Beyond the War on Drugs: Evidence from Portugal's Drug Decriminalization Reform and the *Retornados* Migration

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Drug decriminalization



Overdose deaths hit record levels, murders surge after blue state decriminalizes hard drugs

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 - Now an administrative offense
 - No longer punishable by imprisonment
 - No criminal record

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 - No criminal record
- Addiction seen as a public health issue, not a criminal one

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 - Continuous measure of exposition to treatment
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 - Has no long-term effect on voting for advocating parties
 - Has no effect on hospital admissions
 - Lowers property crime
- → Potentially welfare improving without hurting policy makers

Related Literature and Contribution

Drug policy reforms

- ► MML: Gavrilova (2019), Rice (2019), Miroff (2014)
 - Find reduction in violent crime, organized crime activity
 - Marijuana as a substitute for other drugs
- Decriminalization: Portugal and Tavares (2012), Rasul et al. (2014), Hughes and Stevens (2010)
 - Mixed results
- ► Contribution: Hard drugs, identification, political

Portugal before 1974





- ▶ 1933 to 1974: Estado Novo Authoritarian regime
 - Closed country
- ▶ 1960s and 1970s: Colonial War
 - Independence movements in Portuguese colonies in Africa
- ▶ 1974: Carnation Revolution
 - Deposition of Estado Novo regime
 - Transition to democracy

The Retornados Migration



- ▶ Post 1974: Carnation Revolution's Aftermath
 - Democratic Portugal opens to the world
 - Threat of civil war in African colonies
- The Retornados migration
 - 600,000 retornados from Angola, Mozambique, Guinea-Bissau,
 Cabo Verde, São Tomé and Príncipe and Timor (Asia)
 - Portuguese population increased by 6%

The Influence of the Retornados on Drug Use

- Downward social mobility
 - In Africa: White Portuguese settlers
 - In Portugal: Second-class Portuguese citizens (Marques, 2013)
- Lack of opportunities in Portugal
 - Slow economic growth, high inflation, unemployment
 - No connections
- Angola and Mozambique were drug-producing countries
- ► The retornados established the foundations of the drug market in Portugal (Fernandes, 1993; Nunes Dias, 2004; Calado, 2016)

Data

Portugal Census

- 1960: Population (parish level 2882), educational attainment (municipality level - 278)
- 1981: Microdata, place of residence in 1973 and 1981 (country to parish)
- 2001: Population

Survey on Drug Use

- European Values Study (1999)
- National Survey on the Consumption of Psychoactive Substances in the Portuguese Population (2001)

Parliament records

Parties' position with respect to the legislation in 2001

Data

Electoral Outcomes

- Parliamentary elections from 1976 until 2019
- Voting outcomes by party at the parish level

Health Outcomes

- Portuguese National Health System (SNS)
- Drug-related hospital admissions at the parish-year level (2000-2021)

Crime Outcomes

- Ministry of Justice
- Arrests at the municipality-year level (1993 2021)

The Retornados Migration and Pre-Reform Drug Use

		O. Probit			
	Soft Drugs		Hard	Soft Drugs	
	(1)	(2)	(3)	(4)	(5)
Share Ret. ANG-MOZ	0.500 (2.036)	0.365*** (0.097)	0.069 (0.748)	0.126*** (0.034)	0.006*** (0.001)
Marginal Effects: Almost none					-0.005 (0.000)
Some					-0.009 (0.001)
Many					0.011
Almost all					0.002
Pop. 1960	×	×	×	×	×
Region Level Municipality Level Individual Level	×	×	×	×	×
Mean Outcome 25p to 75p Effect	7.44 23%	7.44 17%	1.42 17%	1.42 30%	2.56
Observations R ²	5 0.402	278 0.121	5 0.131	278 0.463	907

Estimation Strategy

$$y_{l,t} = \beta_0 + \beta_1 \frac{Ret.Ang.Moz._l}{Ret.Total_l} \times Post2001_t + X_l'\mu_t + District_l\mu_t + \lambda_l + \mu_t + \varepsilon_{l,t}$$

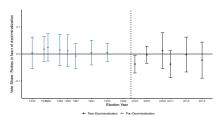
- \triangleright $y_{l,t}$: outcome variables at locality l and year t
- ► Ret.Ang.Moz._p: number of retornados from Angola and Mozambique at locality /
- Ret. Total_p: total number of retornados at locality I
- $X_{l,1960}$: population and average educational level in 1960 at locality l
- ► *District*₁: locality *l*'s district
- $\triangleright \lambda_l$: locality fixed effects
- $\blacktriangleright \mu_t$: year fixed effects
- Standard errors are clustered at the locality level

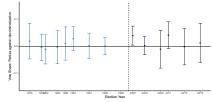
Results: Electoral Outcomes

Table: Effect on voting according to the parties' position with respect to the reform

	Voting share		
	In favor Again		
	(1)	(2)	
Share Ret. ANG-MOZ	-0.003 (0.008)	0.001 (0.009)	
Pop. 1960 × Year FE	×	×	
Education 1960 $ imes$ Year FE	×	×	
District × Year FE	×	×	
Parish FE	×	×	
Year FE	×	×	
Mean Outcome	42.32	52.03	
25p to 75p Effect	0%	0%	
Parishes	3527	3527	
Observations	47,503	47,503	
Adjusted R ²	0.923	0.916	

Figure: Effect on the share of voting for parties that supported and opposed the decriminalization





Results: Health – Hospital Admissions

Table: Effect on drug-related hospitalization rates

	Hospital Admission rate per 100.000 inhabitants						
Panel A: Drug Use	Cannabis	Cocaine	Opioid	Hallucinogen	Ot. Stimulants	Ot. Sedative	
	(1)	(2)	(3)	(4)	(5)	(6)	
Share Ret. ANG-MOZ	-0.732	-0.157	-0.091	0.022	0.237	-0.056	
	(0.509)	(0.129)	(0.099)	(0.024)	(0.624)	(0.123)	
Mean Outcome	5.89	2.44	0.34	0.15	15.34	3.65	
25p-to-75p Effect	-42%	-22%	-91%	51%	5%	-5%	
Panel B: Substitution	Alcohol	Nicotine	Newborn Mom	Newborn Milk	HIV	Hepatitis	
and Contamination	(7)	(8)	(9)	(10)	(11)	(12)	
Share Ret. ANG-MOZ	-5.005	-13.506*	-0.052	0.360	-0.166	-1.958	
	(3.661)	(7.572)	(0.069)	(0.390)	(1.353)	(1.824)	
Mean Outcome	207.34	177.92	0.29	1.23	26.59	40.2	
25p-to-75p Effect	-8%	-26%	-61%	99%	-2%	-17%	
Municipalities	271	271	271	271	271	271	
Observations	4,687	4,687	4,687	4,687	4,687	4,687	

Results: Crime - Arrest Rates

Table: Effect on crime rates

	Crime rate per 100.000 inhabitants						
	Homicide	Assault	Theft	Burglary	Robbery	Sexual Assault	
	(1)	(2)	(3)	(4)	(5)	(6)	
Share Ret. ANG-MOZ	-0.205 (0.181)	-3.195 (2.576)	-15.185*** (5.715)	-5.240** (2.236)	0.659 (0.427)	0.023 (0.114)	
Pop. 1960 × Year FE	×	×	×	×	×	×	
Education 1960 $ imes$ Year FE	×	×	×	×	×	×	
Ret. Total × Year FE							
District × Year FE	×	×	×	×	×	×	
Municipality FE	×	×	×	×	×	×	
Year FE	×	×	×	×	×	×	
Mean Outcome	5.54	416.92	563.55	335.1	27.06	6.44	
25p to 75p Effect	-13%	-3%	-9%	-5%	8%	1%	
Municipalities	271	271	271	271	271	271	
Observations	7,859	7,859	7,859	7,859	7,859	7,859	
Adjusted R ²	0.278	0.568	0.807	0.758	0.846	0.336	

 Political parties do not experience long-term backlash for supporting drug decriminalization

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- Decriminalizing drugs is potentially welfare improving
 - No effect on drug-related hospital admissions
 - Reduction in theft and burglary rates

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- Next step
 - Mechanisms

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Thank you for your attention!



Identification and Robustness

- ► Event Studies Electoral Health Crime
- ► Placebo Test Electoral Crime
- ► Drug Use Ordered Logistic Specification Drug Use
- ► Alternative Specification Drug Use Electoral Health Crime
- ► Inverse Probability Weighted Estimation Electoral Health Crime
- ► Doubly Robust Estimation Electoral Health Crime
- Balance Table
- Clustering
- Multiple Hypothesis Testing

Retornados Distribution

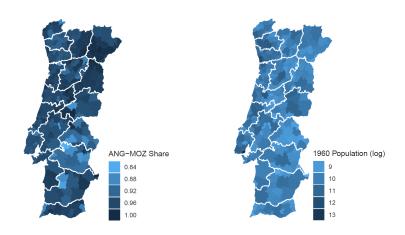
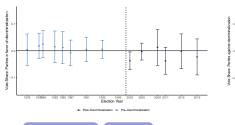


Figure: Effect on the share of voting for parties that supported and opposed the decriminalization



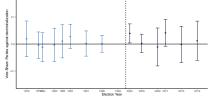






Figure: Cannabis-related disorder hospitalization rate

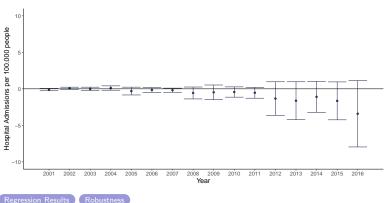
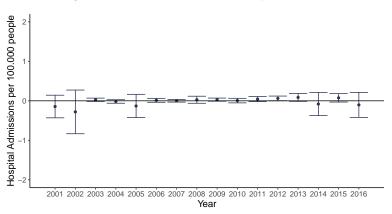
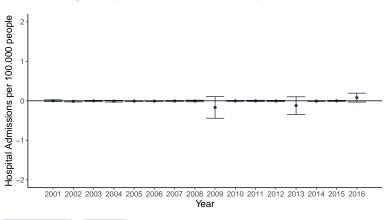


Figure: Cocaine-related disorder hospitalization rate



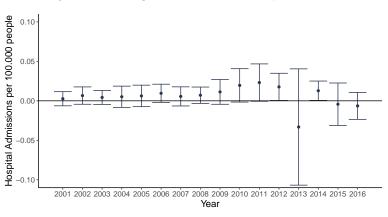
Regression Results Robustness

Figure: Opioid-related disorder hospitalization rate



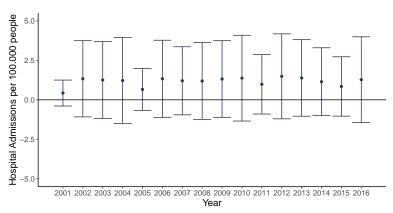
Regression Results

Figure: Hallucinogen-related disorder hospitalization rate



Regression Results

Figure: Other stimulant-related disorder hospitalization rate



Regression Results

Figure: Other sedative-related disorder hospitalization rate

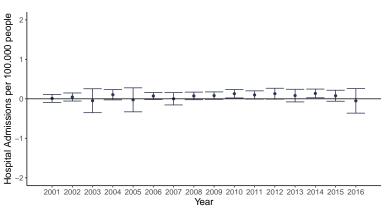
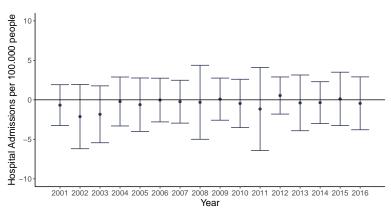
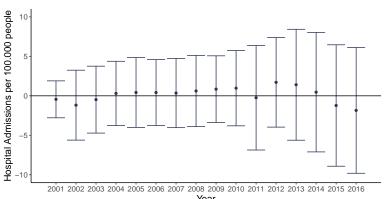


Figure: Alcohol-related disorder hospitalization rate



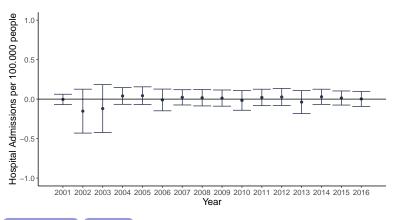
Regression Results

Figure: Nicotine dependence hospitalization rate



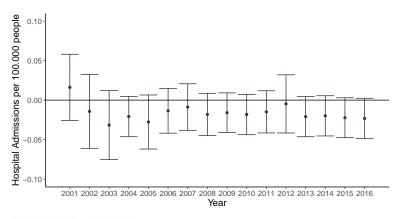
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Figure: Hospitalization rate of newborns (suspected to be) affected by maternal use of drugs of addiction



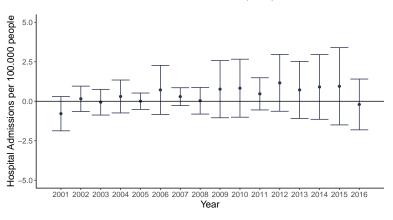
Regression Results

Figure: Hospitalization rate of newborns (suspected to be) affected by noxious substances transmitted via placenta or breast milk



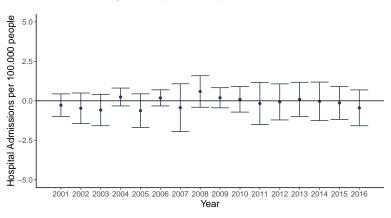
Regression Results

Figure: Human immunodeficiency virus (HIV) hospitalization rate



Regression Results

Figure: Hepatitis hospitalization rate



Regression Results

Figure: Homicide rate per 100.000 inhabitants

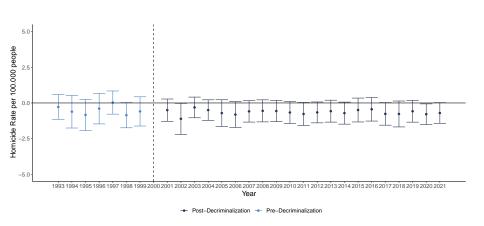


Figure: Assault rate per 100.000 inhabitants

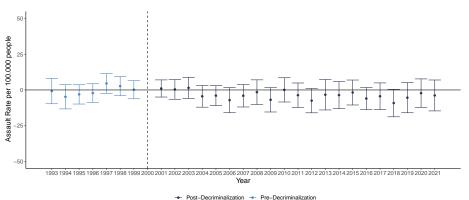
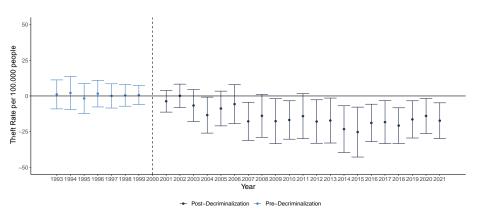


Figure: Theft rate per 100.000 inhabitants



7 H L 7 H L

Figure: Burglary rate per 100.000 inhabitants

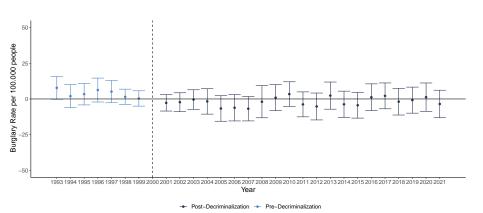
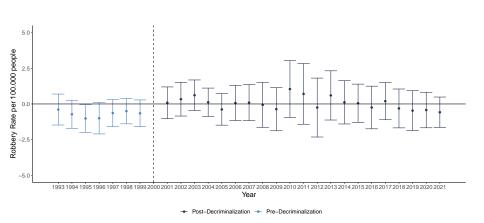


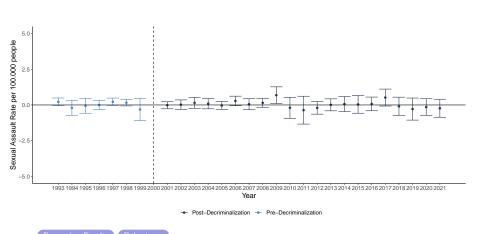


Figure: Robbery rate per 100.000 inhabitants



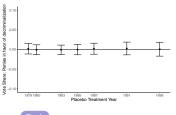
7 B F 7 B F 7 B F 800

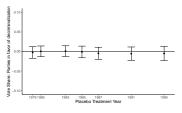
Figure: Sexual Assault rate per 100.000 inhabitants



Placebo Test

Figure: Placebo Regressions - Electoral Outcomes

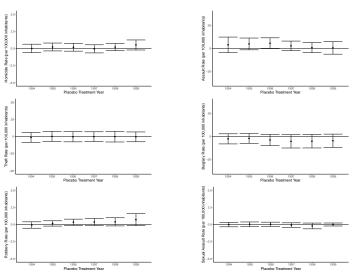






Placebo Test

Figure: Placebo Regressions – Crime Outcomes



The *Retornados* Migration and Pre-Reform Drug Use – Ordered Logistic Specification

Table: Effect on Pre-Reform Drug Use – Ordered Logistic Specification

	Soft Drugs
	O. Logit
	(1)
Share Ret. ANG-MOZ	0.011*** (0.001)
Marginal Effects:	
Almost none	-0.001***
	(0.000)
Some	-0.002***
	(0.001)
Many	0.002***
	(0.000)
Almost all	0.000***
	(0.000)
Population 1960	×
Individual Level	×
Mean Outcome	2.43
Observations	907



The *Retornados* Migration and Pre-Reform Drug Use – Alternative Specification

Table: Effect on Pre-Reform Drug Use – Ordered Logistic Specification

		0	LS		O. Probit
	Soft	Drugs	Hard	Drugs	Soft Drugs
	(1)	(2)	(3)	(4)	(5)
Share Ret. ANG-MOZ	0.575 (2.826)	0.384*** (0.105)	0.154 (0.731)	0.104*** (0.027)	-0.003 (0.002)
Marginal Effects: Almost none					-0.005 (0.000)
Some					-0.009 (0.001)
Many					0.011
Almost all					0.002
Population 1960 × Year FE	×	×	×	×	×
Retornados Total × Year FE Region Level	×	×	×	×	×
Municipality Level Individual Level		×		×	×
Mean Outcome	7.44	7.44	1.42	1.42	2.56
25p-to-75p Effect	14%	9%	19%	13%	
R ² Observations	0.464 5	0.145 278	0.731 5	0.655 278	907

Results: Electoral Outputs – Alternative Specification

Table: Effect on Voting – Alternative Specification

	Voting	g share
	In favor	Against
	(1)	(2)
Share Ret. ANG-MOZ	-0.003 (0.008)	0.001 (0.009)
Pop. 1960 × Year FE	×	×
Education 1960 × Year FE	×	×
Retornados Total \times Year FE	×	×
District × Year FE	×	×
Parish FE	×	×
Year FE	×	×
Mean Outcome	42.32	52.03
25p to 75p Effect	0%	0%
Parishes	3527	3527
Observations	47,503	47,503
Adjusted R ²	0.923	0.916

Results: Health Outputs - Alternative Specification

Table: Effect on drug-related hospitalization rates

	Hospital Admission rate per 100.000 inhabitants						
Panel A: Drug Use	Cannabis	Cocaine	Opioid	Hallucinogen	Ot. Stimulants	Ot. Sedative	
	(1)	(2)	(3)	(4)	(5)	(6)	
Share Ret. ANG-MOZ	-0.832	-0.161	-0.087	0.024	0.236	-0.083	
	(0.528)	(0.138)	(0.106)	(0.025)	(0.683)	(0.127)	
Mean Outcome	5.89	2.44	0.34	0.15	15.34	3.65	
25p-to-75p Effect	-48%	-23%	-87%	55%	5%	-8%	
Panel B: Substitution	Alcohol	Nicotine	Newborn Mom	Newborn Milk	HIV	Hepatitis	
and Contamination	(7)	(8)	(9)	(10)	(11)	(12)	
Share Ret. ANG-MOZ	-5.716	-15.252*	-0.088	0.376	-0.222	-2.131	
	(3.866)	(7.937)	(0.083)	(0.417)	(1.407)	(1.954)	
Mean Outcome	207.34	177.92	0.29	1.23	26.59	40.2	
25p-to-75p Effect	-9%	-29%	-105%	105%	-3%	-18%	
Municipalities	271	271	271	271	271	271	
Observations	4,687	4,687	4,687	4,687	4,687	4,687	

Regression Results

Results: Crime Outputs - Alternative Specification

Table: Effect on Crime Rates – Alternative Specification

	Crime rate per 100.000 inhabitants						
	Homicide	Assault	Theft	Burglary	Robbery	Sexual Assault	
	(1)	(2)	(3)	(4)	(5)	(6)	
Share Ret. ANG-MOZ	-0.185 (0.181)	-3.195 (2.660)	-14.172** (5.870)	-4.873** (2.265)	0.686 (0.444)	0.102 (0.121)	
Pop. 1960 × Year FE	×	×	×	×	×	×	
Education 1960 × Year FE	×	×	×	×	×	×	
Retornados Total × Year FE	×	×	×	×	×	×	
District × Year FE	×	×	×	×	×	×	
Municipality FE	×	×	×	×	×	×	
Year FE	×	×	×	×	×	×	
Mean Outcome	5.54	416.92	563.55	335.1	27.06	6.44	
25p to 75p Effect	-11%	-3%	-9%	-5%	9%	5%	
Municipalities	271	271	271	271	271	271	
Observations	7,859	7,859	7,859	7,859	7,859	7,859	
Adjusted R ²	0.278	0.568	0.807	0.758	0.845	0.337	

Regression Results

Results: Electoral Outputs – IPW Estimation

Table: Effect on voting according to the parties' position with respect to the reform – Inverse Probability Weighted Estimator (Abadie, 2005)

	Voting share			
	In favor Again			
	(1)	(2)		
Share Ret. ANG-MOZ	0.981 (0.619)	-0.415 (0.658)		
Population 1960 × Year FE	×	×		
Education 1960 \times Year FE Retornados Total \times Year FE	×	×		
District × Year FE	×	×		
IPW	×	×		
Mean Outcome	42.23	51.69		
Effect	2%	-1%		
Parishes	2,459	2,459		
Observations	4,918	4,918		

Regression Results

Results: Health Outputs - IPW Estimation

Table: Effect on drug-related hospitalization rates – Inverse Probability Weighted Estimator (Abadie, 2005)

		Hospital Admission rate per 100.000 inhabitants						
Panel A: Drug Use	Cannabis	Cocaine	Opioid	Hallucinogen	Ot. Stimulants	Ot. Sedative		
	(1)	(2)	(3)	(4)	(5)	(6)		
Share Ret. ANG-MOZ	2.898	0.265	-0.775	0.027	34.758	0.480		
	(2.350)	(1.677)	(0.510)	(0.331)	(28.615)	(1.443)		
Mean Outcome	5.15	2.31	0.48	0.19	25.83	3.22		
Effect	56%	12%	-161%	14%	134%	14%		
Panel B: Substitution	Alcohol	Nicotine	Newborn Mom	Newborn Milk	HIV	Hepatitis		
and Contamination	(7)	(8)	(9)	(10)	(11)	(12)		
Share Ret. ANG-MOZ	-4.292	11.010	-0.089	-0.131	21.747	1.258		
	(43.643)	(74.801)	(0.657)	(1.571)	(19.256)	(12.660)		
Mean Outcome	325.40	180.84	0.772	2.29	39.01	50.50		
Effect	-1%	3%	-11%	-5%	55%	2%		
Population 1960	×	×	×	×	×	×		
Education 1960	×	×	×	×	×	×		
Retornados Total								
District	×	×	×	×	×	×		
IPW	×	×	×	×	×	×		
Parishes	1,899	1,899	1,899	1,899	1,899	1,899		
Observations	3,798	3,798	3,798	3,798	3,798	3,798		

Regression Results

Results: Crime Outputs – IPW Estimation

Table: Effect on Crime Rates – Inverse Probability Weighted Estimator (Abadie, 2005)

	Hospital Admission rate per 100.000 inhabitants						
Panel A: Drug Use	Cannabis	Cocaine	Opioid	Hallucinogen	Ot. Stimulants	Ot. Sedative	
	(1)	(2)	(3)	(4)	(5)	(6)	
Share Ret. ANG-MOZ	2.898	0.265	-0.775	0.027	34.758	0.480	
	(2.350)	(1.677)	(0.510)	(0.331)	(28.615)	(1.443)	
Mean Outcome	5.15	2.31	0.48	0.19	25.83	3.22	
Effect	56%	12%	-161%	14%	134%	14%	
Panel B: Substitution	Alcohol	Nicotine	Newborn Mom	Newborn Milk	HIV	Hepatitis	
and Contamination	(7)	(8)	(9)	(10)	(11)	(12)	
Share Ret. ANG-MOZ	-4.292	11.010	-0.089	-0.131	21.747	1.258	
	(43.643)	(74.801)	(0.657)	(1.571)	(19.256)	(12.660)	
Mean Outcome	325.40	180.84	0.772	2.29	39.01	50.50	
Effect	-1%	3%	-11%	-5%	55%	2%	
Population 1960	×	×	×	×	×	×	
Education 1960	×	×	×	×	×	×	
Retornados Total District	×	×	×	×	×	×	
IPW	×	×	× ×	× ×	×	×	
Parishes	1,899	1,899	1,899	1,899	1,899	1,899	
Observations	3,798	3,798	3,798	3,798	3,798	3,798	

Regression Results

Results: Electoral Outputs - Doubly Robust Estimation

Table: Effect on voting according to the parties' position with respect to the reform – Doubly Robust DiD Estimator (Sant'Anna and Zhao, 2020)

	Voting share			
	In favor Again			
	(1)	(2)		
Share Ret. ANG-MOZ	0.924 (0.592)	-0.360 (0.633)		
Population 1960 × Year FE Education 1960 × Year FE	×	×		
Retornados Total × Year FE	^	^		
District × Year FE	×	×		
Doubly Robust	×	×		
Mean Outcome	42.32	52.03		
Effect	2%	-0%		
Parishes	2,459	2,459		
Observations	4,918	4,918		

Regression Results

Results: Health Outputs - Doubly Robust Estimation

Table: Effect on drug-related hospitalization rates – Doubly Robust DiD Estimator (Sant'Anna and Zhao, 2020)

		Н	ospital Admission	rate per 100.000	inhabitants	
Panel A: Drug Use	Cannabis	Cocaine	Opioid	Hallucinogen	Ot. Stimulants	Ot. Sedative
	(1)	(2)	(3)	(4)	(5)	(6)
Share Ret. ANG-MOZ	2.754 (2.358)	0.304 (1.585)	-0.781 (0.505)	0.067 (0.302)	32.271 (26.663)	0.717 (1.500)
Mean Outcome Effect	5.15 53%	2.31 126%	0.48 -162%	0.19 35%	25.83 124%	3.22 22%
Panel B: Substitution	Alcohol	Nicotine	Newborn Mom	Newborn Milk	HIV	Hepatitis
and Contamination	(7)	(8)	(9)	(10)	(11)	(12)
Share Ret. ANG-MOZ	-6.298 (41.722)	11.870 (72.716)	-0.011 (0.670)	0.127 (1.710)	18.311 (17.016)	0.070 12.477
Mean Outcome Effect	325.40 -2%	180.84 6%	0.772 -1%	2.29 5%	39.01 46%	50.50 0%
Population 1960 Education 1960 Retornados Total	×	×	×	×	×	×
District	×	×	×	×	×	×
Doubly Robust	×	×	×	×	×	×
Parishes Observations	1,899 3,798	1,899 3,798	1,899 3,798	1,899 3,798	1,899 3,798	1,899 3,798

Regression Results

Results: Crime Outputs - Doubly Robust Estimation

Table: Effect on Crime Rates – Doubly Robust DiD Estimator (Sant'Anna and Zhao, 2020)

		Crime rate per 100.000 inhabitants						
	Homicide	Assault	Theft	Burglary	Robbery	Sexual Assault		
	(1)	(2)	(3)	(4)	(5)	(6)		
ANG-MOZ High Group	-1.295 (1.859)	58.699 (45.583)	-45.968 (34.729)	-16.888 (14.058)	0.226 (3.998)	-0.584 (0.920)		
Pop. 1960	×	×	×	×	×	×		
Education 1960	×	×	×	×	×	×		
Ret. Total								
District	×	×	×	×	×	×		
Doubly Robust	×	×	×	×	×	×		
Mean Outcome	6.39	386.22	482.05	299.29	18.01	4.73		
Effect (%)	-20%	15%	-9%	-6%	1%	-12%		
Municipalities	182	182	182	182	182	182		
Observations	364	364	364	364	364	364		

Regression Results