

Measuring and Improving the Quality of TB Care in India

Lessons from the QuTUB Project



GEORGETOWN UNIVERSITY

guide²

Grand Challenges Canada®
Grands Défis Canada

JOHNS HOPKINS
UNIVERSITY



Centre
international
de TB McGill

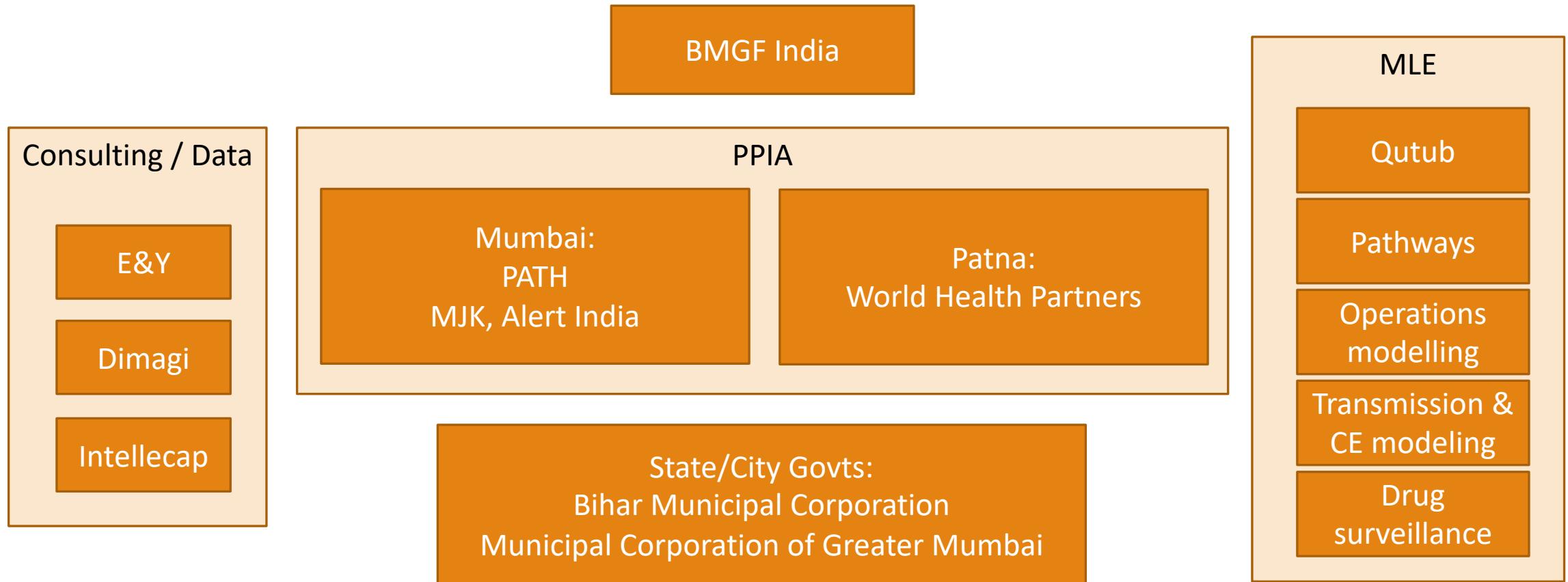


McGill
International
TB Centre

A PAHO/WHO Collaborating Centre for Tuberculosis Research

BILL & MELINDA
GATES foundation

A massive project with many partners



Simulated patient (SP) studies on TB: Now used in 6 countries



Use of standardised patients to assess quality of tuberculosis care: a pilot, cross-sectional study

Jishnu Das, Ada Kwan, Benjamin Daniels, Srinath Satyanarayana, Ramnath Subbaraman, Sofi Bergkvist, Ranendra K Das, Veena Das, Madhukar Pai



PLOS MEDICINE

RESEARCH ARTICLE

Variations in the quality of tuberculosis care in urban India: A cross-sectional, standardized patient study in two cities

Ada Kwan^{1,2*†}, Benjamin Daniels^{1*‡}, Vaibhav Saria³, Srinath Satyanarayana⁴, Ramnath Subbaraman⁵, Andrew McDowell⁶, Sofi Bergkvist⁷, Ranendra K. Das³, Veena Das⁸, Jishnu Das^{1,9*}, Madhukar Pai^{10,11*†}

Use of standardised patients to assess antibiotic dispensing for tuberculosis by pharmacies in urban India: a cross-sectional study

Srinath Satyanarayana, Ada Kwan, Benjamin Daniels, Ramnath Subbaraman, Andrew McDowell, Sofi Bergkvist, Ranendra K Das, Veena Das, Jishnu Das*, Madhukar Pai*



Research

BMJ Global Health

Use of standardised patients to assess quality of healthcare in Nairobi, Kenya: a pilot, cross-sectional study with international comparisons

Benjamin Daniels,¹ Amy Dolinger,¹ Guadalupe Bedoya,¹ Khama Rogo,² Ana Goicoechea,³ Jorge Coarasa,² Francis Wafula,^{2,4} Njeri Mwaura,² Redemptar Kimeu,⁵ Jishnu Das^{1,6}



International Journal of
Environmental Research
and Public Health

Article

Measuring Quality Gaps in TB Screening in South Africa Using Standardised Patient Analysis

Carmen S. Christian^{1,2,*}, Ulf-G. Gerdtham^{3,4}, Dumisani Hompashe^{2,5}, Anja Smith² and Ronelle Burger²



PLOS MEDICINE

RESEARCH ARTICLE

Tuberculosis detection and the challenges of integrated care in rural China: A cross-sectional standardized patient study

Sean Sylvia¹, Hao Xue², Chengchao Zhou^{3*}, Yaojiang Shi², Hongmei Yi⁴, Huan Zhou⁵, Scott Rozelle⁶, Madhukar Pai⁷, Jishnu Das⁸

We recently published a 250-page field manual on how to conduct SP studies



BMJ Global Health

Use of standardised patients for healthcare quality research in low- and middle-income countries

Ada Kwan,¹ Benjamin Daniels,² Sofi Bergkvist,³ Veena Das,⁴ Madhukar Pai,⁵
Jishnu Das^{2,6}

Analysis

Using Standardized Patients to Measure Health Care Quality

A Manual and Toolkit for Projects in Low- and Middle-Income Countries

Release v1.3

Last updated on June 21, 2019

Updated versions of the manual and annexes can be accessed at:
<https://www.qutubproject.org/>

Ada Kwan¹, Sofi Bergkvist², and Benjamin Daniels³
with
Jishnu Das⁴, Veena Das⁵, and Madhukar Pai⁶

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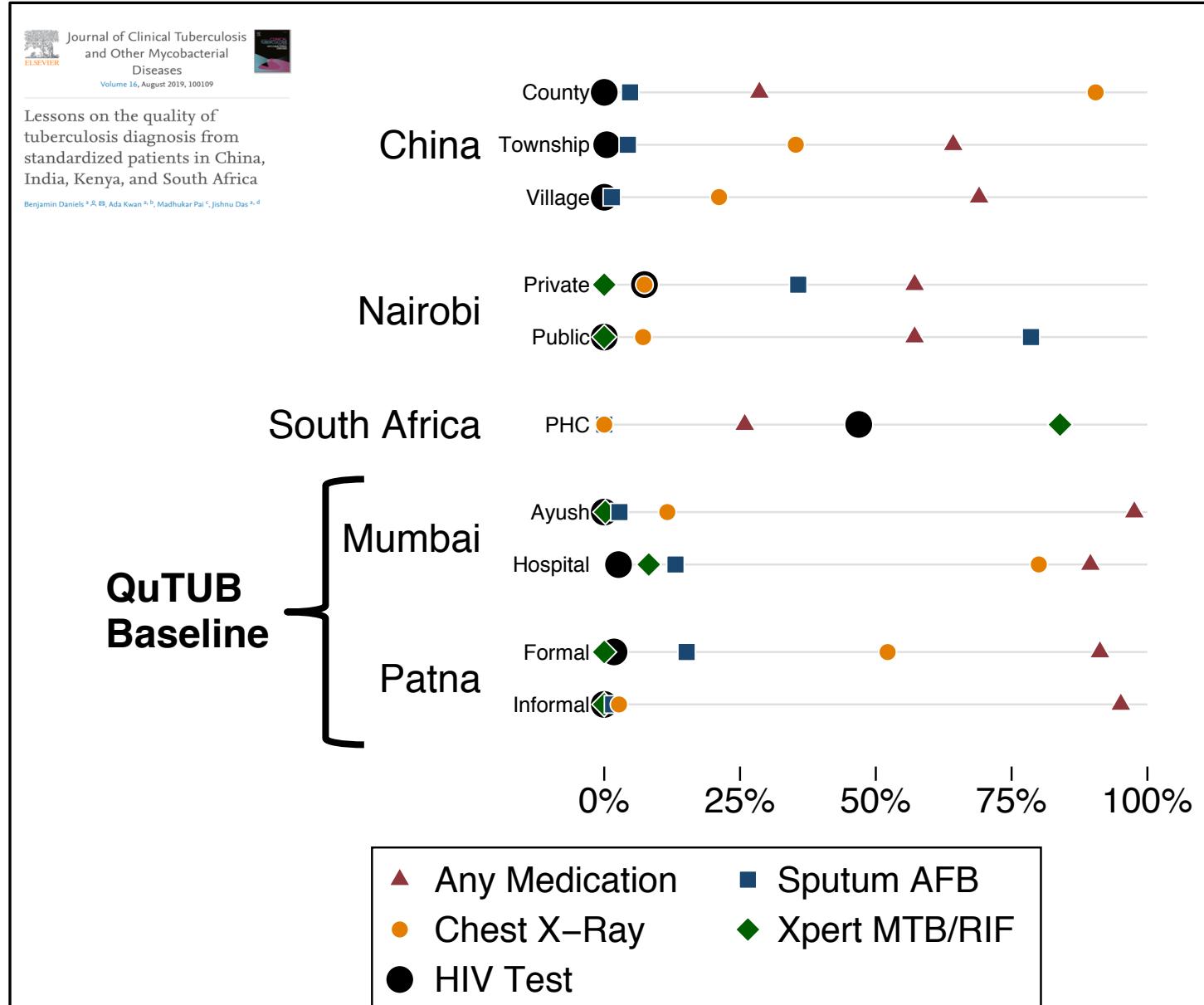
TB care across four countries (SP data)

Low use of TB testing in most settings

High medication use in most settings

Most common TB test is a chest X-ray

Some evidence for higher quality in public sector



Globally: Wide variety of unnecessary and contraindicated medications



Journal of Clinical Tuberculosis
and Other Mycobacterial
Diseases



Volume 16, August 2019, 100109

Lessons on the quality of
tuberculosis diagnosis from
standardized patients in China,
India, Kenya, and South Africa

Benjamin Daniels ^a , Ada Kwan ^{a, b}, Madhukar Pai ^c, Jishnu Das ^{a, d}

	China County	China Township	China Village	Nairobi Private	Nairobi Public	South Africa PHC	Mumbai Ayush	Mumbai Hospital	Patna Formal	Patna Informal
None	15 (71%)	75 (36%)	22 (31%)			132 (92%)	13 (<1%)	49 (16%)	43 (11%)	10 (5%)
Antibiotics	1 (5%)	15 (7%)	5 (7%)			11 (8%)	2 (<1%)	76 (25%)	80 (21%)	14 (8%)
Quinolones							1 (<1%)	4 (1%)	13 (3%)	3 (2%)
Steroids								5 (2%)	3 (1%)	
Unlabelled	3 (14%)	13 (6%)	18 (25%)	13 (46%)	6 (43%)	226 (45%)	33 (11%)	13 (3%)	73 (40%)	
Antibiotics + Quinolones							1 (<1%)		8 (2%)	1 (1%)
Antibiotics + Steroids		1 (<1%)						28 (9%)	(16%)	11 (6%)
Antibiotics + Unlabelled	2 (10%)	85 (41%)	25 (35%)	13 (46%)	8 (57%)	143 (29%)	67 (22%)	(16%)	23 (13%)	
Quinolones + Steroids		1 (<1%)						4 (1%)	18 (5%)	3 (2%)
Quinolones + Unlabelled		3 (1%)	1 (1%)	1 (4%)			15 (3%)	6 (2%)	18 (5%)	7 (4%)
Steroids + Unlabelled		1 (<1%)					34 (7%)	11 (4%)	8 (2%)	9 (5%)
Antibiotics + Quinolones + Steroids								2 (1%)	10 (3%)	
Antibiotics + Quinolones + Unlabelled		11 (5%)						4 (1%)	2 (1%)	12 (3%)
Antibiotics + Steroids + Unlabelled			1 (<1%)		1 (4%)			54 (11%)	13 (4%)	27 (7%)
Quinolones + Steroids + Unlabelled								7 (1%)	3 (1%)	6 (2%)
Antibiotics + Quinolones + Steroids + Unlabelled		1 (<1%)						1 (<1%)	5 (1%)	3 (2%)
Number of Observations	21	207	71	28	14	143	499	305	389	184

QuTUB Baseline

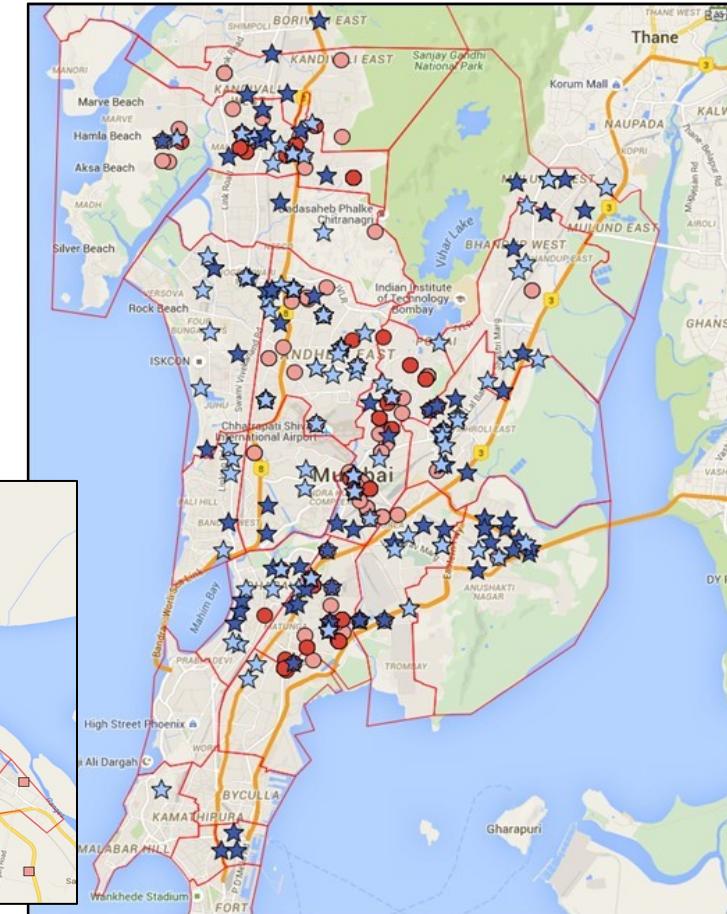
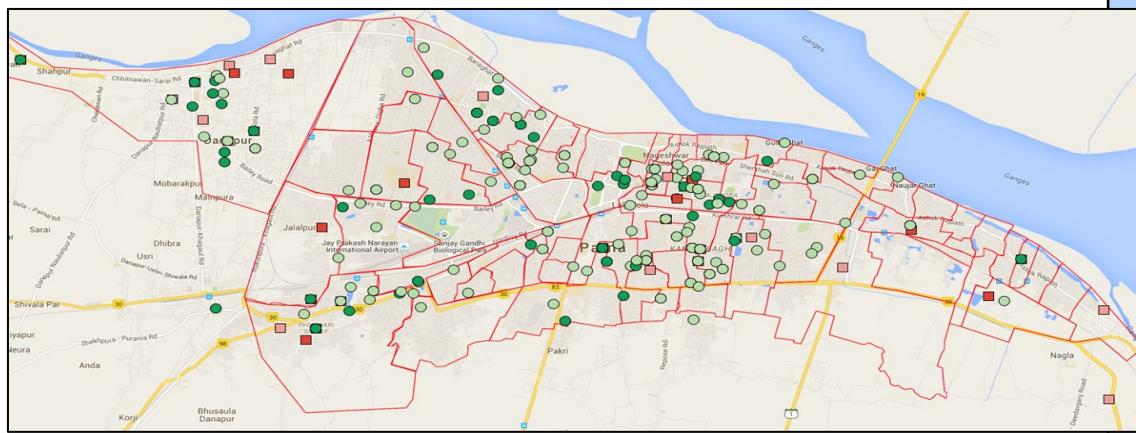
QuTUB project in India: A massive SP study used for quality surveillance

The largest SP study ever conducted

~10,000 SP interactions (so far) with health providers
in private health sector

Three study rounds in each city:

1. Baseline (Pre-PPIA)
2. Endline (PPIA)
3. Follow-up (Post-PPIA / PPSA)



QuTUB project in India: A massive SP study used for quality surveillance

Primary Aim: To attempt to assess whether PPIA projects improved quality of TB care.

Main takeaway 1: We can say the following with confidence:

1. In both cities, the program increased GeneXpert (GX) use among formal providers
2. In both cities, the program never has an impact on use of unnecessary medicines or other services
3. In Mumbai, the learning about GX due to program involvement improves GX use, but once providers have learned, convenience services from the program do not matter for doctors
4. In Mumbai, the program did not have any effect on AYUSH providers

Main takeaway 2: Despite the largest and most comprehensive SP study ever – ground complications, intervention design, and poor data management strategies limit our ability to draw definitive conclusions.

Main takeaway 3: The parameters that we are seeking to identify are key inputs into any modelling exercise. Given the problems in #1, they cannot be clearly pinpointed right now. If we are to say something more definitive in the future, we need to learn from this attempt and make several changes that we discuss.

Calculating the effects of PPIAs

Any changes that we observe in provider behavior is due to a combination of three things:

1. **General environment** – Any new tool or approach has an adoption curve that it will follow even in the absence of intervention
2. **Overall program learning** – CMEs, Field Officer visits, discussions, and services like free GX all gave engaged providers a better opportunity to learn to use the tools
3. **Program convenience services** – Staff stationed in clinic, sputum collection, vouchers, etc. lead providers to change their behavior due to access to services

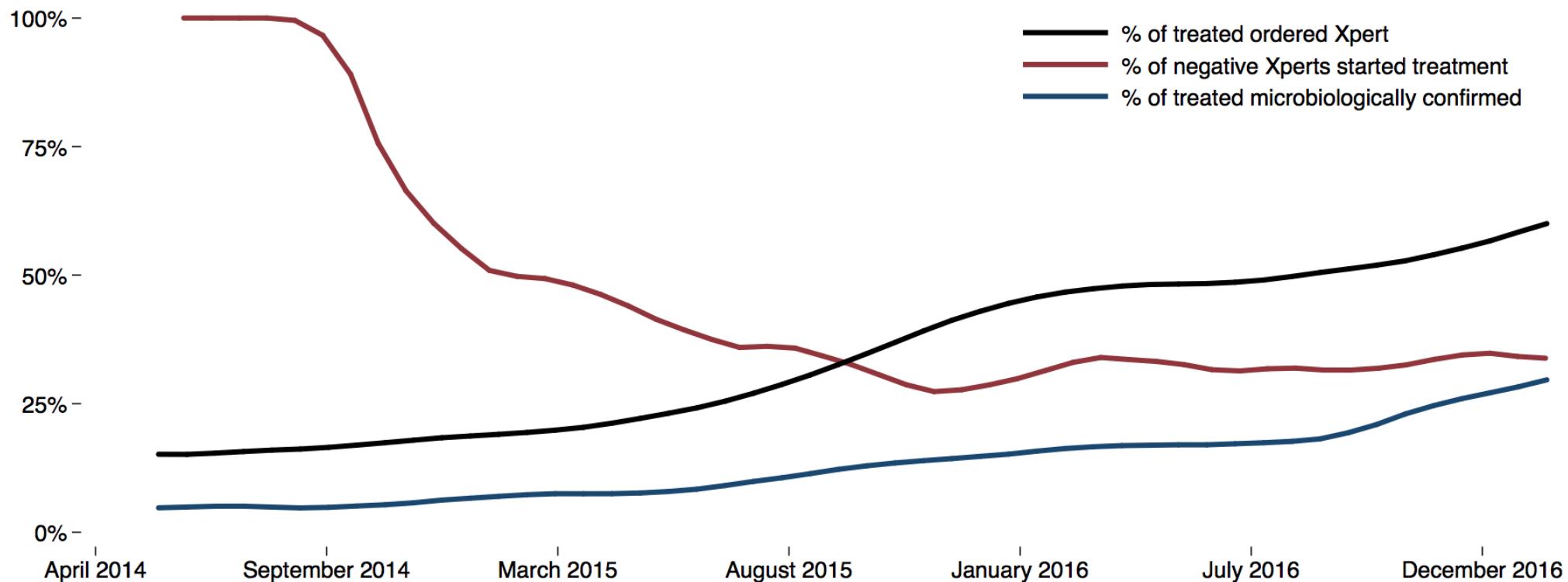
The causal effect of the program is (2) + (3). For budgetary reasons, it is important to separate how much is (2) and how much is (3).

In Patna, we can only identify the combined effect of (2) + (3). In Mumbai we can identify (2) initially and (3) after learning has finished.

Identifying both of these effects requires significant human and financial resources.

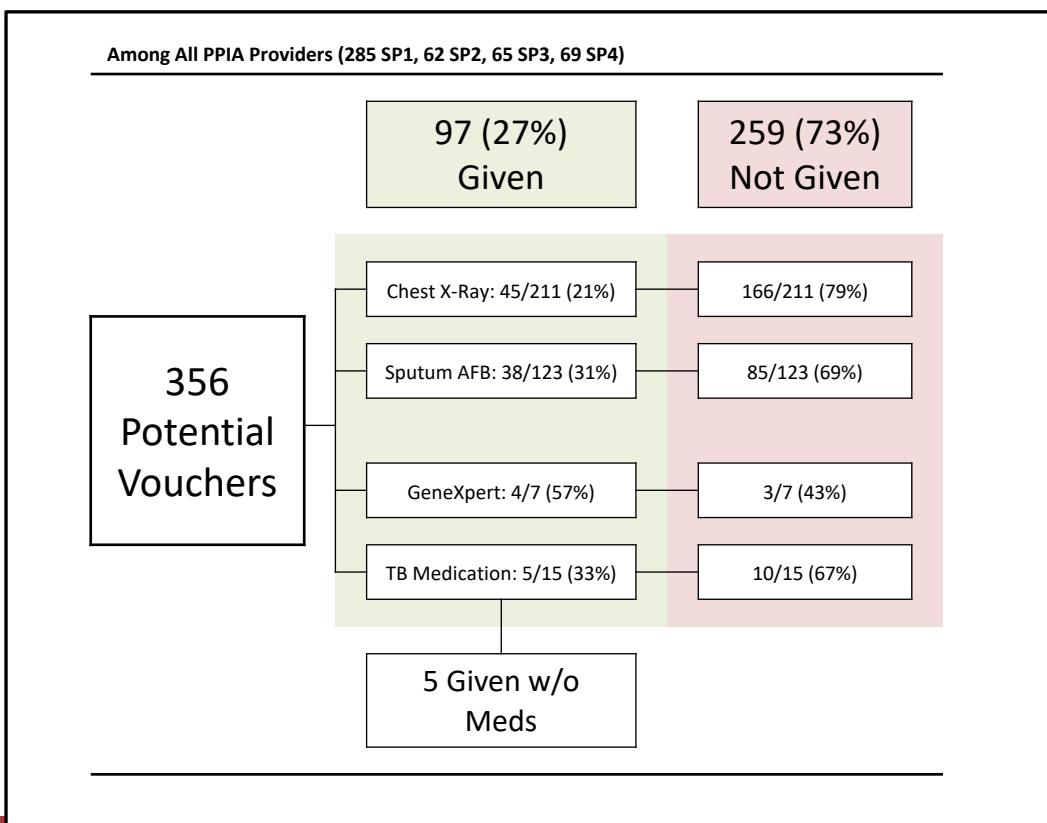
Patna

Patna: Program data suggests large effects

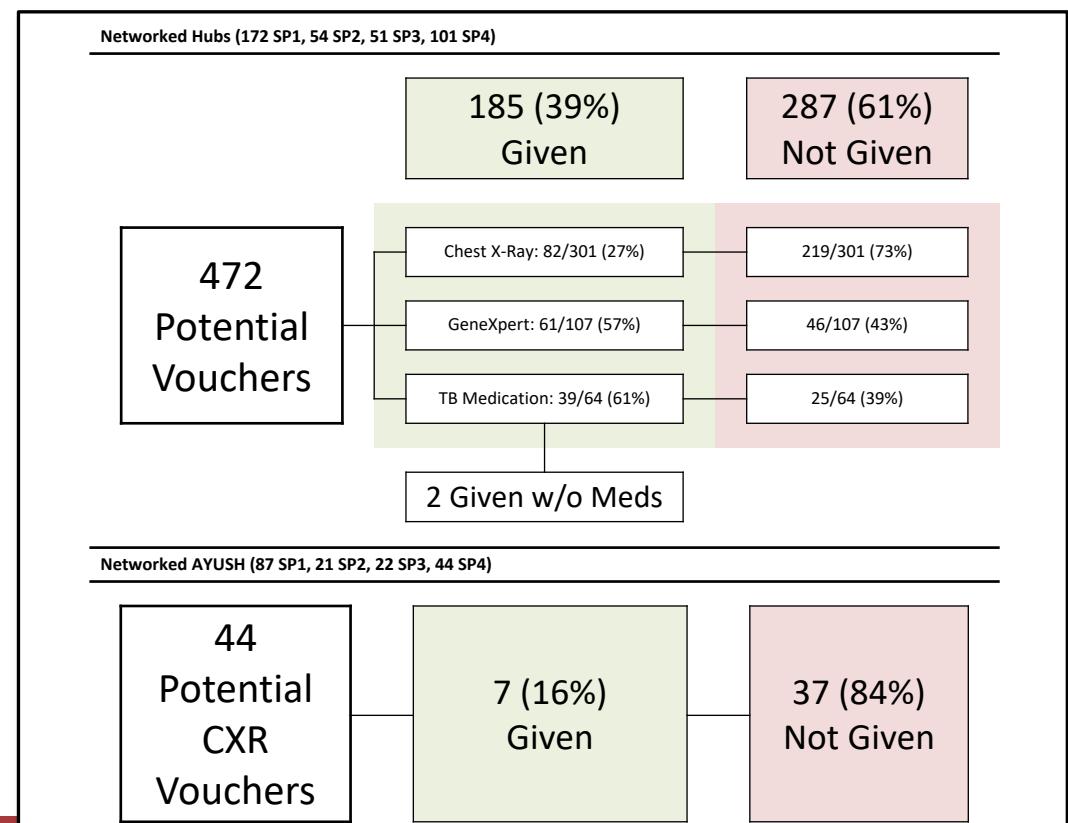


Patna & Mumbai: Use of services was low in SP study

Patna: Vouchers + financial incentives



Mumbai: Vouchers (no incentives)



Therefore there are many patients not observed in program data

Key insight – program data misses two groups:

- a. Providers who are not in the PPIA
- b. Patients who PPIA providers do not register

Therefore:

- a. No direct way to tell how much PPIA behavior change is “general”, or growth in utilization of GX that would have happened anyway
- b. No way to tell how much change in a given provider reflects selective reporting within PPIA, such as learning to only register patients for whom they order GX

SP data addresses these questions by observing providers outside the PPIA, and providers within the PPIA regardless of reporting the patient

Patna: Evaluation Strategies

We have to compare the behavior of providers who are engaged in the program and those who are not. The problem is that providers who choose to engage in the program may be very different from those who choose not to. We use the following strategies:

1. **“Differences-in-differences”** – We can compare the progress over time of four separate groups: (1) providers who never joined the PPIA; (2) providers who were in the PPIA from the beginning; (3) providers who joined the PPIA during the surveillance period; and (4) providers who left the PPIA during surveillance
2. **Randomization** – In the second year during program expansion, we worked closely with WHP to develop an RCT-style evaluation program where providers were offered PPIA engagement based on a randomized draw.

In both cases, the estimate is the *excess* performance gain of PPIA providers in Round 2

PPIA effect on formal providers: DiD

Difference-in-difference regression model estimates effect of engagement across two rounds of SP data

(Bonferroni corrected for multiple hypotheses)

Note: Don't focus on the "correct" measure at this stage since it is sensitive to the modeling choices that are not fully worked out.

Correct Case Management

Chest X-Ray

Sputum AFB

GeneXpert

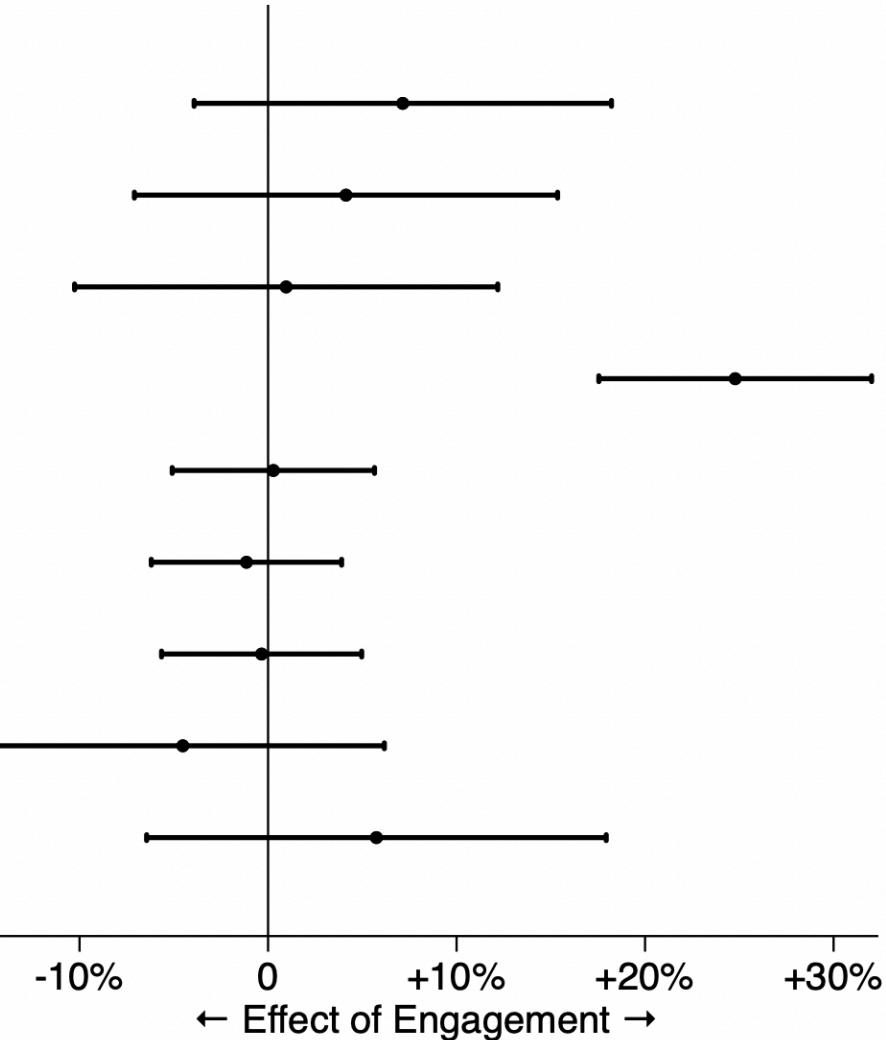
Referral

Steroids

Anti-TB

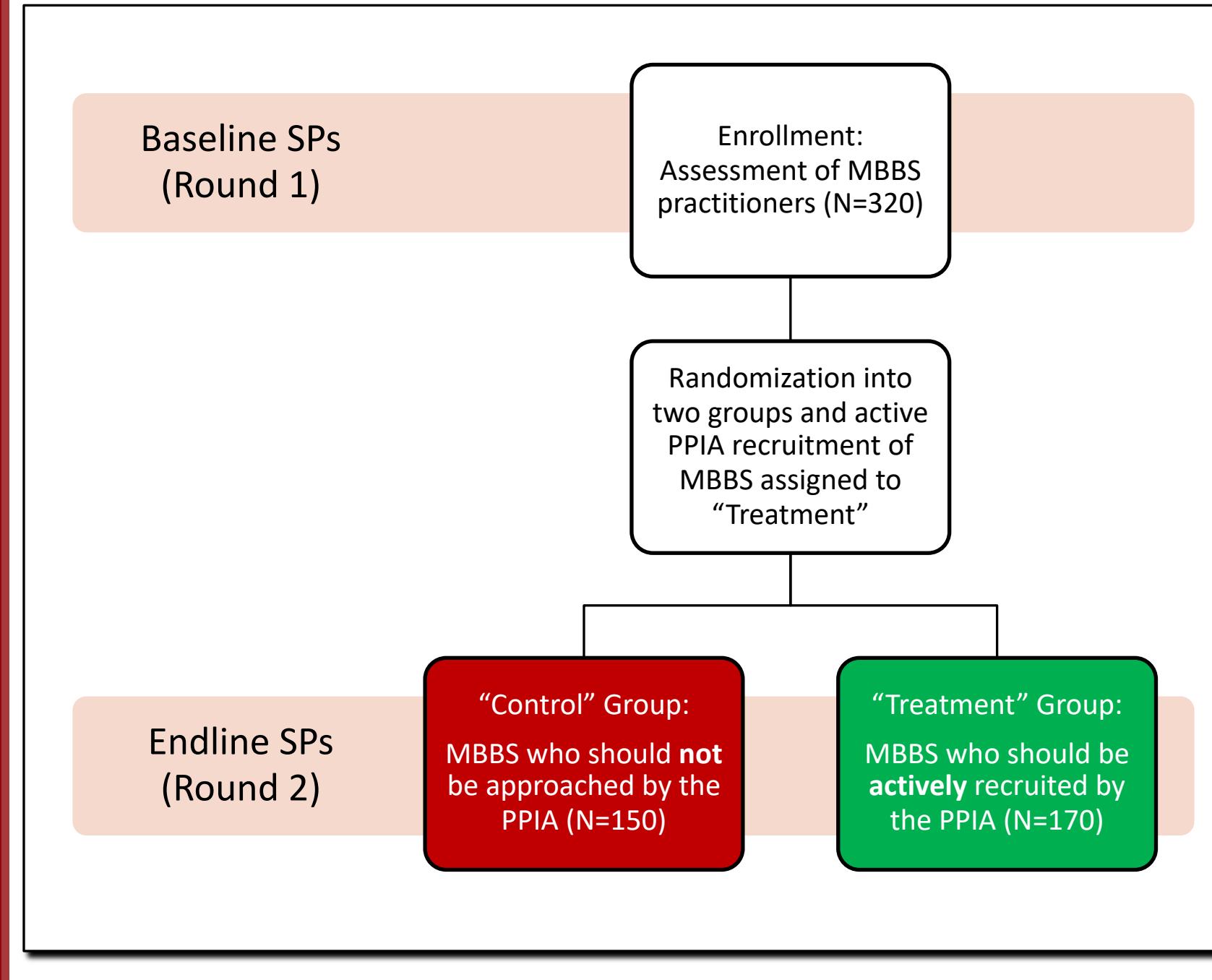
Fluoroquinolone

Other



Randomization experiment

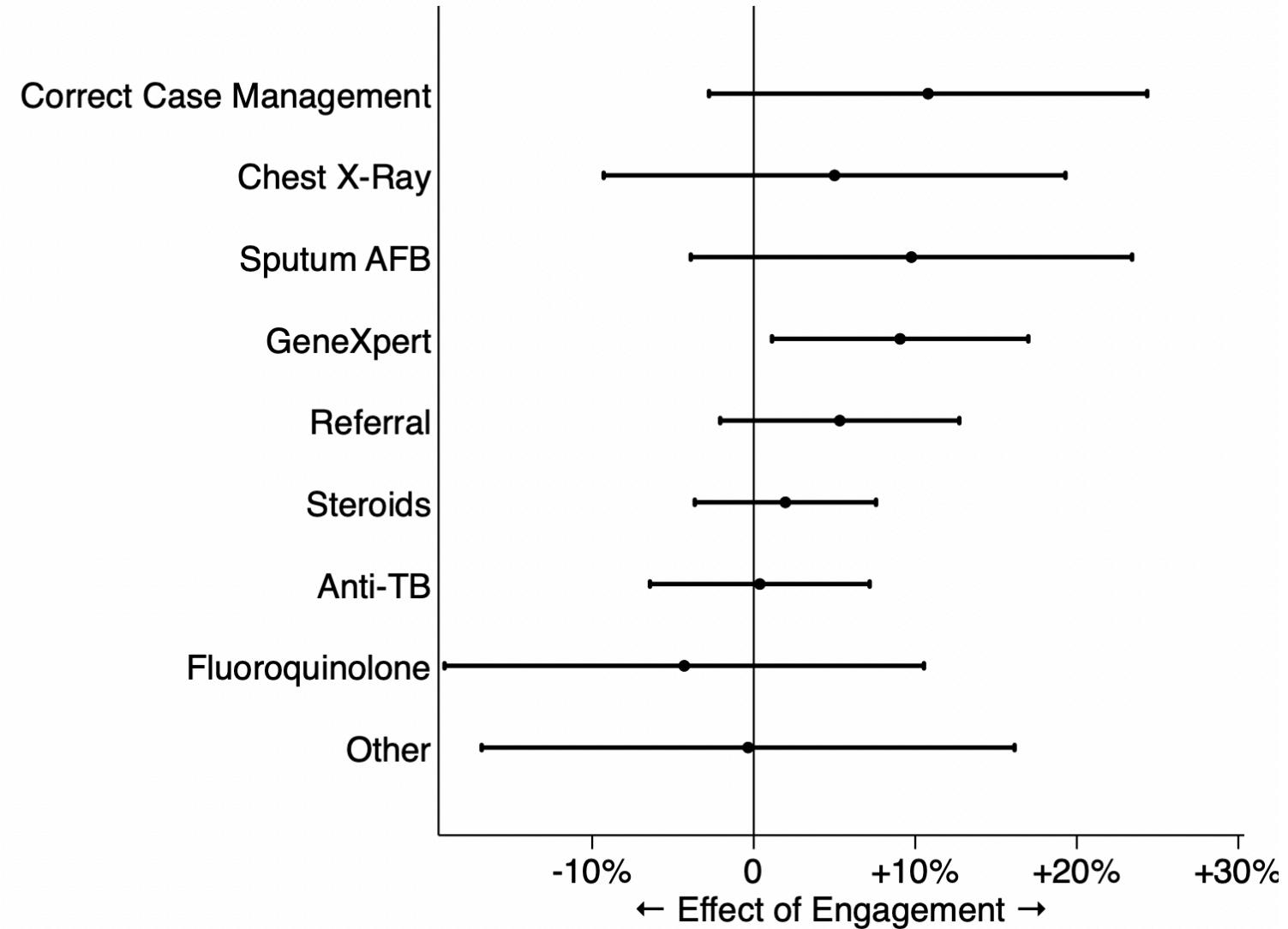
Patna: MBBS Providers who were not engaged at the end of the first SP round



Reduced form results: effect of offering program

Effect sizes double with IV regression – this means that both strategies suggest around 20% increase in GX use from the PPIA

(Bonferroni corrected for multiple hypotheses)

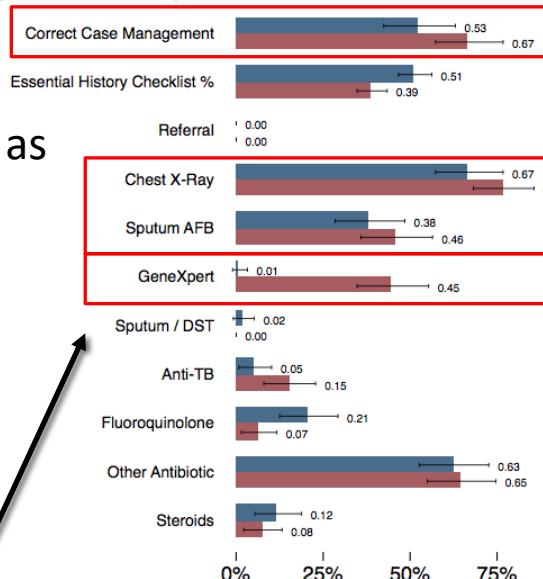


Bounds on the possible effect

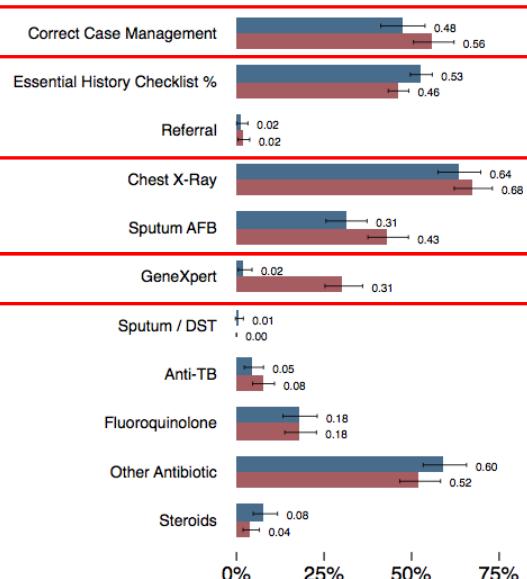
1. Causal impact suggests correct treatment increases ~10% and GX increases ~20%
2. But, this is only representative of providers who joined between the first and second year
3. If impacts were larger on those who joined before SP work began, they might be significantly higher

Some evidence: Differential changes by provider activity

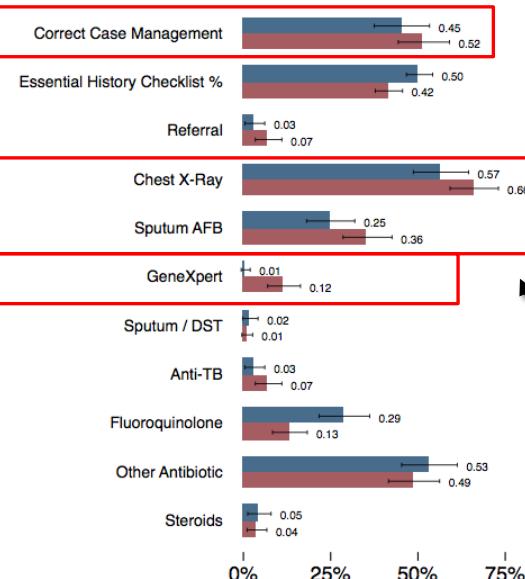
Top 20% active providers



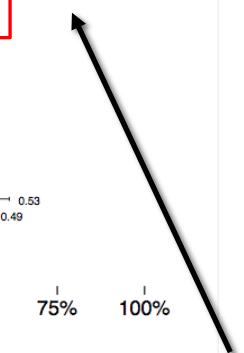
Middle 60%



Bottom 20%



Effects as large as
+14% correct,
+45% GX



Always in the PPIA

Round 1 Round 2

Available for DiD and
randomization strategies

Patna: Conclusions

1. There are clear time trends in the data
2. Despite this, we can definitively say:
 - a. The program potentially had moderate effects on correct treatment
 - b. The program increased GX use (+17-25% among those who accept engagement)
 - c. The program had no effect on unnecessary medicines
3. Because we cannot say anything about providers who were always engaged, these are likely a lower bound effect. The true effects may be much larger, but we cannot make this claim.

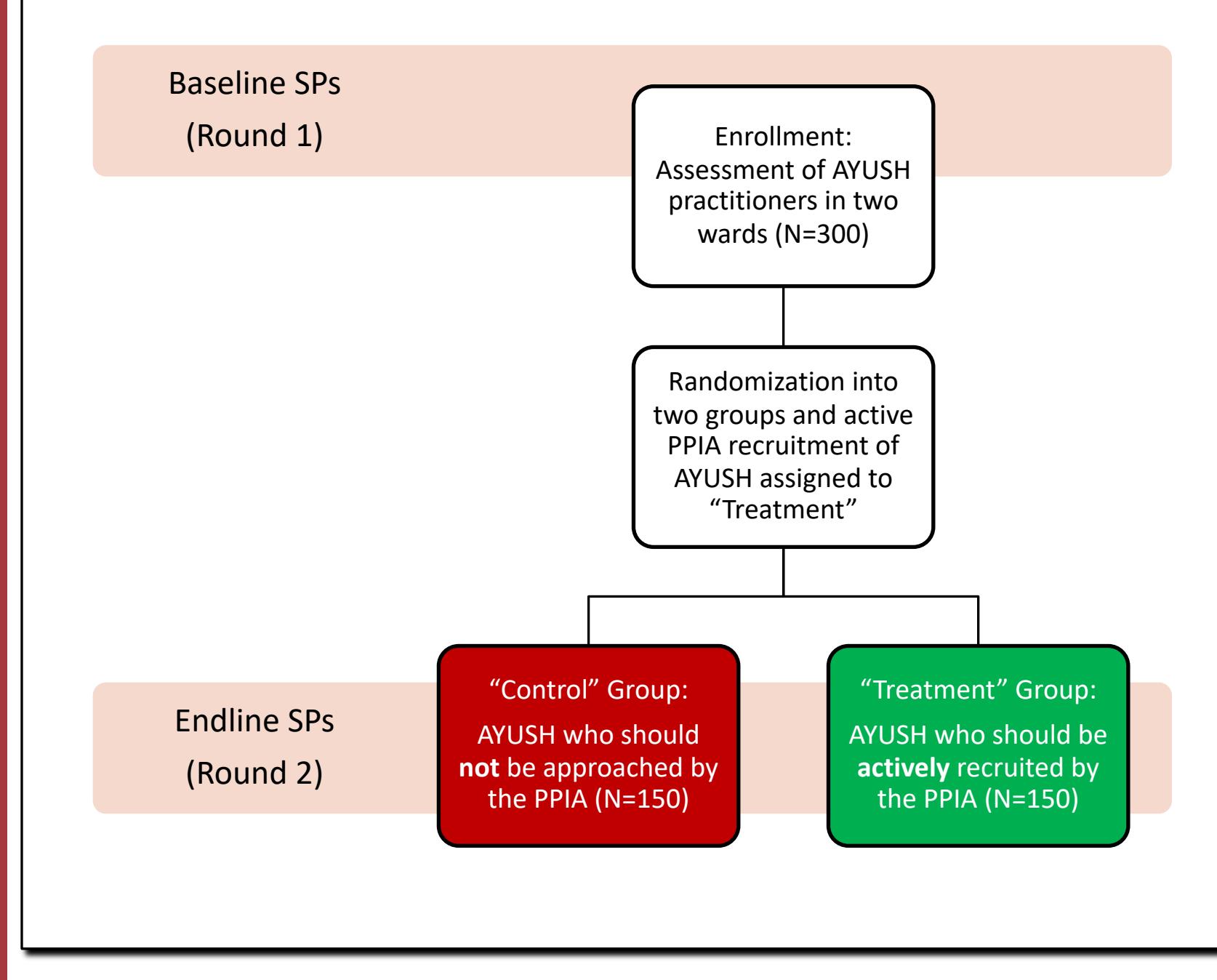
Mumbai

Mumbai: Main differences from Patna

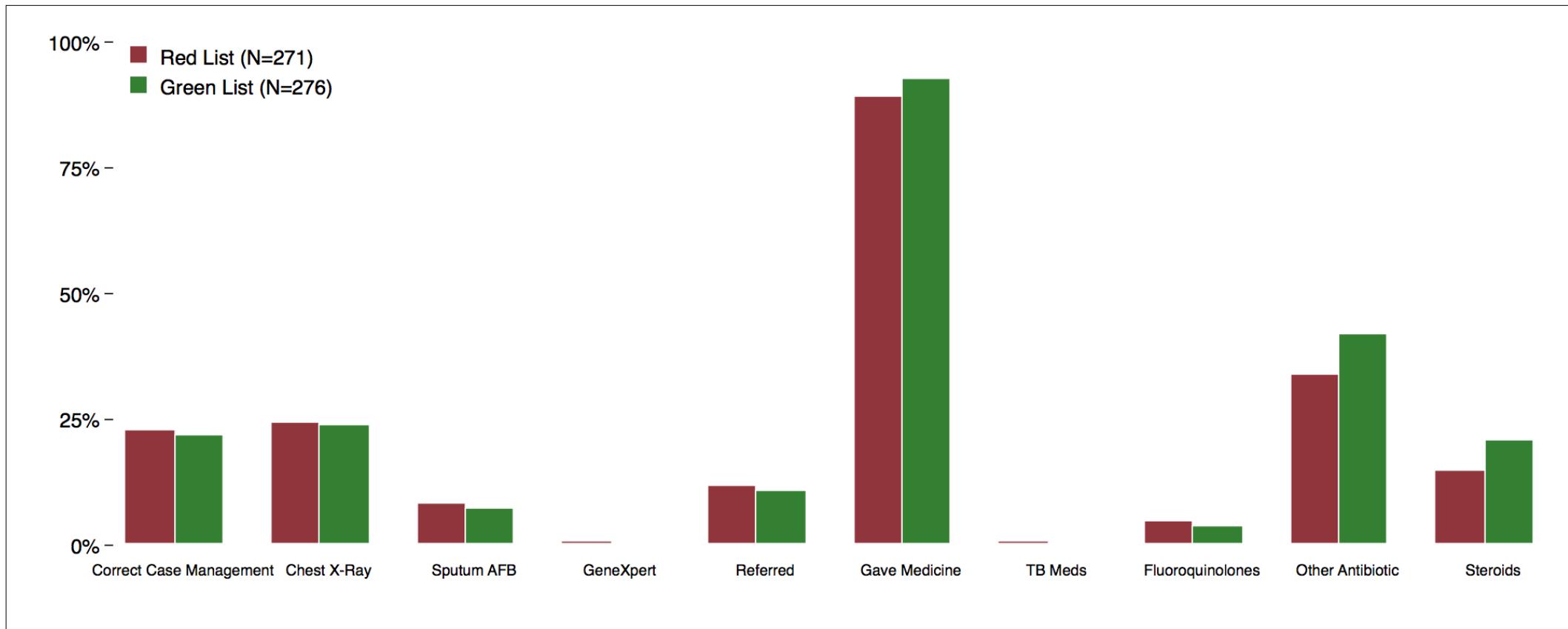
1. We have randomization among AYUSH but not formal providers
2. Among formal providers (“hubs”), we do have very careful sampling that allows us to distinguish convenience and learning effects
3. From Round 2 to Round 3, we can definitively identify convenience effects and show that they are small
4. General messages:
 - a. No program effect on AYUSH at all
 - b. No convenience effect on formal providers at all
 - c. Potentially large and persistent learning effects for formal providers

AYUSH strategy: Randomization

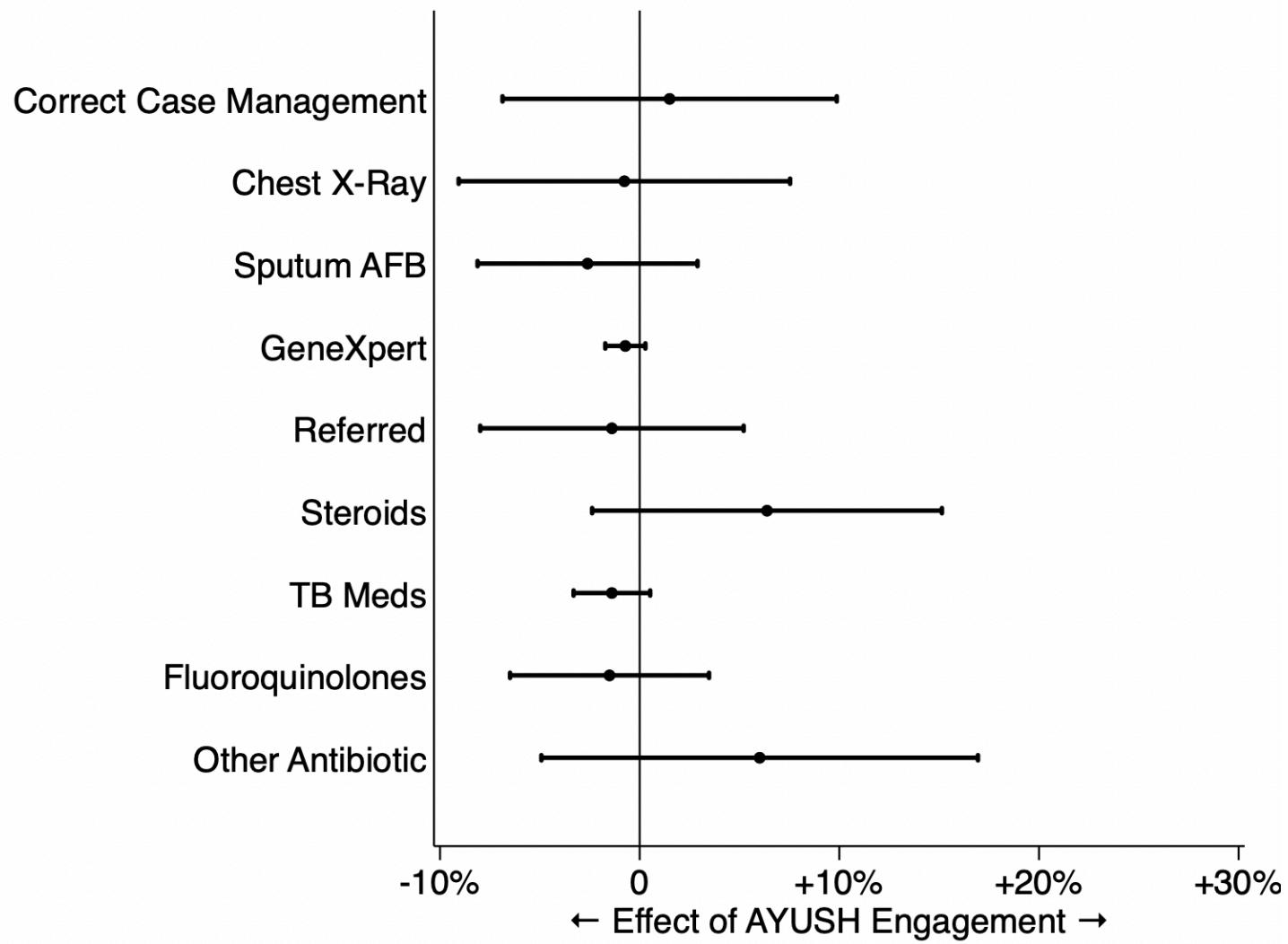
Mumbai: AYUSH providers
who were not engaged at the
end of the first SP round



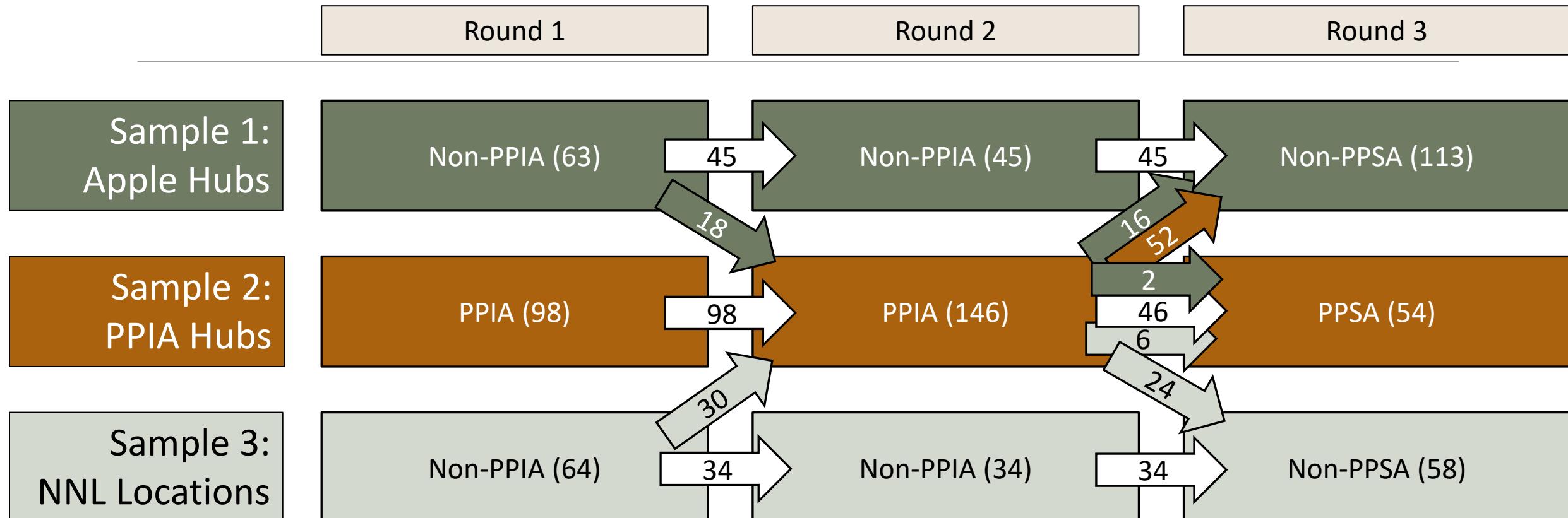
Mumbai: No effect on AYUSH behavior or referral



Regression model



Mumbai Hub Facilities (N=275)



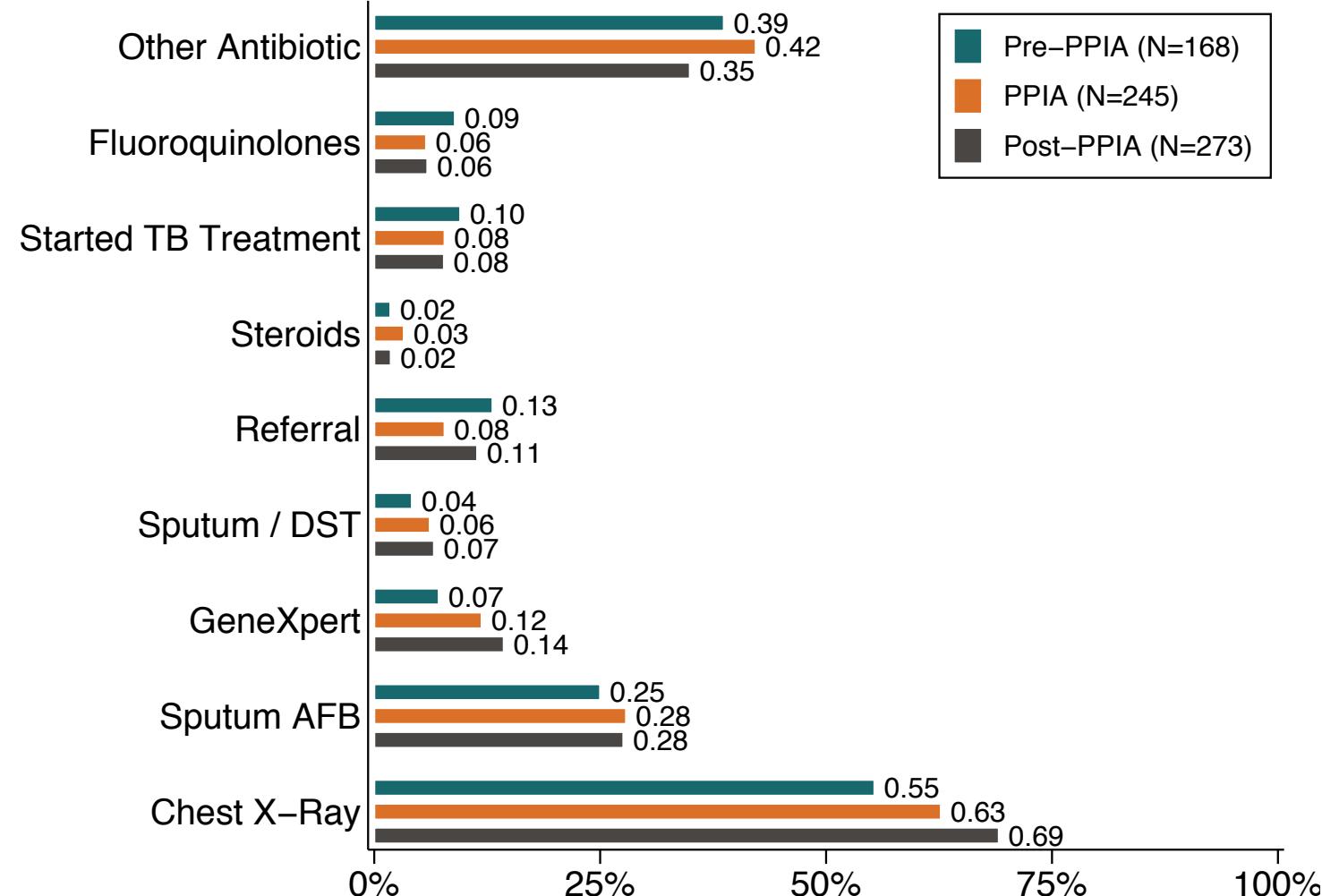
Making this figure required one year of work!
(Why?)

Sample 4:
PPSA Locations

PPSA (50)

Things were changing in the background

(These are facilities that never joined the PPIA)



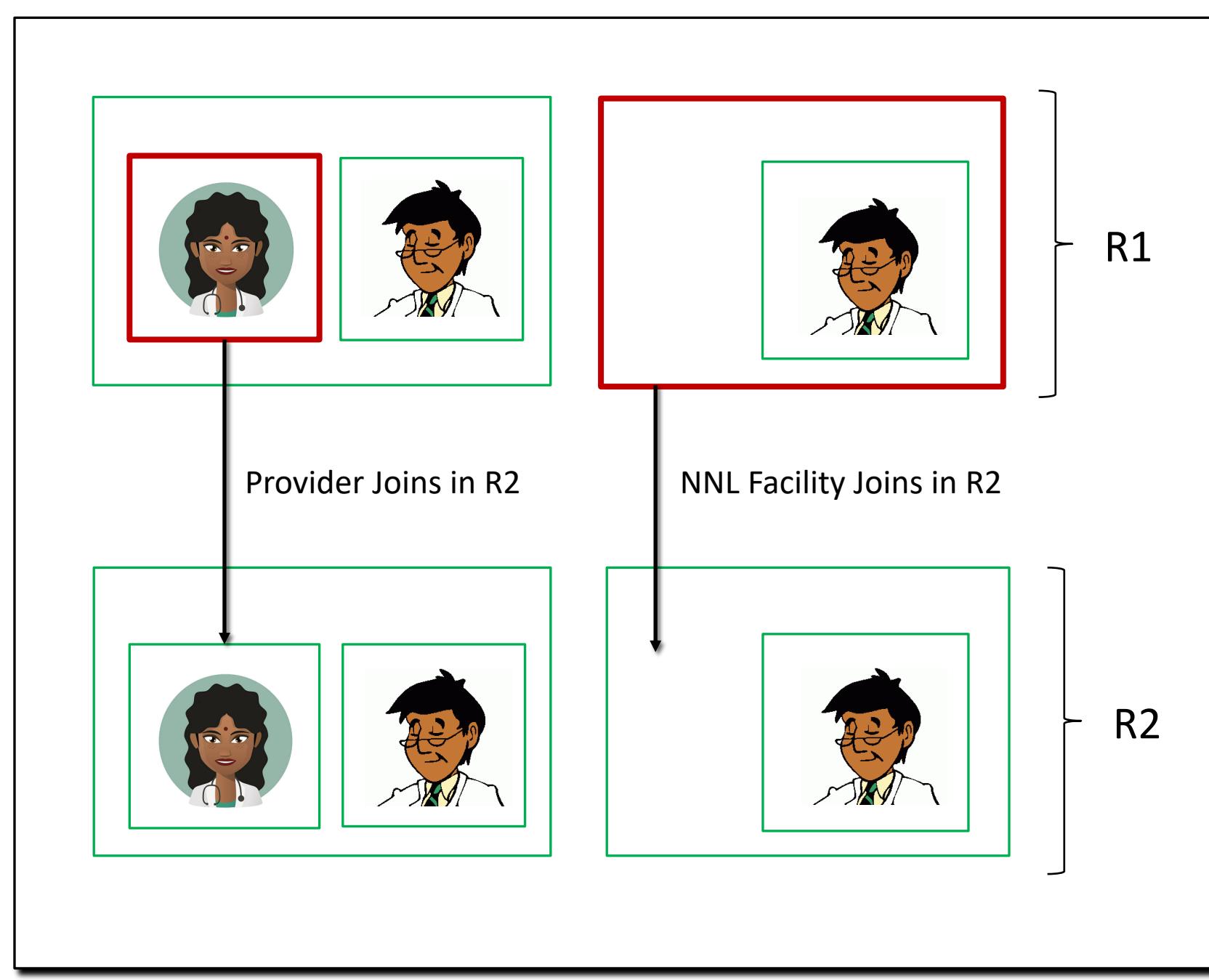
Mumbai Hubs: Complex structure

Green: PPIA

Red: Non-PPIA

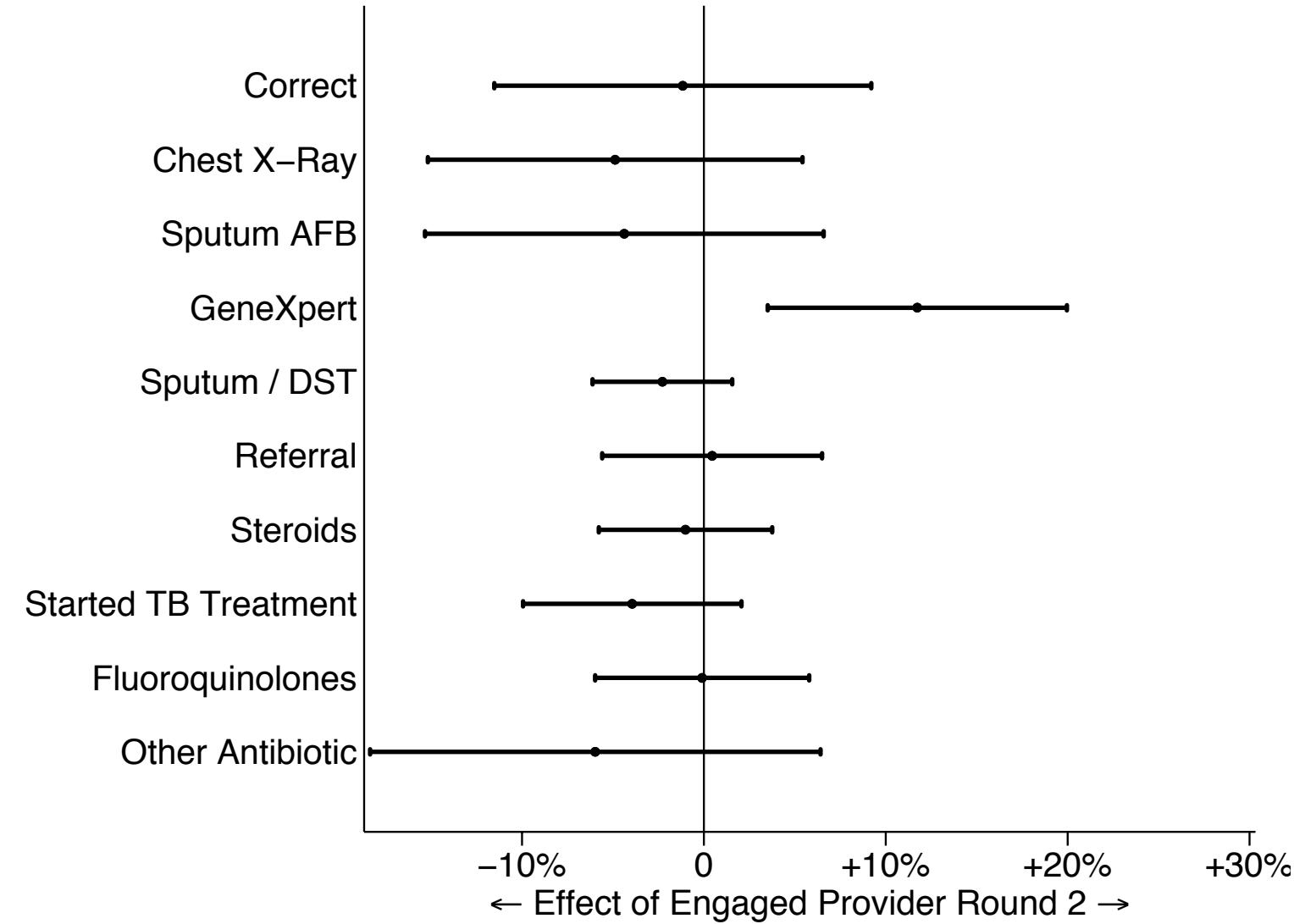
(Note that provider and facility status do not necessarily correspond)

NNL = Non-networked Location, a PPIA provider has another non-PPIA facility



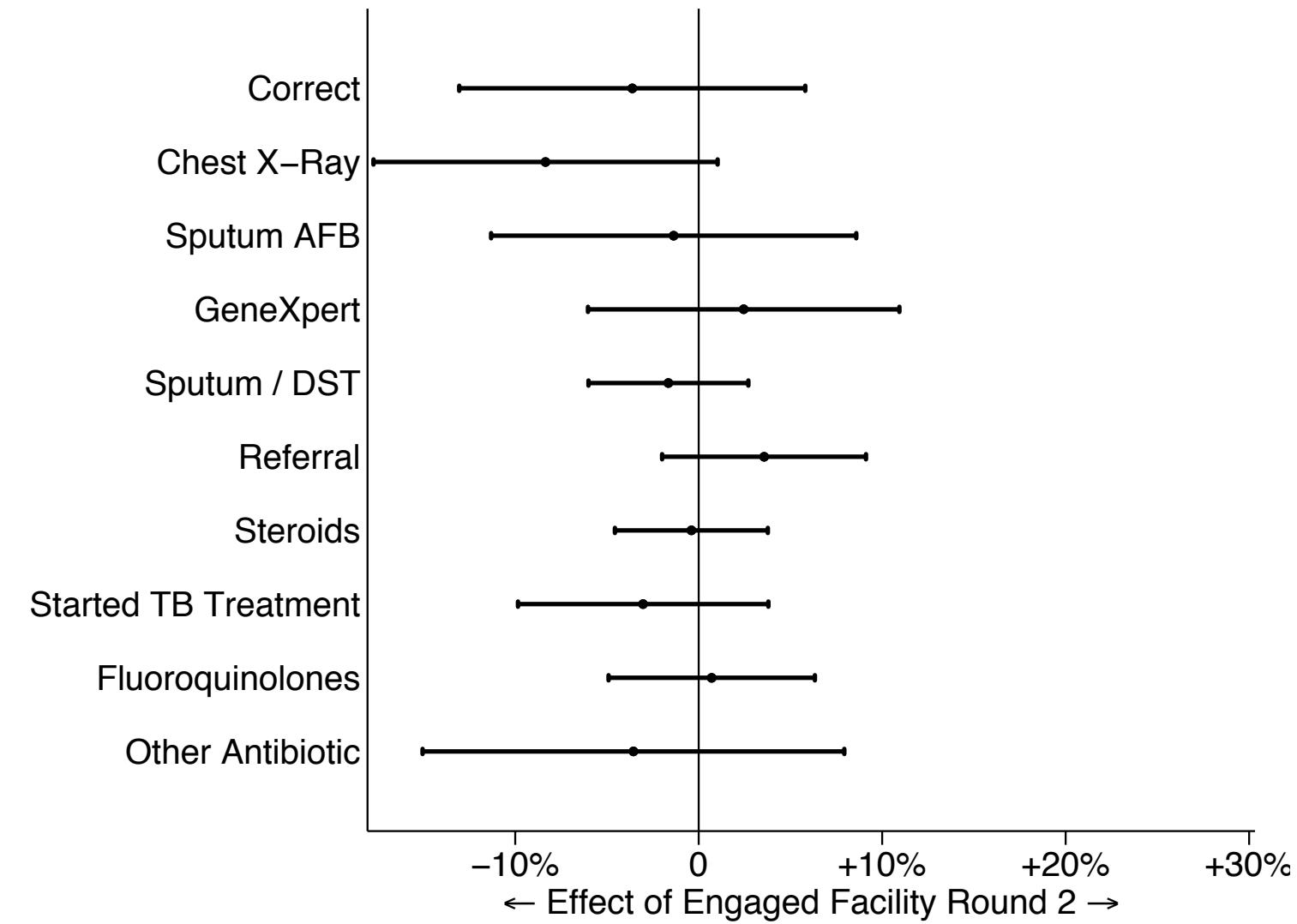
Learning effect improves GX

PPIA providers improve their GX use faster than other providers *in the same facilities*



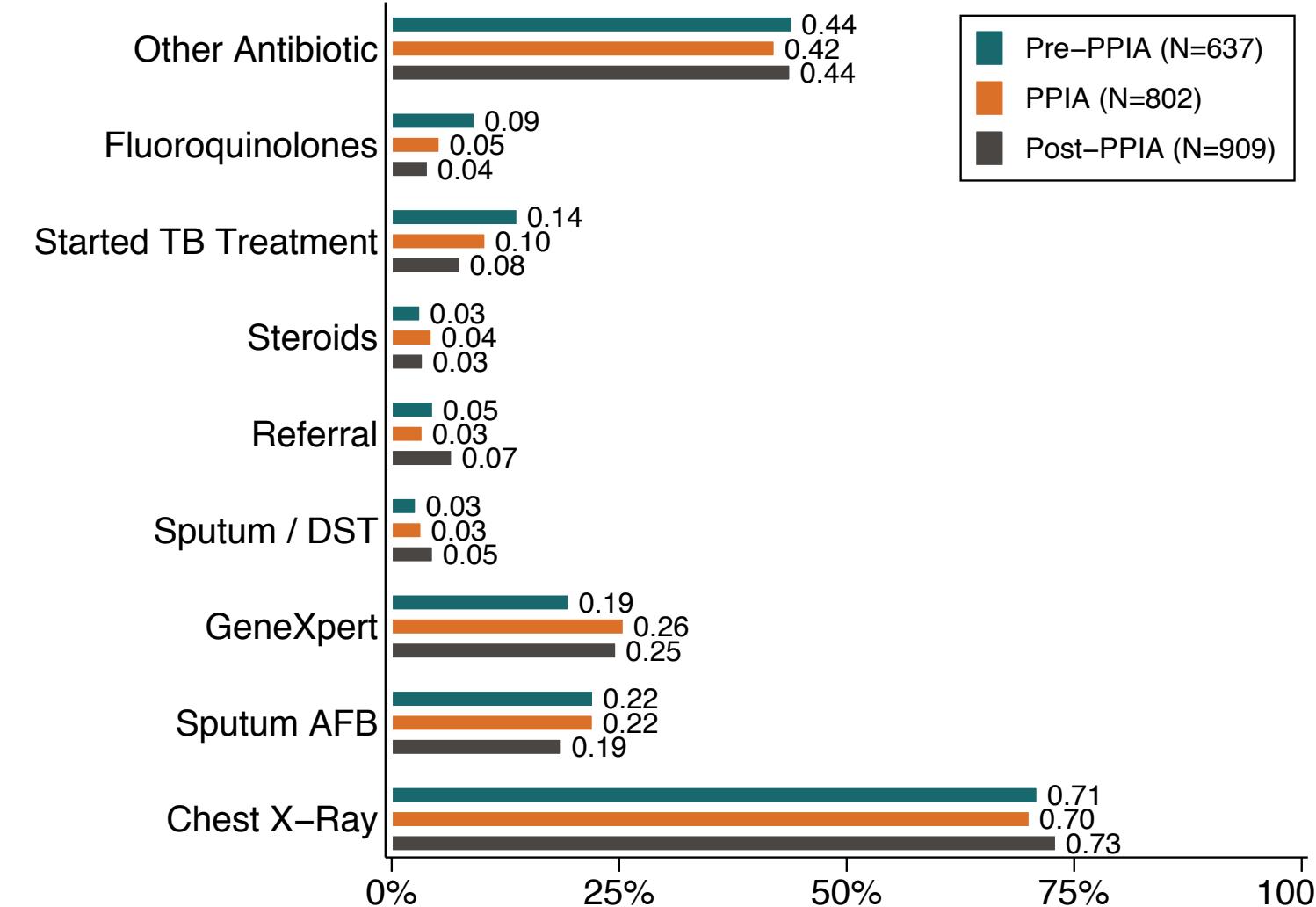
Convenience effect of services

The same PPIA provider
behaves similarly whether in
a PPIA facility or a non-
networked facility



No significant changes after Round 2

Note: Mumbai only; returning to Patna soon

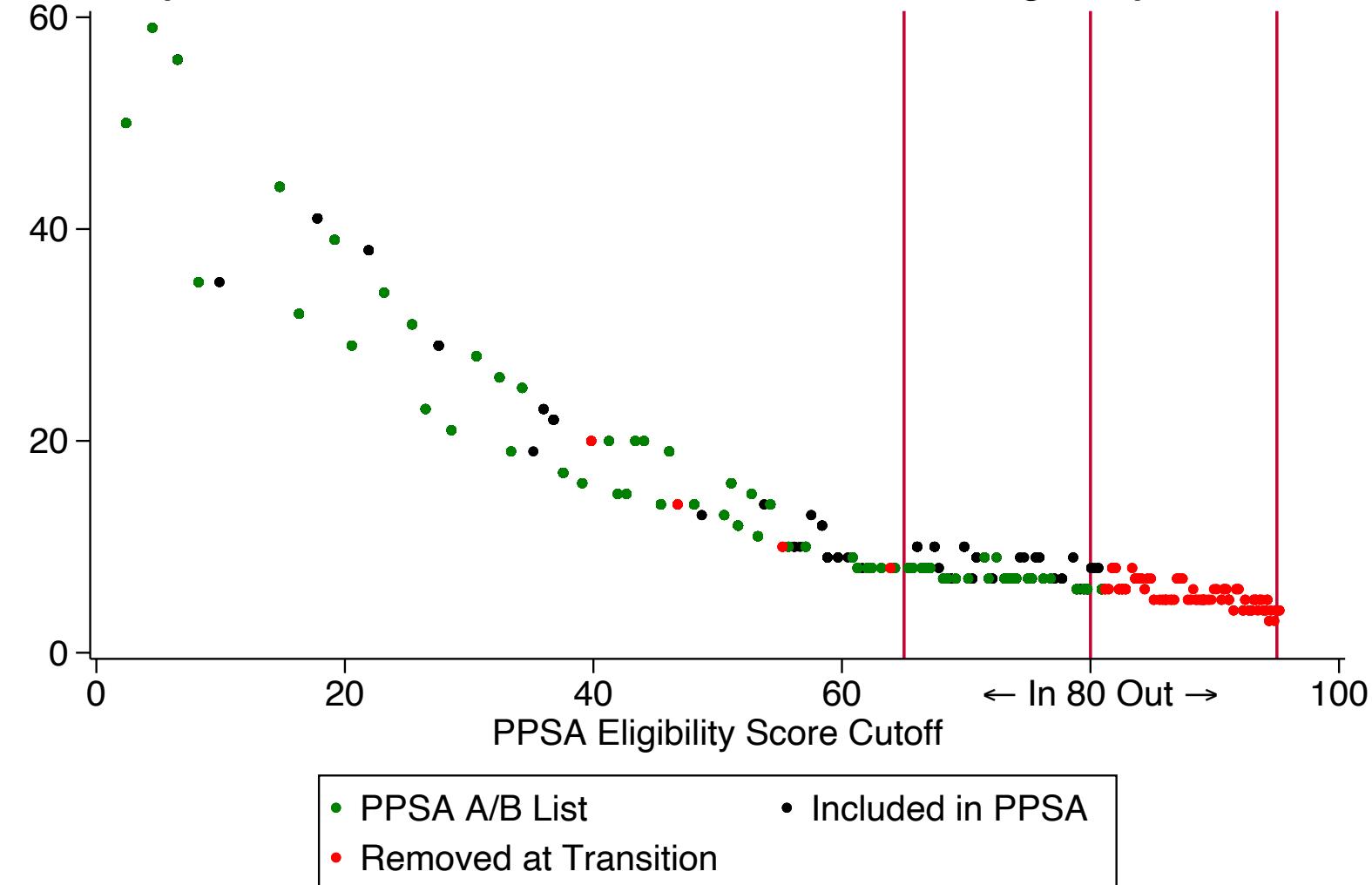


PPSA services “experiment”

During PPSA transition, providers were ranked by number of notifications and cut off above 80% of PPIA patients

This means that providers at an arbitrary level were removed from the convenience services roster

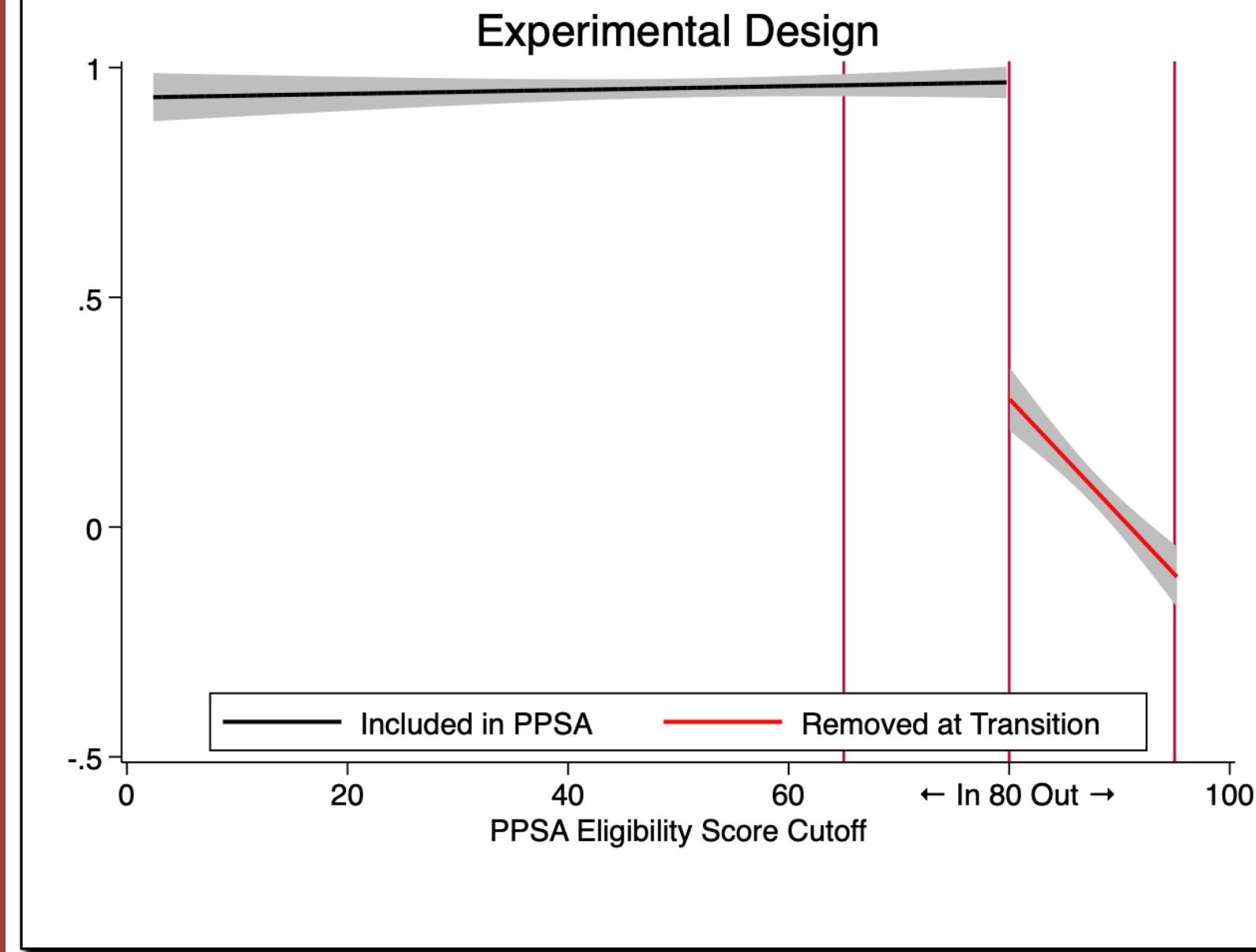
Monthly Notifications and PPSA Transition Eligibility



Strategy: Regression Discontinuity

Design of policy allows us to see what happens to very similar providers affected by arbitrary cutoff

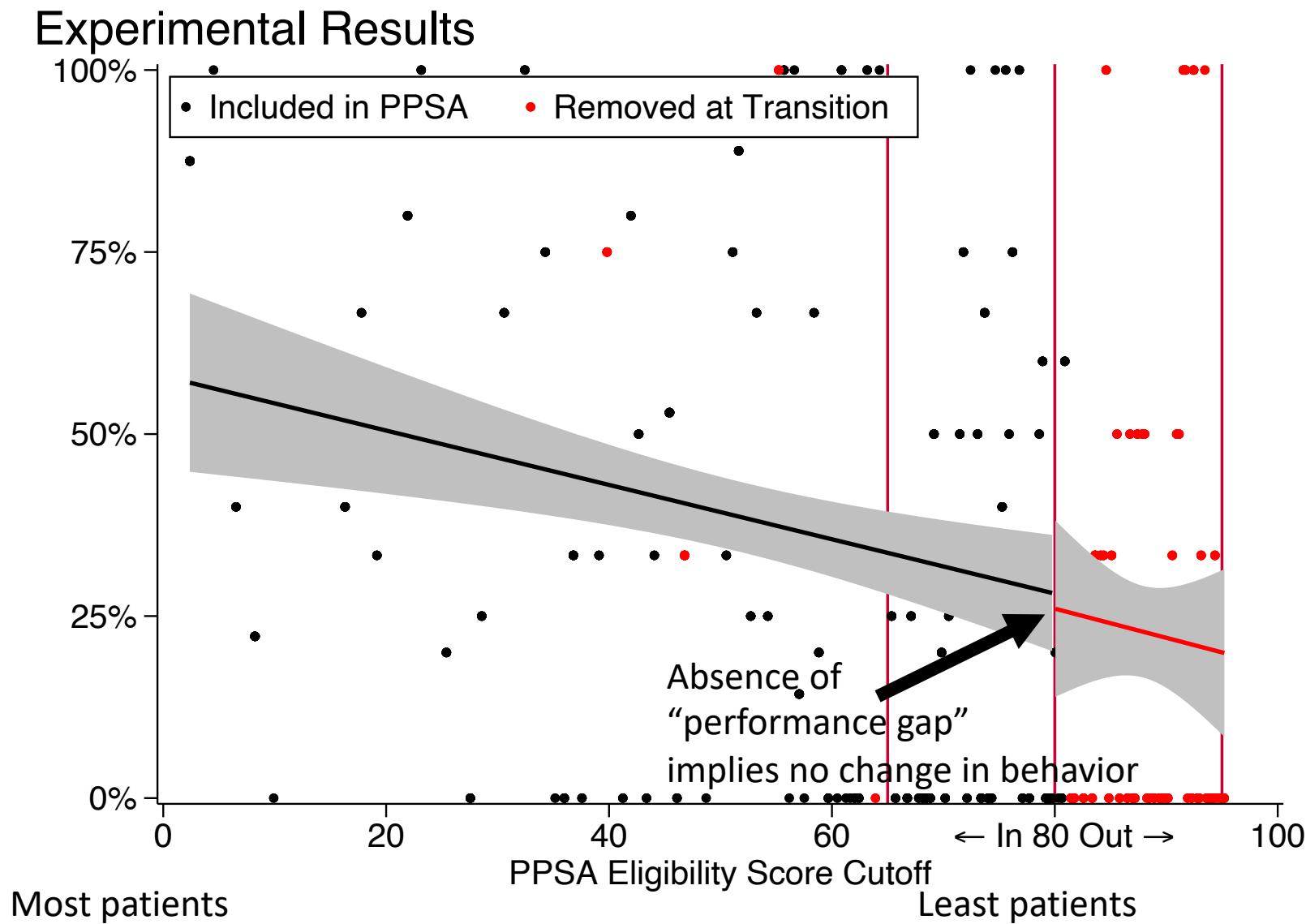
Shown: probability that provider remains in PPSA after transition, by eligibility



No discontinuity at exclusion from PPSA

Strong indication that PPIA/PPSA services had no effect on utilization of GX

Shown: probability that provider uses GX with SPs after transition, by eligibility



This was not easy!

Ground reality was highly complex

1. PPIAs weren't able to wait for us to set up a full randomized controlled trial, so we had to embed attempts to get *as close as possible* to causally identifying an effect from the program via other activities
2. This started with mapping all the private providers (both inside and outside the PPIA) which was necessary both programmatically and from a research perspective
3. Working with the PPIA (in Mumbai) to understand that providers and facilities were independent entities and thus should have separate fields in data took several months, and was poorly reflected in central systems

Partner organizations understand and use data with the ground reality in mind

All partner organizations did an excellent job keeping track of providers and patients in this complex landscape!

This is mostly accomplished through deep knowledge embedded in field officers and program staff

However:

What is useful information today doesn't necessarily systematize into *data* that can be efficient, scalable, and exploitable for other purposes

Over time, we experienced dramatic information loss:

- a. Program staff changed and FOs left
 - b. Very hard to retain institutional memory over years
 - c. Information structure and documentation was not set up for efficient archiving and backwards searching
 - d. Keeping track of providers, provider-facilities, and patients over time was challenging

But, PPIA program data cannot translate well to retrospective research

1. Central data systems were incomplete or mapped poorly to field reality
2. Program data systems were *jugaad*-rigged on the fly
3. Complete mapping of providers and facilities was not fully completed
4. IDs and tracing of providers were weakly maintained across years
5. Functional addressing of facilities was rarely recorded
6. Follow-up of patient pathways was rarely possible

Central data systems were incomplete

In this program, we relied on:

1. PATH custom system
2. WHP custom system
3. UATBC system
4. Nikshay system
5. CommCare reports
6. Hand-written reports

...to name a few!

Various other systems were not delivered on time, not delivered at all, or did not function in a useful way for MLE purposes when they were delivered.

Program data systems were *jugaad*-rigged on the fly

Also the same provider...

dr cheetan kumar jain
dr chela
dr cheta
dr chetah
dr chetam
dr chetam kumar jain
dr chetan
dr chetan bhatt
dr chetan halia
dr chetan haria
dr chetan jai
dr chetan jain
dr chetan jar
dr chetan k jain
dr chetan kem
dr chetan kumar
dr chetan kumar gain
dr chetan kumar jain
dr chetan kumar jian
dr chetan kumar sain
dr chetan kumar tain - m
dr chetan shetty
dr chetan velani
dr chetan veloni
dr chetani
dr chetankum
dr chetankumar
dr chetankumar jain
dr chetankun
dr chetankur
dr chetant kumar
dr chetanta
dr chetantema
dr chetantum
dr cheten kumar
dr cheten kumar jain

All the same provider.

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program data.xlsx	<input checked="" type="checkbox"/>
PPIA Project Suspect Database copy.xlsx	<input checked="" type="checkbox"/>
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Spreadsheets

04-Adherence Data File - MJK - 09 JUNE 2015 (1)1 2.xlsx	<input checked="" type="checkbox"/>
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Daily report_25 June 15.xlsx	<input checked="" type="checkbox"/>
GeoTagMaster.xlsx	<input checked="" type="checkbox"/>
Master_Input.xlsx	<input checked="" type="checkbox"/>

Complete mapping of providers and facilities was not fully completed

Multiple mapping rounds in both cities produced data where duplicate providers could not be resolved, and therefore there was no “master plan” possible for targeting, expansion, or comparison

Date_facilit	Facility_Ty	If_other_sp	Facility_name	facility_owner	operating_days	Is_your_fa																								
					op_day_mon op_day_	No																								
					op_day_every	No																								
2014-05-20	chemist	al	PRAKESH MEDICAL	PRAKESH KUMAR	op_day_every	No																								
2014-04-09	chemist		Dawai Ghar	Nina Singh	op_day_every	No																								
2014-01-30	bams		Maveer chiktsa kendra	Dr an dubey	op_day_every	No																								
2014-02-01	chemist		Epsha Medicals	Dilip Kumar sinha	op_day_every	No																								
2014-01-28	labs		Hitech pathology	Pradeep kr gupta	op_day_every	No																								
2014-05-28	dentist		Jai Mahavir Den	IDS	MOU Sign Date	Provider Qualificat																								
						Address																								
2014-02-18	facility_oth	Informal pr	Informal provic	udan40001	M.K. Zar	MBBS	Mainpura (Behind Hanuman Mandir) Danapur ,Patna																							
2014-02-10	mbbs		Nuerophycian	udan40002	S.N Barn	MBBS	Hatikana More Mainpura Danapur																							
2014-03-01	labs		Jagdish memor	udan40003	Neelam	MBBS	Naharpur Danapur Near Ashirwad tiles.																							
2014-04-11	bams		Homoeo Awsoc	udan40004	am niwas singh (Shidhi	MBBS	Gola Road Patna																							
2014-02-01	chemist		Lucky Pharma	udan40009	li Tech Emergency Hos	MBBS	Near Saguna More Opp Canara Bank Patna																							
2014-03-01	labs		Global Laboratu	udan40011	Ganesh Prasa	MD(other)	Opp. Danapur Police Chouki Danapur Patna																							
2014-03-01	chemist		Nand Medico	udan40012	Kumari Ma	MBBS DGO	Ridhi Clinic Danapur Main Road Patna																							
2014-04-24	eye		Mundrika Micr	udan40014	Madan De	MBBS/MD	Near Shiv Mandir Dalluchak Khagaul Danapur Patna																							
2014-04-06	bams		Dr. Diwakar	udan40015	Usha Kir	MBBS (GYNE)	Yadav Nagar Naya Tola Saguna More Danapur Patna-801503																							
2014-03-11	Facility Address		Facility 24/	Facility Clo	Facility Cor	Mapping D	Mapping E	Facility Nar	Facility Typ	Facility Typ F	Facility Typ G	Facility Typ H	Facility Typ I	Facility Typ J	Facility Typ K	Facility Typ L	Facility Typ M	Facility Typ N	Facility Typ O	Facility Typ P	Facility Typ Q	Facility Typ R	Facility Typ S	Facility Typ T	Facility Typ U	Facility Typ V	Facility Typ W	Facility Typ X	Facility Typ Y	Facility Typ Z
2014-02-11	T		Yes	—	—	2014-01-11	2014-01-11	T	chemist	—	Y.e Chauki Danapur Ward-13																			
2014-02-11	Sarakchhap		No	15:14:00.000+05:30	2014-01-11	2014-01-11	Eer	labs	—	SJIC PHC Danapur Patna																				
2014-07-04	(Rajeev Nagar		No	08:00:00.0 7.87E+09	2014-01-11	2014-01-11	Home Cillin	bams	—	O Daudpur Danapur Patna																				
2014-04-11	Patliputra goalmber		No	10:00:00.0 9.43E+09	2014-01-11	2014-01-11	An and Me	chemist	—	Soad, Gola Road, Danapur Patna																				
2014-09-04	186patliputra colony		No	09:30:00.0 9.28E+09	2014-01-11	2014-01-11	Life line m	chemist	—	NBibiganj danapur, near uday palace																				
2014-09-04	(Patliputra colony, opposite P and M r	Yes	—	9.93E+09	2014-01-11	2014-01-11	Dr. J.K.Lak	hospital	—	S Rajiv Nagar -24 Patna																				
2014-05-21	Gosai tola		No	21:00:00.0 9.91E+09	2014-01-11	2014-01-11	Anil homec	bams	—	O Ishant Hospital Uday Palace Danapur																				
2014-03-21	Alpana market' intermatinol school ro		No	07:30:00.0 9.8E+09	2014-01-11	2014-01-11	Om sai pa	collection	—	O Gurhatta Patna city.																				
2014-05-11	Patliputra colony		No	09:00:00.0 6.12E+09	2014-01-11	2014-01-11	Shiva Medi	chemist	—	S bypass Ram Vilash Path patna																				
2014-05-11	(Alpana Market		No	10:00:00.0 8.99E+09	2014-01-11	2014-01-11	Ganga Me	chemist	—	S Nhall Machuatoli, danapur cantt, patna																				
2014-04-11	Gosai tola		No	09:00:00.0 9.3E+09	2014-01-11	2014-01-11	Saurav me	chemist	—	Nhi talab Gardani bagh patna																				
2014-04-11	92, Patliputra colony, road no.11		No	18:00:00.0 6.12E+08	2014-01-11	2014-01-11	J.p saran	labs	—	O Sahayog ho hospital																				
2014-02-11	(Patliputra colony		Yes	—	9.33E+09	2014-01-11	2014-01-11	Dr.M.Qais	bams	—	P Sanj Path Near Birla Colony Patna																			
2014-08-07	Patliputra,gosai tola		No	20:00:00.0 9.84E+09	2014-01-11	2014-01-11	Medicine p	chemist	—	S West Kachi Talab																				
2014-05-21	40 Patliputra colony		Yes	—	6.12E+08	2014-01-11	2014-01-11	Sahyog Hc	hospital	—	R -6 Beside Oasis school																			
2014-05-21	40, Patliputra colony, Patna		Yes	—	6.12E+09	2014-01-11	2014-01-11	Ajit medica	chemist	—	R patliputra colony patna 13																			
2014-08-22	(Naura nagar,gosai tola		No	22:00:00.0 9.12E+09	2014-01-11	2014-01-11	Medicine p	chemist	—	F Onti Gunj Opp Petrol Pump Phulwarishariff Patna																				
2014-05-21	Naura nagar		No	22:00:00.0 9.33E+09	2014-01-11	2014-01-11	Medical po	labs	—	B Gurhatta Patna city.																				
2014-08-22	Naura nagar		No	22:00:00.0 9.33E+10	2014-01-11	2014-01-11	Sahyog Hc	labs	—	P																				
2014-05-21	40, Patliputra colony, Patna		Yes	—	6.12E+09	2014-01-11	2014-01-11	Ayuesh me	chemist	—	S																			
2014-08-22	40,patliputra colony patna		Yes	—	6.12E+09	2014-01-11	2014-01-11	Dr. Jitendre	mbbs	—	N																			
2014-05-21	New patliputra rd		No	11:00:00.0 8.88E+09	2014-01-11	2014-01-11	Dr. Jitendre	mbbs	—	P																				
2014-08-22	House no . 164, Patliputra colony, P. No		No	11:00:00.0 6.12E+09	2014-01-11	2014-01-11	Chandmen	hospital	—	S																				
2014-05-21	164,Patliputra colony patna-13		No	11:00:00.0 6.12E+08	2014-01-11	2014-01-11	Dr.Jitendra	mbbs	—	M																				
2014-08-22	House no. 173, Patliputra clony, Pat		Yes	—	6.12E+09	2014-01-11	2014-01-11	Chand Me	hospital	—	N																			
2014-05-21	House no-173 Patliputra		Yes	—	6.12E+09	2014-01-11	2014-01-11	Royal mad	chemist	—	P																			
2014-08-22	Boring patliputra road pani tank more		No	10:00:00.0 9.95E+08	2014-01-11	2014-01-11	Drug cente	chemist	—	N																				
2014-05-21	45/1New patliputra colony mehta m:	No	No	11:00:00.0 9.85E+09	2014-01-11	2014-01-11	Vision I Ca	nursing	—	P																				
2014-08-22	129 E, Patliputra colony, Patna-13		Yes	—	9.94E+09	2014-01-11	2014-01-11	Amit farma	chemist	—	N																			
2014-05-21	Rajiv nagar Patliputra		No	15:45:00.0 9.8E+09	2014-01-11	2014-01-11	Vision ICar	nursing	—	P																				
2014-08-22	129E Patliputra colony		Yes	—	7.49E+09	2014-01-11	2014-01-11	Vision ICar	nursing	—	S																			
2014-05-21	Adarsh market		No	22:00:00.0 9.47E+09	2014-01-11	2014-01-11	Dr.M.S.SH	bams	—	N																				
2014-08-22	Alpana market road, Patliputra, Patn		No	21:00:00.0 9.34E+09	2014-01-11	2014-01-11	Dr. Ila Priya	mbbs	—	N																				
2014-05-21	Rajiv nagar Patna		No	21:00:00.0 9.33E+09	2014-01-11	2014-01-11	New Sawai	chemist	—	V																				

IDs and tracing of providers were weakly maintained

Multiple IDs for each provider that changed with each data system revision

Often not linked to a master database, with providers not appearing in patient list and vice versa

B	C	D	E	F	G	H	I	J	K	
Agency ids For Provider	HEID	New HEID (User Name)	Password	Active/Inactive	provide	provide	active	reason	r.No.	IDS
108487	77094	077094	whp@1234	Active	lab	412206	yes	---	2	udan40002
108526	77084	077084	whp@1234	Active	formal	107561	yes	---	8	udan40003
108586	78018			Not active last 3 month(Inactive)	chemist	521029	yes	---	25	udan40004
108623	78981	078981	whp@1234	Active	formal	118347	yes	---	50	udan40009
108630	87027	087027	whp@1234	Active	chemist	505741	yes	---	82	udan40011
108647	77439	077439	whp@1234	Active	informal	207884	no	few_patie	86	udan40012
108668	86719	086719	whp@1234	Active	lab	405244	yes	---	97	udan40014
108685	78019	078019	whp@1234	Active	formal	119701	yes	---	99	udan40015
108729	77613	077613	whp@1234	Active	informal	208226	no	few_patie	77	udan40016
108749	86720			Not active last 3 month(Inactive)	chemist	506030	yes	---	40	udan40018
106809	77512	077512	whp@1234	Not active last 3 month(Inactive)	formal	107167	yes	---	108	udan40019
106826	78094	078094	whp@1234	Active	chemist	505704	no	few_patie	111	udan40021
106863	78100			Not active last 3 month(Inactive)	chemist	506388	yes	---	136	udan40024
106902	79758	079758	whp@1234	Not active last 3 month(Inactive)	formal	107349	no	few_patie	159	udan40029
106910	83002	083002	whp@1234	Active	informal	208305	yes	---	16	upat40011
106921	77857	077857	whp@1234	Active	chemist	505504	no	few_patie	162	udan40030
106922	87032			Not active last 3 month(Inactive)	chemist	505663	yes	---	18	upat40013
106923	78013			Not active last 3 month(Inactive)	formal	107524	yes	---	19	upat40014
106925	79380	079380	whp@1234	Active	formal	107382	no	few_patie	190	udan40032
106926	87033	087033	whp@1234	Active	formal	118348	yes	---	7	upat40001
106927	83341	083341	whp@1234	Active	chemist	505605	yes	---	5	upat40002
106929	514150	087035	whp@1234	Active	formal	107083	yes	---	6	upat40003
113742	86723	086723	whp@1234	Active	formal	108365	yes	---	9	upat40004
106941	78009	078009	whp@1234	Active	lab	405410	yes	---	10	upat40005
106942	83251	083251	whp@1234	Active	chemist	606589	yes	---	11	upat40006
106943	79378	079378	whp@1234	Not active last 3 month(Inactive)	informal	208508	yes	---	12	upat40007
106946	86816	086816	whp@1234	Active	informal	207864	yes	---	13	upat40008
106947	79402	079402	whp@1234	Active	chemist	505587	no	few_patie	29	udan40005
					chemist	506490	yes	---	30	udan40006
					informal	221783	yes	---	31	upat40009

Functional addressing of facilities was rarely recorded

Remember that for us to say anything with SPs, the SPs must successfully visit specifically sampled providers and locations, with addresses that are given by us

Round 1 of Patna SPs was halted in field because the provided addresses were unusable for survey work

This was remedied in the field by a comprehensive remapping of formal providers by WHP with the support of the Qutub team, but not extended to other databases

Facility Address
Boarding road, Patna-800013
Boring road
Boring road
Gyan Ganga Kitab bhawan gali, boaring road, Patna-800013
Kitaba bhawan lane
Jag at narayan road
28, Sanjay Apartment Kitab bhawan lane, shree Krishnapuri, Patna-800013
All Bahadur Shastri marg, north S.K.puri, Patna-800013
Kurji more
Mainpura
Yr
Digha ghat
Digha ghat
Kadam kuan
Kadam kuan,
Digha Ghat Patna
Digha Ghat Patna
Diga road
Yarpur
Mithapur
Phulwari Anisabad road
Phulwari sharif
Phulwari sharif
Phulwari sharif
Diga road
Ppppp
Rtt
Kurji mor
Rajiv nagar
Kautilya nagar, main road, A.G. Colony, Patna-800023
A.G.Colony,Main Road
A.G.Colony
Main road, A. G. Colony
A.G.Colony
A.G.Colony

Follow-up of
patient pathways
was rarely
possible

Patient databases similar:
took multiple formats, many
duplicate names, IDs
changed with technical
changes in program

Patients could rarely be traced on referral or throughout the treatment process in the data

SR	V1_ID	V2_DATE	Month_R	Sr. No.	Q1	Q2
1	55832	4/23/15	Apr_15	S 1		
Treatment Outcome	Treatment Outcome (UATBC)			Beneficiary Id	Case ID	Date of Registration (DD/MM/YYYY)
TREATMENT COMPLETED	TREATMENT COMPLETE			treatment status		
TREATMENT COMPLETED	TREATMENT COMPLETE				85677	5/8/15
OG	TREATMENT COMPLETE				85678	5/8/15
TREATMENT COMPLETED	TREATMENT COMPLETE				85679	5/8/15
TREATMENT COMPLETED	TREATMENT COMPLETE			OG		
TREATMENT COMPLETED	TREATMENT COMPLETE			OG	85680	5/9/15
TREATMENT COMPLETED	TREATMENT COMPLETE			OG	85681	5/9/15
TREATMENT COMPLETED	TREATMENT COMPLETE			CONTINUE		
TREATMENT COMPLETED	TREATMENT COMPLETE				85682	5/9/15
DEFALTED	LOST TO FOLLOW UP - MIGRATED			OG	85683	5/9/15
TREATMENT COMPLETED	CURED			CONTINUE		
DEFALTED	LOST TO FOLLOW UP - MIGRATED			DISCONTINUE	83846	5/7/15
SHIFTED TO CAT - IV (MDR)	SWITCH TO CAT VI/V				83847	5/7/15
TREATMENT COMPLETED	TREATMENT COMPLETE			CONTINUE		
OG	OG				83848	5/7/15
DEFALTED	LOST TO FOLLOW UP - OTHERS			DISCONTINUE		
OG	OG					

These still remain unstandardized

The process was very manual and different each time, and this continues to be the case in the PPSA records

For example, we can identify 578 formal providers who are networked in one of the programs, but then when we ask who is active, we have two conflicting answers in the same database

Sr.No.	Agency ids For	Active/Inactive	Active/Inactive
633	135245	Active	Active
634	ep7v	Not active last 3 month(Inactive)	
635	eneq	Not active last 3 month(Inactive)	
636	epyry	Not active last 3 month(Inactive)	
637	erha	Not active last 3 month(Inactive)	
638	erh4	Not active last 3 month(Inactive)	
639	erya	Not active last 3 month(Inactive)	Inactive
640	146068	Not active last 3 month(Inactive)	Active
641	147501	Not active last 3 month(Inactive)	Inactive
642	159702	Not active last 3 month(Inactive)	Inactive
643	167120	Not active last 3 month(Inactive)	Active
644	178632	Not active last 3 month(Inactive)	Active
645	179547	Active	Inactive
646	179551	Active	Active
647	179553	Active	Active
648	179555	Not active last 3 month(Inactive)	Inactive
649	179562	Not active last 3 month(Inactive)	Active
650	181242	Not active last 3 month(Inactive)	Inactive
651	400977	Not active last 3 month(Inactive)	Inactive
652	400975	Active	Inactive
653	401535	Active	Inactive
654	402896	Not active last 3 month(Inactive)	Inactive
655	404478	Active	Active
656	404484	Not active last 3 month(Inactive)	Inactive
657	404494	Not active last 3 month(Inactive)	Inactive
658	522037	Active	Active
659	535308	Active	Inactive
660	535326	Active	Inactive
661	535403	Not active last 3 month(Inactive)	Inactive
662	538324	Not active last 3 month(Inactive)	Inactive
663	538328	Active	Inactive

Recap

QuTUB Project Primary Aim: To attempt to assess whether PPIA projects improved quality of TB care.

Main takeaway 1: We can say the following with confidence:

1. In both cities, the program increased GeneXpert (GX) use among formal providers
2. In both cities, the program never has an impact on use of unnecessary medicines or other services
3. In Mumbai, the learning about GX due to program involvement improves GX use, but once providers have learned, convenience services from the program do not matter for doctors
4. In Mumbai, the program did not have any effect on AYUSH providers

Main takeaway 2: Despite the largest and most comprehensive SP study ever – ground complications, intervention design, and poor data management strategies limit our ability to draw definitive conclusions.

Main takeaway 3: The parameters that we are seeking to identify are also key inputs into any modelling exercise. Given the problems in #1, they cannot be clearly pinpointed right now. If we are to say something more definitive in the future, we need to learn from this attempt and make several changes that we discuss.

Acknowledgements

QuTUB and ISERDD:

Jishnu Das

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Laserson

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Afternoon Session: Proposed Next Steps

Lessons for monitoring and evaluation

FIELD NOTES FROM THE QUTUB PROJECT'S RESEARCH
PROJECT AND PRODUCTS

Current state of play

1. Program design, field complications, and field-oriented data management make it challenging and cumbersome to definitively attribute improvements to the program
2. In addition, aspects of the program that are very costly may be the least important (convenience services vs learning effects)
3. The parameters that we are able to causally attribute to the program may be substantially smaller than what are being used for epidemiological modelling

An MLE consortium with a central steering group and a range of partners is a great idea – but what can we do better?

We've learned a lot about what the gaps in knowledge and measurement are, but building routine data collection at scale that fills these gaps is a big lift.

Standardized data management strategies across the PPSAs

1. Continuous analysis of routinely collected secondary data and primary studies/new data collection will require standards agreed upon and adopted by all PPSAs.
 - a. This needs an approach to all current routine data that works across cities
 - b. This also needs a new extension into types of data that are not currently collected
 - c. Needs to have a focus on high-quality inputs so that extensive cleaning is not needed
2. Rolling out the data system for this should not be immediately scaled to all areas, but should focus on being developed in some of the 9 priority states and repeated after 3-5 years to monitor trends.

Much better “triangulation” to fill in information on missing patients

1. Main shortcoming with monitoring data is that we have information on only providers who are engaged and the patients they choose to enroll
 - a. This makes behavior change relative to others hard to calculate, even if patient selection effects are strongly discounted
2. We cannot say how the behavior of the non-engaged providers differs from those of the engaged without triangulation
3. Current triangulation is done using SPs and drug sales data
4. Need to add in lab data with ordering doctor IDs, especially for services that are obtained from specialist labs (LPA, GX, DST), to get a more complete picture
 - a. This is a challenging manual process now, but once we understand how existing systems work, we can develop one that accommodates them.

Serious effort needed to improve utility of administrative data

1. Using eNikshay data for operational decision making and patient tracing was difficult, if not impossible: it was too messy for any retrospective analysis
2. Our experience in building similar systems (for instance, the RSBY platforms) is that we have to start with what exists, and make sure that it evolves to a common platform that everyone can use.
3. Once basic data is flowing smoothly, we need to start improving the quality of the input data.
 - a. This calls for a two-step process, where first, the platform is built and then specific QI strategies are implemented that improve the quality of the data. High-quality data input is an iterative challenge to resolve issues that are making the data hard to use on the back-end.
4. This requires not only a lot of upfront investment, but also buy-in and willingness to work with many teams on the structure of data as an essential ongoing component of the upcoming work program, not as a one-off task.

Use SPs for targeted A/B testing to resolve program and data questions

We strongly feel that the biggest impact of the PPE is that it leads to behavior change, and a key issue is how those results are mirrored in admin and routine data.

1. SPs in the pilot phase have shown robustly that they can be used for quality surveillance, but a “routine” SP program is not well-powered to answer specific questions about either performance or administrative data quality
2. We have now understood how to design targeted A/B *experiments* with SPs:
 - a. For instance, if we see that more patients are being asked to take a GX, but the routinely monitored lab data is not showing greater GX use, we can undertake a narrowly tailored root-cause analysis to see why this is so and change data systems depending on the finding.
 - b. This way, we don't land up 3-5 years down the line without the necessary triangulated data to make clear statements, since we are constantly auditing data quality and program functioning with SPs.

It would be a shame if the program had large effects, but we were not able to detect them because they did not find their way into the data correctly. SPs can help both measure program effects directly, and to calibrate data systems, if they are carefully targeted.

Qutub project team support

We want to help to make sure that this does not happen--and love the idea of an MLE consortium with a primary studies section in a small number of priority settings that are used to adaptively improve the program and the data systems.

We propose two ways to do this:

1. Light touch
 - a. Receive data produced across all teams and provide initial assessments of data quality
 - b. Assess program performance when data is appropriate; flag datasets that are not usable or informative
 - c. Conduct targeted SP studies to evaluate specific program components or to audit data system quality
2. Heavy lift
 - a. Lead a team of M&E officers in each city with primary mission of making routine administrative data usable and informative – this will involve hiring and contracting M&E officers for each location under Qutub management
 - b. Conduct routine SP interactions for A/B testing of data system improvement strategy and course-correction
 - c. Coordinate across other research teams to produce useful results that triangulate on various data sources
 - d. Conduct targeted SP studies to evaluate specific program components or to audit data system quality

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PATH team
WHP team
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Puneet Dewan
Peter Small
Sameer Kumta & Kayla
Laserson
MCGM (Daksha Shah)

Thank you!

THE QUTUB PROJECT TEAM



GEORGETOWN UNIVERSITY

guide²

 Grand Challenges Canada®
Grands Défis Canada



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TB Centre

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BILL & MELINDA
GATES foundation