Workfare programs and family planning: The case of MGNREGA

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    - Employment guarantee scheme in rural India

- I employ difference-in-differences technique to estimate causal effects.

- Intra-household bargaining as well as additional household income is a likely mechanism of impact.

Institutional background

- The Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), 2005

    - 100 days of minimum wage paid public employment per fiscal year for all households in rural India.

    - Projects involve the use of unskilled manual labor.

- At least one-third of the beneficiaries are required to be women with a wage paid as equal to the men.

- Workfare programs are used largely as an outside option in rural areas. Plot Person-days

Theory of change
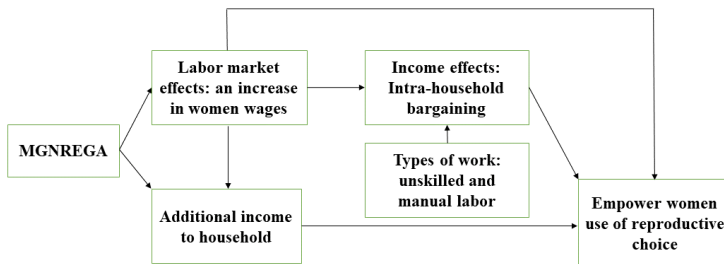
Note: The figure highlights the various mechanisms through which MGNREGA, the employment guarantee act empowers the use of women reproductive choice. Source: Own elaboration.

Previous Literature

- **Labor market outcomes**: Azam, 2011; Imbert and Papp, 2015; Zimmermann, 2012; Muralidharan et al., 2017; Berg et al., 2018; Merfeld, 2019

- **Reduction in school engagement**: Ajefu and Abiona, 2019

- **Lower conflict levels**: Fetzer, 2020

- **Increases infant mortality**: Chari et al., 2019

Data and Summary statistics

- District Level Household and Facility Survey (DLHS): DLHS-2 (2002/04) and DLHS-3 (2007/08)

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- Timeline of the MGNREGA map of the study area

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District	200	130	270
Year	2006	2007	2008
Treatment groups	Treated		Untreated

Data and Summary statistics

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MGNREGA	Phase I	Phase II	Phase III
District	200	130	270
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- Outcome variables:
  1. **Any modern methods**: Female/Male Sterilization, Intrauterine Device (IUD), Oral Pills, Condom, and Others
  2. **Any traditional methods**: Rhythm, Periodic Abstinence, and Withdrawal
  3. **Any family planning methods**: 1+2
- Summary statistics of `outcome variables`

Inverse probability of treatment weighting

$$Treated_d = \beta_0 + X_d{'}\beta + \varepsilon_d$$

where X_d is a vector of district-level variables

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- Selected district-level summary statistics

	Treated	Control	Diff. (p)
Propensity score	0.579	0.605	0.582
Percent Scheduled Castes	0.160	0.137	0.145
Percent Scheduled Tribes	0.133	0.237	0.111
Average casual wage (INR)	318.108	324.924	0.688
LFPR	0.658	0.673	0.344
Female LFPR	0.200	0.222	0.162
Number of districts	280	199	479

Note: IP-weighted mean is reported. LFPR refer to the Labor Force Participation Rate. INR refer to Indian rupees.

IP-weighted individual summary statistics

Econometric DiD Specification

$$y_{ihdt} = \beta_0 + \beta_1 T_d * Post_t + \xi_{ihdt} + \alpha_d + \phi_{st} + \lambda_{mt} + \varepsilon_{ihdt}$$

where:

- y_{ihdt} is the outcome of interest for individual i in household h in district d at time t
- T_d is the dummy variable, 1 if public workfare program, MGNREGA, is available in district d
- $Post_t$ is a dummy variable indicating that the observation is from DLHS-3 (2007/08)
- ξ_{ihdt} is a vector of individual-level and household-level controls
- α_d, ϕ_{st}, and λ_{mt} is a vector of district, state-year, and month and year of the interview fixed effects
- ε_{ihdt} is the error term

Effects of MGNREGA on the use of family planning methods

	Any methods	Any modern methods	Any traditional methods
MGNREGA x Post	0.032***	0.013**	0.003
	(0.011)	(0.006)	(0.005)
Mean dep. var.	0.337	0.466	0.071
Observations	580,432	580,421	580,421
Number of districts	479	479	479
R-squared	0.270	0.252	0.091

Note: Levels of significance: p< 0.01***, p< 0.05**. Robust standard errors in parentheses are clustered at the level of treatment (district). WLS estimator is used for all regressions.

Regression results without IP-weight

# Effects of MGNREGA on selected types of reproductive choice

	Female sterilization	IUD/Cooper-t	Oral pills
MGNREGA x Post	0.004	0.0002	0.004
	(0.005)	(0.002)	(0.003)
Mean dep. var.	0.356	0.017	0.043
Observations	580,421	580,421	580,421
Number of districts	479	479	479
R-squared	0.301	0.033	0.085

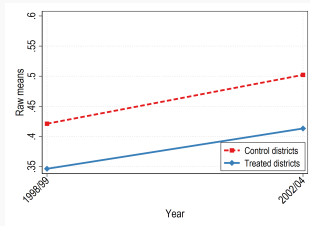Note: WLS estimator is used for all regressions.

Pre-Program Trends
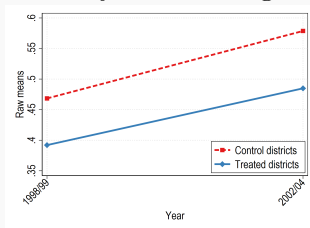
- Raw-mean by treatment groups
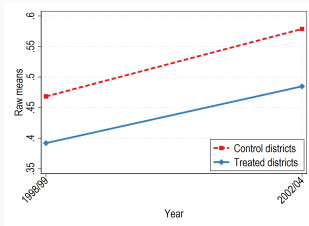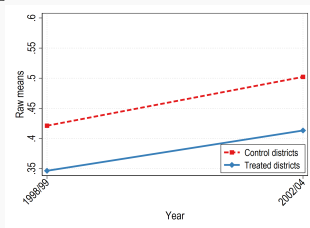

(a) Any family planning methods

(b) Any modern methods

Pre-Program Trends

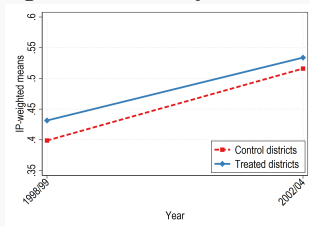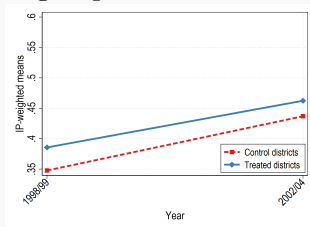- Raw-mean by treatment groups

(a) Any family planning methods

(b) Any modern methods

- IP-weighted mean by treatment groups

(a) Any family planning methods

(b) Any modern methods

Effects of MGNREGA on the use of family planning methods - Placebo

	Any methods	Any modern methods	Any traditional methods
MGNREGA x Post	-0.010	-0.012	0.001
	(0.011)	(0.008)	(0.007)
Mean dep. var.	0.468	0.408	0.060
Observations	573,892	573,882	573,882
Number of districts	418	418	418
R-squared	0.140	0.138	0.093

Note: *Post* is a dummy variable indicating that the observation is from the 2002/04 round, before the program was implemented, to assess whether pre-program outcomes are trending differentially. WLS estimator is used for all regressions.

Threats to identification

1. Districts assigned in different phases were non-random.
   - IP-weighted to match district characteristics

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3. Two-way fixed effects (TWFE) linear regression can provide biased estimates in DiD with multiple time periods (Callaway and Sant'Anna, 2021)
   - Show that MGNREGA in all districts were homogeneously implemented.

Potential pathways

- Labor reallocation toward non-agricultural activities.

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- Labor reallocation toward non-agricultural activities.
- Effect of MGNREGA on employment situations

|	Self-employed: Farm	Self-employed: Non-farm
MGNREGA x Post	0.002	-0.008***
	(0.006)	(0.003)
Mean dep. var.	0.113	0.053
Observations	429,147	429,147
Number of districts	483	483
R-squared	0.061	0.015

Note: The dependent variables are share of days spent on each occupation choice and are in log terms using IHS transformation.

Concluding remarks

- This paper provides new evidence on the impact of public works on the use of family planning methods.

- I exploit the variation in timing of the treatment to employ a difference-in-differences (re-weighted) estimator.

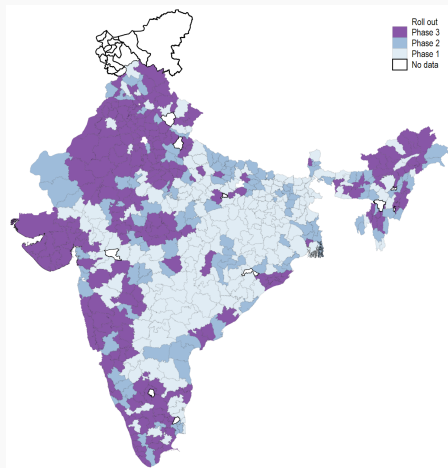- I find that MGNREGA increased the use of family planning methods by **3** percentage points.

Total Employment provided by National Rural Employment Guarantee scheme
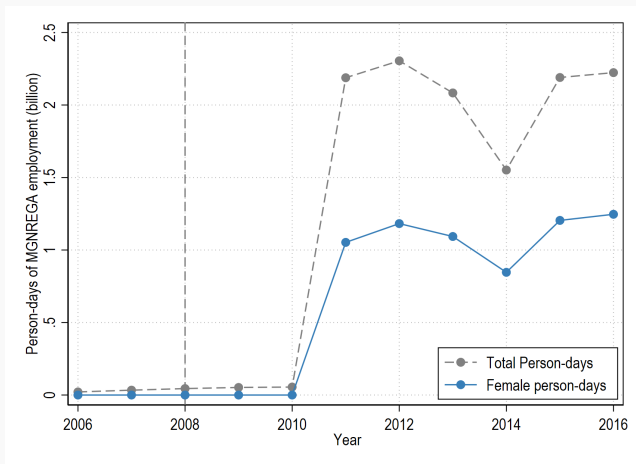
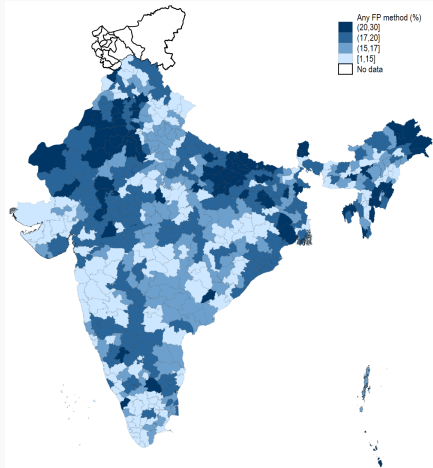

Source: Management Information System (MIS), Government of India.

Back to ◀ MGNREGA

Map of study area

(a) NREG phase-wise roll out

(b) Current use of Family Planning (FP) methods
(Current married rural women age 15-44 years).
Source: DLHS-2, 2002/04

Back to ◂ data

Individual-level summary statistics

	Treated	Control	Diff. (p)
Any family planning methods	0.302	0.480	0.000
	[397,627]	[245,263]	
Any modern methods	0.433	0.522	0.000
	[397,642]	[245,265]	
Any traditional methods	0.069	0.075	0.412
	[397,642]	[245,265]	

Note: Raw-mean is reported. Observations are in square bracket. Treated includes phase one and two districts, and control includes phase three districts. Source: DLHS round 2 (2002/04).

Individual-level summary statistics

	Treated	Control	Diff. (p)
Any family planning methods	0.341	0.329	0.592
	[356,502]	[224,885]	
Any modern methods	0.481	0.441	0.192
	[356,487]	[224,889]	
Any traditional methods	0.069	0.073	0.554
	[356,487]	[224,889]	

Note: IP-weighted mean is reported. Observations are in square bracket. Treated includes phase one and two districts, and control includes phase three districts. Sample is restricted to common support region. Source: DLHS round 2 (2002/04).

Back to ◂ specification

Effects of MGNREGA on the use of family planning methods

	Any methods	Any modern methods	Any traditional methods
MGNREGA x Post	0.042***	0.019***	0.004
	(0.011)	(0.006)	(0.005)
Mean dep. var.	0.332	0.467	0.071
Observations	641,841	641,858	641,858
Number of districts	536	536	536
R-squared	0.270	0.251	0.091

Note: Levels of significance: p< 0.01***, p< 0.05**. Robust standard errors in parentheses are clustered at the level of treatment (district). OLS estimator is used for all regressions.

◂ return

Effects of MGNREGA on the use of family planning methods by female LFPR: Triple difference

	Any methods	Any modern methods	Any traditional methods
MGNREGA x Post x	-0.011	-0.005	0.001
High Female LFPR	(0.022)	(0.014)	(0.012)
MGNREGA x Post	0.038**	0.015	0.001
	(0.016)	(0.009)	(0.010)
Mean dep. var.	0.337	0.466	0.071
Observations	580,432	580,421	580,421
Number of districts	479	479	479
R-squared	0.270	0.252	0.091

Note: Levels of significance: $p < 0.05$**. WLS estimator is used for all regressions.