

Dictating Development? The Political Economy of Rwanda's Fertility Transition

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Introduction

- How do local institutions bolster successful policy implementation?

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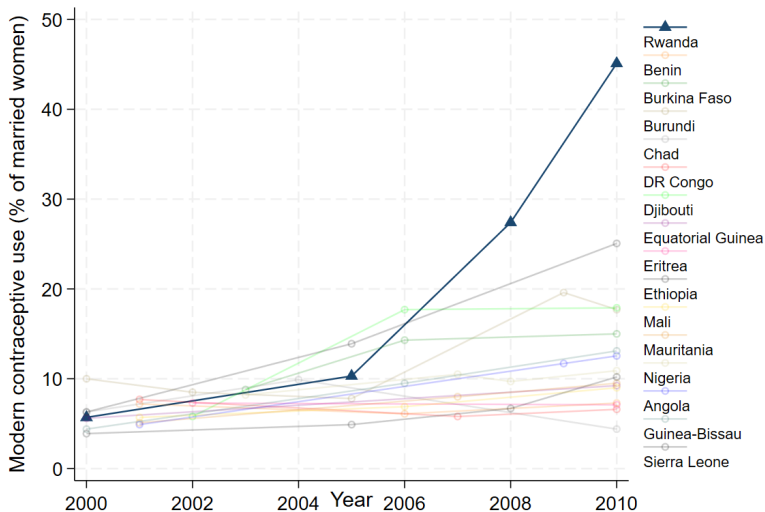
- How do local institutions bolster successful policy implementation?

Our Focus: Rwanda, known for substantial progress on development indicators e.g. family planning in the 00's. Two oft-cited explanations:

- *Community meetings* held at village level.
 - ▶ can empower and enhance bottom-up monitoring (Besley et al., 2005; Beath et al., 2017; Björkman Nyqvist et al., 2017)
 - ▶ but also be a tool in top-down policy implementation (Parthasarathy et al., 2019; Acemoglu et al., 2014; Bonnier et al. 2020).
- *Performance contracts* for local leaders. Potentially:
 - ▶ increase effort, thereby close information gaps or improve access (Ashraf et al., 2014, Björkman & Svensson, 2009)
 - ▶ entail pressure and coercion (Léon-Ciliotta et al., 2023; Pelras & Renk, 2023)

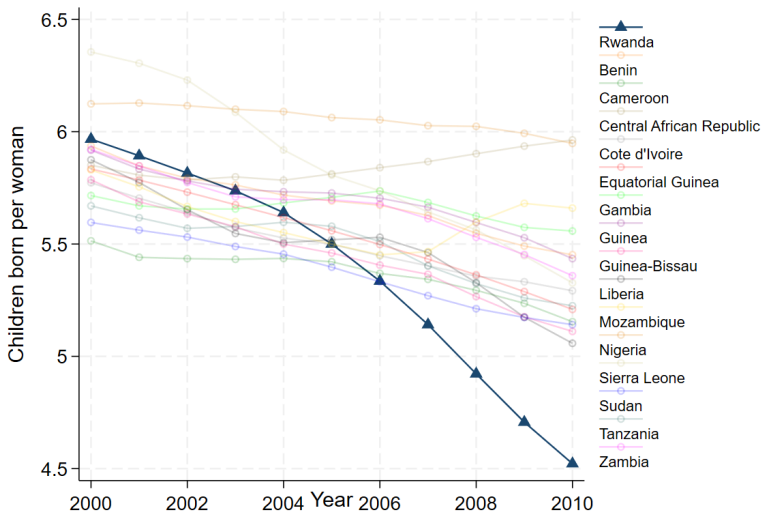
We analyze the impact of **community meetings** – and their interaction w **Performance contracts** – on adoption of a stigmatized health technology: **contraceptives**.

Contraceptives in Africa in the 2000's



Source: UN WPP (2024); HFD (2024) – w. major processing by Our World in Data

Fertility in Africa in the 2000's



Source: UN WPP (2024); HFD (2024) – w. major processing by Our World in Data

What we do

We want to estimate the effect on mandatory community meetings on contraceptive adoption, around the launch of performance contracts.

- before: local leaders' preferences similar to local population.
- after: local leaders' incentives aligned w the government's.

Empirical Challenge:

- Plausible omitted variable bias in assessing the impact of meetings.
- No reliable data on participation rates in meetings.

Empirical strategy:

- meetings are held outdoors on Saturdays \Rightarrow we utilize exogenous variation in rainfall to proxy for intensity of community meetings.
 - ▶ Methodology from [Bonnier, Poulsen, Rogall & Stryjan, 2020](#).

Preview of Findings

- **After the launch of performance contracts** for local leaders, one more meeting in a month in a given village
⇒ 18% ↑ in likelihood to adopt contraceptives in same month.
 - ▶ No relation betw. our meeting proxy and adoption before performance contracts (sig. difference betw periods).
- ⇒ Top down mechanisms important for success of community meeting!
- Suggestive evidence of
 - ▶ pressure on citizens to adopt
 - ▶ inefficiencies in implementation.

Context: Rwanda in 00's

A low income country, 169th on “Human Development Index” in 2004.

- in 2004, Rwandan gvmt launched ambitious 5-year Health Sector Strategic Plan aligned with UN Millennium Development Goals.
 - ▶ Objectives included increasing modern contraceptive prevalence from 4% to 20% by 2010.
 - ▶ Widespread opposition to and stigma around contraceptive use; strong pro-natalist norms post-1994 genocide.
- Nevertheless, by 2010, Rwanda surpassed its targets, with modern contraceptive use at 25.2%, and a substantial drop in fertility, vastly outperforming similar countries.

Mandatory community meetings: *Umuganda*

Umuganda: a community program mandatory for all Rwandan adults, held on Saturdays. Re-institutionalized from the late 1990's.

- outdoor physical labor followed by **meetings**, that:
 - ▶ ...officially aim to help population resolve local issues.
 - ▶ ...involve top-down communication of gvmt policies.
(Mukarubuga, 2004; Purdekova, 2011, Uwimbabazi, 2012)
 - ▶ ...are recognized by the government as tools for implementing development targets from performance contracts.
- Participation often involuntary. (Mukarubuga, 2004; Purdekova, 2011)

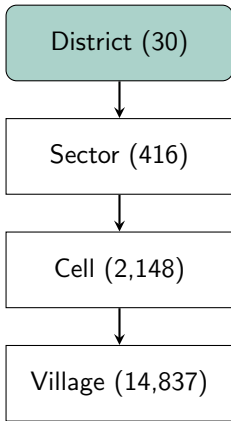
Performance contracts for public officials: *Imihigo*

Performance contracts for district mayors introduced in April 2006 by president Kagame; cascaded down to all levels of public administration.

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- most local targets reflect national policies.
(Hasselskog, 2015; Ingelaere, 2014)
 - ▶ contraceptive use a central target nationwide.
- public vows and evaluations, risks of public humiliation and job loss for poor performance.
- village targets implemented by having **residents vow contributions in Umuganda meetings.**
 - ▶ Village, cell and sometimes higher level **leaders visit these meetings.**
 - ▶ vows recorded in booklets & followed up, reports of pressure and compulsion.



Umuganda community meetings in the 2000's



Umuganda community meetings in the 2000's



Conceptual framework

- Development targets set by government, but local leaders and the community decides how to implement them. (Hasselskog, 2015)
 - ▶ Since 2004, contraceptives were a prioritized policy goal to be discussed during meetings.
 - ▶ Before performance contracts (April 2005 - March 2006) community members could potentially use meeting to coordinate on contraceptive use.
 - ▶ With performance contracts (April 2006 - March 2007), local leaders are incentivized to increase adoption rates.
- Achieving targets could be framed as a public good, with the whole community held accountable for implementation failures.
- Local leaders can use **community meetings** to
 - ▶ convey government policies (before and after).
 - ▶ choose contributors and oversee the collective implementation process (after).

Alternative mechanisms & Saturday effects

An additional channel through which the meeting or Saturday rainfall could affect take-up:

1. **Information** about benefits or how to use technology (Ashraf et al., 2014, Björkman & Svensson, 2009)
 - ▶ Not likely as information was high throughout the period.
2. **Access**: If non-rainy Saturdays enabled visits to health center, our Saturday rain measure could also pick up **access**.
 - ▶ health centers closed or too expensive on weekends.
 - ▶ (91% of any modern method users in DHS report that source was a health facility.)

Data

(1) Outcomes from DHS (Demographic and Health Survey)

- ▶ adoptions and conceptions fr. calendar entries (DHS, 2010)
- ▶ additional outcome var: bed nets from DHS, 2005, 2007/08
- aggregated at village level
 - ▶ representative sample 492 villages, 12,540 HHs in DHS 2010.

(2) Explanatory variable: Rainfall data from US NOAA

- ▶ CMORPH data, High frequency, starting in 1998.
- Mapped to village using GPS coordinates.
- We define dummies for “non-rainy” days following [Bonnier et al., 2020](#); [Madestam et al., 2013](#); [Moreno-Medina, 2019](#).

More on data considerations

Empirical strategy

$$Y_{it} = \alpha + \sum_{d=1}^7 \beta_d \times \text{norain}_{ctd} + \gamma_i + \tau_t + \varepsilon_{it}$$

- Y_{it} is a binary variable $\in \{0, 100\}$ of adoption of the observational unit i (woman or household) during month t .
- norain_{ctd} is the number of “non-rainy” weekday d in observational unit i 's community c during month t . (different thresholds used).
- γ_i and τ_t are observational unit and monthly time fixed effects.
- Errors clustered at the community (village) level = entity of meetings and local leaders' performance targets.
- The regression is run separately for the 2 time intervals

Main result

Dependent variable: Panel data:	Contraceptive Adoption		p-value (1) - (2)
	after	before	
	(1)	(2)	
# Sat. (Rainfall \leq 3mm)	0.071*** (0.023)	-0.019 (0.025)	[0.008]
# Sun. (Rainfall \leq 3mm)	-0.015 (0.027)	-0.029 (0.022)	[0.688]
# Mon. (Rainfall \leq 3mm)	0.020 (0.032)	-0.004 (0.028)	[0.575]
# Tue. (Rainfall \leq 3mm)	0.034 (0.033)	0.009 (0.021)	[0.522]
# Wed. (Rainfall \leq 3mm)	0.036 (0.032)	-0.012 (0.021)	[0.213]
# Thu. (Rainfall \leq 3mm)	0.014 (0.027)	0.002 (0.027)	[0.750]
# Fri. (Rainfall \leq 3mm)	-0.037 (0.027)	0.020 (0.023)	[0.106]
Observations	130,966	125,193	
Unit & Time FE	Yes	Yes	
Dep. var. mean	0.395	0.228	

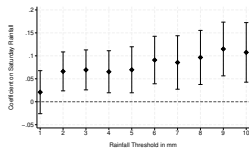
Main result

- Before performance contracts we observe no systematic relation between “meetings” and contraceptive adoption.
- After performance contracts were introduced, one more meeting (non-rainy Saturday) in a month \rightarrow 0.071 ppt higher likelihood to adopt contraceptives in the same month - an 18% increase (0.071/0.395).
 - ▶ effects significantly different from Saturday rain estimate between the two time periods.

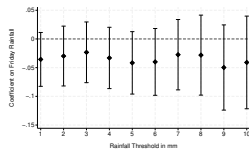
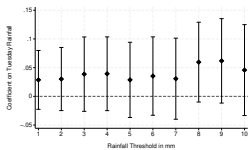
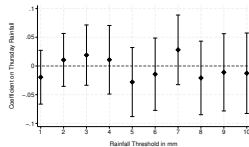
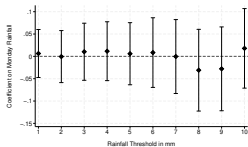
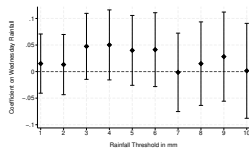
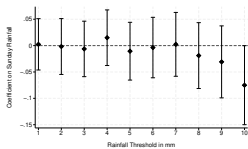
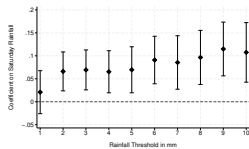
numbers

rolling reg

Results robust to threshold choice



Results robust to threshold choice



Robustness and Mechanisms

Robustness: Are results robust to other incentivized outcomes also prioritized in the 2004 Health Sector Strategic Plan?

- Another outcome that was emphasized in Rwanda's development plan is bednets. While proven effective in preventing malaria, large share of Rwanda is high altitude and not prone to mosquitos.
 - ▶ Indeed, very similar effect pattern of meetings on bednet adoption: Bednets
 - ▶ Finding the same pattern for two targeted, but otherwise unrelated outcomes suggests that performance contracts are responsible for aligning meetings with national policy.

Mechanisms: To understand if pressure and enforcement are important we examine:

- conception (pregnancies) as a strategy to avoid contraceptives
- heterogenous effects by objective need of bednets.

Mechanisms

Dependent variable: Panel data:	Conception		p-value (1) – (2)	Bed Net Acquisition	
	after	before		Median split by altitude	
	(1)	(2)		high (3)	low (4)
Sat. (Rainfall \leq 3mm)	0.121** (0.048)	-0.062 (0.066)	[0.024]	0.232*** (0.087)	0.139 (0.089)
Sun. (Rainfall \leq 3mm)	-0.050 (0.057)	0.075 (0.059)	[0.143]	-0.134 (0.095)	-0.053 (0.102)
Mon. (Rainfall \leq 3mm)	-0.063 (0.062)	-0.016 (0.068)	[0.614]	0.143* (0.080)	0.158 (0.096)
Tue. (Rainfall \leq 3mm)	0.088 (0.061)	0.053 (0.066)	[0.705]	0.104 (0.099)	-0.069 (0.090)
Wed. (Rainfall \leq 3mm)	0.145** (0.062)	0.005 (0.058)	[0.096]	0.006 (0.103)	0.103 (0.102)
Thu. (Rainfall \leq 3mm)	-0.024 (0.052)	0.133* (0.070)	[0.079]	-0.054 (0.080)	-0.032 (0.100)
Fri. (Rainfall \leq 3mm)	-0.075 (0.055)	0.005 (0.062)	[0.323]	-0.020 (0.074)	-0.187** (0.091)
Unit FE	Yes	Yes		Yes	Yes
Time FE	Yes	Yes		Yes	Yes
Observations	130,966	125,193		43,500	43,944
R-squared	0.072	0.070		0.083	0.087
Dep. var. mean	1.445	1.610		1.733	2.203

Mechanisms

- After performance contracts were introduced, one more meeting in a month → 0.121 ppt higher likelihood of *conception* in the same month.
 - ▶ Significantly different from the Saturday rain estimate in the before period.
 - ▶ Suggestive evidence of “avoidance” behavior to preempt enforcement.
- For bed nets: meetings were especially effective in areas with the lowest objective need for the technology: high altitude areas.
- Suggests there was pressure to adopt – despite this being inefficient.

Conclusion

- Community meetings entail higher adoption of contraceptives...
- but only when leader performance contracts are in place.
- indications of enforcement and increases in adoption occurring independent of demand.
- Findings challenge notion that community meetings mainly drive development through bottom-up pressure; they may be used by leaders to exert top-down pressure or persuasion.
- New perspective on Rwanda's top performance in MDGs; relevant for understanding developments in other countries w authoritarian tendencies.
- Possible social/political backlash of perceived coercive policies in the fertility domain (Léon-Ciliotta et al., 2023; Pelras & Renk, 2023)

Thank you!

Appendix

Two points about measures and data suitability

Exogenous variable: How define a “rainy” day?

- We study outdoor meetings and define dummies for “rainy” days following Bonnier et al., 2020; Madestam et al., 2013; Moreno-Medina, 2019.
- The American Meteorological Society classifies rainfall > 2.5 mm as “moderate”. We choose the closest integer to this threshold: 3 mm.
 - ▶ reassuringly, our results are robust to higher thresholds.

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Outcome data: Desirability or recall bias affecting measures of take-up?

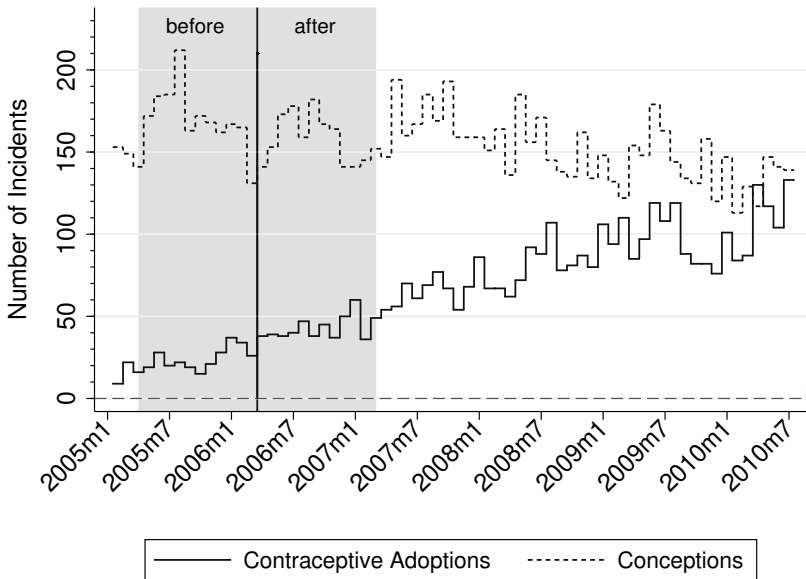
- Desirability bias unlikely given the delay in survey data collection.
- 90% of contraceptives are injectables or IUDs for which date can be verified, limiting recall issues.

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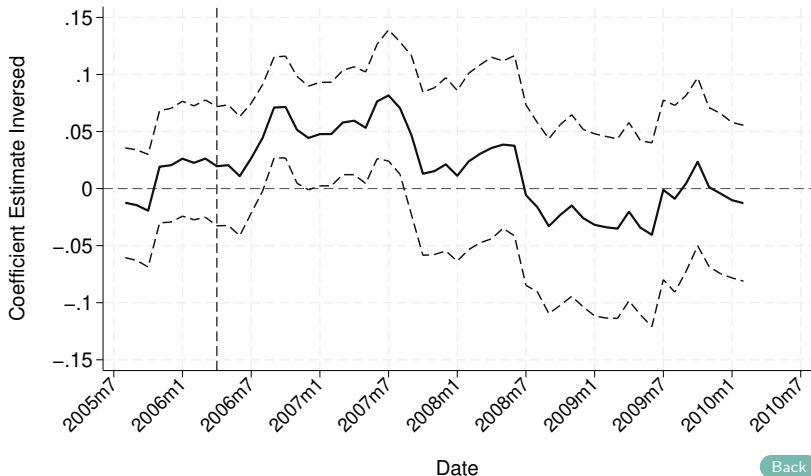
Robustness: bednets as outcome

Dependent variable: Panel data:	Bed Net Acquisition		p-value (1) - (2)
	after (1)	before (2)	
# Sat.(Rainfall \leq 3mm)	0.174*** (0.063)	0.009 (0.030)	[0.018]
# Sun.(Rainfall \leq 3mm)	-0.105 (0.068)	-0.038 (0.031)	[0.363]
# Mon.(Rainfall \leq 3mm)	0.151** (0.062)	0.002 (0.028)	[0.028]
# Tue.(Rainfall \leq 3mm)	0.006 (0.066)	-0.030 (0.033)	[0.621]
# Wed.(Rainfall \leq 3mm)	0.061 (0.071)	0.029 (0.033)	[0.691]
# Thu.(Rainfall \leq 3mm)	-0.049 (0.063)	0.049 (0.032)	[0.166]
# Fri.(Rainfall \leq 3mm)	-0.103* (0.058)	0.019 (0.029)	[0.061]
Observations	87,444	121,752	
Unit & Time FE	Yes	Yes	
Dep. var. mean	1.969	0.636	

Numbers over time



rolling window coeff on # NonrainySat and 95% c.i.



The regression estimates are displayed above the 7th month of the rolling window.

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