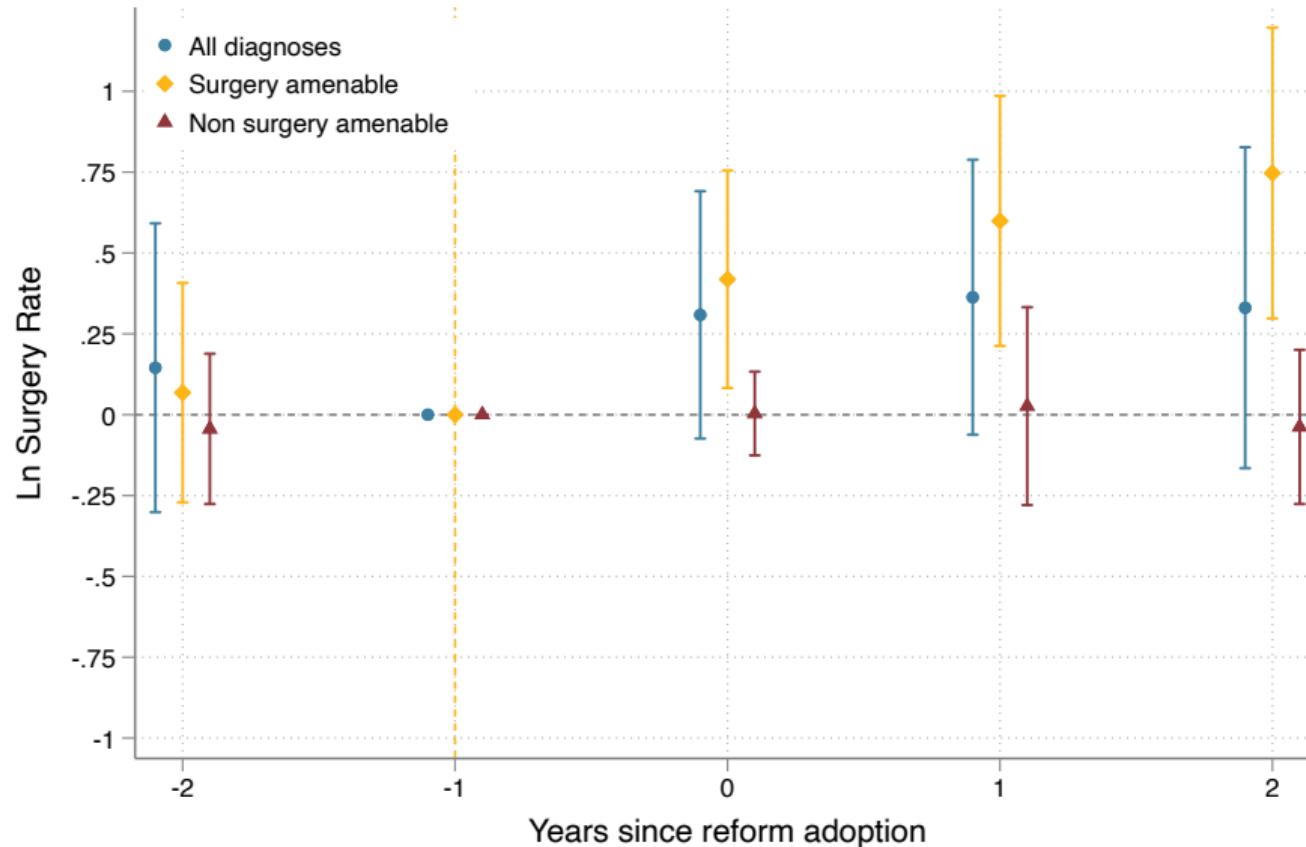
Reform induced more efficient utilization of operating room



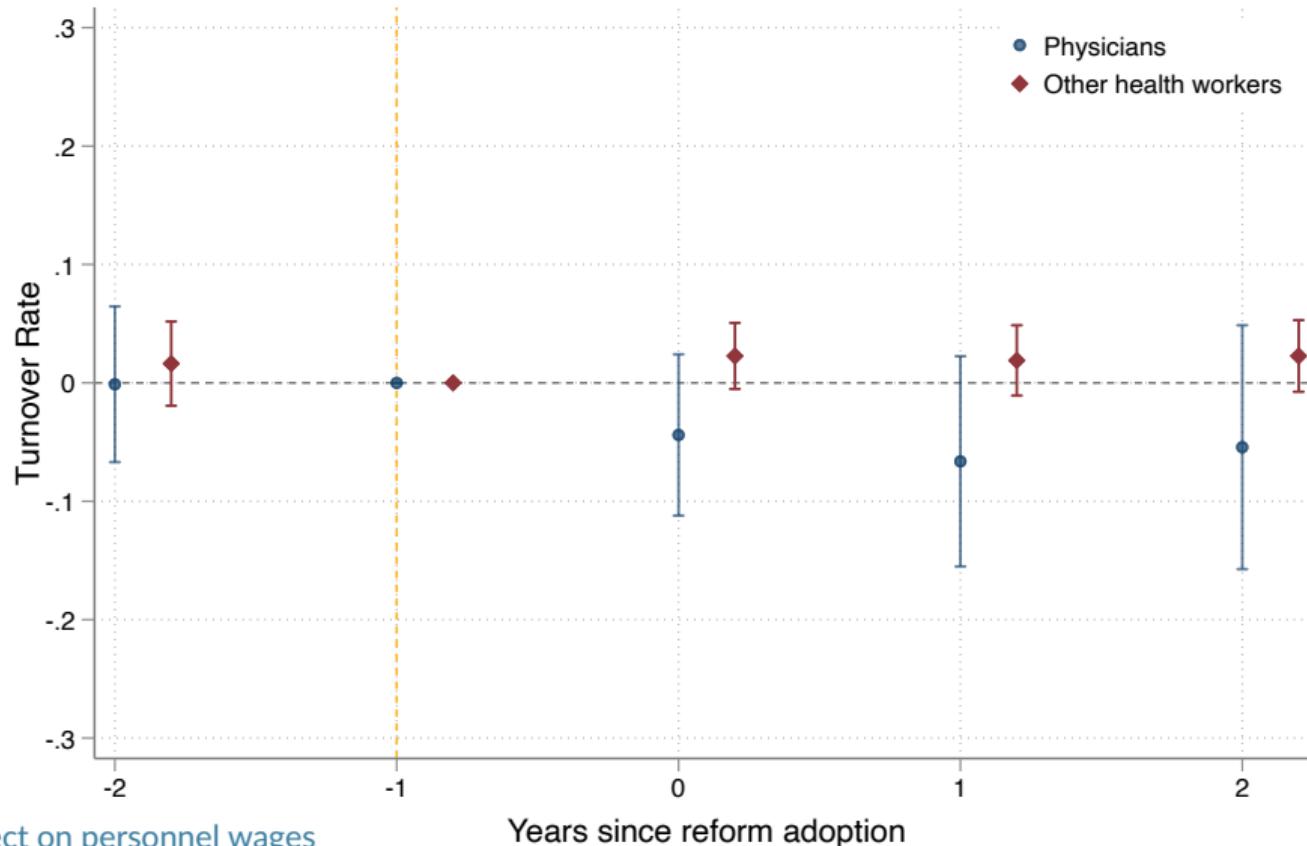
Leads to more surgeries...



... but only in deadly cases amenable to treatment through surgery



Reform also reduced turnover of doctors



► No effect on personnel wages

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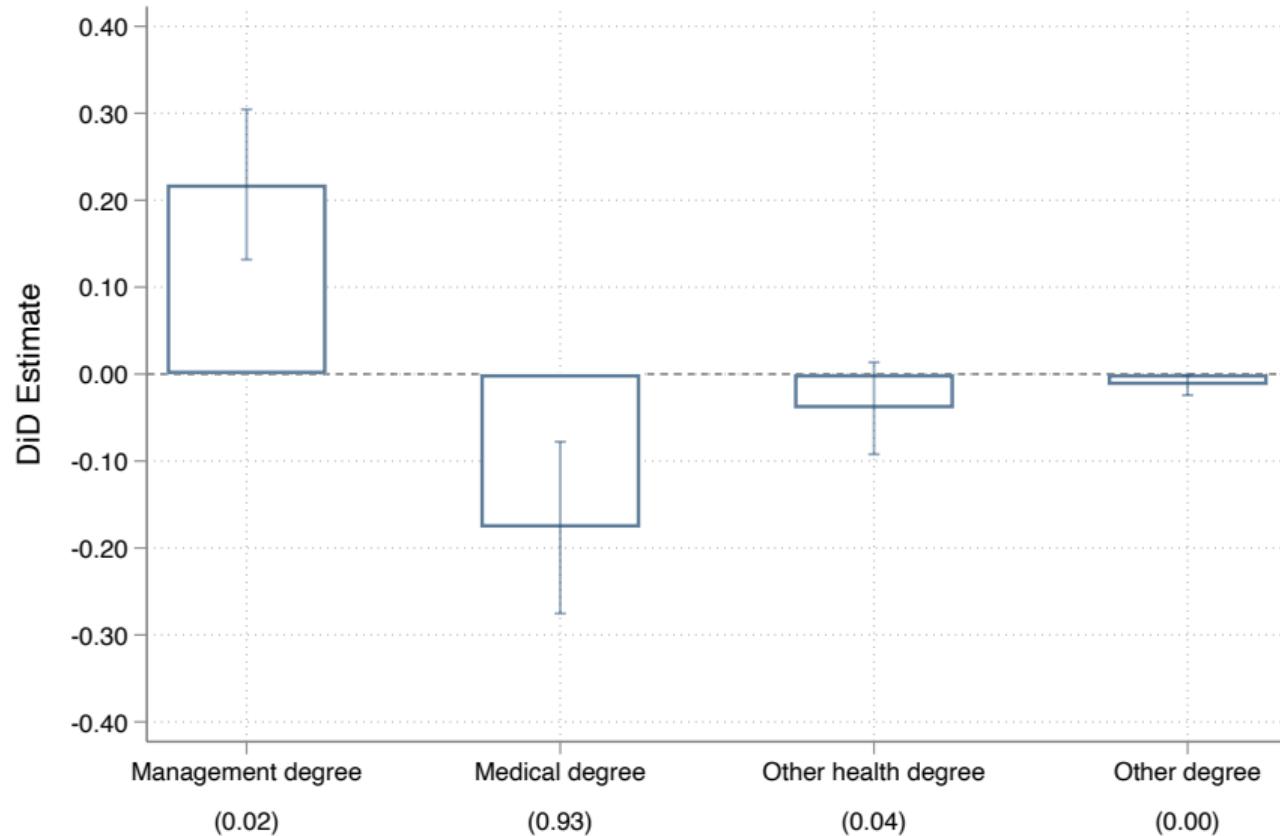
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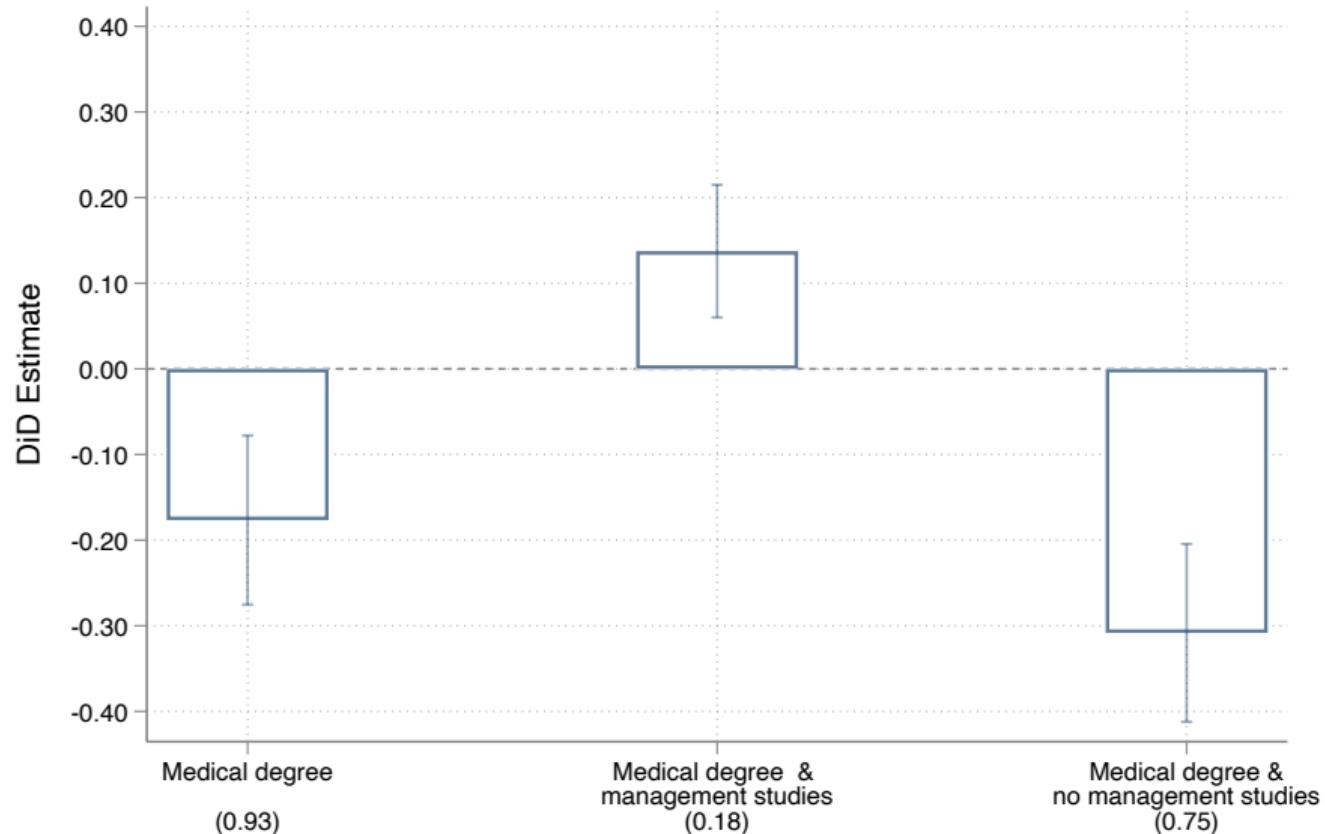
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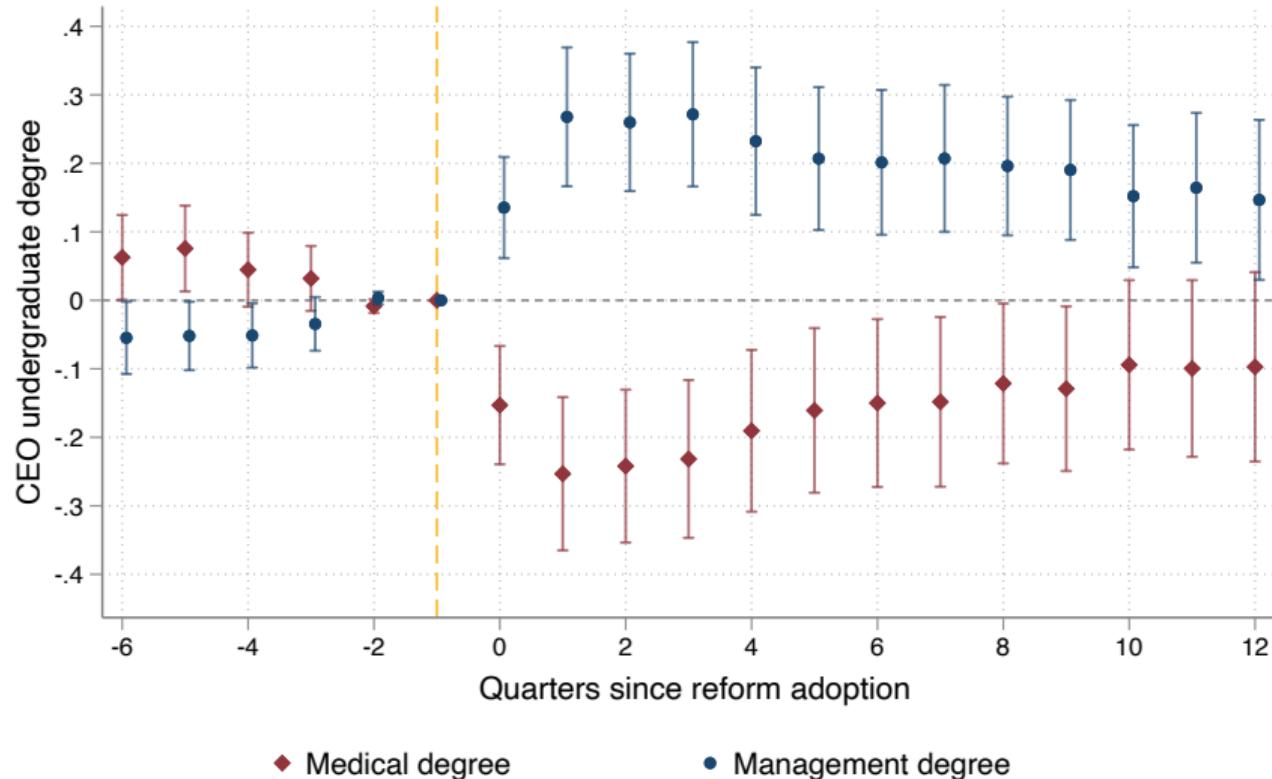
Reform displaced doctor CEOs



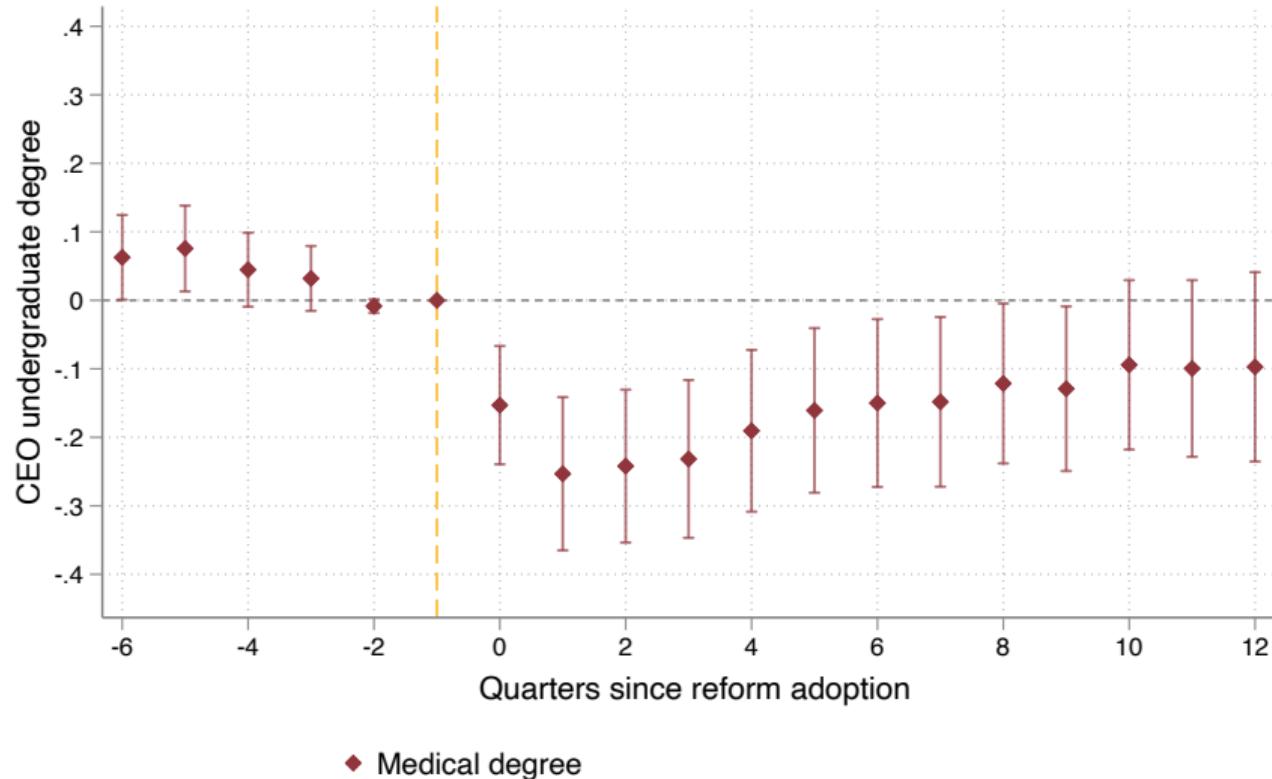
... but only those with no managerial qualifications



Doctor CEOs displaced by CEOs with mgmt. undergrad.

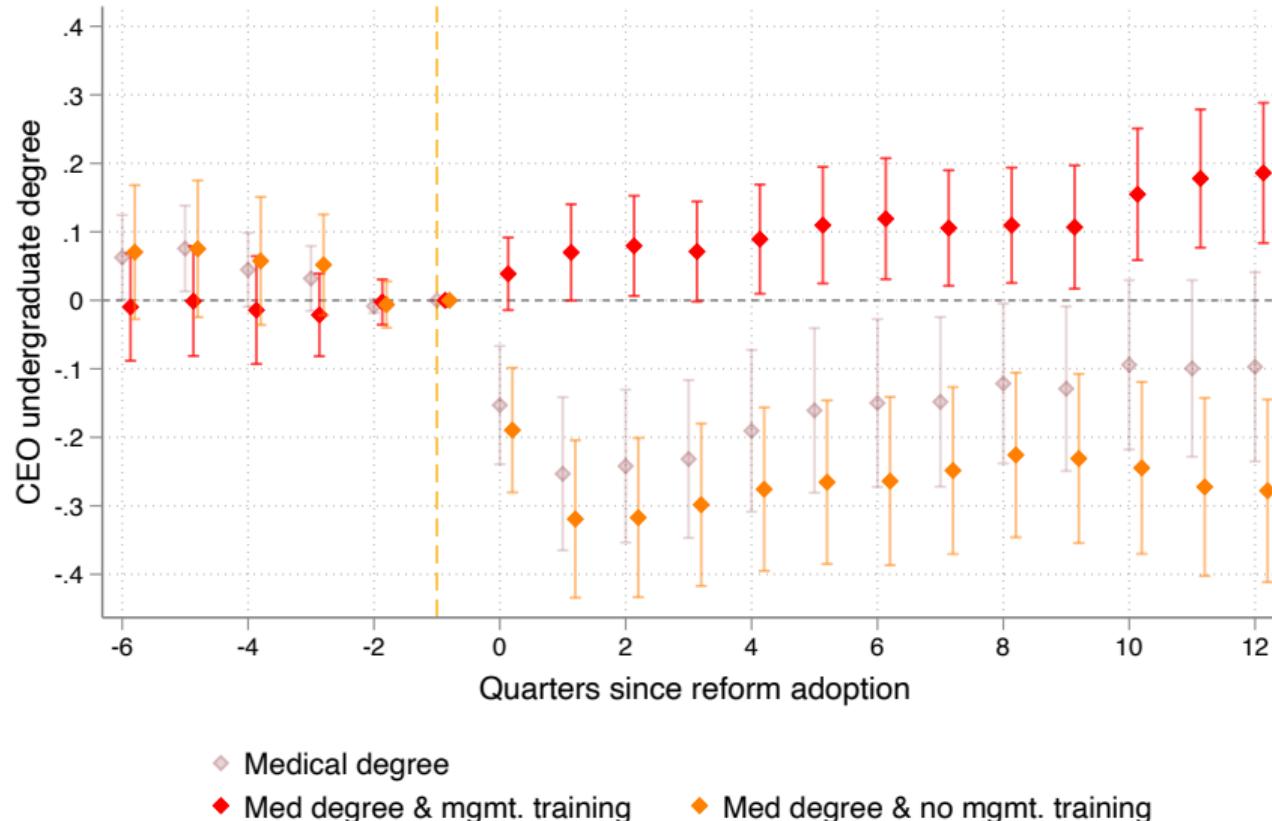


Doctor CEOs gradually recover from initial displacement

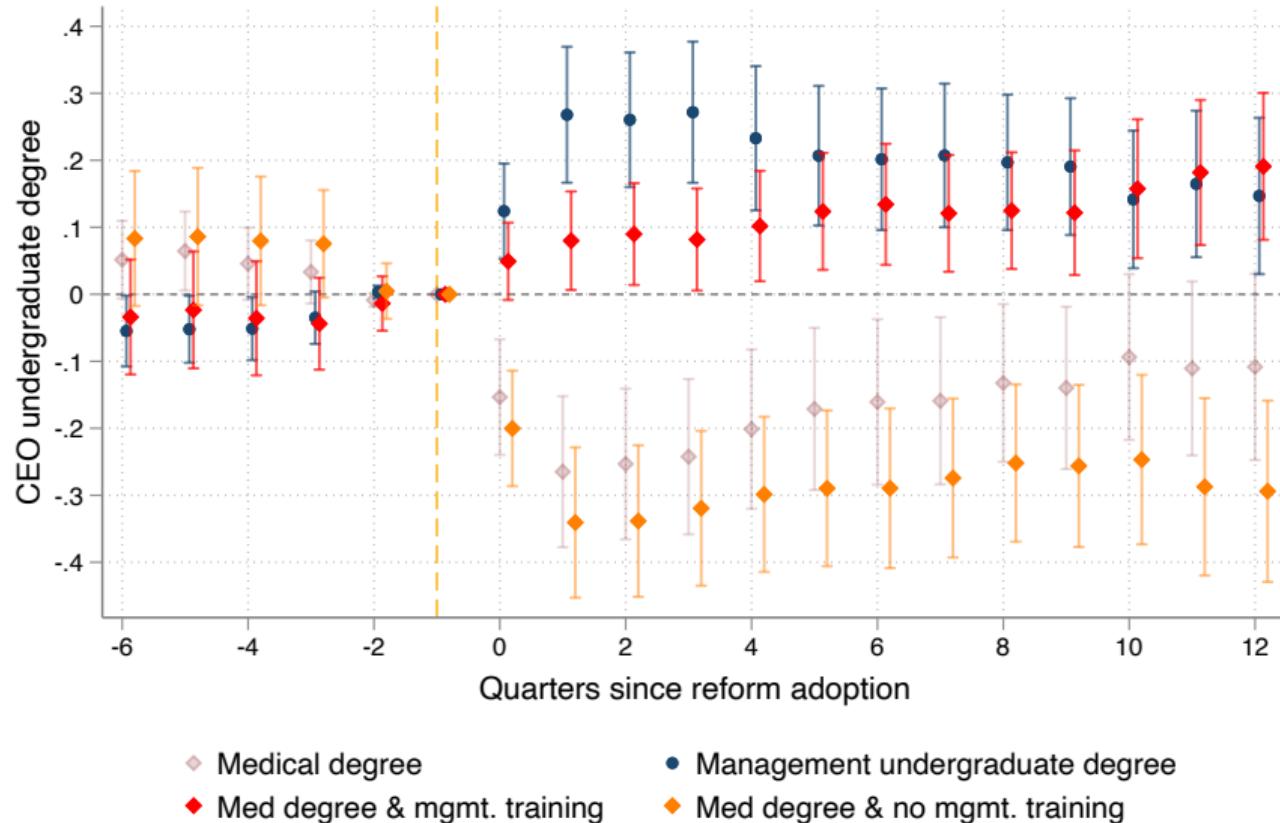


Reform increases doctor CEOs w/ mgmt. training

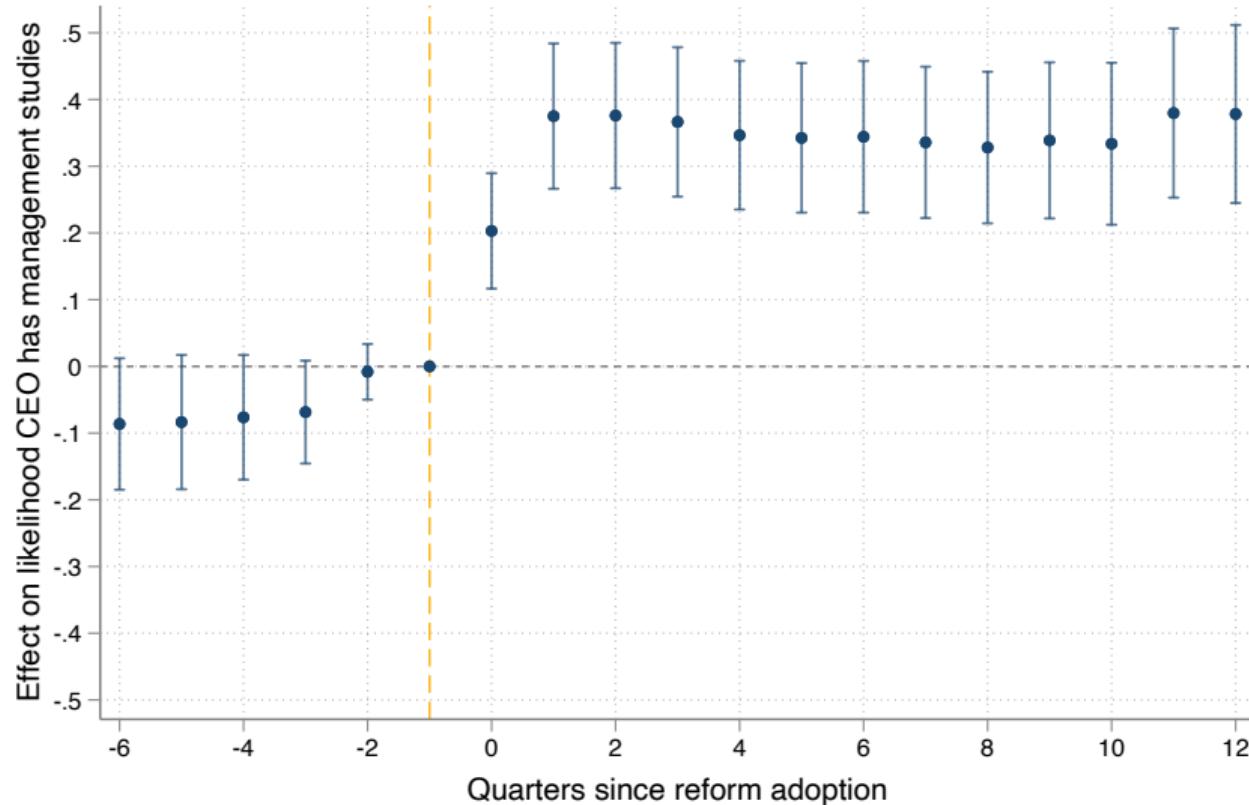
▪ Avg. effect



Doctor CEOs w/ mgmt. training partially revert initial hit



The reform made more likely CEOs have mgmt. training



Training & Career

MBA in health for Chilean doctors to enter the world of management

The Universidad Mayor and UNAB offer hospital management programs.

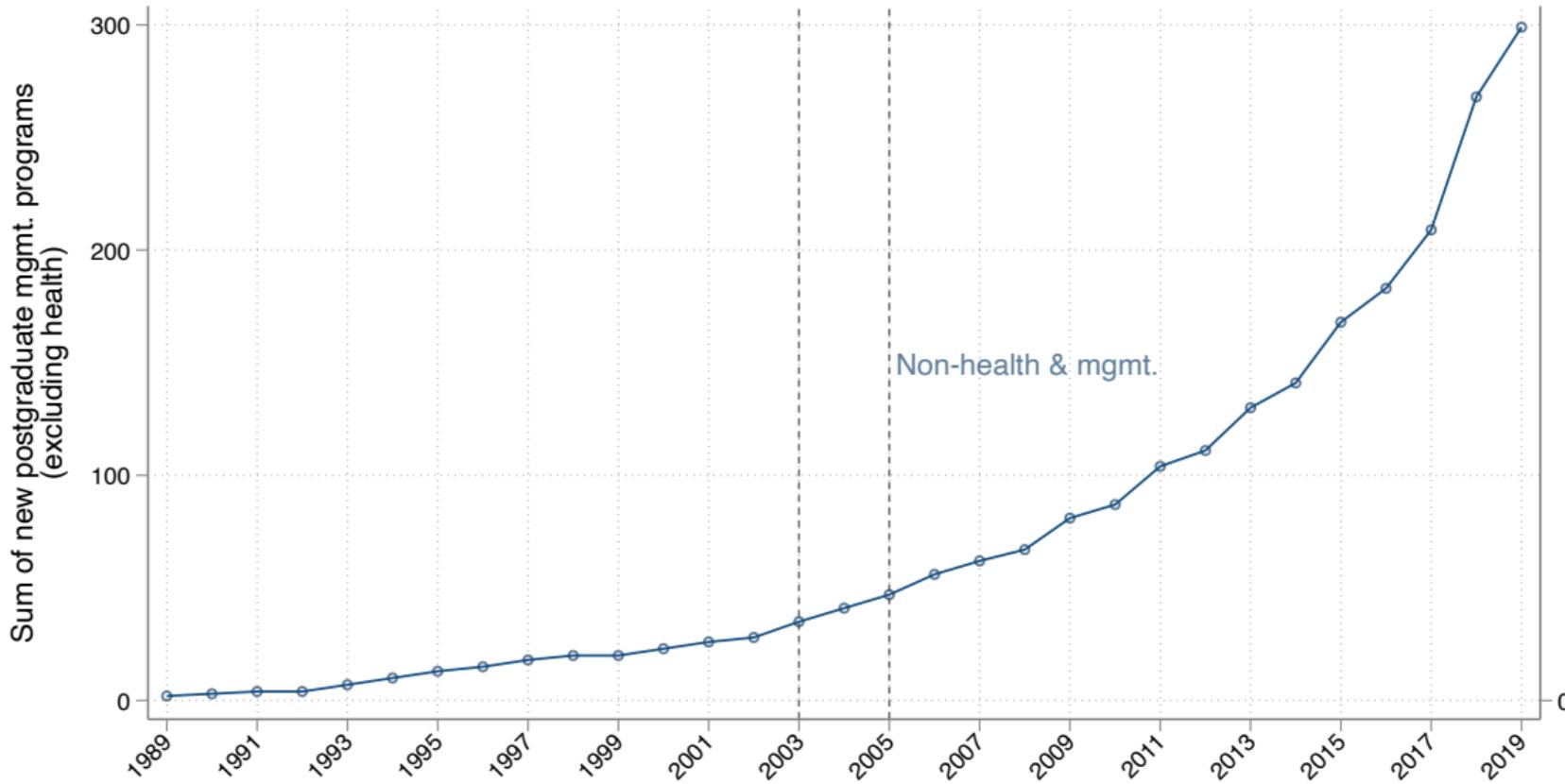
Autor: [AméricaEconomía.com](#) | November 12, 2010

Some Chilean universities offer an MBA in Health, so that their graduates can work in administrative positions such as managers or directors of hospitals and even Seremis.

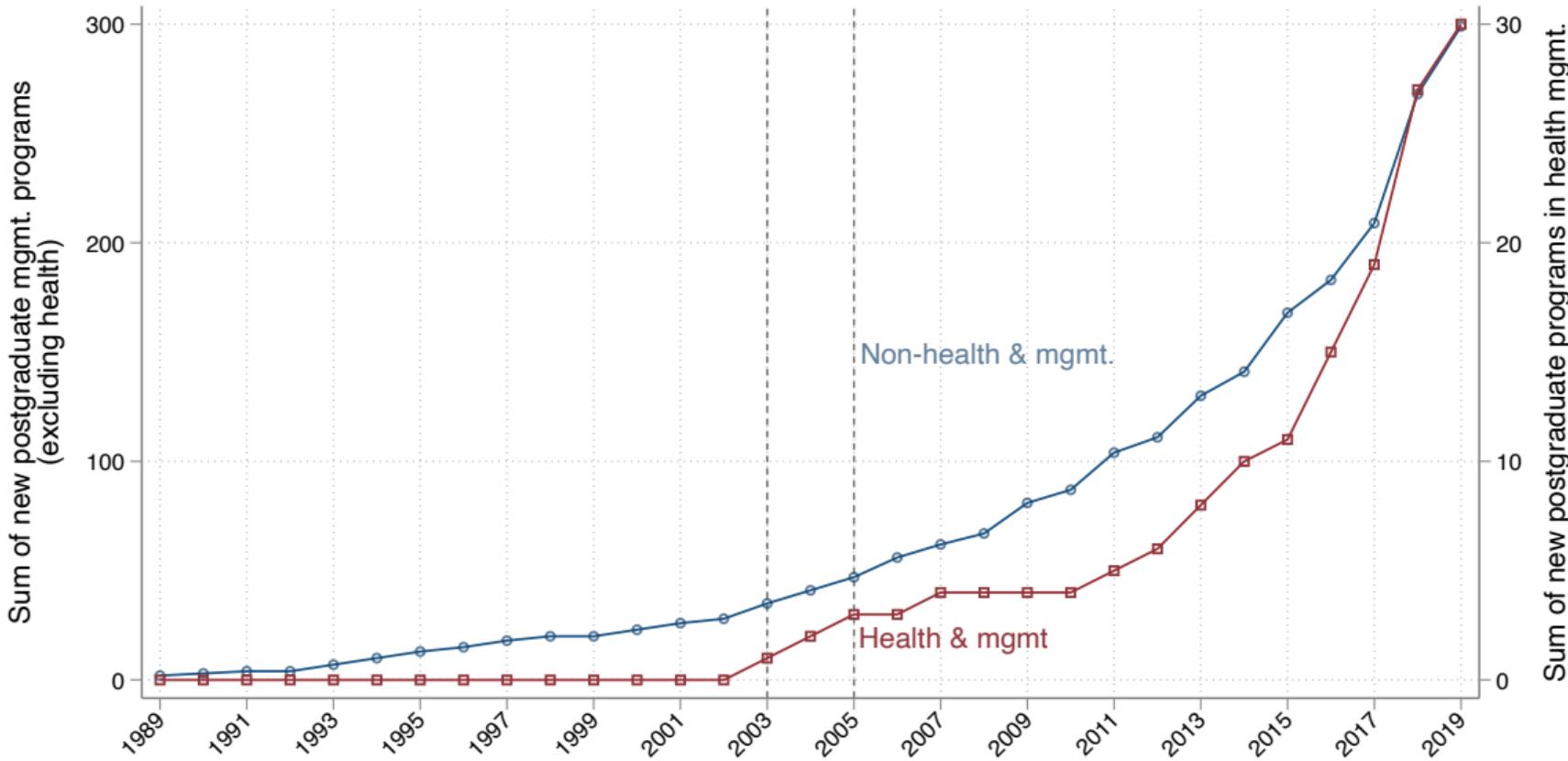
One of the institutions offered by this MBA with a specialization in Health is the Andrés Bello University (Unab), which allows students to acquire and deepen subjects such as economics, administration, marketing, epidemiology applied to management and clinical management.

Unab has made 21 versions of this program since 2005, and its success is based on its realization in several cities of the country, from Iquique to Punta Arenas, in hotels and hospitals, with more than 500 graduates, according to the newspaper La Tercera.

Reform incentivized doctors to study management



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Effect of the reform on managers' skills and demographics

	Skills				Demographics	
	CEO Fixed Effect (1)	Avg. PSU Score (2)	Math Specific Exam (3)	Science Specific Exam (4)	Age (5)	Female (6)
1 if reform adopted	-0.09*** (0.03)	-0.12 (0.10)	0.08 (0.08)	-0.13** (0.05)	-1.87* (1.06)	-0.03 (0.05)
Observations	4,391	7,053	5,561	5,561	7,906	8,085
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Hospital FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	No	No	No	No	No
# of Hospitals	111	177	162	162	180	180
Mean Dep. Variable	0.570	2.000	0.740	0.990	50.190	0.210

Outline

1. Setting, data, and descriptive evidence
2. Reform impact on hospital performance
3. Recruitment effects of the reform
4. CEO management training and performance
5. Role of financial incentives included in the reform
6. Concluding thoughts

CEO management training and hospital performance

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- We examine whether correcting skill mismatch enhances organization performance
 - limited or no research in the public sector (Nordin et al. 2010; Besley et al. 2022)

CEO management training and hospital performance

	Ln Death (%) (1)	Ln Death (%) (2)	Ln Death (%) (3)
Reform & mgmt. undergrad.	-0.111*** (0.029)		
Reform & non-mgmt. undergrad.	-0.076*** (0.026)		
Reform & any mgmt. studies		-0.122*** (0.025)	-0.130*** (0.028)
Reform & non-mgmt. studies		-0.028 (0.027)	-0.027 (0.027)
Sample	All CEOs	All CEOs	Doctor CEOs
Observations	8,085	8,085	5,732
Time FE	Yes	Yes	Yes
Hospital FE	Yes	Yes	Yes
Case Mix	Yes	Yes	Yes
Mean Dep. Variable	2.63	2.63	2.49
p-value Mgmt. = Non Mgmt.	0.22	0.00	0.00

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- Focus on transitions where **incumbent** CEO doesn't have mgmt. studies **incoming** CEO has mgmt. training

► CEO transitions

Do doctor CEO to mgmt. CEO transitions predict lower mortality?

	Ln Death (%) (1)	Ln Death (%) (2)
CEO with mgmt. studies	-0.072*** (0.025)	
CEO with no mgmt. studies		-0.010 (0.022)
Observations	71,027	193,177
Time FE	Yes	Yes
Hospital FE	Yes	Yes
Case Mix	Yes	Yes
Mean Dep. Variable	2.88	2.41

► No pre trends

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- ⇒ Financial incentives do not drive mortality results of the reform

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- Results suggest that management training reaps benefits for public sector organizations
 - even if later in life!
- Policy implication: public sector orgs. may emphasize mgmt. education when recruiting CEOs
 - even if candidates rise up from the lower ranks of their respective professions

Final thoughts

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Zoë Schiffer (@ZoeSchiffer) · ...

NEW: Elon Musk has sent another email to Twitter engineers warning them about code reviews. “All managers are expected to write a meaningful amount of software themselves. Being unable to do so is like a cavalry captain who can’t ride a horse.”

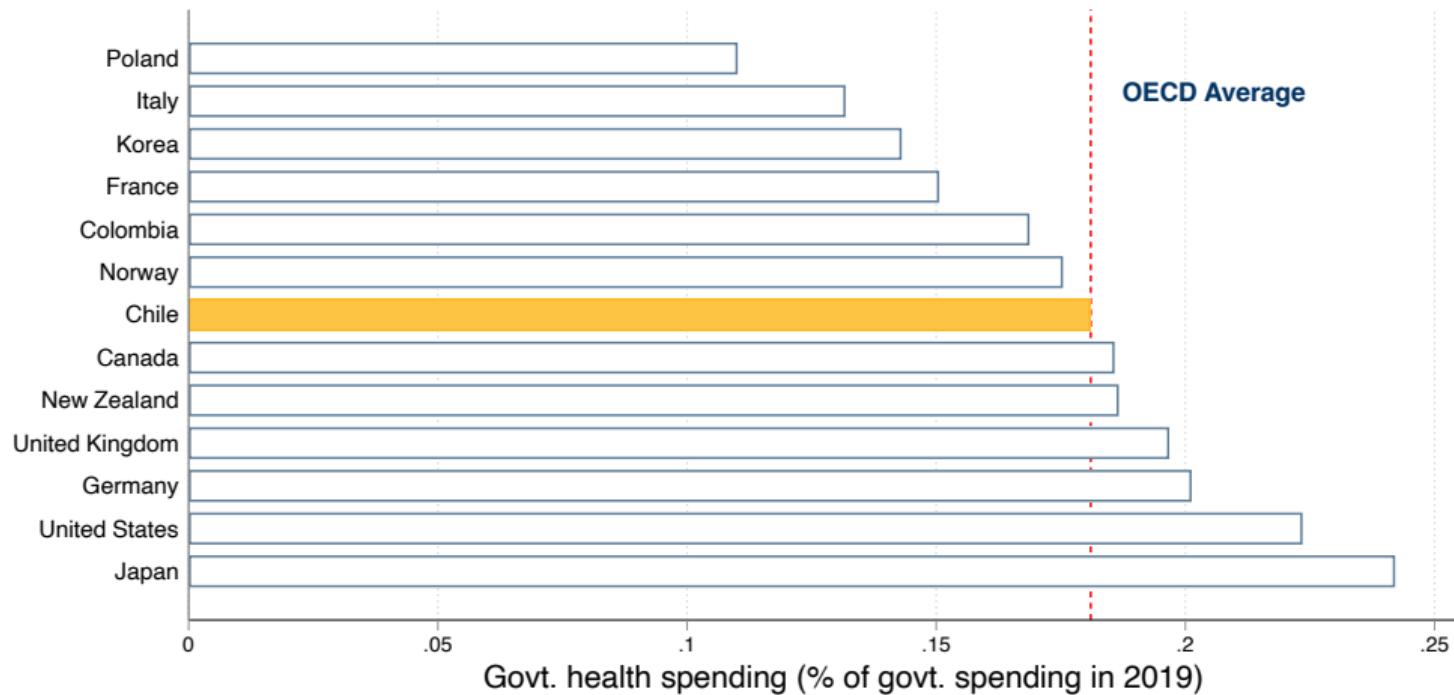
4:58 AM · Nov 28, 2022

3,239 Retweets 968 Quote Tweets 37.3K Likes

Comments and feedback
cotero@berkeley.edu

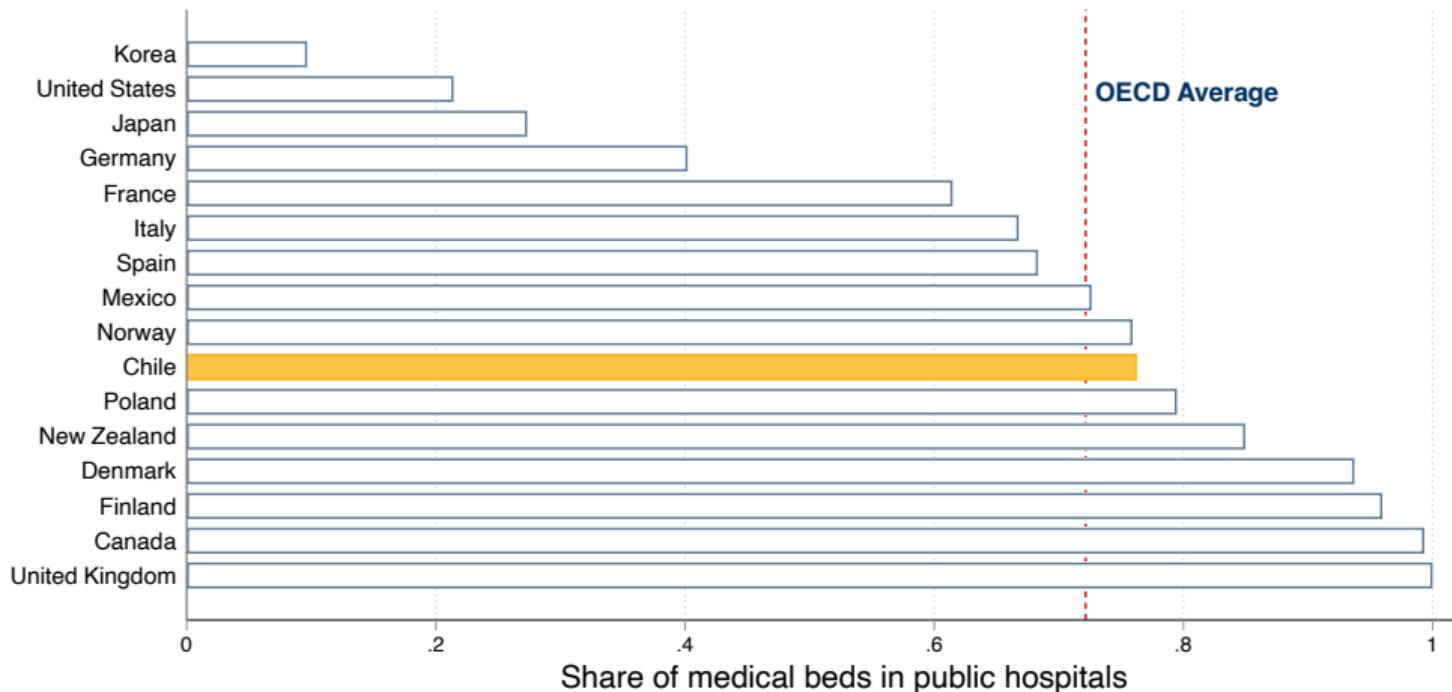
Appendix

Healthcare government spending is large



Public hospitals are important for access and equity

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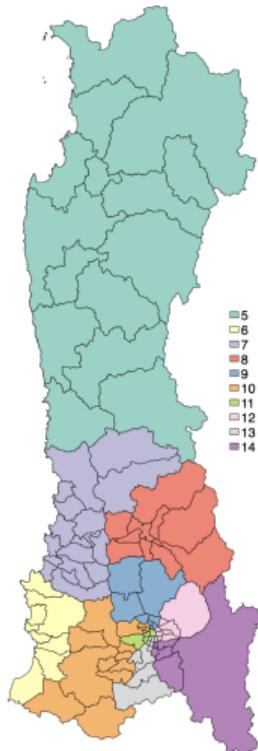


Healthcare provision is organized geographically

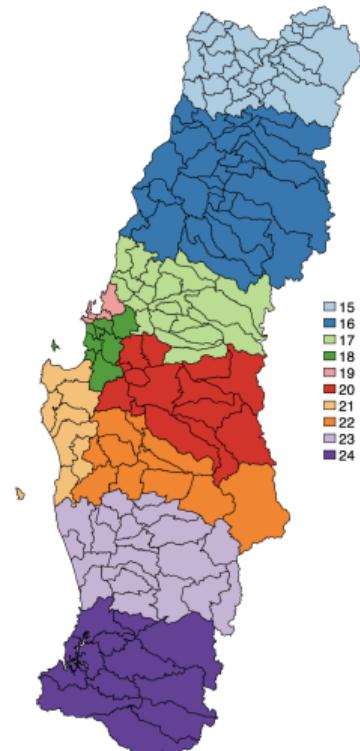
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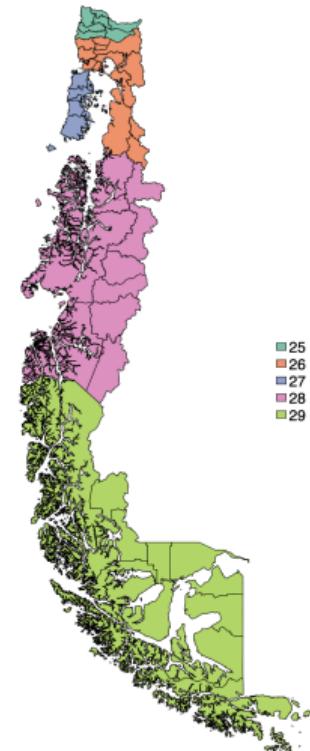
North



North-Center



Center-South



South

Referrals follow strict guidelines

ESTABLECIMIENTOS ATENCIÓN SECUNDARIA Y TERCIARIA	1	COMPLEJO HOSPITALARIO SAN JOSÉ							5	UAPO COMUNAL												
	2	HOSPITAL CLÍNICO DE NIÑOS ROBERTO DEL RÍO							6	COSAM COMUNAL												
	3	INSTITUTO PSICIÁTRICO DR. JOSÉ HORWITZ BARAK																				
	4	INSTITUTO NACIONAL DEL CÁNCER DR. CAUJUPOLICÁN PARDÓ CORREA																				
SERVICIO DE SALUD																						
COMUNA																						
ESTABLECIMIENTO																						
PEDIATRÍA																						
CARDIOLOGÍA PEDIÁTRICA	2	2	2	2	2	2	2	2	2	2	2	2										
ENDOCRINOLOGÍA PEDIÁTRICA	2	2	2	2	2	2	2	2	2	2	2	2										
ENFERMEDADES RESPIRATORIAS PEDIÁTRICAS	2	2	2	2	2	2	2	2	2	2	2	2										
GASTROENTEROLOGÍA PEDIÁTRICA	2	2	2	2	2	2	2	2	2	2	2	2										
GINECOLOGÍA PEDIÁTRICA Y DE LA ADOLESCENCIA	2	2	2	2	2	2	2	2	2	2	2	2										
HEMATOLOGÍA ONCOLÓGICA PEDIÁTRICA	2	2	2	2	2	2	2	2	2	2	2	2										
HEMOFILIA (SIN LÍMITE DE EDAD)	2	2	2	2	2	2	2	2	2	2	2	2										
INFECTOLOGÍA PEDIÁTRICA	2	2	2	2	2	2	2	2	2	2	2	2										
NEFROLOGÍA PEDIÁTRICA	2	2	2	2	2	2	2	2	2	2	2	2										
NUTRICIÓN CLÍNICA DEL NIÑO Y EL ADOLESCENTE	2	2	2	2	2	2	2	2	2	2	2	2										
NANEAS	2	2	2	2	2	2	2	2	2	2	2	2										
MEDICINA INTERNA	1	1	1	1	1	1	1	1	1	1	1	1										
CARDIOLOGÍA	1	1	1	1	1	1	1	1	1	1	1	1										
NUTRICIÓN Y DIABETES	1	1	1	1	1	1	1	1	1	1	1	1										
PROGRAMA MANEJO DE LA OBESIDAD	1	1	1	1	1	1	1	1	1	1	1	1										
ENDOCRINOLOGÍA ADULTO	1	1	1	1	1	1	1	1	1	1	1	1										
ENFERMEDADES RESPIRATORIAS ADULTO	1	1	1	1	1	1	1	1	1	1	1	1										
GASTROENTEROLOGÍA ADULTO	1	1	1	1	1	1	1	1	1	1	1	1										
HEMATOLOGÍA	1	1	1	1	1	1	1	1	1	1	1	1										
VIH																						
< 15 AÑOS	2	2	2	2	2	2	2	2	2	2	2	2										
> 15 AÑOS	1	1	1	1	1	1	1	1	1	1	1	1										
NEFROLOGÍA ADULTO	1	1	1	1	1	1	1	1	1	1	1	1										
ONCOLOGÍA MÉDICA																						
< 15 AÑOS	2	2	2	2	2	2	2	2	2	2	2	2										
> 15 AÑOS (Derivación desde APS sólo con confirmación diagnóstica realizada)	4	4	4	4	4	4	4	4	4	4	4	4										
REUMATOLOGÍA																						
< 15 AÑOS	2	2	2	2	2	2	2	2	2	2	2	2										
> 15 AÑOS	1	1	1	1	1	1	1	1	1	1	1	1										
Colina																						
109310 - Centro de Salud Familiar Colina																						
109316 - Centro de Salud Familiar Esmeralda																						
109416 - Posta Salud Rural Colorado																						
109417 - Posta Salud Rural Los Ingleses																						
109418 - Posta Salud Rural Las Canteras																						
109419 - Posta Salud Rural Santa Marta de Liray																						
109420 - Posta Salud Rural Chacabuco																						
109716 - Centro Comunitario de Salud Familiar Esmeralda																						
109810 - SAPU Colina																						
109302 - Centro de Salud Familiar Lucas Sierra																						
109308 - Centro de Salud Familiar Alberto Bachete Martínez																						
109309 - Centro de Salud Familiar José Symon Ojeda																						
109314 - Centro de Salud Familia Juantia Aguirre																						
109709 - Centro Comunitario de Salud Familiar Dr. José Symon Ojeda																						
Conchali																						

Referrals follow strict guidelines

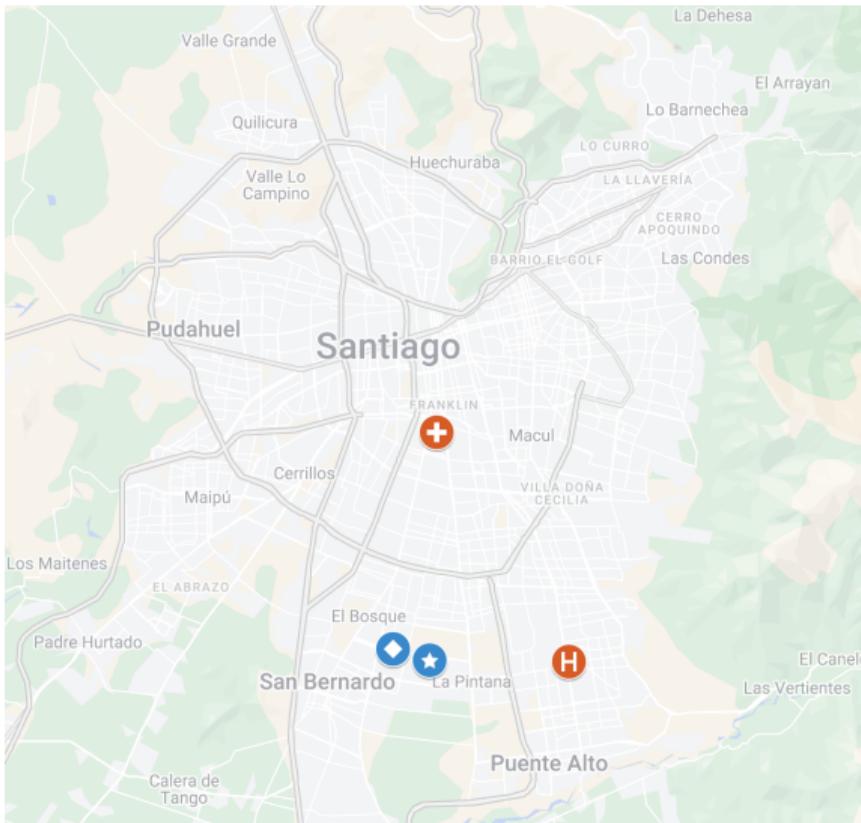
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Health Service Name	Metropolitano Norte		Metropolitano Oriente	
	CESFAM Colina (1)	CESFAM Esmeralda (2)	CESFAM Aguilucho (3)	CESFAM La Faena (4)
Pediatrics				
Pediatric respiratory diseases	2	2	4	4
Internal Medicine				
Cardiology	1	1	5	4
Medical Oncology				
< 15 years	2	2	7	7
> 15 years	3	3	5	5
General Surgery				
Thoracic Surgery	3	3	6	6

1. Complejo Hospitalario San José; 2. Hospital Clínico De Niños Roberto Del Río; 3. Instituto Nacional Del Cáncer Dr. Caupolicán Pardo Correa; 4. Centro de Referencia de Salud Cordillera Oriente; 5. Hospital Del Salvador; 6. Instituto Nacional del Torax; 7. Hospital de Niños Dr. Luis Calvo Mackenna.

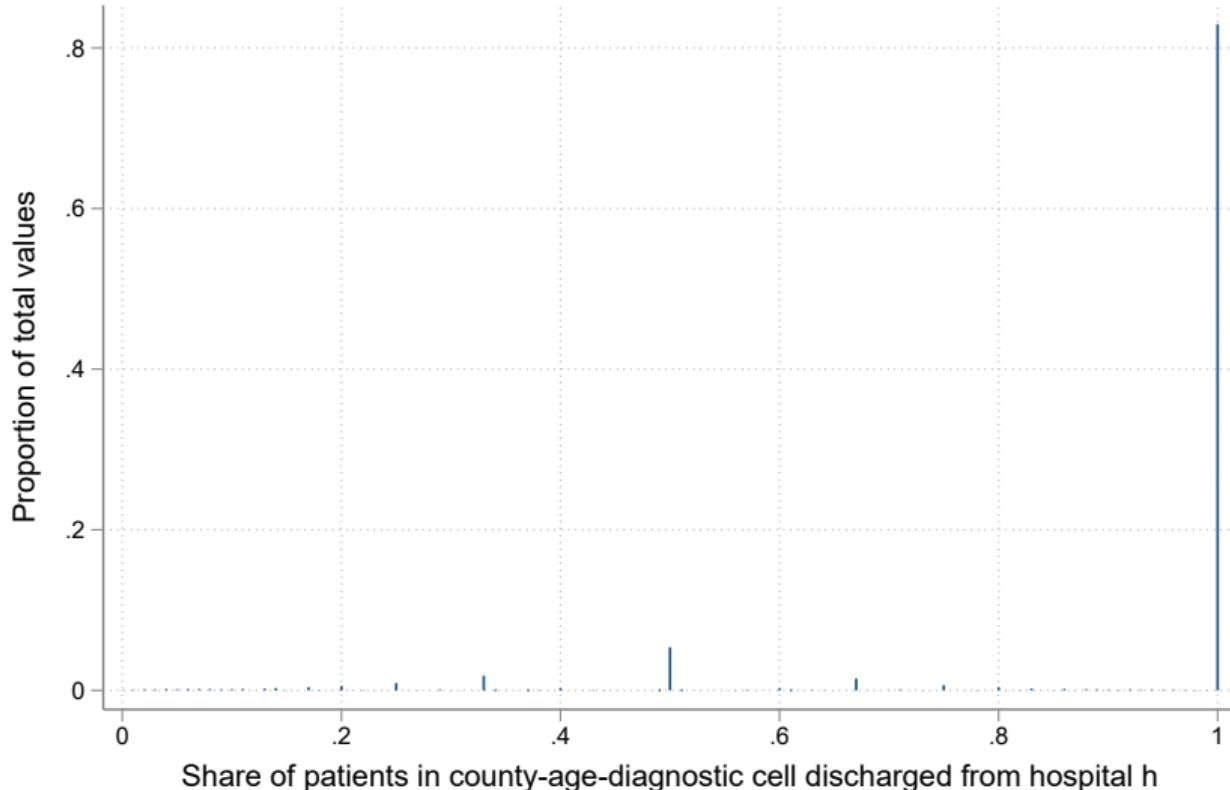
Referrals follow strict guidelines

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Strict referrals

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- Employees in the public health sector:
 - FOIA + hand-collected: monthly-level records all public hospitals CEOs and middle manager characteristics and transitions (2001-19)
 - novel and admin. data covering the universe of employees in the public health sector between (2011-19)
- Inpatient discharges > 30 million individual-level admin records of all public hospital discharges (2001-19)
 - include an id, the date and cause of admission, date of discharge or in-hospital death date, type of admission (ER), individual covariates, set of hospital characteristics
- Death records: > 1.5 million individual-level observations covering all deaths in the country (2001-18)
 - include same id as hospital discharges, date of death, cause and place of death

Descriptive statistics

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	Mean (1)	Std. Dev. (2)	Bottom 10% (3)	Median (4)	Top 10% (5)	# of Obs. (6)
Number of deaths	38.21	63.27	1.00	12.00	116.00	13,988
Number of inpatients	1,491	2,006	101	587	4,568	13,988
Death rate	2.46	1.94	0.38	2.15	4.69	13,988
Death rate ER	3.01	3.53	0.15	2.55	5.69	11,087
% Public insurance	0.96	0.05	0.92	0.98	1.00	13,988
% Female	0.59	0.08	0.47	0.60	0.68	13,988
% Age < 29	0.36	0.16	0.14	0.37	0.49	13,988
% Age ∈ (30,39)	0.12	0.05	0.06	0.12	0.17	13,988
% Age ∈ (50,59)	0.10	0.04	0.06	0.09	0.14	13,988
% Age > 89	0.02	0.02	0	0.01	0.05	13,988

Hospital mortality:

1. Compute death indicators at patient level following a hospital event
 2. Aggregate by hospital and quarter
 3. Compute death rate dividing total deaths by # of inpatients
-
- Same procedure to compute case mix shares by hospital and quarter

- Exploit the rotation of CEOs across hospitals to study impact on hospital quality
- Consider following model:

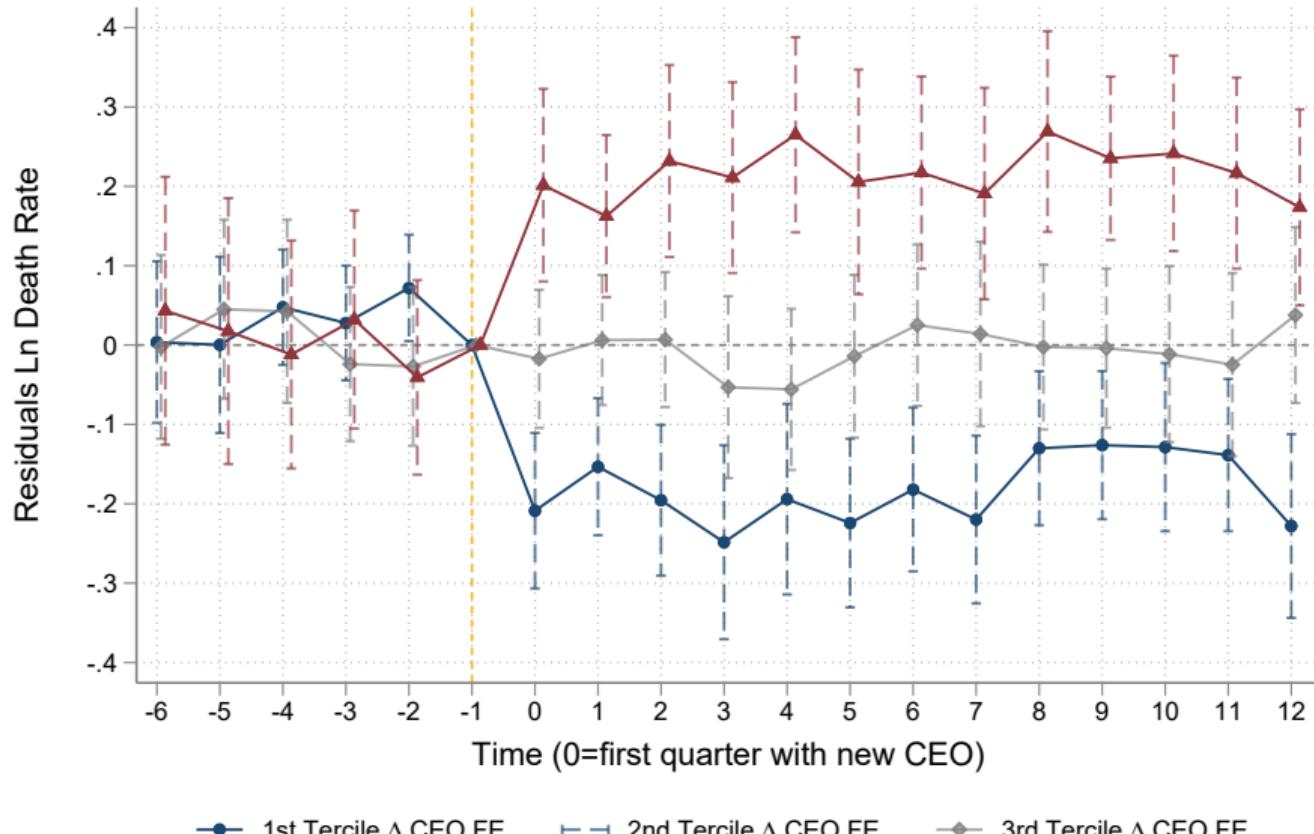
$$\ln(\text{death rate})_{ht} = \alpha_h + \psi_{M(h,t)} + \gamma_t + X'_{ht}\Delta + u_{ht},$$

- α_h and $\psi_{M(h,t)}$ are hospital and CEO fixed effects, respectively

- For estimation: condition on connected sets (Abowd et al. 1999; Card et al 2013)
 - # CEOs: 789; # hospitals: 113; # connected sets: 19; # movers: 86
- Threats to identification → Supporting evidence
 1. CEO mobility might be endogenous
 2. potential existence of match effects between CEOs and hospitals
- Bias-corrected variance covariance decomposition (Andrews et al. 2008) → Results
- Correlation between CEO fixed effect and characteristics → Results

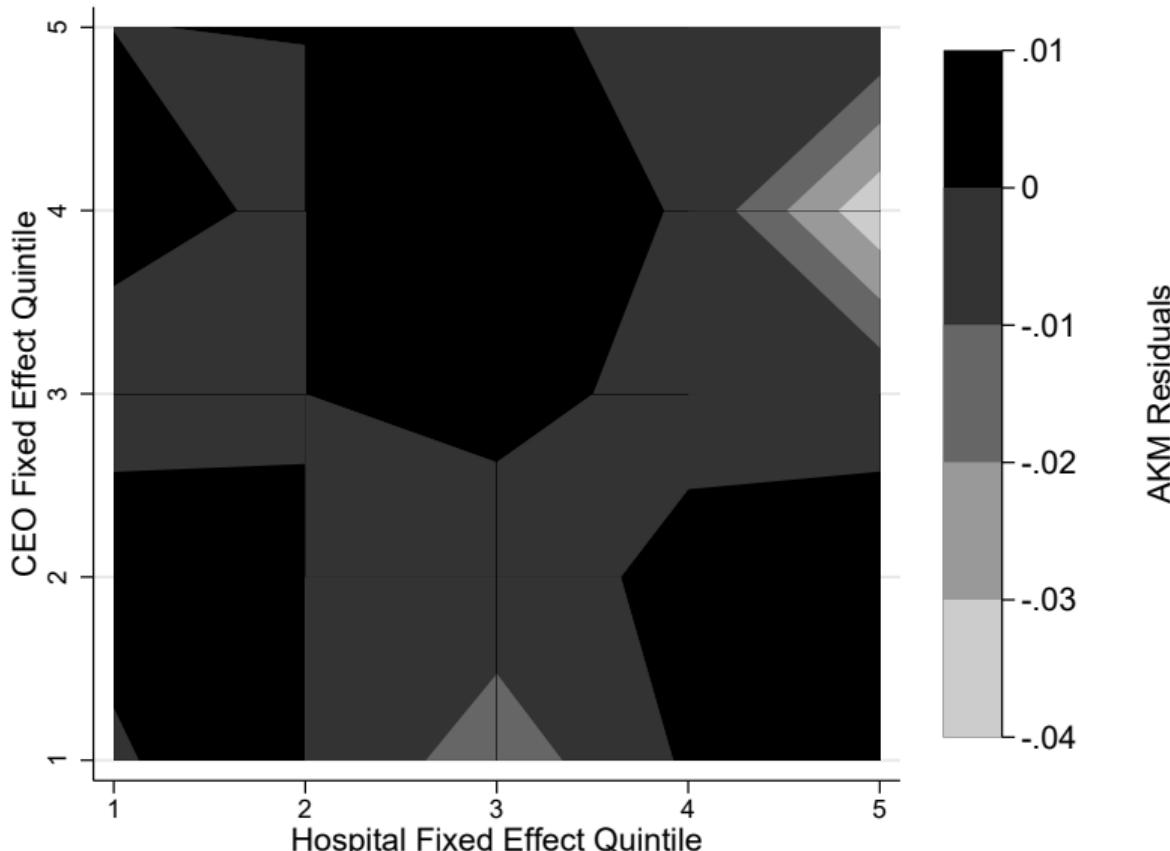
Threats to the identification of managerial talent: Switchers

› Back



Mean residual by CEO-hospital quintile

► Back



- The variance of log death rates can be decomposed as:

Bias-corrected variances and covariances

› Back

- The variance of log death rates can be decomposed as:

$$\begin{aligned}\mathbb{V}(\ln(\text{death rate})_{ht}) = & \mathbb{V}(\alpha_h) + \mathbb{V}(\psi_{M(h,t)}) + \mathbb{V}(x'_{ht}\beta) + 2\mathbb{C}(\alpha_h, \psi_{M(h,t)}) \\ & + 2\mathbb{C}(\alpha_h, x'_{ht}\beta) + 2\mathbb{C}(\psi_{M(h,t)}, x'_{ht}\beta) + \mathbb{V}(u_{ht}),\end{aligned}$$

Bias-corrected variances and covariances

› Back

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	Component	Share of Total
	(1)	(2)
$\mathbb{V}(\text{Log Death Rate})$	0.526	100%
$\mathbb{V}(\text{Manager})$	0.139	26%
$\mathbb{V}(\text{Hospital})$	0.193	36%
$\mathbb{V}(x'_{ht}\beta)$	0.403	76%
$2\mathbb{C}(\text{Manager}, \text{Hospital})$	-0.055	-10%
$2\mathbb{C}(x'_{ht}\beta, \text{Manager} + \text{Hospital})$	-0.001	-0.00%
$\mathbb{V}(\text{Residual})$	-0.149	-28%

Correlation between CEO fixed effect and characteristics

› Back

	CEO Fixed Effect				
	(1)	(2)	(3)	(4)	(5)
Female	-0.068*	-0.065*	-0.071*	-0.054	-0.052
	(0.037)	(0.036)	(0.036)	(0.035)	(0.035)
Age	0.166***	0.163***	0.163***	0.163***	0.163***
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)
Age ²	-0.002***	-0.002***	-0.002***	-0.002***	-0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Physician		-0.084**	-0.166***	-0.101**	-0.115***
		(0.039)	(0.039)	(0.041)	(0.041)
Mgmt. Background			-0.105**	-0.093*	-0.106**
			(0.053)	(0.054)	(0.053)
Physician × Mgmt. Studies				-0.199***	-0.199***
				(0.037)	(0.037)
Observations	8,197	8,197	8,197	8,197	8,185
R-squared	0.101	0.102	0.102	0.109	0.110
Sample	All	All	All	All	Degree data available

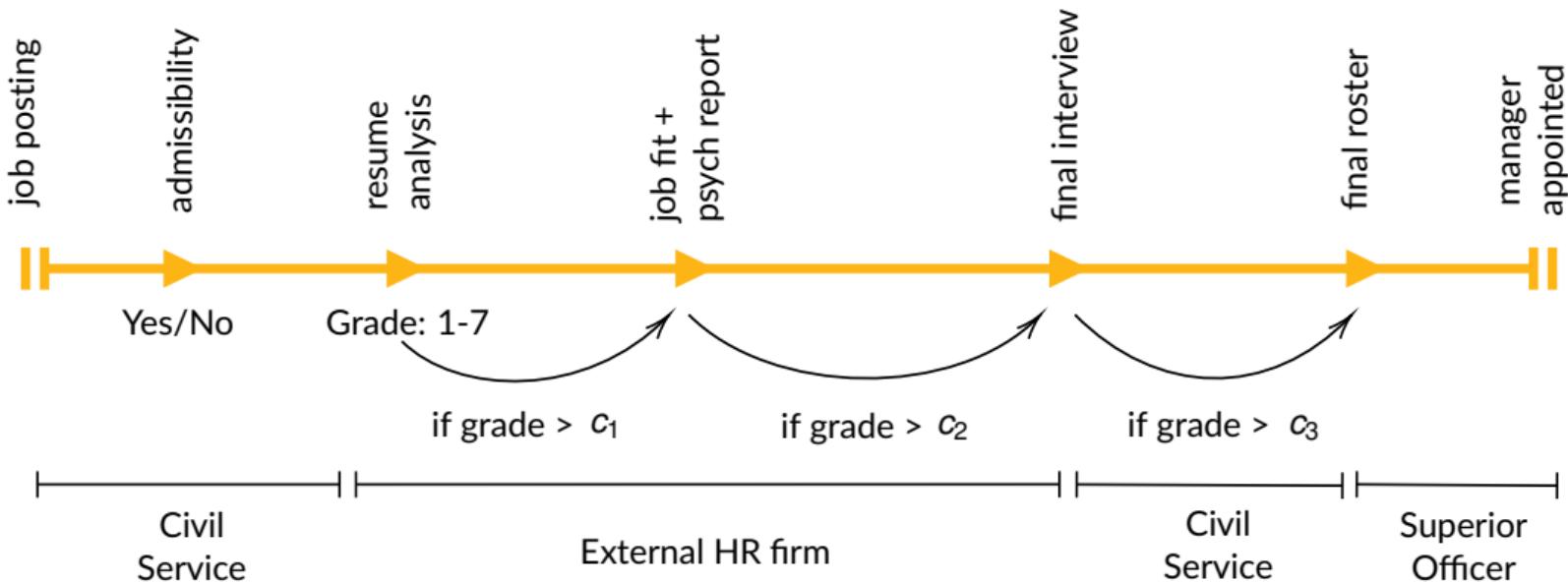
- (i) Higher base (position-specific) wages in the form of a monthly unconditional bonus
 - in our setting represents a 33% increase in the position's pay → [Box plot](#)
- (ii) Performance pay incentives: only trivial penalty based on past performance

$$\text{Yearly Wage}_t = \begin{cases} 100\% & \text{if } \text{performance}_{t-1} \geq 95\% \\ 98.5\% & \text{if } 65\% \leq \text{performance}_{t-1} < 95\% \\ 93\% & \text{if } \text{performance}_{t-1} < 65\% \end{cases}$$

- de facto lax and not binding in our setting (and across the board)

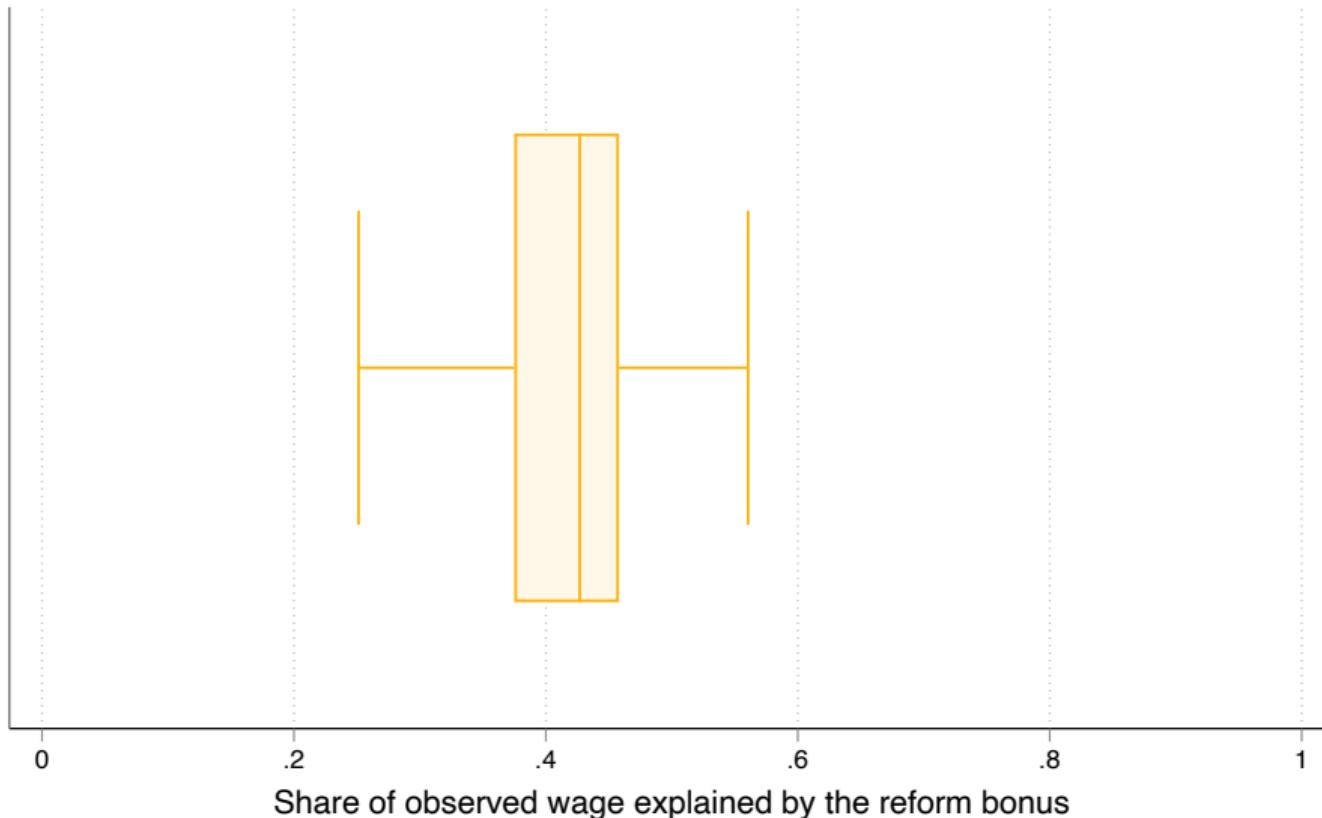
Hiring process in detail

› Back



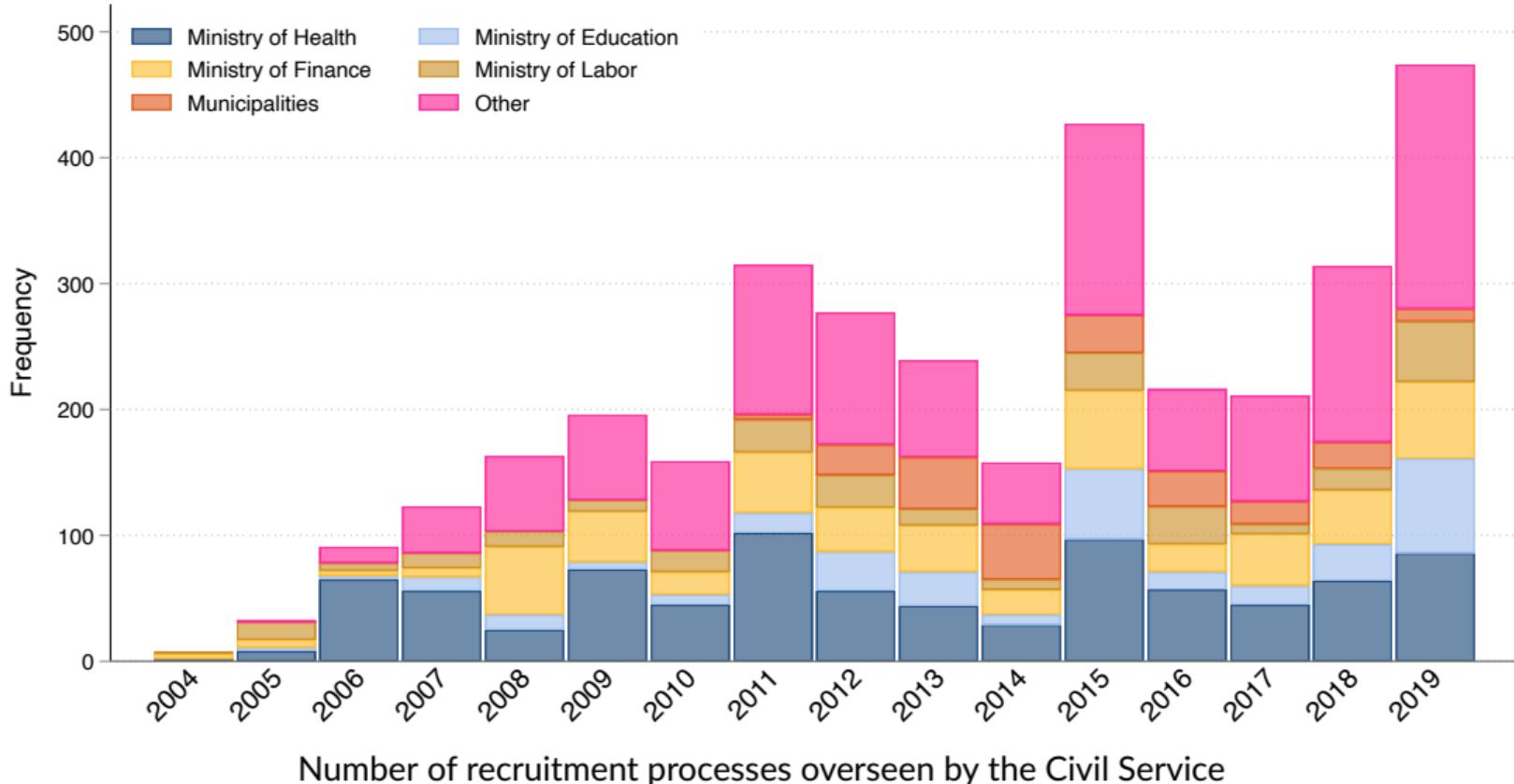
Share of total wage explained by bonus

› Back



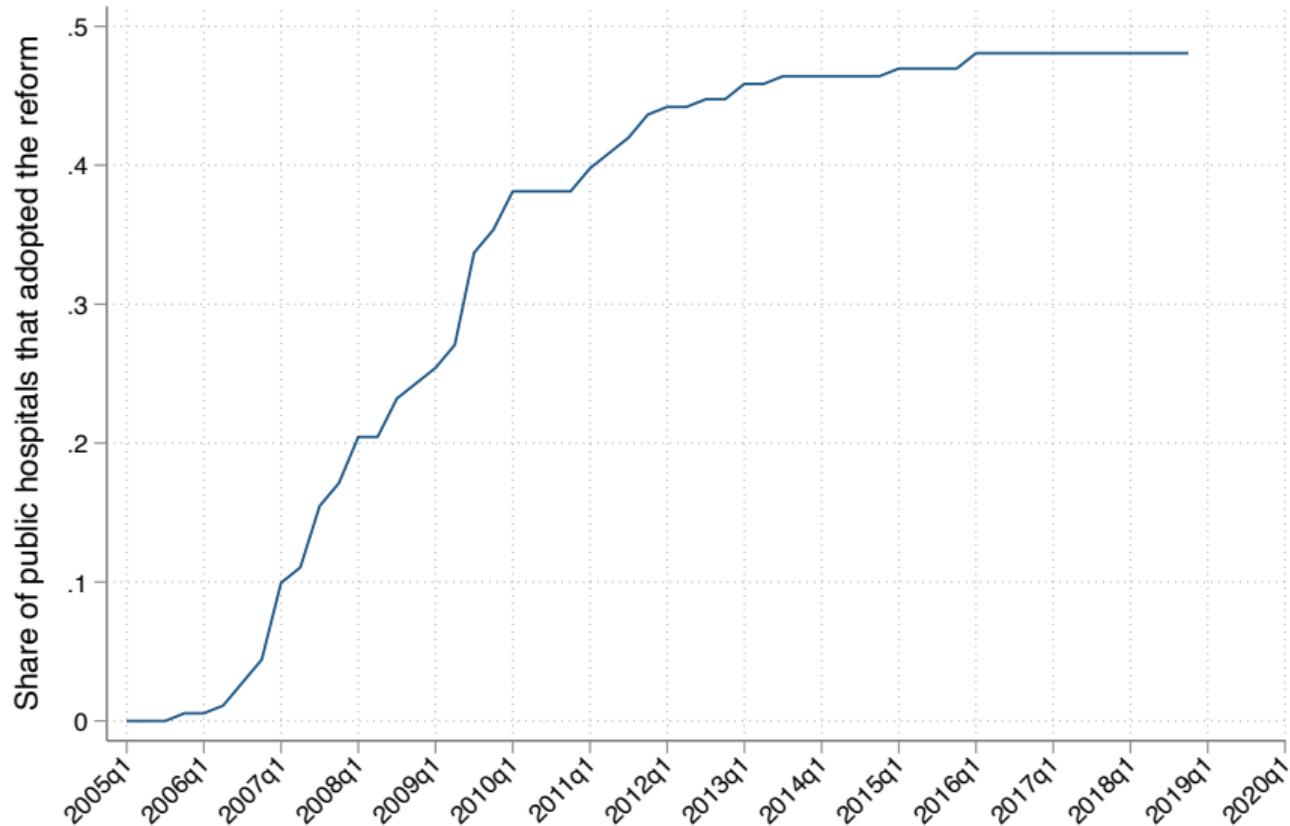
Public agencies gradually adopted selection reform

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Public hospitals adopting the reform

► Back



Adoption by hospital size

› Back

	Never Treated	Ever Treated	Total
Big Hospital	5	58	63
Medium Hospital	5	23	28
Small Hospital	90	7	97
Total	100	88	188

Balance in observables before the reform

Patient composition:	Avg. never adopter (1)	β Ever adopter (Levels) (2)	β Ever adopter (First-Diff) (3)
% Age < 29	0.381	0.042 (0.060)	0.004 (0.003)
% Age ∈ (30,49)	0.220	0.005 (0.021)	0.003 (0.002)
% Age ∈ (50,69)	0.185	0.009 (0.024)	-0.003 (0.003)
% Age ∈ (70,89)	0.197	-0.047** (0.021)	-0.004* (0.002)
% Age > 89	0.018	-0.009*** (0.002)	-0.000 (0.001)
% Female	0.605	-0.027 (0.018)	0.000 (0.003)
% Public insurance	0.972	-0.043*** (0.009)	0.003 (0.002)

Balance in observables before the reform

Hospital outcomes:	Avg. never adopter (1)	β Ever adopter (Levels) (2)	β Ever adopter (First-Diff) (3)
Number of deaths	5.970	47.943*** (16.157)	0.999 (1.053)
Death rate	1.389	0.497 (0.366)	0.083 (0.083)
Death rate ER	1.483	1.325** (0.618)	0.137 (0.116)
Death rate 28 days	3.305	-0.046 (0.504)	0.155 (0.143)

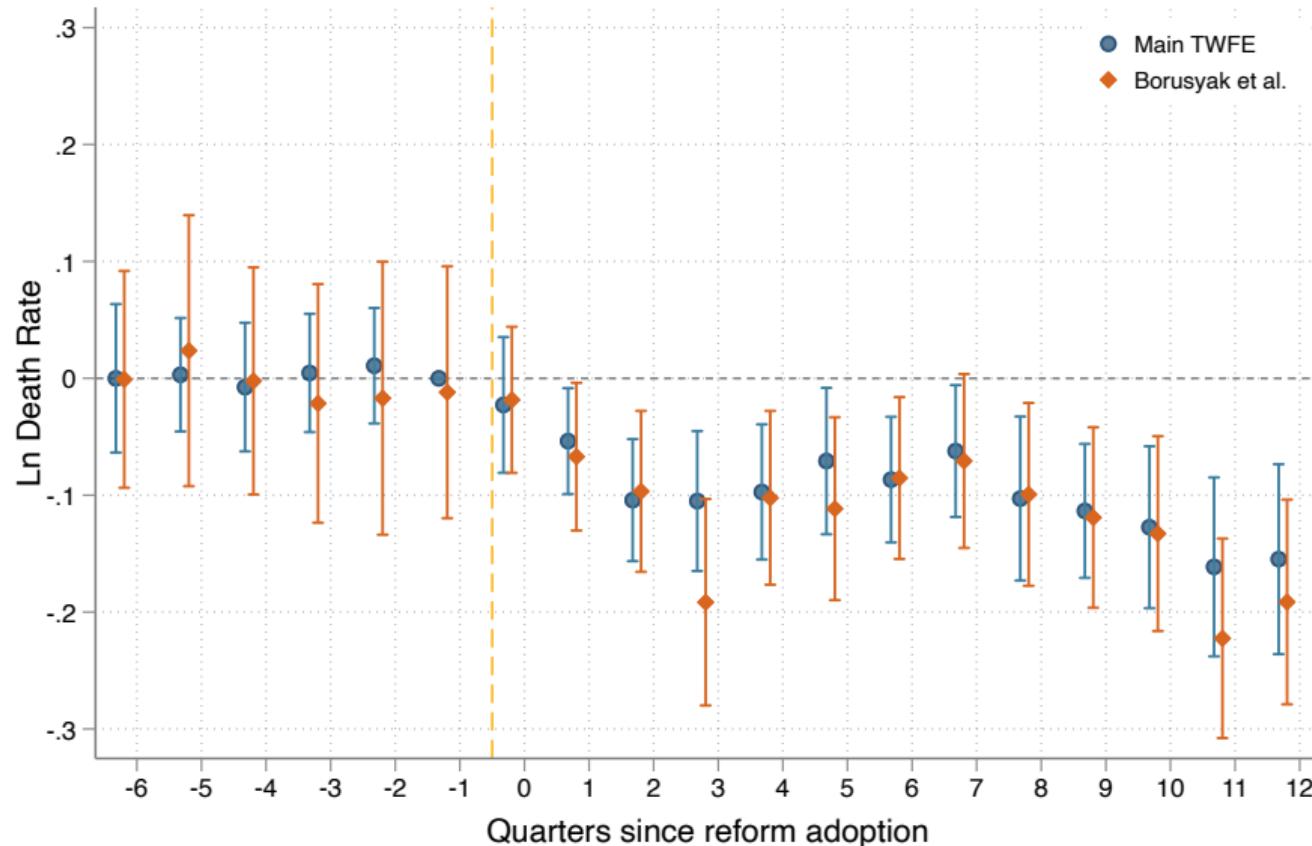
Balance in observables before the reform

» Back

Political variables:	Avg. never adopter (1)	β Ever adopter (Levels) (2)	β Ever adopter (First-Diff) (3)
% Votes for right	25.764	8.186* (4.792)	2.674 (5.691)
% Votes for center	19.107	5.499 (5.633)	2.046 (3.970)
% Votes for left	24.435	-8.226 (5.256)	-4.579 (4.275)

Impact on hospital performance

► Back



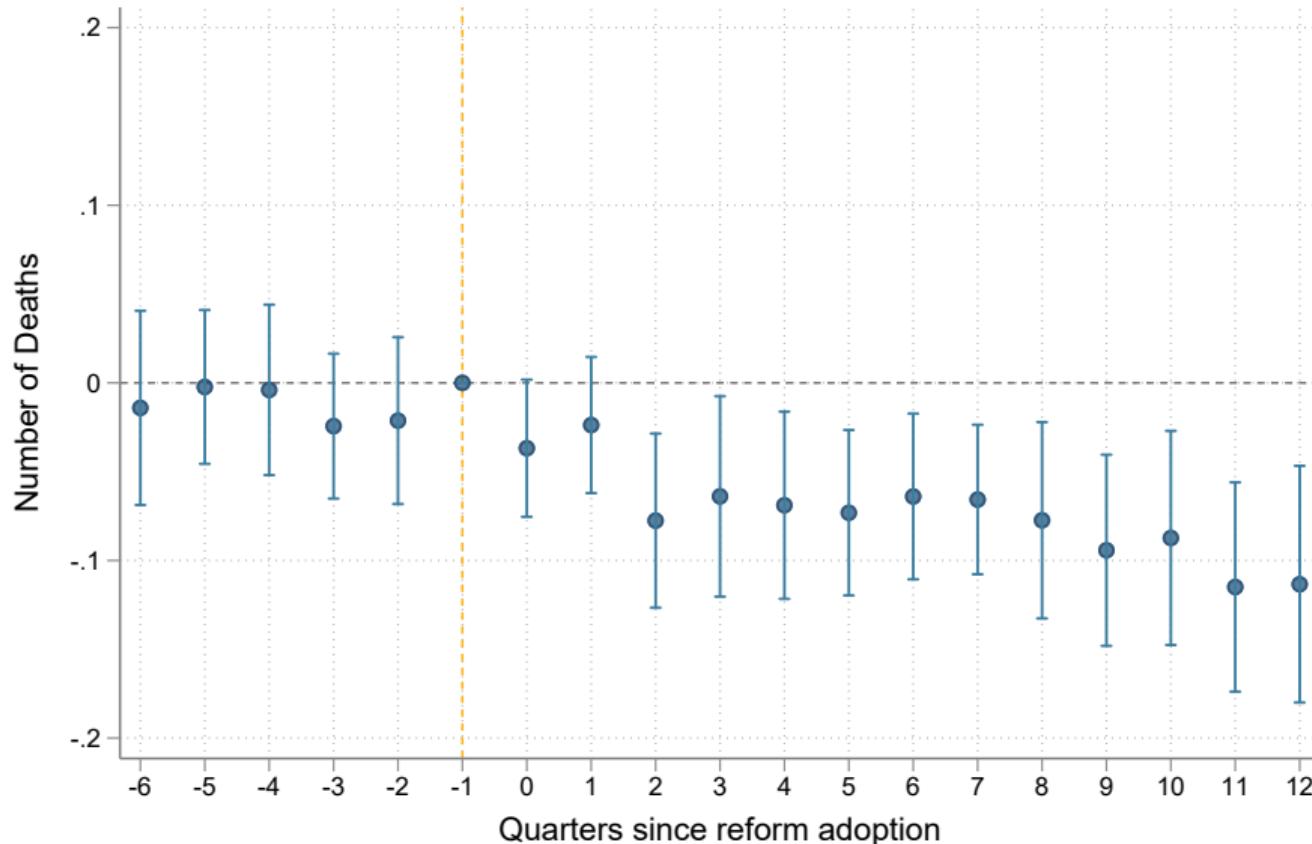
Alternative outcome variables and models

[Back](#)

	Ln Death Rate					Poisson (# Deaths)	
	All			28-days	ER	All	ER: AMI
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1 if reform adopted	-0.131*** (0.025)	-0.081*** (0.022)	-0.095*** (0.023)	-0.061*** (0.016)	-0.156*** (0.036)	-0.054*** (0.018)	-0.146 (0.134)
Observations	8,104	8,104	8,104	8,104	6,592	8,104	1,956
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Hospital FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Case-Mix Controls	No	Yes	Yes	Yes	Yes	Yes	Yes
Flexible Case-Mix Interactions	No	No	Yes	Yes	Yes	Yes	No
# of Hospitals	181	181	181	181	175	181	132
Mean Dep. Variable	2.625	2.625	2.625	4.726	3.088	21.85	16.22

New selection process decreased # of deaths

[Back](#)



Are results mechanically explained by CEO transitions?

- Stacked event study to deal with multiple CEO transitions within hospital
(Lafortune et al. 2018; Cengiz et al. 2019; Baker et al. 2021; Atal et al. 2022)

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- Select valid events: balanced & no transitions in 4 periods before event

Are results mechanically explained by CEO transitions?

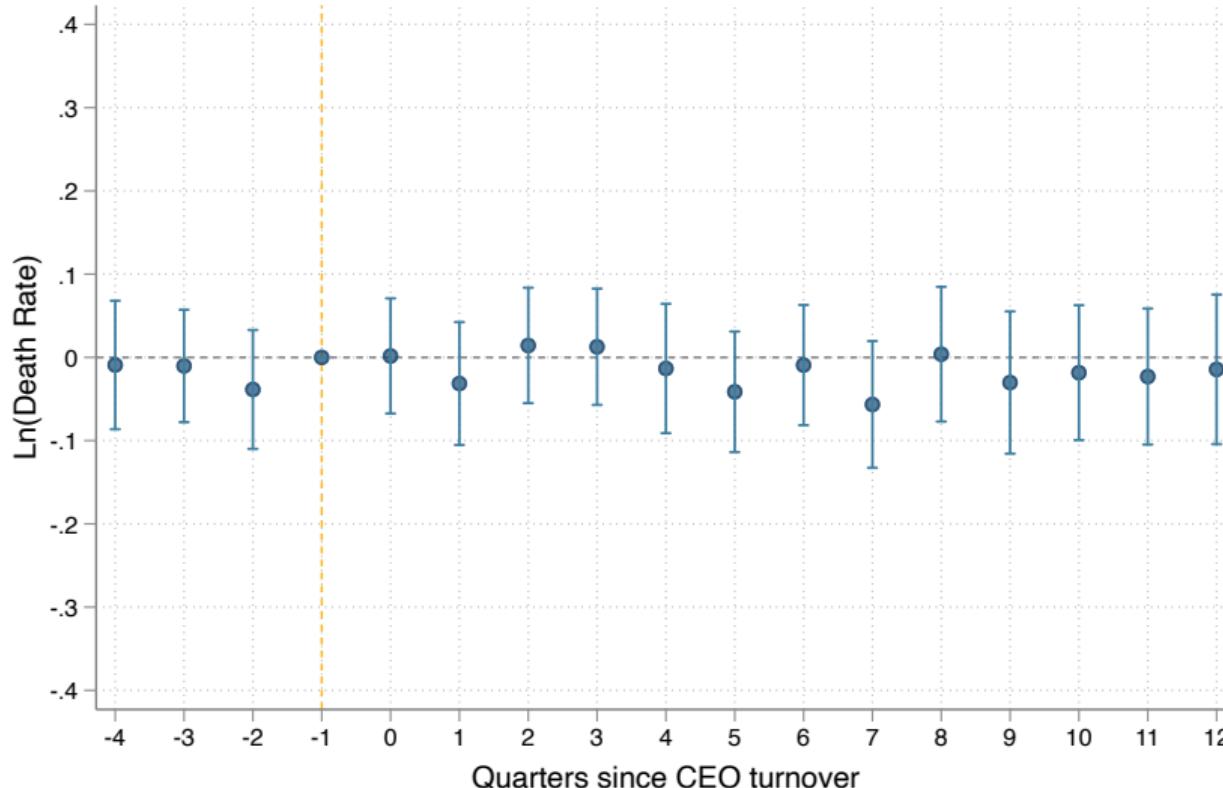
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- Append data for all valid events and estimate:

$$y_{hte} = \alpha_{he} + \gamma_{te} + \sum_{k=-4}^{12} \beta_k D_{hte}^k + \epsilon_{hte},$$

- e is a valid event

No evidence of impacts on hospital performance

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CEO selection reform in context of other policies

» Back

Policy (1)	Paper (2)	Death rate definition (3)	Average death rate (4)	Impact on death rate (5)	Sample of patients (6)
Spending					
↑ 10% p/capita	Doyle et al. JPE '15 Ours	All, 1-year	37% 32%	↓ 6% ↓ 7%	ER + Amb. + $\geq 65^*$ ER + ≥ 65
Public vs Private					
VA v. Non-VA hospitals	Card & Chan '22 Ours	All, 1-year	29% 32%	↓ 7% ↓ 7%	ER + Amb. + ≥ 65 ER + ≥ 65
Competition					
+1 hospital in neighborhood ↓ 10% HHI	Bloom et al. ReStud '15 Gaynor et al. AEJ EP '13 Ours	In-hospital, 28-day In-hospital, 28-day	15% 1.6% 2.3%	↓ 10% ↓ 1% ↓ 15%	ER + AMI All patients All patients

Notes: HHI: Herfindahl-Hirschman index; AMI: Acute Heart Infarction; Amb: arriving by ambulance; *: non-deferrable medical conditions.

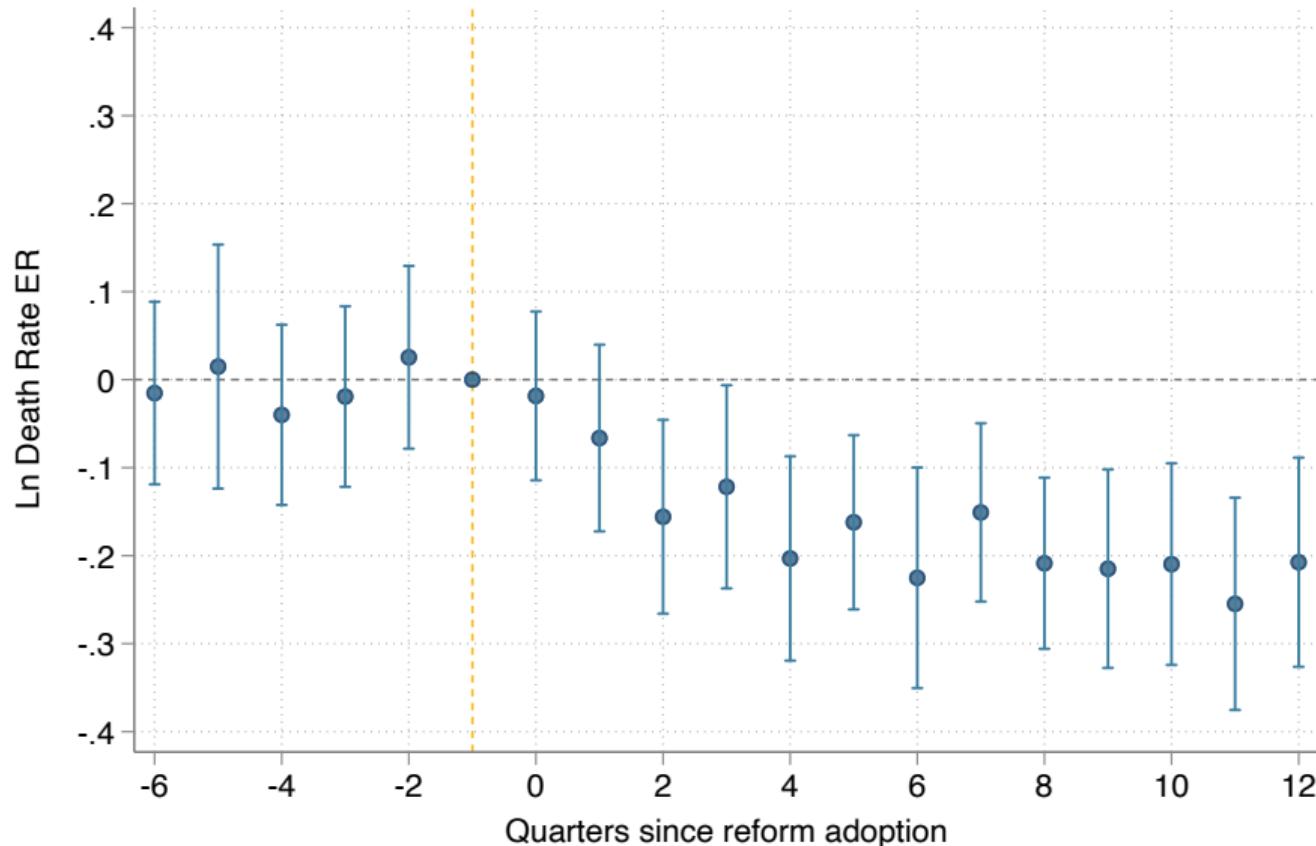
Results are not explained by a change in patient composition

› Back

	Death Rate			
	Ln Predicted	Ln Actual/Predicted		
		(1)	(2)	(3)
1 if reform adopted in hospital	-0.004 (0.004)	-0.086*** (0.023)	-0.090*** (0.024)	-0.089*** (0.024)
Observations	8,104	8,104	8,104	8,104
Time FE	Yes	Yes	Yes	Yes
Hospital FE	Yes	Yes	Yes	Yes
Patient Demographics	Yes	Yes	Yes	Yes
Type of Insurance	Yes	No	Yes	No
Enhanced Elixhauser Comorbidity Index	Yes	No	No	Yes
Pseudo-R ² Logit		0.147	0.158	0.176
# of Hospitals	181	181	181	181
Mean Dep. Variable	3.506	0.780	0.712	0.737

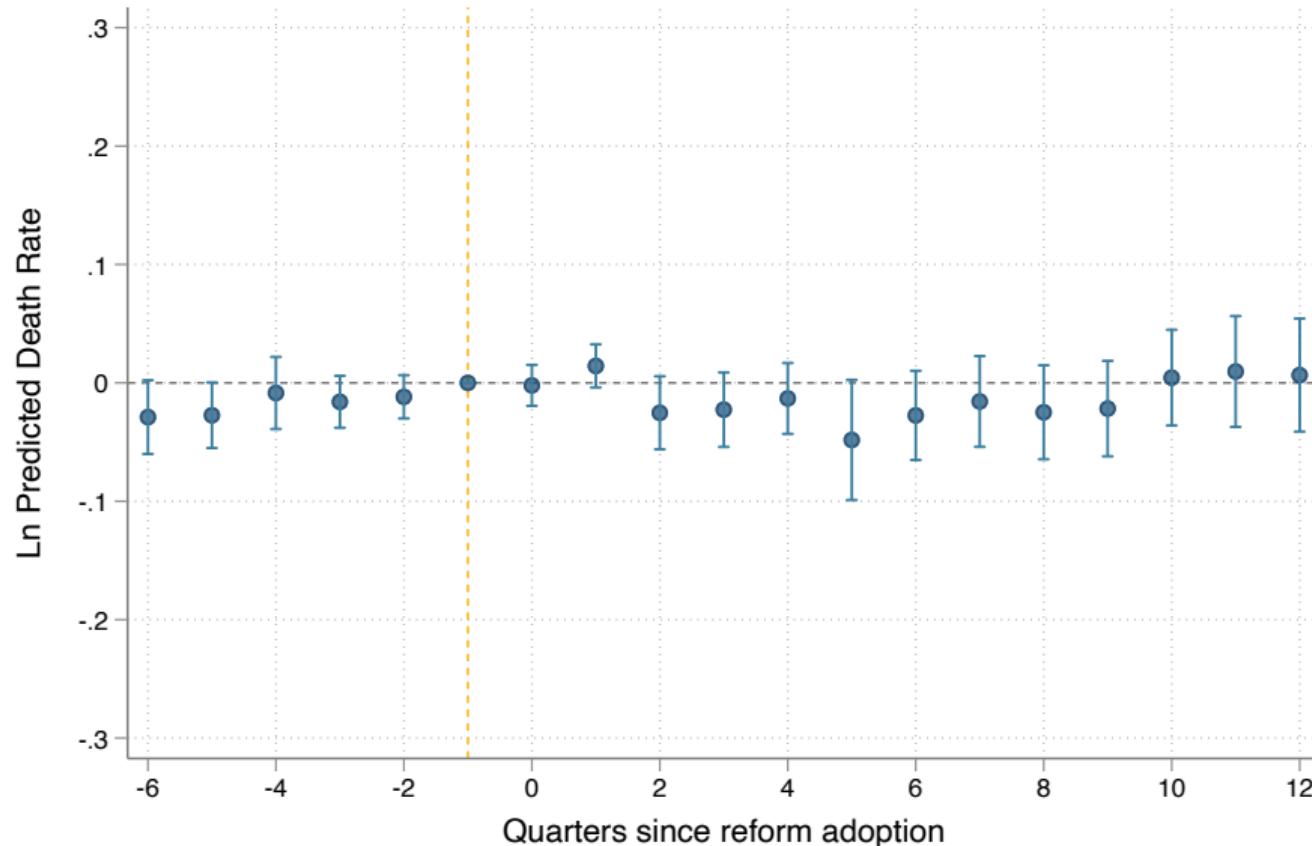
Results are robust in specifications for ER patients

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Patient risk doesn't change after adoption

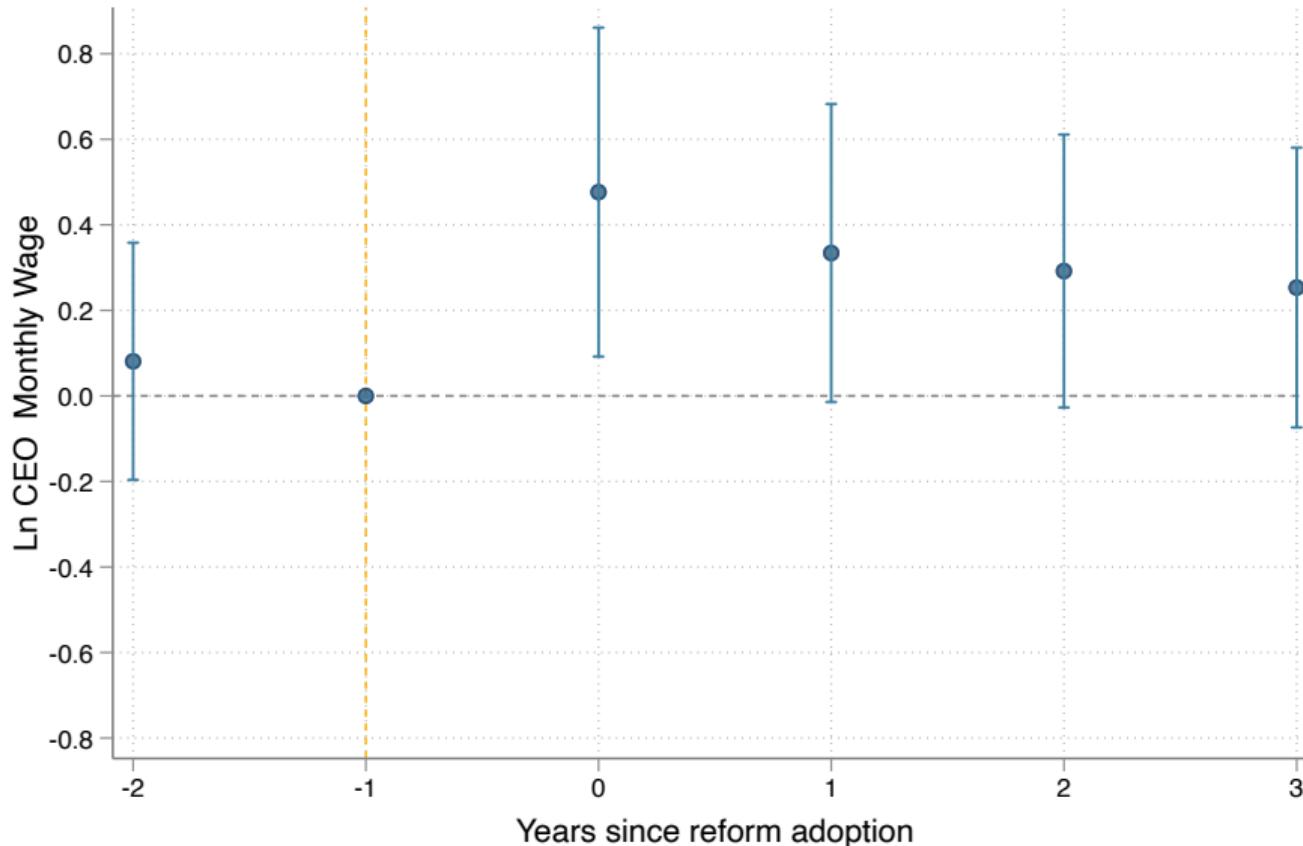
► Back



	Mean	Std. Dev.	Obs.
Previous experience			
in same hospital	.33	.47	773
in public sector	.93	.25	648
in health sector	1	.07	648
in management	.99	.12	648
as CEO	.45	.5	648
as CEO in private hospital	.07	.25	648

Wage effects

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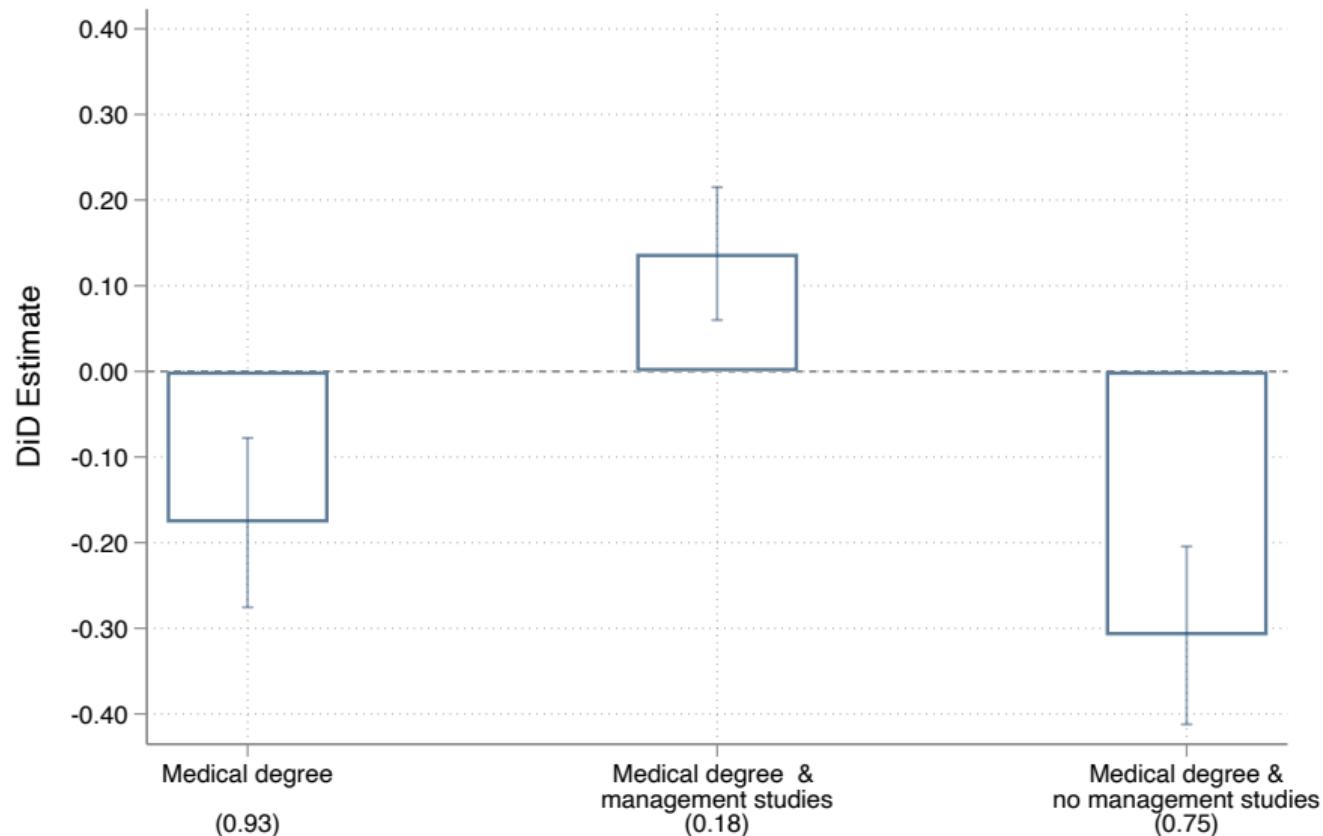
No differential impact in performance pay scores

» Back

	Ln Death (%) (1)	Ln Death (%) (2)
Reform	-0.087*** (0.028)	
Reform & High Score		-0.086** (0.033)
Reform & Low Score		-0.089** (0.036)
Observations	7,670	7,670
Time FE	Yes	Yes
Hospital FE	Yes	Yes
Case Mix Controls	Yes	Yes
# of Hospitals	181	181
Mean Dep. Variable	2.61	2.61
p-value <i>High Score = Low Score</i>		0.94

Reform only displaced doctor CEOs w/o mgmt. training

▶ Back



Reform incentivized doctors to study management

› Back

Some Chilean universities offer an MBA in Health, so that their graduates can work in administrative positions such as managers or directors of hospitals and even Seremis.

One of the institutions that offers this MBA with a specialization in Health is the Andrés Bello University (Unab), which allows students to acquire and deepen subjects such as economics, administration, marketing, epidemiology applied to management and clinical management.

Unab has carried out 21 versions of this program since 2005, and its success is based on its implementation in several cities in the country, from Iquique to Punta Arenas, in hotels and hospitals, with more than 500 graduates, reported the newspaper La Tercera.

There is also a Senior Management version, aimed at professionals with more experience and who intend to achieve or remain in senior management positions. The difference of this program is that it has a double degree with the lede-UEM Business School of Spain, even one of the three semesters that the MBA lasts is taught entirely by Spanish professors, and it is necessary that the students carry out an internship in Europe.

Universidad Mayor has the MBA in Health Management and Management, a one-and-a-half year program with a more strategic focus, focused on problem solving, development of entrepreneurship for new business ideas. The 18-month master's degree has three lines of development: strategic analysis, business management and strategic direction.

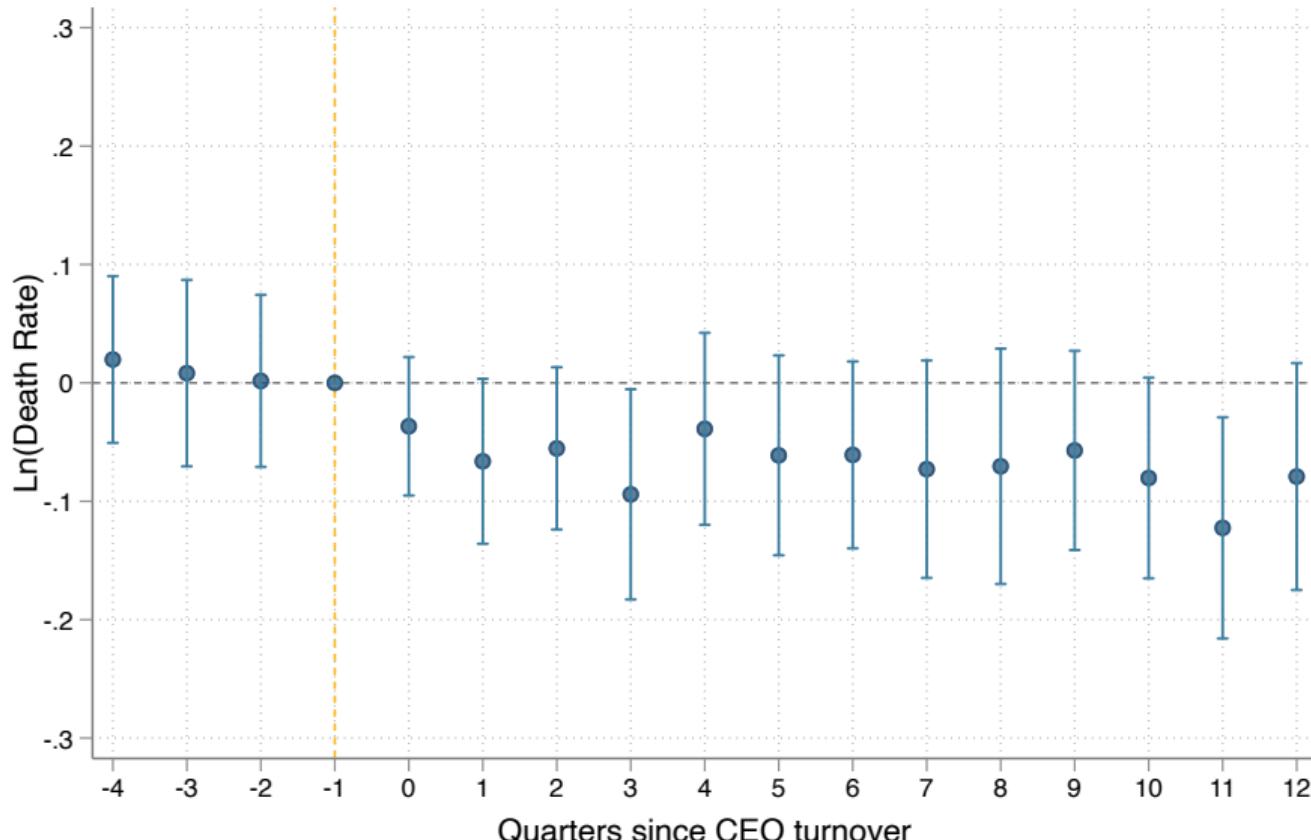
CEO transitions according to management studies

» Back

Previous CEO had:	Current CEO has:			Total
	Non-Mgmt. Studies (1)	Mgmt. Studies (2)	No Data (3)	
Non-Mgmt. Studies	431	94	5	530
Mgmt. Studies	95	66	4	165
No Data	31	4	4	39
Total	557	164	13	734

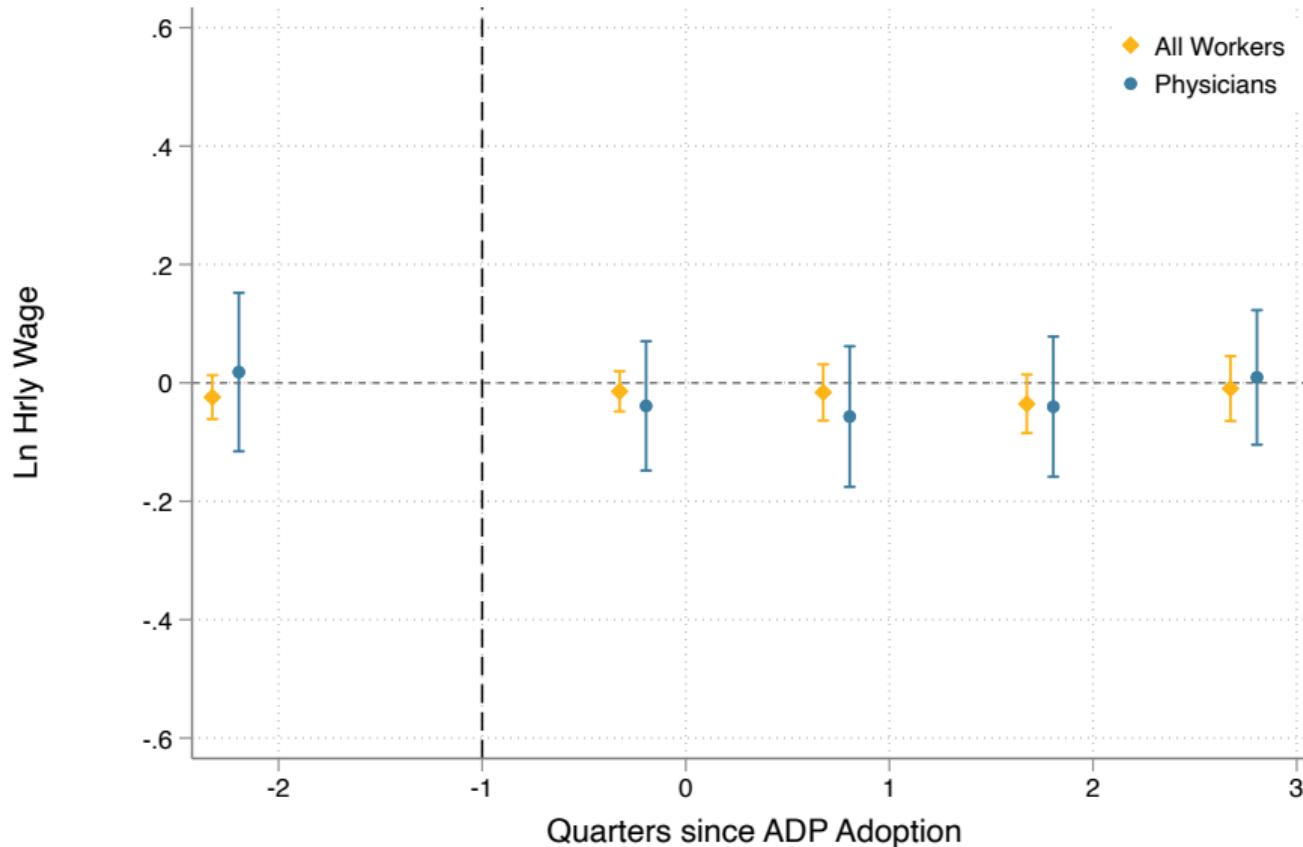
No pre trends in CEO transition

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No effect on hourly wages

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Are new CEOs exerting more effort due to higher wages

- Reform simultaneously changed recruitment & increased wages

Are new CEOs exerting more effort due to higher wages

- Reform simultaneously changed recruitment & increased wages → *exploit amendment to reform*

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Are new CEOs exerting more effort due to higher wages

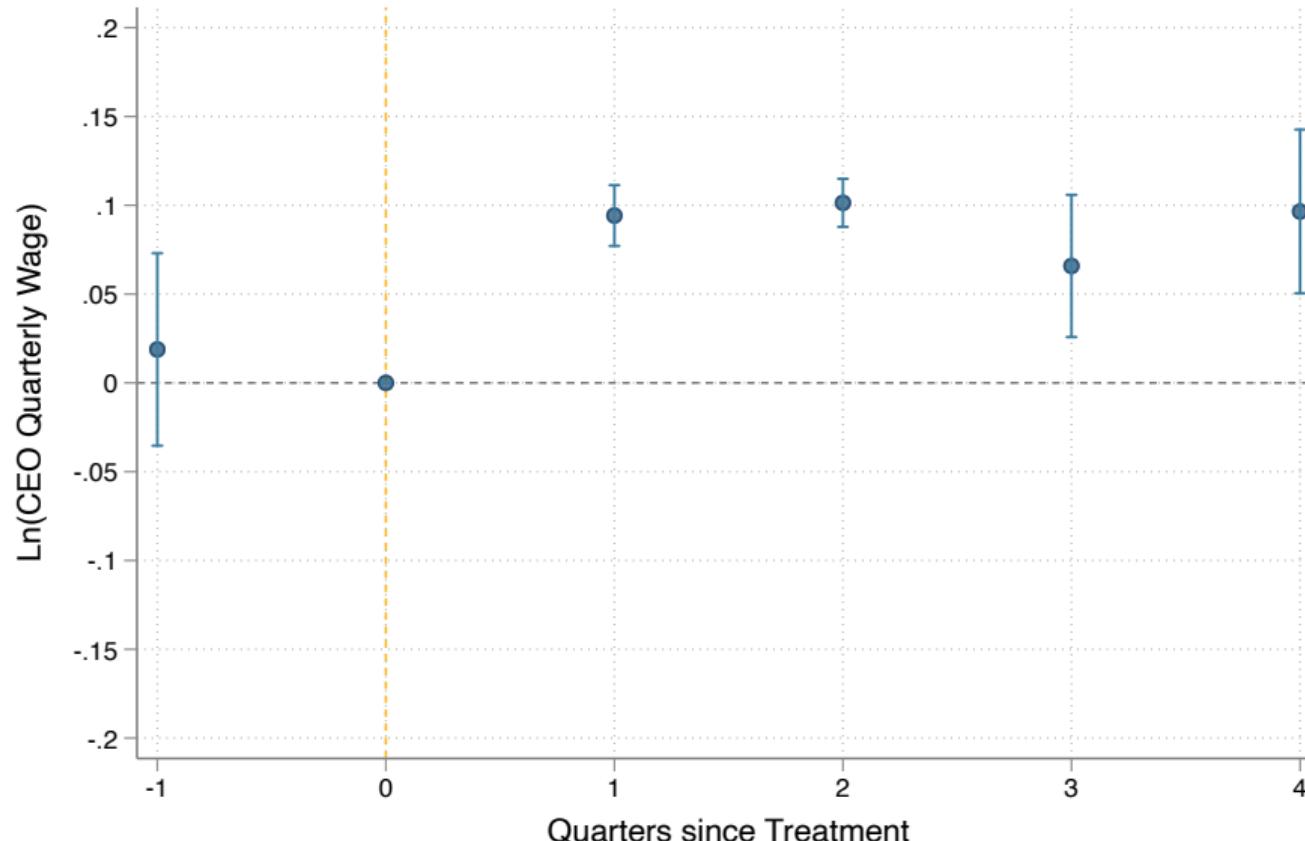
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 - select valid events e (26/35): balanced & no transitions 2 periods before event

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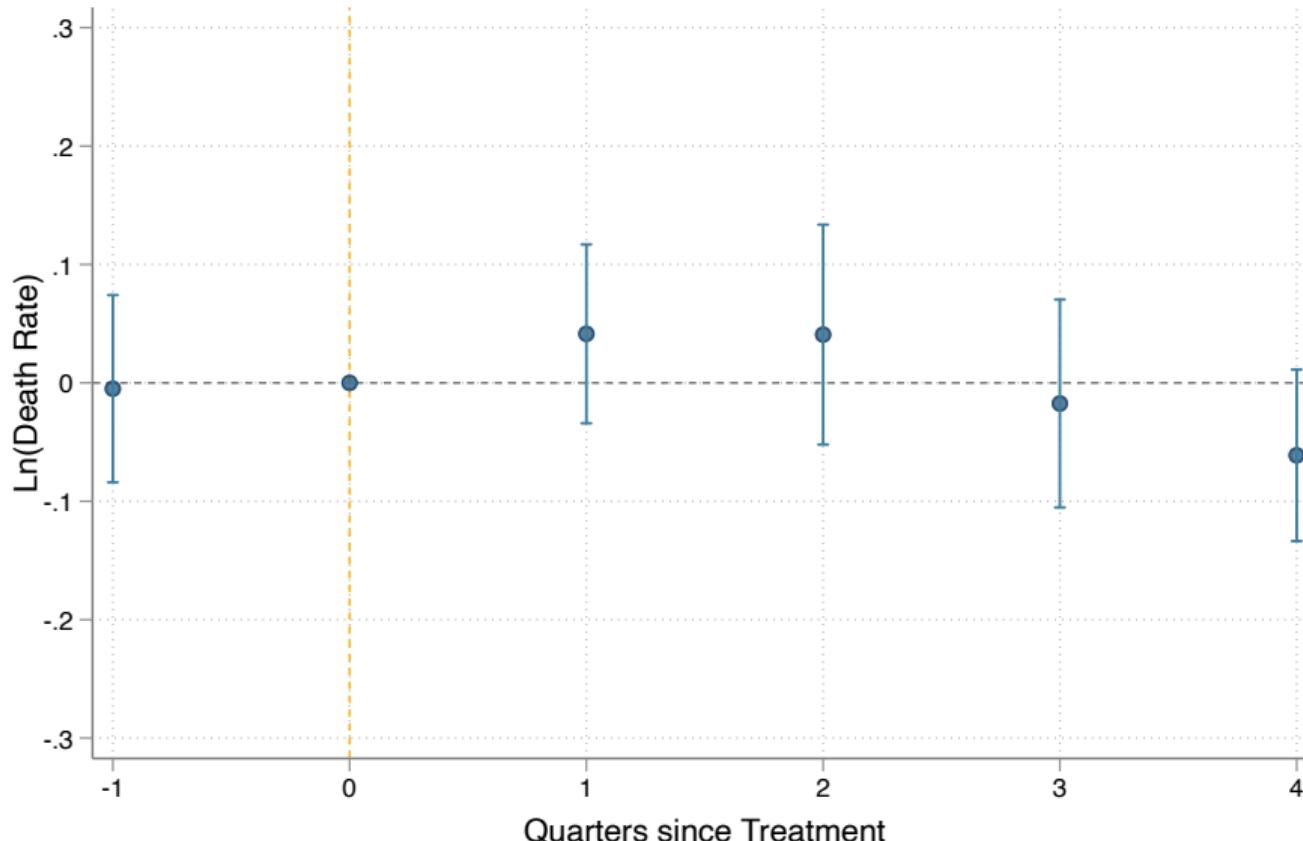
$$y_{hte} = \alpha_{he} + \gamma_{te} + \sum_{k=-1}^{4} \beta_k D_{hte}^k + \epsilon_{hte}$$

Amendment to the reform effect on wages



CEO performance doesn't improve with higher wages

► Back



Performance pay incentives in the reform

- Senior executives agree to a 3-year performance contract
 - get a performance score based on the parameters in the contract
- Performance score impacts compensation according to:

$$\text{Yearly Wage}_t = \begin{cases} 100\% & \text{if } \text{performance}_{t-1} \geq 95\% \\ 98.5\% & \text{if } 65\% \leq \text{performance}_{t-1} < 95\% \\ 93\% & \text{if } \text{performance}_{t-1} < 65\%. \end{cases}$$

- performance incentives trivial part of wage and apply only after second year

Performance pay was not binding

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