Accreditation as a Quality-Improving Tool: Family Planning, Maternal Health, and Child Health

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ERF 26th Annual Conference
June 2020

Existing evidence and motivation

- Most studies reported on the effect of accreditation on:
  - Compliance with quality standards, suggesting that accreditation has a positive effect
  - Quality of care measures (process indicators), providing no conclusive evidence on the effect of accreditation

- Limited evidence on the effect of accreditation on patient outcomes in all settings; no study estimating the effect on patient outcomes (maternal health, child health, etc.) in a low- or middle-income country being identified

- Accreditation entails significant costs and the majority—if not all—of low- and middle-income countries are resource constrained

Objectives

- Estimate the effects of improving the quality of health care through facility accreditation on family planning, maternal health, and child health outcomes

- Identify the prerequisites for sustaining the positive effects –if any; expanding knowledge on the effectiveness of quality improvement interventions in middle-income countries

Background: HSRP triggers

In 1997, Egypt launched a *Health Sector Reform Program (HSRP)* to address fundamental challenges in the healthcare system:

1. Poor health outcomes
2. Inaccessibility and inequity
3. Inefficiency
4. Poor quality of care
5. Financial instability

Background: HSRP aims

- Improve population health status and well being through universal coverage to a basic package of primary healthcare (PHC) services

- Improve access to, efficiency, and quality of PHC services

Background: HSRP interventions

1. Service delivery component

- Renewal of PHC infrastructure and equipment (supply)
- Development of human resources "family health training" (supply)
- Quality assurance "a facility accreditation program" (supply)

2. Financing component

- Rechanneling of funds from direct to performance-based financing (PBF) through Family Health Funds (FHF) at the governorate level (supply)
- Introduction of a non-linear price system for the uninsured at the point of delivery "user fees" (demand)

Background: Facility accreditation program

The *facility accreditation program* was defined by Egypt's Ministry of Health (MOH) as (1) an organized process to:

- monitor the quality of services and

- influence the behavior and functions of healthcare providers,

to ensure compliance with quality standards;

(2) followed up by visits during which technical assistance was provided to develop improvement plans.
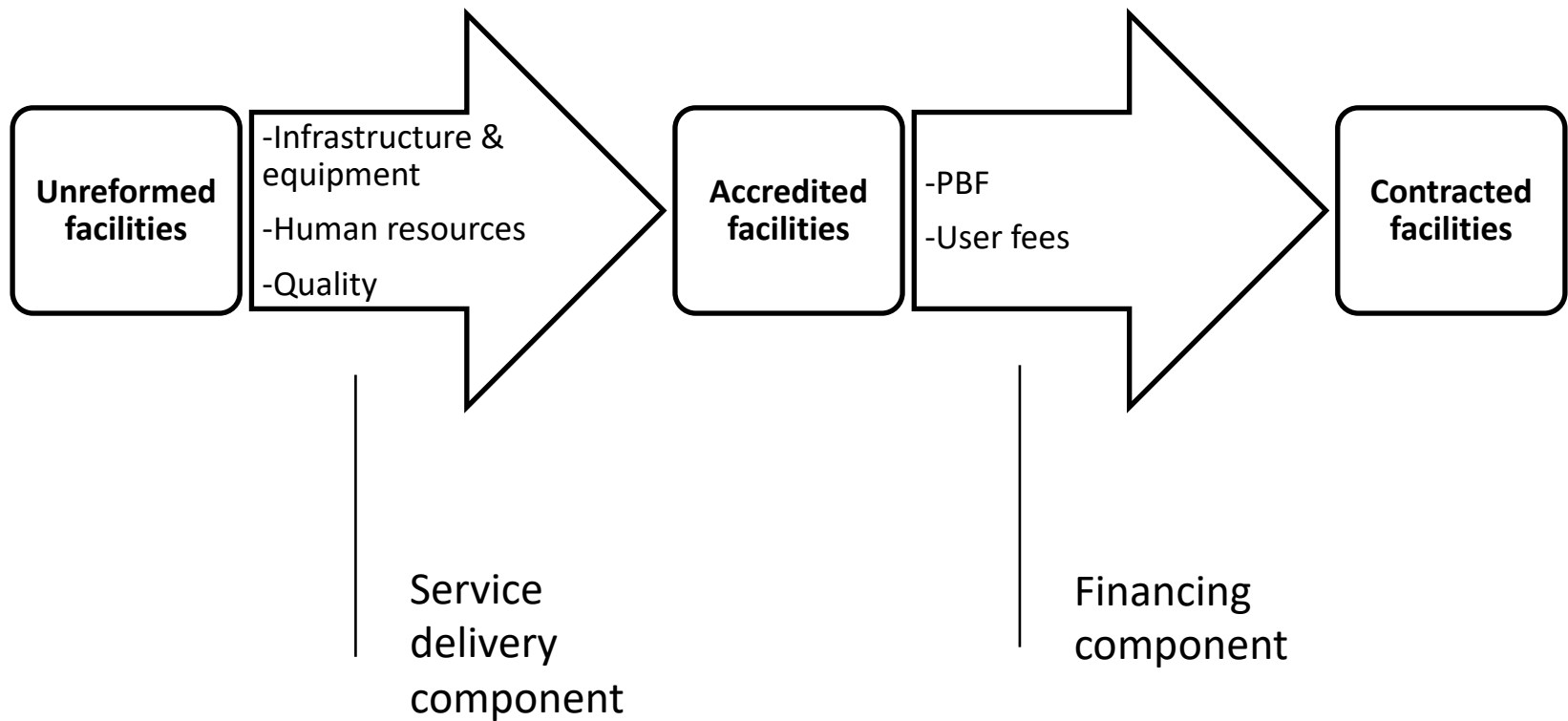
Background: Facility accreditation program (Cont'd)

The *accreditation survey* evaluates the extent to which a facility complies with the accreditation standards.

| Quality dimension	Dimension weight	% of total score
Patient rights	1	6%
Patient care	5	29%
Safety	3	18%
Support services	2	12%
Management of information	1	6%
Quality improvement program	1	6%
Family practice model	3	18%
Management of the facility	1	6%
Total	17	100%

A score of 80%+ implies full accreditation; 50-79% implies provisional accreditation; <50% implies denial of accreditation.

Background: HSRP pathway

Unreformed facilities → -Infrastructure & equipment / -Human resources / -Quality → Accredited facilities → -PBF / -User fees → Contracted facilities

Service delivery component

Financing component

Background: HSRP implementation progress

- Out of 4,882 eligible PHC facilities across Egypt, a total of 2,549 facilities were successfully accredited by year 2014,

- 763 out of which became contracted by 2014.

- A total of 1,786 PHC facilities remained "accredited only" by 2014. These facilities have not been subject to any of the financing interventions introduced under the HSRP.
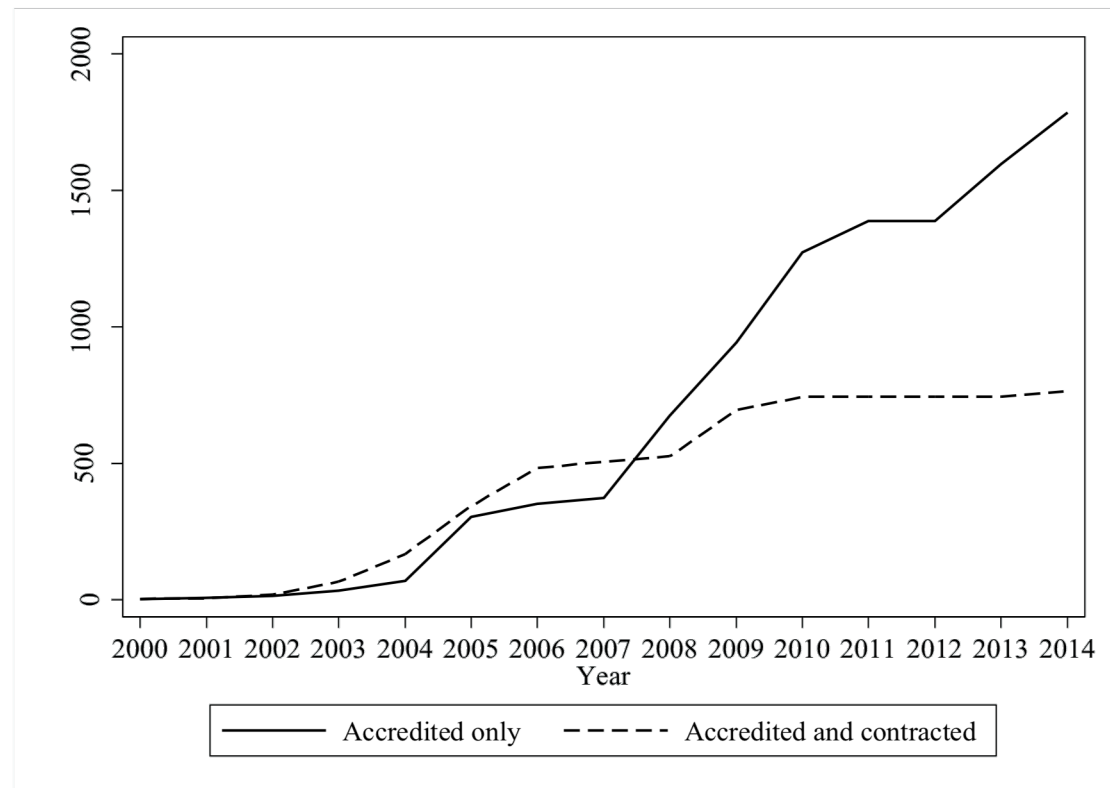
Background: Anticipated effect of the facility accreditation program

Different interventions, including accreditation, have evolved in response to *asymmetric information* in healthcare markets.

- **Direct effect** on outcomes reflecting the standards assessed during the accreditation survey:
    - Antenatal care (ANC) coverage
    - Quality of ANC
    - Child morbidity prevalence
    - Informed choice of contraceptive methods

- **Indirect effect** on the utilization of antenatal and delivery care services through quality improvement:
    - ANC coverage (at least four visits)
    - Institutional delivery
    - Skilled assistance during delivery

Methods: DiD with fixed effects

For each health facility i at time t, we estimate the **typical difference-in-differences (DiD) specification**

$$y_{it} = \alpha + \beta \, acc_{it} + \gamma \, d_{post} + \delta \, acc_{it} * d_{post} + \zeta \, fac_i + \eta \, dist_i + \varepsilon_{it}$$

- y_{it} is a health outcome of interest; t = 0 for the baseline years (2000, 2005, or 2008) and t = 1 for the follow-up years (2005, 2008, or 2014)
- acc_{it} = 1 if facility i is treated
- d_{post} = 1 for the follow-up year(s)
- $acc_{it} * d_{post}$ = 1 for a treated facility i in the follow-up year(s)
- δ captures the effect of accreditation on each outcome at the facility level
- fac_i is a vector of facility-level controls; $dist_i$ is a vector of district-level controls

…and the **DiD fixed-effects specification**

$$y_{it} = \alpha + \beta \, policy_{it} + \gamma \, year_t + \delta_i + \varepsilon_{it}$$

Methods: PSM DiD

Propensity Score Matching (PSM) DiD extends the conventional DiD estimates by defining outcomes conditional on the PS. Observations are reweighted according to the weighting function of the matching estimator.

DiD: $\hat{\delta}_i = \left(y^T_{ipost} - y^T_{ipre}\right) - \left(y^C_{jpost} - y^C_{jpre}\right)$

(Kernel) PSM DiD: $\hat{\delta}_i = \left(y^T_{ipost} - y^T_{ipre}\right) - \sum_{j \in C} \omega(i,j)\left(y^C_{jpost} - y^C_{jpre}\right)$

$\omega(i,j) = \dfrac{K(\frac{P_j - P_i}{a_n})}{\sum_{K \in C} K(\frac{P_k - P_i}{a_n})}$, is the weight given to the jth control facility matched to treated facility i.

Data: Dependent variables

- **Family planning**
  - Knowledge of side effects of contraceptive method used
  - Knowledge of other methods of contraception that could be used

- **ANC**
  - 4+ visits
  - Weight measurement, blood pressure measurement, blood sample collection, urine sample collection
  - Iron supplementation

- **Delivery care**
  - Institutional delivery
  - Skilled assistance during delivery

- **Child morbidity prevalence**
 - Acute respiratory infection (ARI)
  - Fever
  - Diarrhea

Data: Dependent variables (Cont'd)

Is self-reported facility data reliable? If no, then…?

1. Collapse individual-level data from six waves of Egypt's Demographic and Health Survey (DHS) (1992, 1995, 2000, 2005, 2008, and 2014) at the facility level "data spatial join"

2. Recode and calculate health outcomes at the facility level for each of the Egypt DHS rounds

3. Combine the facility-level outcomes of the six rounds of the Egypt DHS in a panel

Data: Dependent variables (Cont'd)

Data spatial join of women and districts
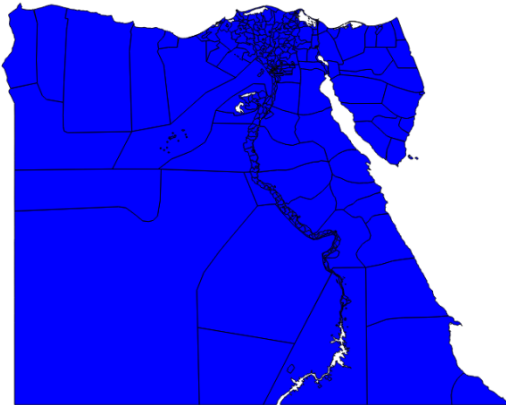
(1)

(2)

(3)
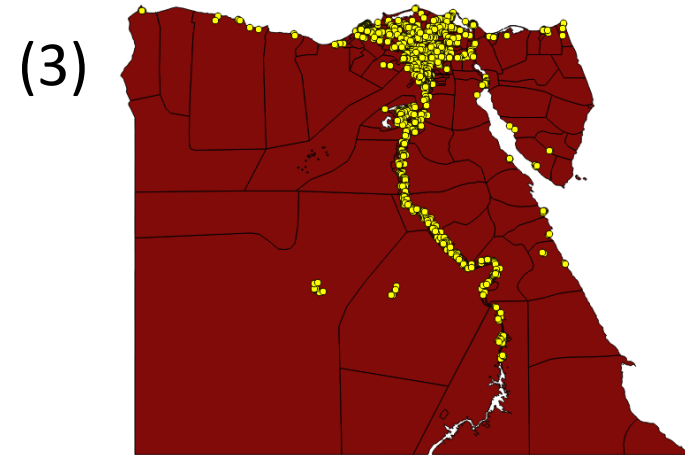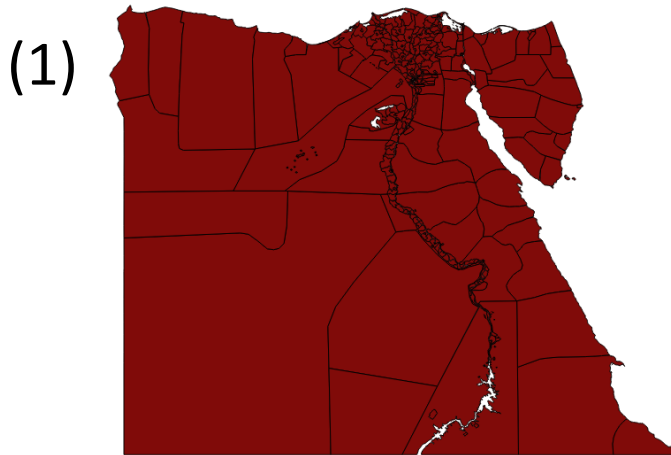
Imported *women's* GPS data points (DHS) into the Geographic Information System (GIS) software (QGIS) and spatially joined the displaced cluster locations to GIS polygon data of the *district* boundaries.

Data: Dependent variables (Cont'd)

Data spatial join of facilities and districts

(1)

(3)

(2)

Imported *health facilities'* GPS data points (DHS) into the Geographic Information System (GIS) software (QGIS) and spatially joined the displaced cluster locations to GIS polygon data of the *district* boundaries.
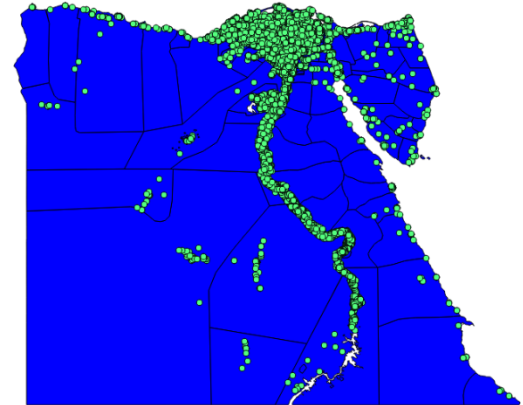
Data: Dependent variables (Cont'd)

Link each woman to the nearest mapped facility within a district...

Total Safe Villages and Catchment Area of PHC's, CHC's & New PHC's
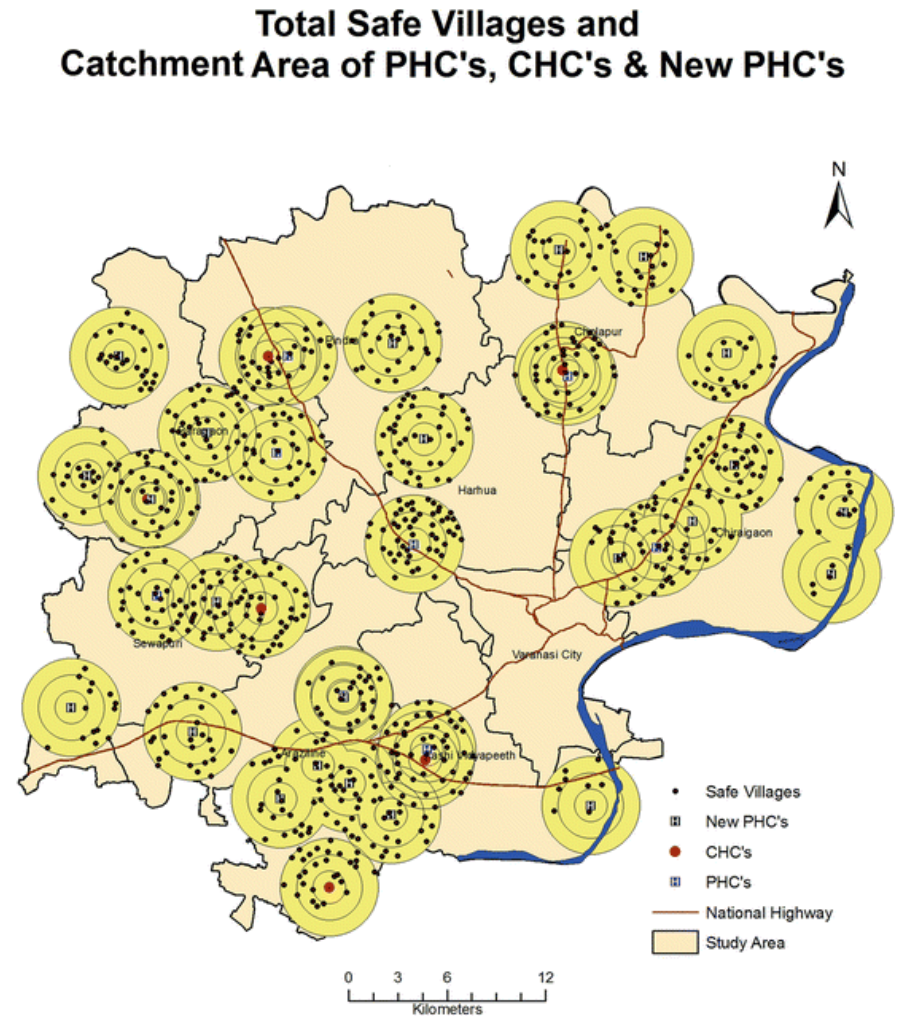
Data: Explanatory variables

- Treatment variable

- Facility-level controls
  - Labor force (eight categories of workers), building condition, population coverage

- District-level social and economic controls
  - Illiteracy, unemployment, income dependency, inaccessibility to electricity, inaccessibility to potable water, average family size, household (HH) crowding factor, population size

- Regional dummies

Results: DiD FEs estimates, 1992-2014

	Family planning		ANC				
	Knowledge of side effects	Knowledge of contraceptives	4+ visits	Informed of complications	Weight measurement	Blood pressure measurement	Urine sample collection
treat=1	-1.168	1.318	0.717	3.305	-1.445	-2.710	-1.350
	(2.357)	(2.461)	(1.823)	(2.729)	(1.780)	(1.788)	(2.501)
Years (Ref: 1992)							
1995	-4.360**		6.288***				
	(1.990)		(1.938)				
2000	37.991***	40.478***	15.990***				
	(2.044)	(1.855)	(1.931)				
2005	38.417***	47.627***	36.737***	12.471***	25.150***	23.544***	26.875***
	(1.960)	(1.670)	(1.786)	(1.870)	(1.577)	(1.519)	(1.800)
2008	43.714***	51.344***	40.673***	15.131***	23.499***	23.435***	22.960***
	(1.973)	(1.841)	(1.846)	(2.039)	(1.609)	(1.550)	(1.969)
2014	37.326***	51.250***	53.917***	24.522***	26.489***	31.460***	31.044***
	(2.151)	(1.950)	(1.881)	(2.139)	(1.700)	(1.634)	(1.955)
Constant	7.753***	5.522***	26.436***	19.129***	62.212***	62.062***	46.657***
	(1.413)	(1.071)	(1.428)	(1.226)	(1.126)	(1.100)	(1.292)
Obs.	3,526	3,444	3,808	2,935	2,937	2,937	2,937

Results: DiD FEs estimates, 1992-2014 (Cont'd)

	Delivery care		Child morbidity prevalence		
	Institutional delivery	Skilled-assisted delivery	ARI	Fever	Diarrhea
treat=1	-1.523	0.226	-1.740	1.658	-2.674**
	(1.781)	(1.647)	(1.506)	(1.820)	(1.197)
Years (Ref: 1992)					
1995	7.678***	7.559***	14.132***	19.168***	3.028**
	(2.007)	(2.004)	(1.286)	(1.719)	(1.178)
2000	21.227***	18.313***	0.398	-3.950**	-5.935***
	(1.904)	(1.885)	(1.066)	(1.542)	(1.090)
2005	39.178***	33.367***	2.308**	-0.573	4.236***
	(1.874)	(1.843)	(1.122)	(1.580)	(1.148)
2008	42.058***	34.188***	2.688**	-7.025***	-3.924***
	(1.910)	(1.906)	(1.251)	(1.653)	(1.086)
2014	54.279***	42.006***	6.863***	1.376	-0.109
	(1.992)	(1.988)	(1.368)	(1.756)	(1.257)
Constant	30.473***	46.392***	9.287***	21.932***	13.829***
	(1.523)	(1.532)	(0.860)	(1.241)	(0.853)
Obs.	3,810	3,810	3,807	3,807	3,807

Results: DiD and Kernel PSM DiD estimates; 2000-2005, 2005-2008, 2008-2014

Outcome	2000-2005		2005-2008		2008-2014	
	DiD	PSM DiD	DiD	PSM DiD	DiD	PSM DiD
Family planning						
Knowledge of side effects	16.853	15.777***	9.915**	1.246	-2.207	-3.586
	(10.306)	(3.990)	(4.275)	(3.309)	(2.859)	(3.465)
Knowledge of contraceptives	8.370	6.578*	-0.402	-8.643***	1.622	0.356
	(8.253)	(3.528)	(4.014)	(3.222)	(3.080)	(3.560)
ANC						
4+ visits	10.318	3.132	3.959	5.180*	-1.216	-2.404
	(9.359)	(3.505)	(3.742)	(2.832)	(2.197)	(2.704)
Informed of complications	12.465	6.430**	10.725**	5.454*	3.394	2.046
	(8.654)	(2.972)	(4.168)	(3.113)	(2.996)	(3.603)
Weight measurement	-2.956	-4.414	4.194	3.374*	0.241	0.692
	(7.004)	(3.012)	(2.704)	(1.981)	(1.689)	(2.086)
Blood pressure measurement	-1.527	-5.512*	2.254	1.745	-2.168	-1.894
	(6.624)	(2.834)	(2.698)	(2.047)	(1.477)	(1.770)
Urine sample collection	0.128	0.379	7.657**	4.369	-2.077	-4.884
	(8.645)	(3.225)	(3.796)	(2.834)	(2.502)	(3.007)
Delivery care						
Institutional delivery	15.933*	7.043**	-3.661	-3.224	0.454	-0.214
	(8.166)	(3.289)	(3.096)	(2.826)	(2.138)	(2.826)
Skilled-assisted delivery	18.138**	11.465***	-0.361	0.606	-0.106	-0.698
	(7.470)	(3.154)	(3.004)	(2.573)	(1.834)	(2.387)
Child morbidity prevalence						
ARI	-7.737*	-9.677***	2.299	1.616	-0.737	-1.355
	(4.114)	(1.630)	(2.519)	(1.835)	(1.785)	(2.171)
Fever	-8.222	-10.121***	3.107	3.297	-2.213	-3.532
	(5.991)	(2.178)	(2.893)	(2.169)	(2.107)	(2.478)
Diarrhea	-5.054	-4.342***	0.878	-0.514	-3.221**	-4.705***
	(4.015)	(1.515)	(2.434)	(1.836)	(1.401)	(1.718)
Obs.	1,588	958	1,531	1,088	1,422	1,026

Conclusions

- Accreditation as a policy tool to improve quality can have multiple significant positive effects, especially on delivery care and child morbidity prevalence (2000-2005).

- However, to sustain the positive effects of accreditation, high level of commitment from the central government is indispensable (2005-2008 and 2008-2014).

- There is evidence that improvements in health outcomes can be achieved through combining accreditation with other interventions [e.g., PBF (Quimbo et al., 2008)].

Thank you.