



Trade and Health: Effect of the 2015 Nepal-India Border Blockade on Child Mortality

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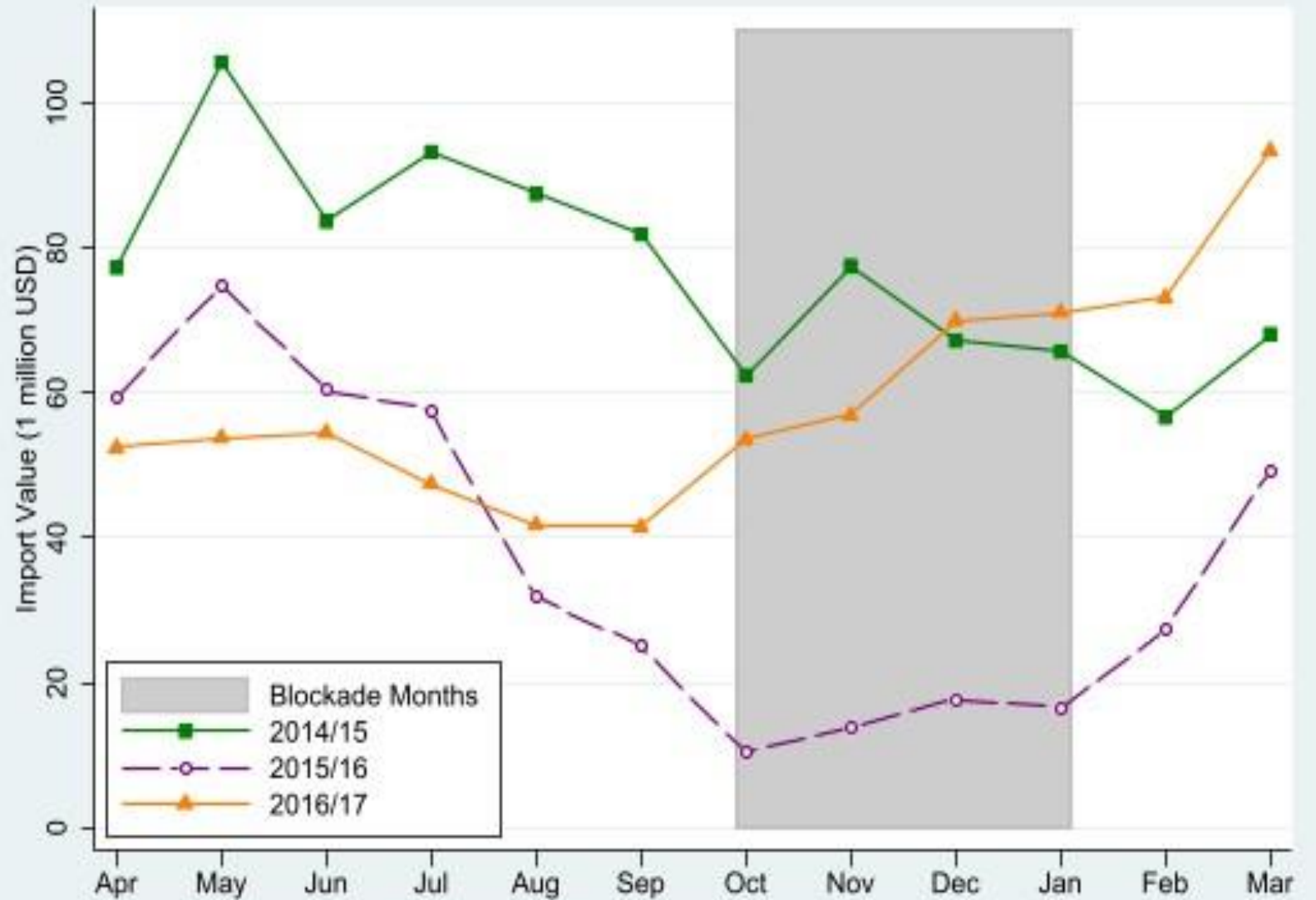
Overview

Objective	Examine the child mortality consequences of trade stagnation in Nepal due to 2015 Nepal-India border blockade
Data & Analysis	Natural political experiment, Province-panel and individual child level analysis using Nepal DHS 2016 dataset
Key variables	Mortality rate, births on blockade months (Blockade dummy)
Major Findings	5% increase in neonatal death for children born on blockade months, Effects are intense for high-risk mothers
Validity	Results un-confounded by preexisting mortality trend and robust to non-parametric regression discontinuity estimation

Background

- Volatile political climate in Nepal 2006 - 2015.
 - Constitution assembly, partisan strife, ethnic divisiveness and new constitution.
- Demonstration at Nepal's Southern border after the new constitution in 2015.
 - Trade stagnation, reduced supply of fuel and essential goods.

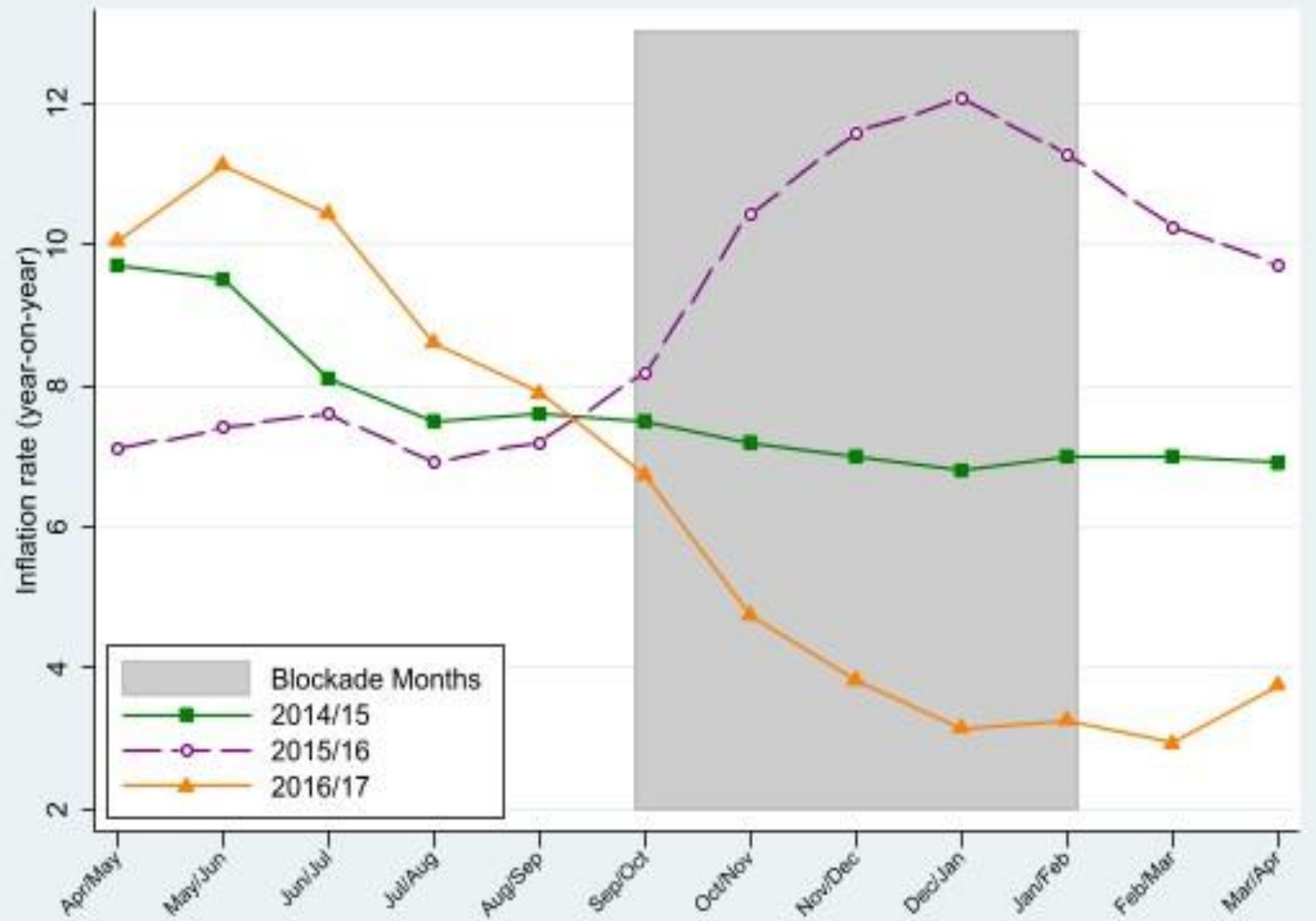
Effect on Petroleum Supply from India



Note: Imported products are those with the HS code 2709 and 2710.

Source: Authors' drawing from UN Comtrade database.

Effect on Inflation Rate



Source: Authors' drawing from Database on the Nepalese Economy Nepal Rastra Bank 2014-2016.

Existing Studies on Trade and Health

Trade Sanctions

- Effects of legally binding long-term sanctions on maritime countries (e.g. Parker, Foltz & Elsea 2016).

Land - lockedness

- Mostly macroeconomic consequences instead of microeconomic effects (e.g. Arvis, Raballand & Marteau 2010)

Public Health

- Descriptive and conjectural approach to investigate health effects of trade sanctions (e.g. Deponte and Garfield 2000)

Dataset

- Nepal Demographic and Health Survey 2016: nationally representative cross-sectional survey
- 383 clusters from 7 province, 11040 households interviewed, 12862 eligible women (15-49 years).
- Provides information on birth and death history of children in the past five years preceding the survey.
- Month specific mortality rates from July 2014 to June 2016 from the birth record data.

Baseline Specification

Province level: $M_{im_y} = blockade_{my} \beta + \delta_{im} + \delta_{iy} + \gamma_{im_y} + \mu_{im_y}$ (1)

- M_{im_y} is deaths per 100 live births in a province i in a month m and year y , γ_{im_y} province-month linear trend
- $blockade_{my}$ is the period from 7th-9th of 2072 Bikram Sambat year,

Child level: $D_{ihjt} = blockade_t \beta + X_{ih} \Theta + \delta_{jt} + v_{ihjt}$ (2)

- D_{ihjt} takes unity if a child i in household h in village j born in period t died within first month of his/her life.
- $blockade_t$ is the period from 7th-9th of 2072 Bikram Sambat year

Regression Discontinuity Estimation (for robustness check)

$$D_{it} = \alpha_0 + \alpha_1 blockade_t + \alpha_2 r(t) + \alpha_3 \{r(t) * blockade_t\} + \mu_{it}$$

$$\forall t \in (t_0 - h^*, t_0 + h^*)$$

- $r(t)$ time trend and h^* estimated optimal bandwidth

Result: Impact on Mortality

	(1)	(2)	(3)	(4)	(5)	(6)
	Under 5		5 to 9		10 to 19	
Panel A: Child Mortality						
Treatment (blockade)	0.082**	0.089*	-0.001	-0.006	-0.004	-0.005
	(0.032)	(0.040)	(0.005)	(0.007)	(0.002)	(0.005)
R-squared	0.028	0.020	0.004	0.005	0.019	0.024
	20 to 29		30 to 39		40 to 49	
Panel B: Adult Mortality						
Treatment (blockade)	-0.003	0.002	0.013	0.010	0.009	-0.009
	(0.005)	(0.005)	(0.012)	(0.010)	(0.019)	(0.033)
R-squared	0.004	0.004	0.020	0.021	0.009	0.012
Province-month fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Province-month linear trend	No	Yes	No	Yes	No	Yes
Observations (7 Province X 60 Months)	420	336	420	336	420	336

Source: Authors' calculation from NDHS data. Robust standard error in the parenthesis. Mortality rates in Column 1 and 2 are total no of death under 5 divided by total under 5 children alive at the begging of corresponding months. Blockade months represent 7th to 9th months of Nepal year 2072.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Impact of Child Mortality (Decomposition)

	(1)	(2)	(3)	(4)	(5)	(6)
	Neonatal deaths (< 1 month)		Infant deaths (1 to 12 month)		Child deaths (1 to 5 years)	
Treatment (blockade)	4.375*	3.815*	0.020	0.131	-0.009	-0.011
	(2.115)	(1.871)	(0.061)	(0.187)	(0.011)	(0.007)
Province-month fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Province-month linear trend	No	Yes	No	Yes	No	Yes
Observations	420	336	420	336	420	336
R-squared	0.045	0.035	0.006	0.005	0.011	0.007

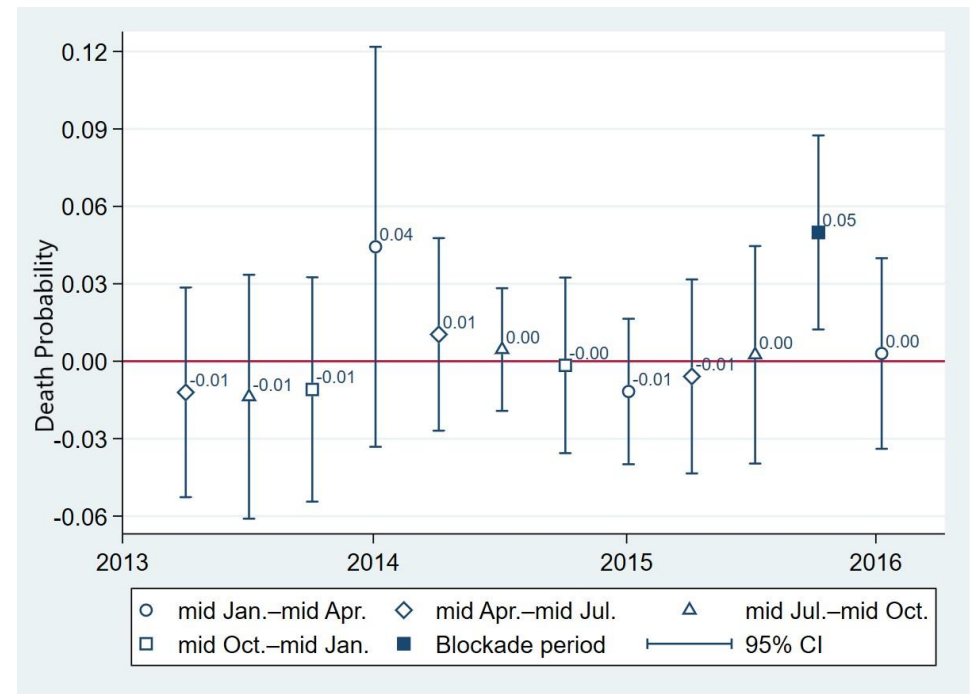
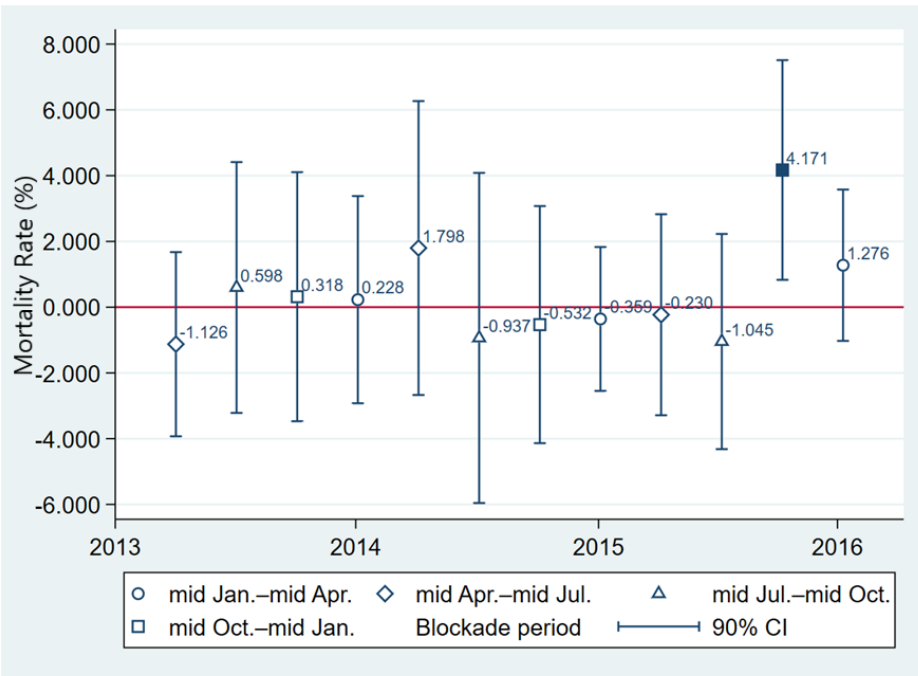
Source: Authors' calculation from NDHS data. Robust standard error in the parenthesis. Mortality rates are total no of death divided by total children alive at the beginning of corresponding months. Denominator for neonatal death rare in column 1 and 2 is the total live births at the beginning of corresponding month. Blockade months represent 7th to 9th months of Nepal year 2072: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Result: Neonatal Mortality – Child Level Data

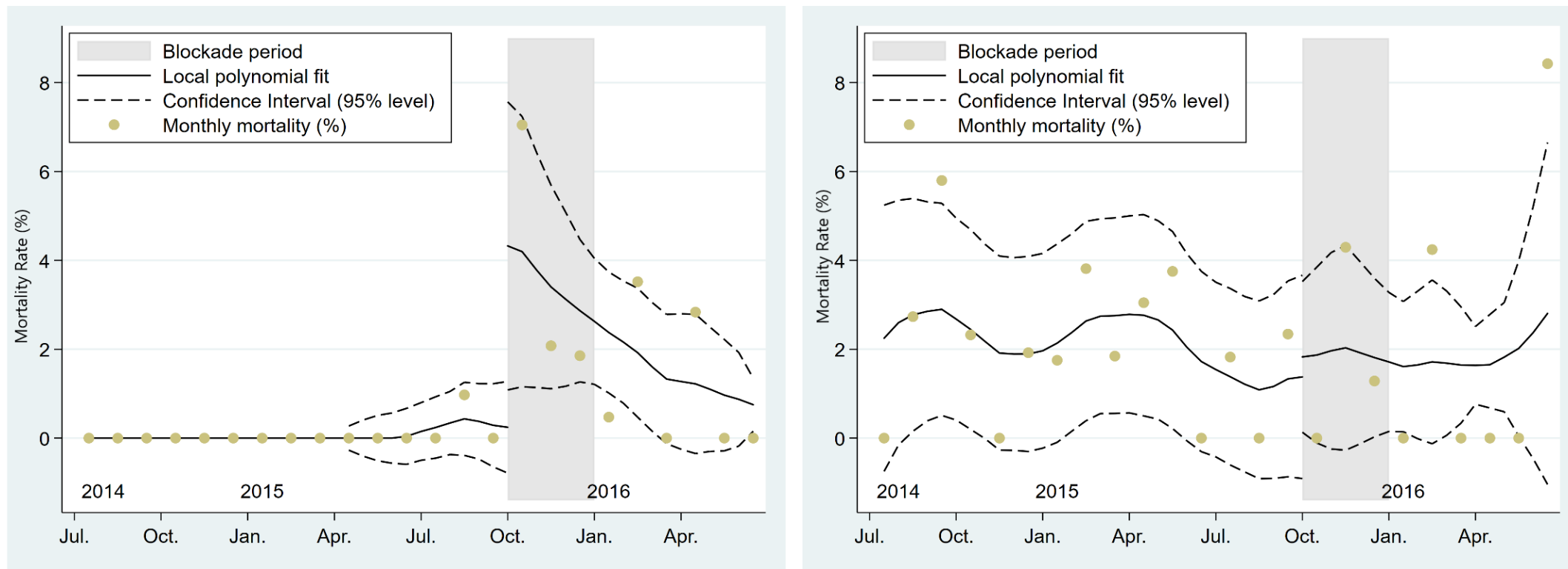
	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable: Died	under 1 month old		within 15 days		on birthday	
Mean (std. dev.)	0.0156 (0.1239)		0.0134 (0.1150)		0.0099 (0.0991)	
Blockade (mid-Oct 2015 & mid-Jan 2016)	0.052 ^{***} (0.020)	0.050 ^{***} (0.019)	0.049 ^{**} (0.020)	0.048 ^{**} (0.019)	0.033 ^{**} (0.014)	0.032 ^{**} (0.013)
District-month fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
district-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Mother & HH characteristics	No	Yes	No	Yes	No	Yes
Observations	2,840	2,840	2,840	2,840	2,840	2,840
R-squared	0.336	0.372	0.323	0.349	0.325	0.351

*Source: Authors' calculation from the birth record of 2016 NHDS data. Note: Standard errors in the parenthesis are clustered at NDHS primary sampling units. An observation is a child born within five years preceding the survey. Estimates are interpreted as the proportion of deaths. Blockade months correspond to the first day of Kartik 2072 to the end of Paush 2072 in the Bikram Sambat calendar. Coefficients are adjusted for district-month fixed effects, district-year fixed effects, maternal (e.g. age, education, delivery method and place of delivery) and household characteristics (e.g. wealth index). Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$*

Potential Confounding



Robustness Check



*Note: Neonatal (< 1 month) death rate. Urban sub sample in the left and rural in the right.
The solid lines represent kernel-weighted local polynomial smooth fits with triangular kernel weights.*

RD Effect on Child Mortality

	(1)	(2)	(3)	(4)	(5)	(6)
	Urban Sample			Rural Sample		
Age group	Neonatal (<1 month)	1 to 11 months	12 to 23 months	Neonatal (<1 month)	1 to 11 months	12 to 23 months
RD effect	0.047** (0.022)	-0.001 (0.002)	0.000 (0.000)	-0.003 (0.030)	0.000 (0.000)	-0.001 (0.002)
Estimated bandwidth	10.999	9.002	18.723	7.666	11.226	11.338
Observations	2,615	28,440	30,902	1,991	21,352	23,072

Cutoff is at the onset of blockade (7th month of Bikram Sambat year 2072), treatment effects are non-parametric RD estimation based on MSE-optimal bandwidth with triangular kernel weights. Standard errors in the parenthesis are clustered at NDHS 2016 primary sampling units.

Maternal characteristics

- 17.9% increase in neonatal death for children born to women under 19 and above 35 during the blockade months.
- Significant impact on pregnancy loss (20% increase) for mothers exposed to blockade during first trimester.
- No significant impact on access to perinatal care and low birthweight. Response negatively correlated with neonatal death.



Conclusion

- Although short lived, immediate impact on child mortality.
- Cautionary tail for contemplating blockade as a policy instrument.
- Unable to untangle all possible channels – lack of cause specific mortality data and medical supplies data.
- Further research on other aspects of human capital formation (e.g., education attainment).

Summary

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Reference

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