

The Impact of Pay-for-Performance (P4P) in the health sector in Rwanda

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Overview

- Program Description
- Evaluation Design and Methodology
- Baseline Descriptive Statistics
- Impact of P4P
- Next Steps



P4P Objectives and Definition

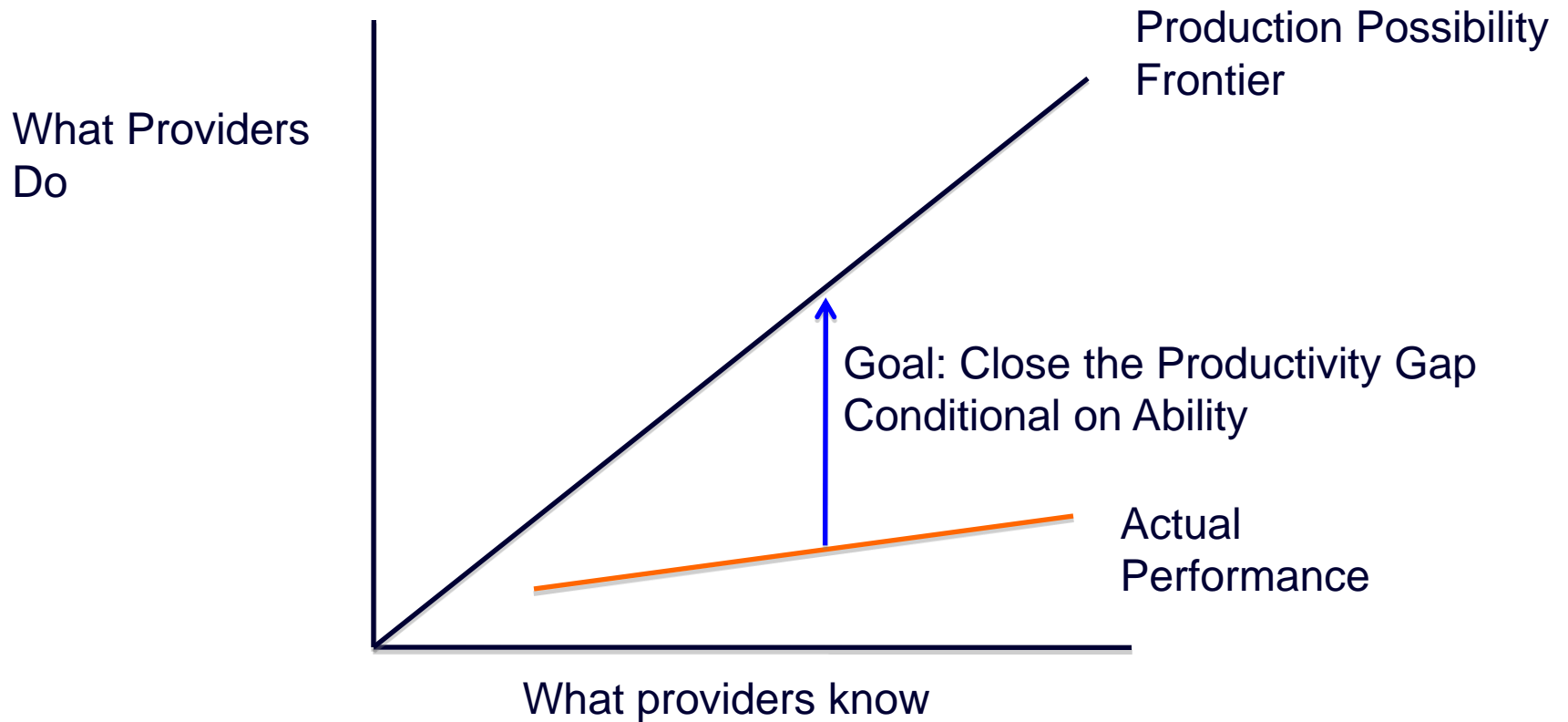
- Objectives: Improve
 - access to and quality of care
 - health outcomes
- Pay medical care providers a bonus based on measured performance
- Rwandan idea
 - Evaluation finds large impact
 - Message to the world



Pay-for-Performance

- Can improve performance via
 - More resources
 - Incentives
 - Monitoring performance
- Evaluation objective:
 - Impact of incentives
 - Justify extra administrative cost of incentives

The Productivity Gap





Rwanda: Central African Country

- 9 million people
- Genocide in early 1990s
- GNP per capita: 250 US\$
- Weak Health Care Infrastructure
 - 36 Hospitals, 369 health centers
 - Doctors: 1/50,000 inhabitants
 - Nurses: 1/3,900 inhabitants;
 - 17% of nurses in rural areas
- Poor health status, but getting better

Quarterly Payment to Facility i in period t

$$Payment_{it} = \left(\sum_j P_j U_{jit} \right) \times Q_{it} \quad , \quad 0 \leq Q_{it} \leq 1$$

P_j = payment per unit of each PBF service j

U_{ijt} = number of patients using service j in facility i in period t

Q_{it} = facility i 's quality in period t

Table 1: Output Indicators (U's) and Unit Payments for PBF Formula

OUTPUT INDICATORS		Amount paid per unit (US\$)
Visit Indicators: Number of ...		
1	curative care visits	0.18
2	first prenatal care visits	0.09
3	women who completed 4 prenatal care visits	0.37
4	first time family planning visits (new contraceptive users)	1.83
5	contraceptive resupply visits	0.18
6	deliveries in the facility	4.59
7	child (0 - 59 months) preventive care visits	0.18
Content of care indicators: Number of ...		
8	women who received tetanus vaccine during prenatal care	0.46
9	women who received malaria vaccine during prenatal care	0.46
10	at risk pregnancies referred to hospital for delivery	1.83
11	emergency transfers to hospital for obstetric care	4.59
12	children who completed vaccinations (child preventive care)	0.92
13	malnourished children referred for treatment	1.83
14	other emergency referrals	1.83

P4P Facility Quality Score

$$Q_{it} = \sum_k \omega_k S_{kit} \quad \text{with} \quad \sum_k \omega_k = 1, \quad 1 \geq S_{ikt} \geq 0$$

Where S_{kit} = facility i 's Quality index of Service k

□ Indicator types:

- Structural: Availability of medical equipment/drugs needed to deliver adequate medical care
- Process: Clinical content of care (CPGs)

Table 1: Services (*S*'s) and Weights (*W*'s) Used to Construct the *Q* for PBF Formula

	Service	Weight	Share of weight allocated to structural components	Share of weight allocated to process components	Means of assessment
1	General administration	0.052	1.00	0.00	Direct observation
2	Cleanliness	0.028	1.00	0.00	Direct observation
3	Curative care	0.170	0.23	0.77	Medical record review
4	Delivery	0.130	0.40	0.60	Medical record review
5	Prenatal care	0.126	0.12	0.88	Direct observation
6	Family planning	0.114	0.22	0.78	Medical record review
7	Immunization	0.070	0.40	0.60	Direct observation
8	Growth monitoring	0.052	0.15	0.85	Direct observation
9	HIV services	0.090	1.00	0.00	Direct observation
10	Tuberculosis service	0.028	0.28	0.72	Direct observation
11	Laboratory	0.030	1.00	0.00	Direct observation
12	Pharmacy management	0.060	1.00	0.00	Direct observation
13	Financial management	0.050	1.00	0.00	Direct observation
	Total	1.000			



Monitoring Facility Reporting

- District Comitee
 - Approves quarterly payment
 - Based on facility reports & independent audits
- Random utilization audit (once quarterly)
 - One focal point per administrative district
- Random quality audits (once quarterly)
 - District supervisors based in District Hospital
- Interview random sample of patients
 - Identify phantom patients
 - MSH study – less than 3-5% phantom patients



Evaluation Questions: Did P4P...

- Increase the quantity of contracted health services delivered?
- Improve the quality of contracted health services provided?
- Improve child health status?



Identification Strategy

- Phased rollout at district level
- Excluded districts that already had P4P in 2005
- Group districts into “similar pairs” based on population density & livelihoods
- Randomly assign one to treatment and other to control
- 8 pairs



Isolating the incentive effect

- Pay-for-Performance
 - Performance incentives
 - Additional resources

- Compensate control facilities with equal resources
 - Average of what treatments receive
 - Not linked to performance

Sample: 160 clinics and 2145 households

	Treatment	Control	TOTAL
Nr. of clinics	78	82	160

- Random sample of 14 households per clinics

Baseline Expenditures & Staffing

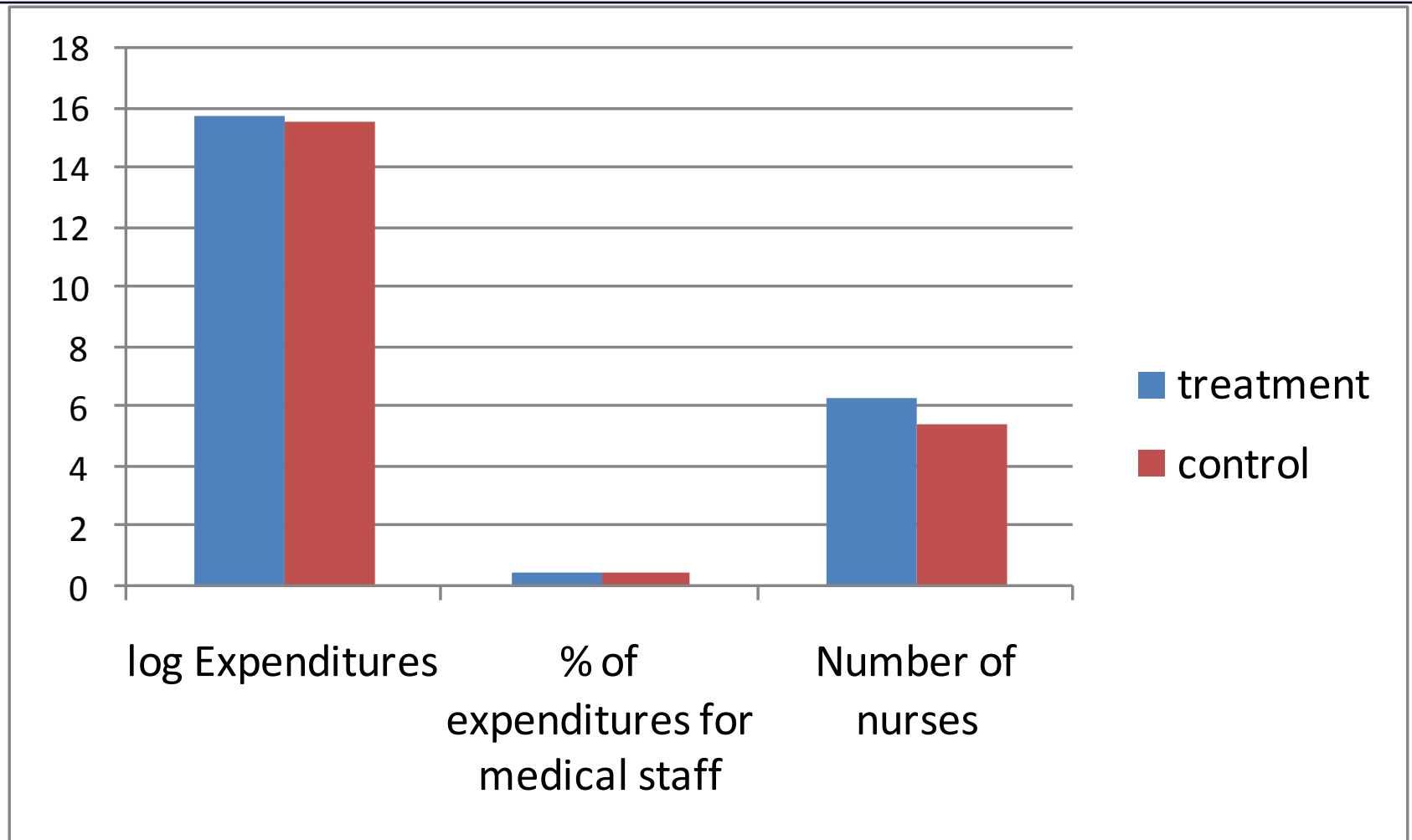


Table 3: Health Facility Baseline (2006) Characteristics

	Treatment		Control		Difference	P-Value*
	Mean	Std dev	Mean	Std dev		
Structural Quality						
Curative Care	0.80	(0.07)	0.81	(0.07)	-0.01	0.575
Delivery	0.78	(0.11)	0.79	(0.10)	0.00	0.840
Prenatal Care	0.96	(0.15)	0.97	(0.11)	-0.01	0.285
Immunization	0.94	(0.17)	0.94	(0.15)	0.00	0.897
Laboratory	0.49	(0.32)	0.43	(0.32)	0.06	0.402
Observations		86		79		

Log Expenditures

Year	Treatment	Control	Difference	P-Value
2006	15.812	15.612	0.200	0.418
	(1.042)	(1.007)	0.241	
2008	16.906	16.989	-0.083	0.568
	(0.71)	(1.08)	(0.14)	

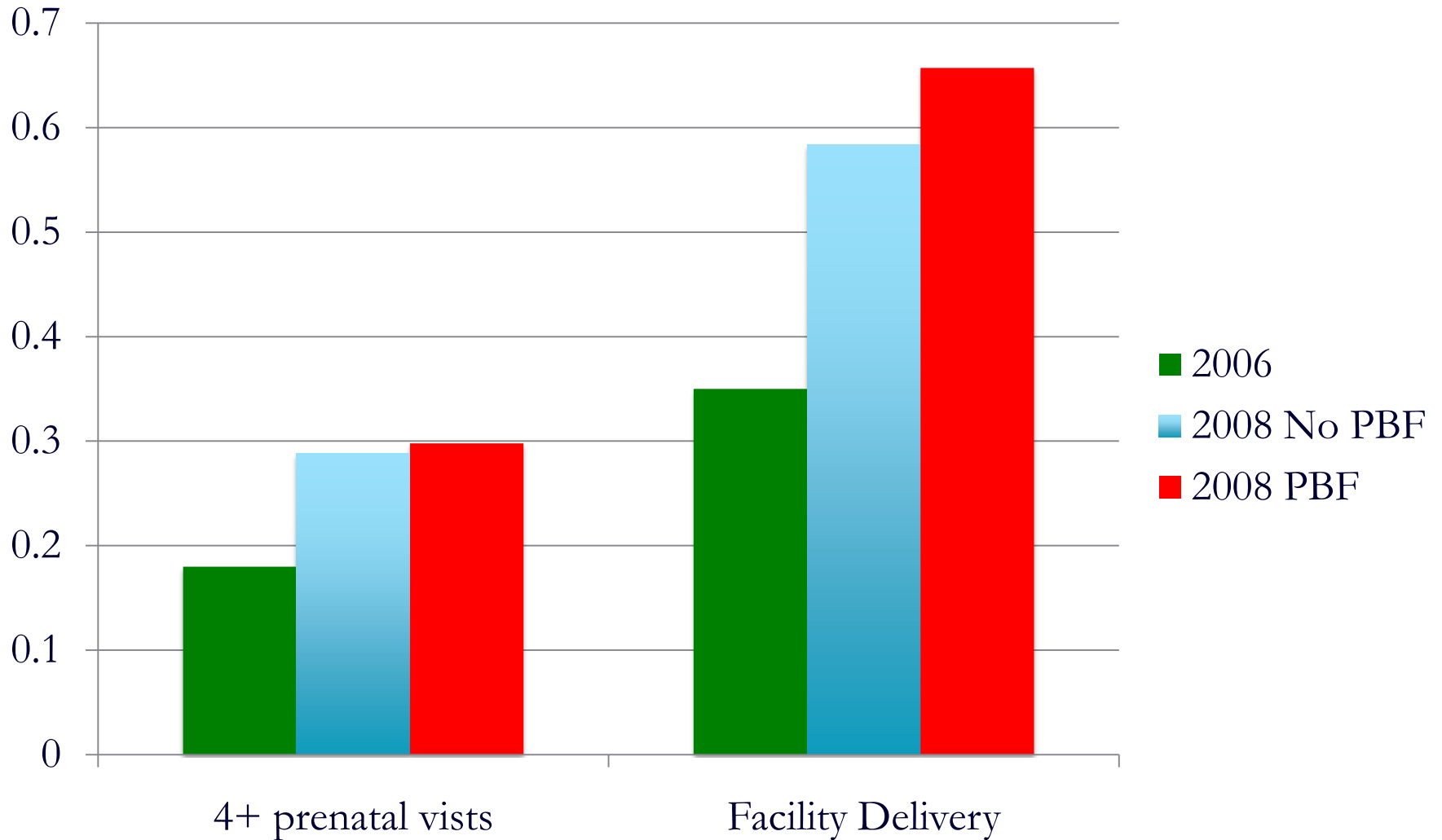
- Randomization balanced baseline
- Follow-up balanced, so difference in follow-up outcomes due to incentives **not** resources



Impact of P4P: Statistical methods

- Have balance at baseline on all key outcomes
- Use difference in differences analysis
 - Not a pure randomized experiment
- Clustered at district-year level
- Facility Fixed Effects
- Year dummy
- Controls: age, parity, education, household size, health insurance, land, value of assets

Impact on 4+ Prenatal Visits and Facility Delivery

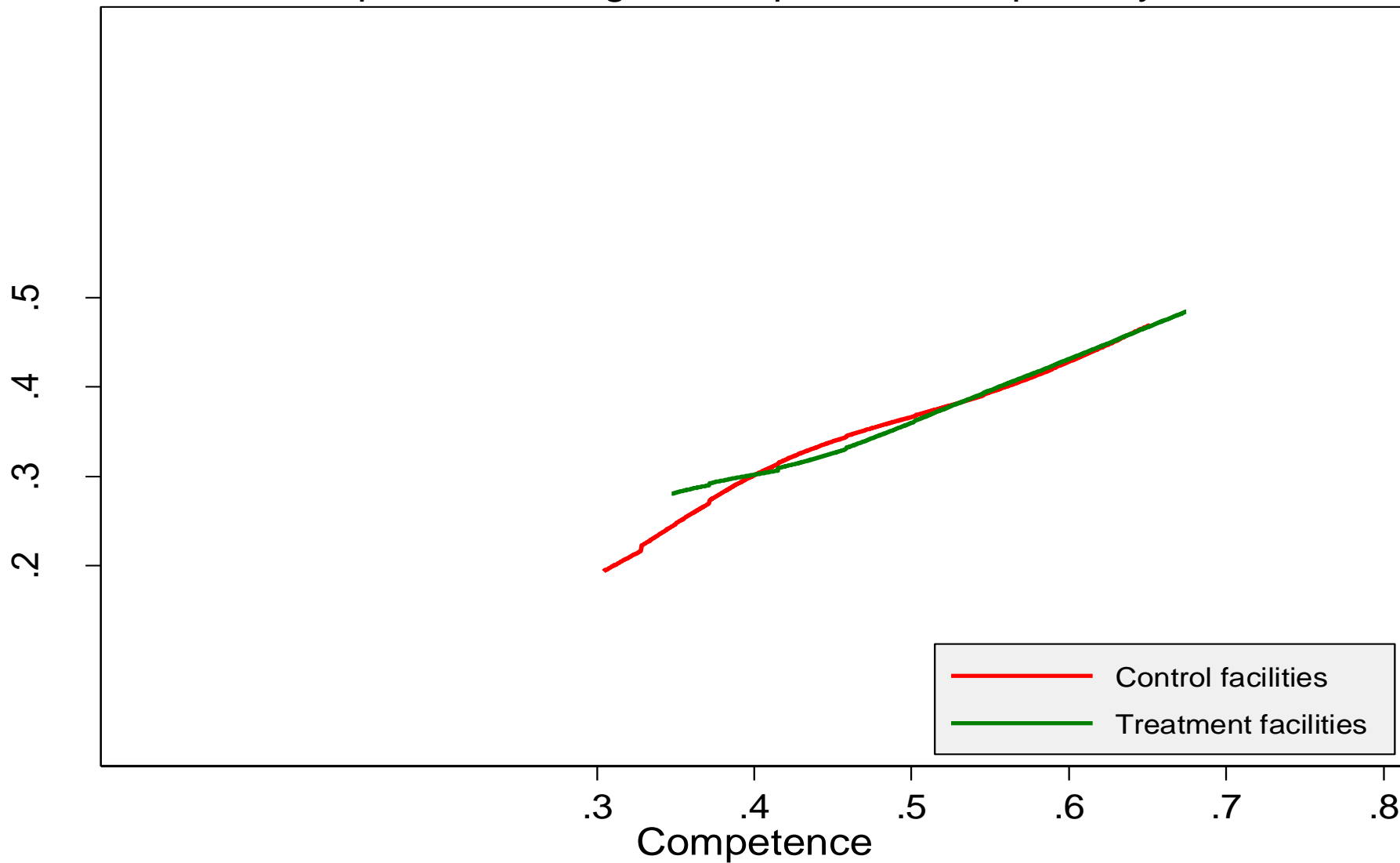




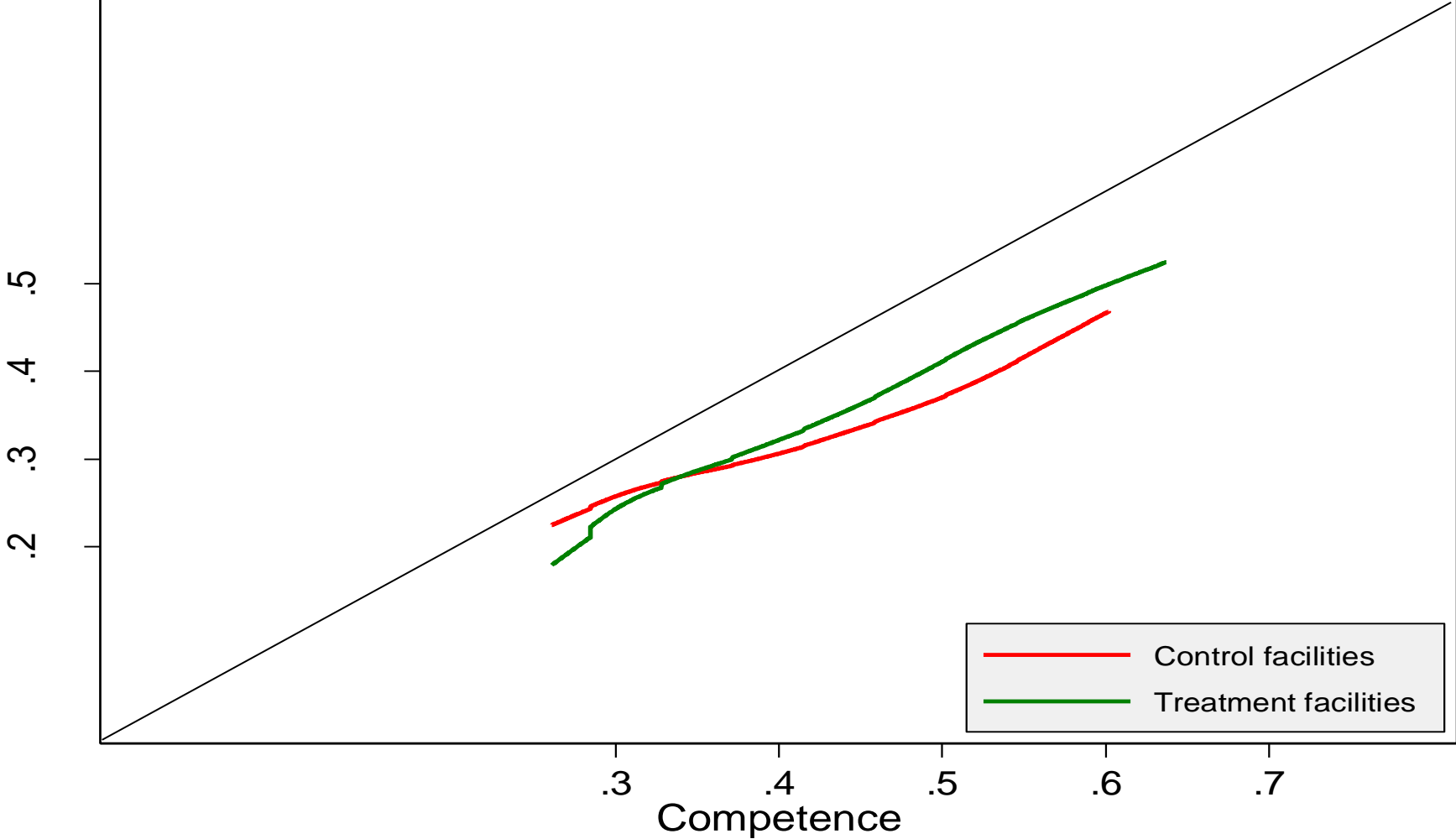
Prenatal Competency & Quality

- Provider knowledge/competency
 - Standardized vignette presented to provider
 - Compare answers to Rwandan CPG
 - Measure of ability/knowledge
- Process quality
 - Patient exit interview of clinical services provided
 - Clinical content of care
 - Provider effort

Kernel Non parametric regression practice-competency at baseline



Kernel Non parametric regression practice-competency at follow up



Impact of PBF on Prenatal Care Quality

	Model 1	Model 2	Model 3
PBF (=1)	0.157***	0.140***	0.110***
2008 (=1)	0.090***	0.177***	0.150***
PBF * High Competency			0.231***
Maternal Characteristics		X	X
Provider Knowledge		X	X

Impact on Likelihood of Getting Tetanus Vaccine During Prenatal Care

Baseline Mean = 0.71	Model 1	Model 2	Model 3
Treatment 2008 (=1)	0.067***	0.054**	0.007
(Treatment 2008) X (Faith Based)			0.035
2008 (=1)	-0.099***	0.032	0.032
Patient Characteristics		X	X
Clinic Fixed Effects	X	X	X
Observations	2810	2810	2810
Number of healthfacility_id	144	144	144

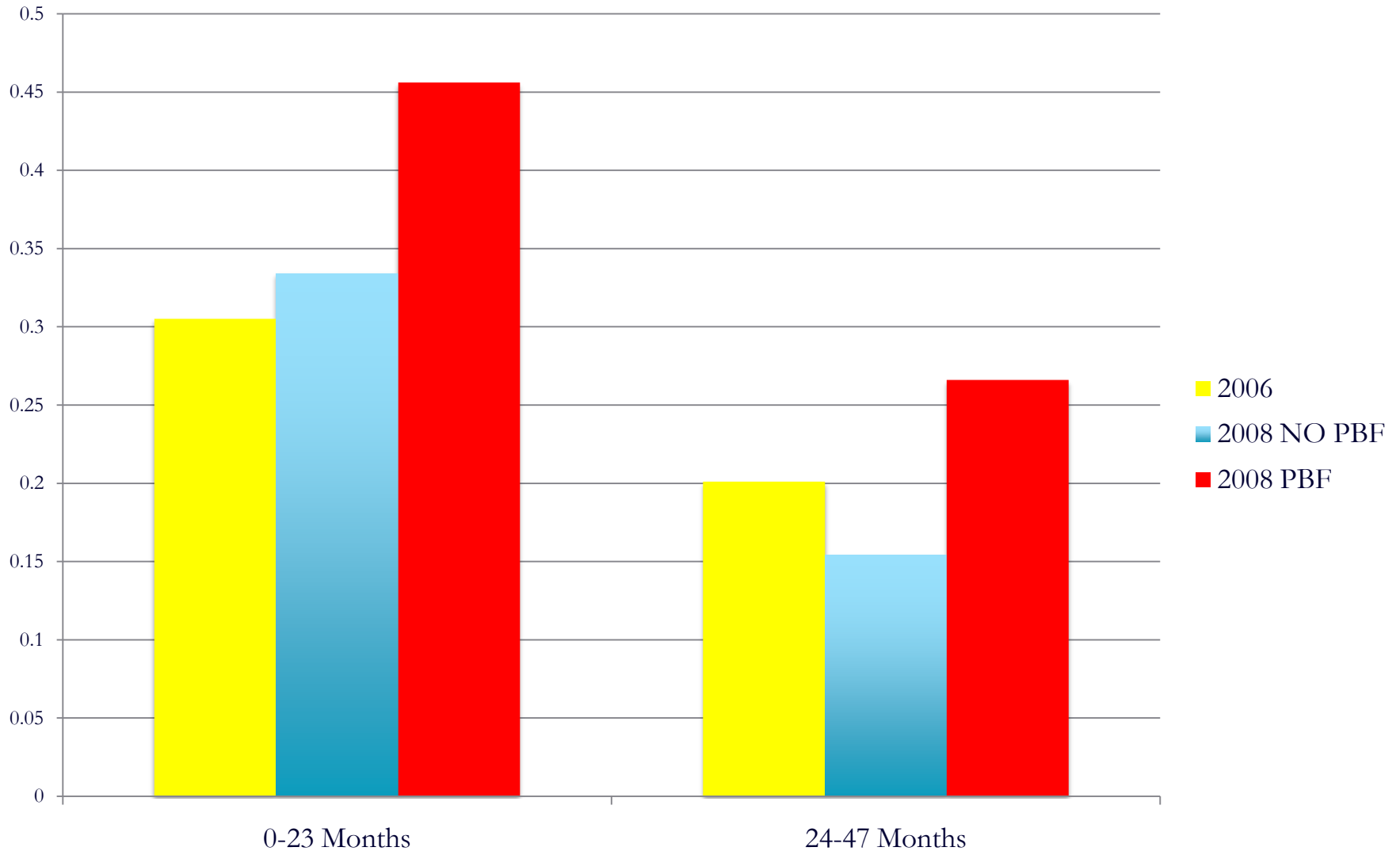
Impact of PBF on Provider Knowledge

PBF (=1)	-0.010
2008 (=1)	-0.228**
Observations	280

Table 5: Children 0-5 years old Baseline (2006) Characteristics

Variable	Treatment Mean	Control Mean	Difference	P-Value
Child preventive medical care				
Visit by child 0-23 months in last 4 weeks (=1)	0.21	0.24	-0.03	0.56
Visit by child 24-59 months in last 4 weeks (=1)	0.08	0.14	-0.05	0.11
12-23 month old is fully immunized (=1)	0.62	0.67	-0.05	0.52
Sick in last 4 weeks				
Children 0-12 months	0.49	0.46	0.03	0.73
Children 24-47 months	0.28	0.20	0.03	0.11
Height (cm.)				
Children 0-12 months	63.74	64.19	-0.45	0.55
Children 24-47 months	87.16	86.75	0.41	0.62

Impact of PBF on Prob of Child Preventive Care Visit in Last 4 Weeks



Impact of PBF on Child Health (z-scores)

	Height/ Age	Weight/ Age	Weight/ Height	Sick
0-12 Months				
PBF	--0.085	0.365***	0.625***	0.002
24-47 Months				
PBF	0.260***	0.033	-0.180**	-0.080**



Results Summary

- Balanced at baseline
- Expenditures same, so isolate incentives
- Impact on utilization
 - Delivery & Child prevention, but not prenatal
- Impact on prenatal quality
 - Bigger effect for better nurses
- Reduced child morbidity & Taller children
- Effect sizes bigger than most other interventions

Policy Messages

- You get what you pay for
- Returns to effort important
 - Bigger effects in things more in provider's control
 - Patient or community health workers for prenatal care/Immunization
- Need to pilot to get prices “right”
- Evaluation feedback useful
- World will notice: Grameen Bank (Bangladesh)
CCTs (Mexico)