

Title: Provision of emergency obstetric services in rural Gujarat, India: Challenges and Solutions

Authors:

Iyer V, Sidney K, Mehta R, Mavalankar D, De Costa A

Authors Affiliations:

Iyer, Veena (Corresponding author)

1. Assistant Professor, Indian Institute of Public Health Gandhinagar, Public Health Foundation of India, SPIESR Campus, Drive-in Road, Thaltej, Ahmedabad, 380054.

Email: veenaiyer@iiphg.org; Tel: +91 79 40240444 (O), +91 79 26762134(R), +91 9898908471(M)

2. Doctoral candidate, Department of Public Health Sciences, KarolinskaInstitutet, Stockholm, Sweden

Sidney, Kristi

1. Researcher,

2. Doctoral candidate, Department of Public Health Sciences, KarolinskaInstitutet, Stockholm, Sweden

Mehta, Rajesh

1. Professor and & Head, Department of Preventive and Social Medicine, GMERS Medical College, Valsad, Gujarat

Mavalankar, Dileep

1. Director, Indian Institute of Public Health Gandhinagar, Public Health foundation of India, SPIESR Campus, Drive-in Road, Thaltej, Ahmedabad, 380054.

De Costa, Ayesha

1. Associate Professor, Department of Public Health Sciences, KarolinskaInstitutet, Stockholm, Sweden

ABSTRACT

Background: The importance of emergency obstetric services in saving mothers' lives and the inadequacy of these services in less developed regions of the world has been documented by many agencies. The development of private health services in recent decades in many of these regions has opened up the possibility of public-private-partnerships as an approach to make emergency obstetric services available to vulnerable women. The Chiranjeevi Yojana is a Public Private Partnership between the state of Gujarat and private obstetricians in the state. It was started in 2006-7 because of lack of adequate numbers of public facilities which could provide emergency obstetric care in the state. This program addresses the inequity in access to obstetric care among vulnerable households in the state due to financial barrier. The state government directly pays a capitation fee to accredited private obstetricians so that mothers from vulnerable households can access free institutional delivery and emergency obstetric care from them. This study examines the distribution of obstetric care in three districts of Gujarat as well as characteristics of private providers who participate in the Chiranjeevi program.

Methodology: We conducted a facility survey of three districts; Sabarkantha, Dahod and Surendranagar. All public facilities and all private facilities which had conducted a delivery in last one year were visited and a modified version of the Averting Maternal Death and Disability (AMDD) questionnaire was administered.

Results: In the three districts 151 private and 149 public facilities had conducted any delivery in the previous year. Of these, 111 private and 47 public conducted more than 30 deliveries in last three months (high load). Forty-five percent of high load public facilities and only 5% of private high load facilities were situated at rural/peripheral locations. Of all high load private facilities, 30% were located in the three district headquarter towns while the remaining 65% were clustered in 14 of 27 district and sub-district headquarter towns. Nine blocks had neither private nor public caesarean section facility. Of these high load facilities, 13% (6/47) public and 81% (90/111) private had performed the crucial functions of caesarean sections (CS) with or without blood transfusion in the past three months. Further analysis showed that 36 of the 90 facilities participated in the CY program. Facilities which participated in the Chiranjeevi program tended to have obstetricians with less than 5 years' experience and conducted more than 75 normal deliveries in a month.

Discussion: Half of the high load public facilities were located in rural areas. They provided normal delivery services and referral services to the rural populations of these three districts which have as yet not been reached by private obstetricians. But they did not provide life-saving caesarean and blood transfusion facilities. Strengthening of public sector needs to be targeted at these performing public facilities rather than general plans for expansion of the health infrastructure. The crowding of private services in district and

block towns may be used to advantage by the state to recruit young partners who are new in practice. Authorities need to design more nuanced partnerships with select providers, based on locations of providers. This will provide more effective EmOC coverage for a given expenditure.

Conclusions:

The total absence of life-saving services in remote blocks and their clustering in 18 towns indicates a need for a central policy to encourage more even distribution of life saving services through the public and private sectors.

Keywords: Emergency obstetric care; Rural obstetric care; Delivery; EmOC; BEmOC and CEmOC; Public-Private Sector Partnerships; Gujarat, India

1. Background:

It is estimated that in the year 2010, 287,000 maternal deaths occurred globally. India, with a Maternal Mortality Ratio (MMR) of 200 per 100,000 live births accounted for the largest share, 56,000 (19%) of these maternal deaths. However, the country has recorded a 66% decrease in maternal mortality ratio (MMR) from 1990, when, at a MMR of 600 per 100,000 births, it accounted for 34% of the global maternal deaths[1].

That access to quality emergency obstetric care reduces maternal mortality has been well established[2, 3]. During the last decade, the government of India has invested 400 million USDs to improve skilled attendance at birth and institutional deliveries. This was done by strengthening supply side mechanisms through two nation-wide programs, the Child Survival and Safe Motherhood program (CSSM 1992-97) and the first phase of Reproductive and Child Health Program (RCH 1- 1997 to 2004)[4, 5]. Both these programs were later declared to have had limited success in achieving desired outcomes [6-8]. As a result, the RCH II project plan (2005 to 2012), clearly articulated the need for decentralized planning and implementation by the provinces. The goal was to evolve localized strategies of public-private partnerships to improve maternal outcomes[8]. As a consequence of this, the Chiranjeevi Yojana (CY), a Public-Private-Partnership (PPP) was launched in the state of Gujarat in 2006[9].

The Chiranjeevi Program (CY) was intended to provide emergency obstetric services through the private sector to the most underprivileged mothers – those below the poverty line and/or belonging to scheduled tribes (**BPL/ST**)¹. Qualified obstetricians were invited to partner in the program if they possessed functioning nursing homes with labor and operating rooms and the ability to perform emergency Caesarean Sections (CS) and blood transfusions. Around 865 obstetricians enrolled into the scheme in 2006-7. Each was paid 4500 USDs for a package of 100 deliveries of eligible mothers, based on an assumption of 85 normal deliveries, 8 complicated deliveries and 7 cesarean sections[9]. As of 2012, nearly 1 million women have delivered under the program[10]. The State government's HMIS data states that 475 obstetricians partnered in this scheme in September 2012 and 360 in June 2013. The payment package has been upgraded to 6200 USDs since September 2013.

¹The poverty line is an economic threshold set by the government of India, based on a survey which scores household assets to indicate households to which social welfare programs are targeted. Those with scores from 0 to 16 are eligible for the Chiranjeevi program. Scheduled tribes are specially recognized by the Indian constitution as disadvantaged groups in the country and form ~7.5% of India's population. These lists are regularly updated by the government and are used for government schemes.

This study was designed to investigate the size and characteristics of private and public emergency obstetric care and to compare and study characteristics of private CY participant and non-participant facilities in three districts of Gujarat.

2. Methods:

2.1 Study setting: Gujarat, with a population of 60.4 million is the western-most province of India. Fifty-seven percent of the population is rural [11]. Gujarat had a maternal mortality ratio of 160 per 100,000 live births and infant mortality rate of 48 per 1000 live births in 2009 [12]. This province is composed of 26 districts, the average population of a district being 2 million. Three heterogeneous districts from the central, western and eastern belts with low Human Development Indices (ranked among the lowest 25% of districts in the state), Sabarkantha, Surendranagar and Dahod, were purposively selected (Table 1) [13].

Table 1 here [11], [14], [15]

Table 1: Profile of study districts

	Population (in millions) [11]	Proportion rural [11]	Scheduled Tribe [11]	Proportion Below Poverty Line [14]	Birth Rate per 1000 [15]	Chiranjeevi uptake 2010-11 ^a
Gujarat province	60.4	57%	14.8%	39.61%	22.7	11.56%
Sabarkanthadist	2.43	85%	19.68	32.86%	28	28.54%
Surendranagardist	1.75	72%	0.92%	46.45%	23	8.6%
Dahoddist	2.12	90%	72.4%	71.60%	30.2	30.56%

^a Health Management Information System report from Department of Health, Gujarat

2.2 Data collection:

Listing of Facilities: In order to ascertain all facilities which had conducted deliveries in the last year, we first prepared a master list from freely available information about public and private obstetric facilities. We obtained a list of all public facilities from the state health department's website and a list of private facilities from the local chapter of the Federation of Obstetric and Gynecological Society of India (FOGSI-GUJARAT). The master list was complemented in the field by snowballing techniques. All private and public obstetric facilities and private pharmacies in the study districts were asked to identify obstetric facilities in the neighborhood. These locations were visited by district coordinators, eligible facilities were added to the list and further snowballing was done throughout the listing and survey phases until no more new facilities could be identified.

Survey: In order to further investigate obstetric facilities, we visited all the listed public and private facilities between June 2012 and April 2013. We administered an initial short screening questionnaire which enquired whether any deliveries had been conducted in the last one year, if yes, the number of deliveries conducted in the last three months,

and whether the facility was a current CY participant. We then administered a modified version of the Averting Maternal Death and Disability (AMDD) questionnaire to facilities conducting more than 30 deliveries (high load) in the previous three months and/or CY participants. The questionnaire elicited information pertaining to the actual performance of the two comprehensive (CEmOC) signal functions, CS (Caesarean Section) and blood transfusion, in the three months before the survey from the facility in-charge or the delivery room nurse. These respondents were also administered the sections of the questionnaire which enquired about costs of normal and LSCS delivery charged from paying patients and about participation in CY or the Rashtriya Swasthya Bima Yojana (RSBY, National Health Insurance Program). The sections of the questionnaire pertaining to physical characteristics of the facilities like their age, location and bed strength were asked to the hospital administrator. Hospital records were examined to collect service statistics information including recorded deliveries and CS in the last 6 months. Study instruments were pilot tested and revised prior to implementation of the main study.

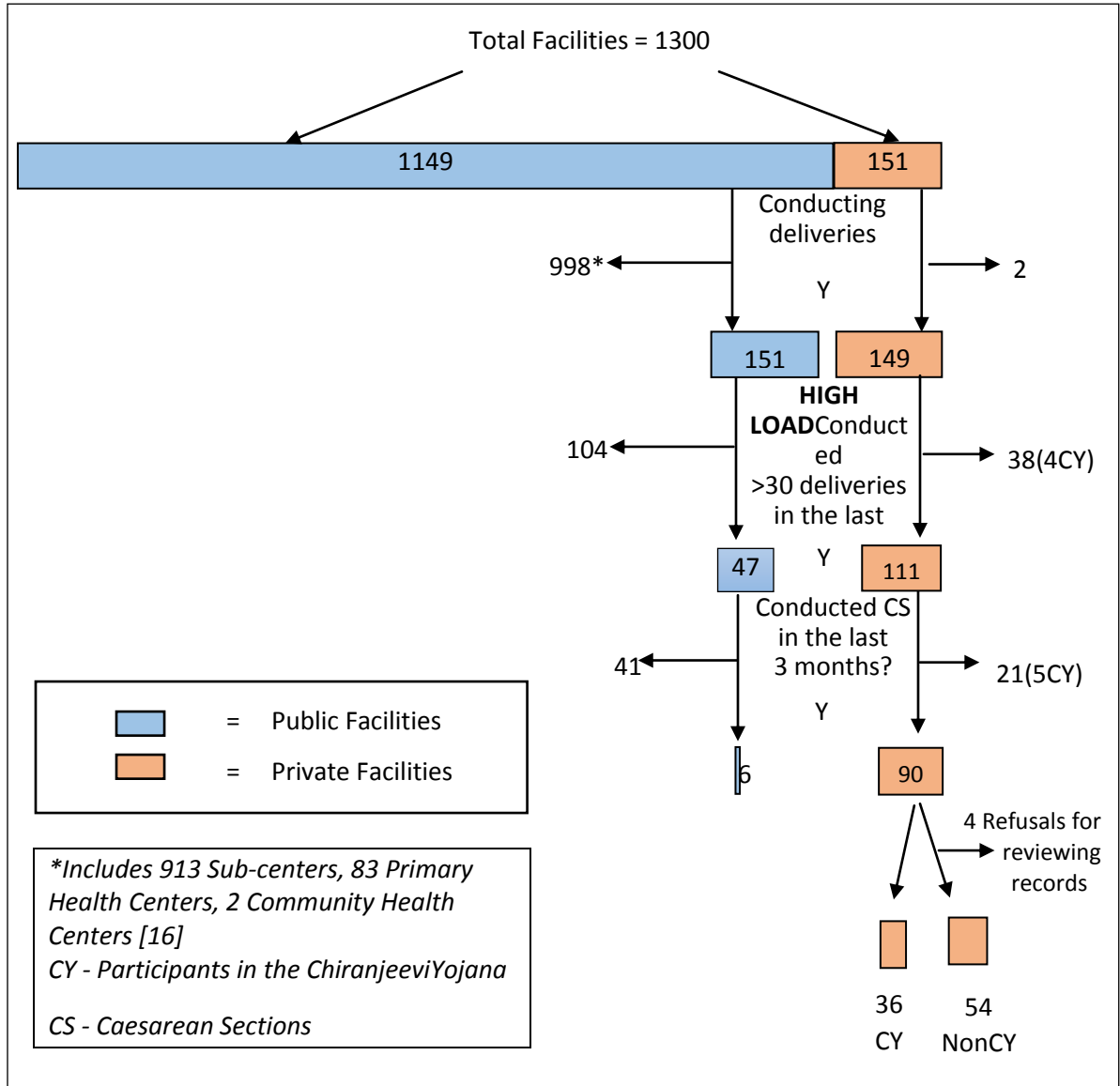
2.3 Analysis: Data was extracted from Research Electronic Data Capture (REDCap) database and imported and analysed using Stata (Version 12.0, StataCorp, College Station, Texas). Bivariate analyses were performed between (a) public and private facilities and (b) CY participants and CY non-participants private facilities. We created a Poisson Regression model with robust confidence intervals to study facility characteristics associated with CY participation among private facilities.

Ethical approval for this study was obtained from institutional review board at Indian Institute of Public Health Gandhinagar [TRC-IEC No: 23/2012].

3. Results: Our initial list of 1145 public and 76 private facilities in June 2012 was revised throughout the snowballing exercise in the field and culminated in a list of 1151 public and 149 private facilities in April 2013.

3.1 Distribution of facilities by public/private and high/low delivery loads: The final list of 1300 facilities (Figure 1) contained 300 facilities which had conducted at least one delivery in the previous three months, 151 in the public and 149 in the private sector. Of these 300, 158 facilities (47 public and 111 private) had conducted more than 30 deliveries in the last three months and were classified as high load. Of the 158 high load facilities, 96 had performed caesareans in the last 3 months. Only 6 of these were in the public sector. Among the 90 private sector facilities which did CS; 36 were participating in the CY program at the time of the survey, while 54 were non-participants. Four CY non-participant facilities did not allow us to view their records for services statistics.

Figure 1: Distribution of facilities by (i) public/private, (ii) conducted less than/ more than 30 deliveries in previous 3 months and (iii) conducted caesarean in last three months [16]



3.2 Geographic distribution of 300 facilities which conducted 1-30 deliveries and more than 30 deliveries in previous three months:

As seen in Figure 2 and 3, numerous public facilities had conducted less than 10 deliveries per month in the rural areas while private facilities had conducted more than 10 deliveries per month and were predominantly located in towns.

Figure 2: Geographic distribution of facilities conducting 1 to 30 deliveries in previous three months

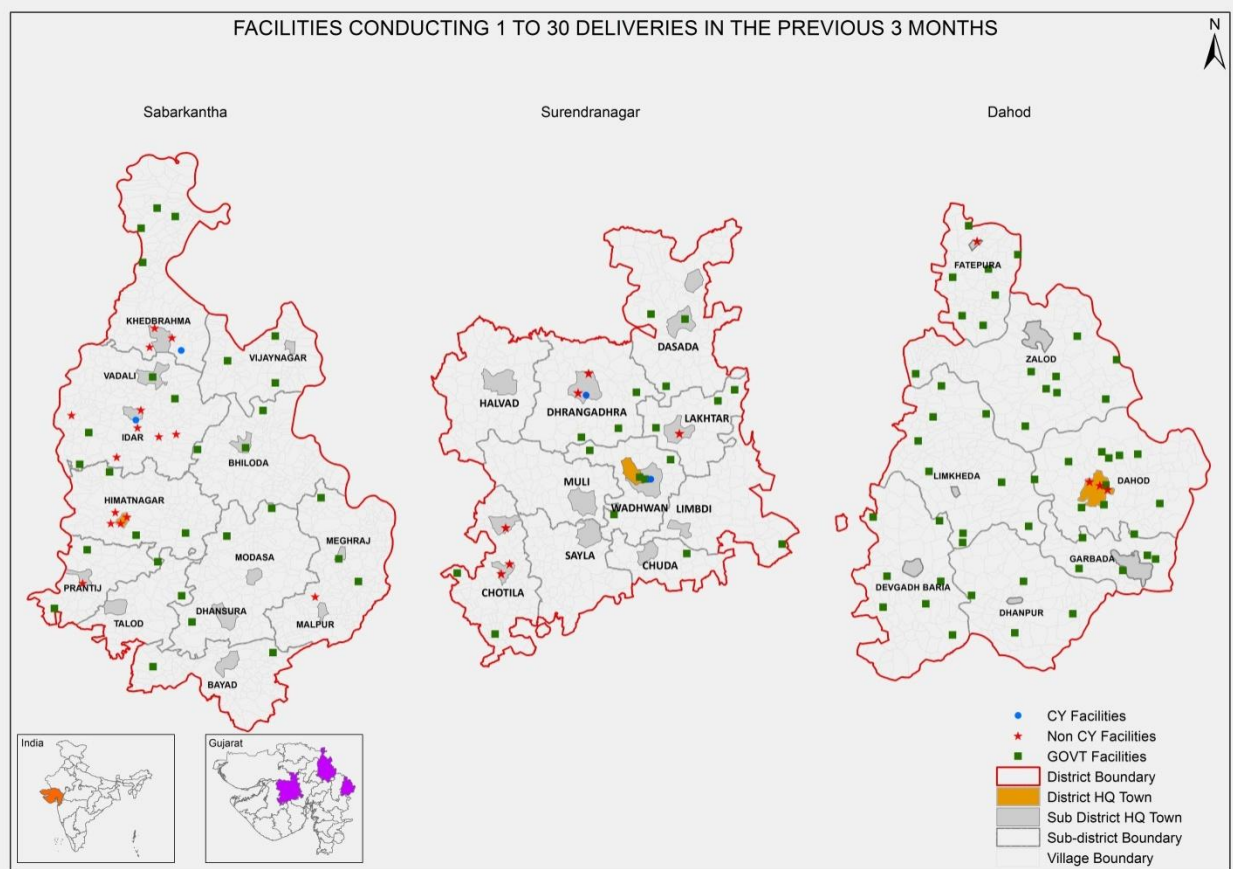
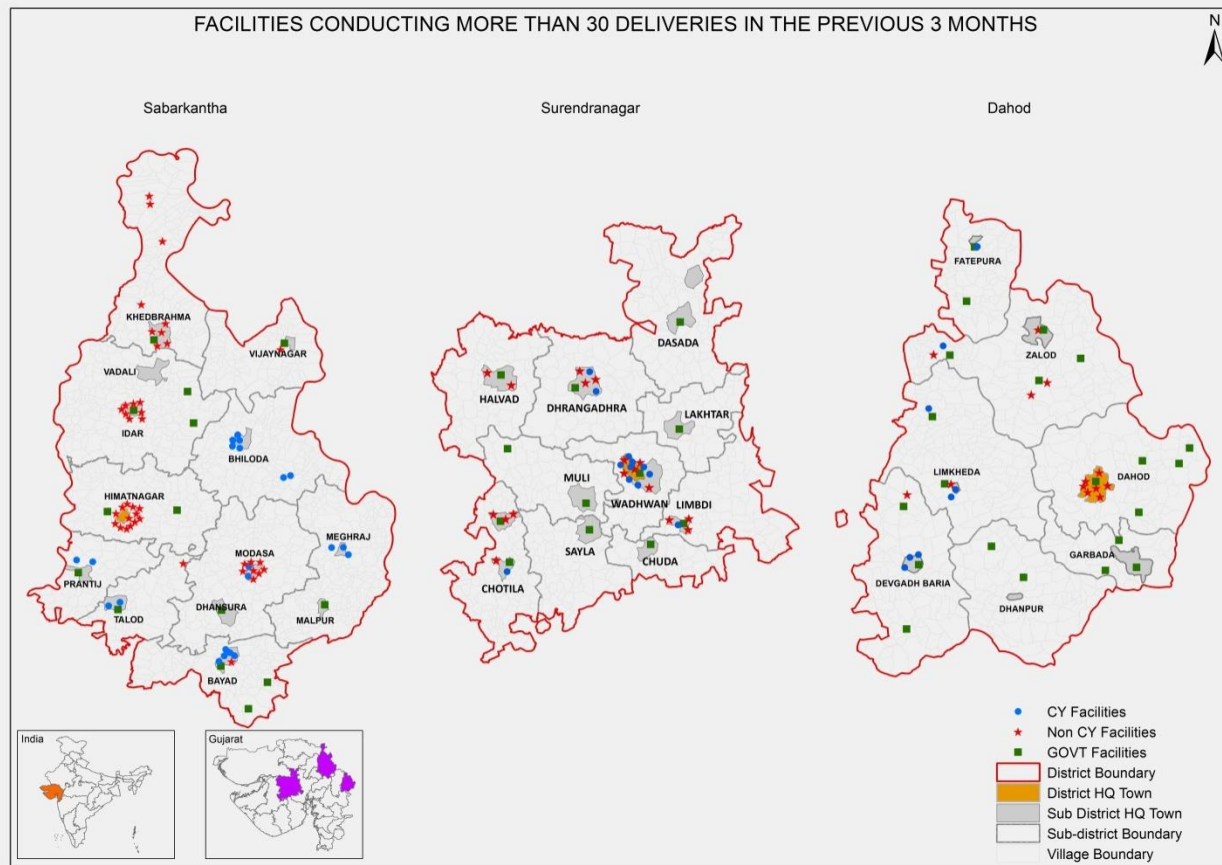


Figure 3: Geographic distribution of facilities conducting more than 30 deliveries in previous three months



3.3 Summary characteristics of 158 high load facilities: Table 2 describes characteristics of public and private facilities which self-reported that they did more than 30 deliveries in the last three months (at least one delivery per day). While the median size of private facilities was 15 beds, that of public facilities was noticeably higher at 20 beds. Public facilities were considerably older (median age 23.5 years) than private facilities (12 years). Among the private facilities, CY participants (median age 10 years) were younger than non-participants (13 years). Based on the records reviewed during the survey, on average, private facilities conducted ten more deliveries than public facilities every month; though the range showed that there were very high volume outliers among the public facilities.

The proportion of public facilities performing CS (17%) was much lower than the private facilities (81%). Among the private facilities, more CY participant (89%) than non-participant (77%) facilities performed CS. The non-participant facilities that did perform CS tended to do many more CS than CY participants, pushing up the median CS for this group to 11 per month, nearly double that among CY participants at 6.

Reported out of pocket costs charged by the facilities for normal delivery were similar in both CY and non CY participant private facilities, though CS was significantly more expensive in non-participant facilities (p 0.006).

Table 2 here

Table 2: Summary characteristics of 158 high load facilities

Facility characteristics	Public (N=47)	All Pvt (N=111)	CY (N=41)	NonCY (N=70)
	Median (Range)	Median (Range)	Median (Range)	Median (Range)
Total Bed Strength	20 (36 - 200)	15 (1 - 180)	15 (5 -180)	15 (1 - 150)
Years of functioning	23.5 (2.8-54)	12 (0.17 - 75)	10 (0.3- 75)	13 (0.2- 60)
Av. num of Normal Deliveries recorded per month in last six months	26.3 (7.2 - 423.2)	36.5 (2 - 295)	36.5 (7 - 273.3)	39.2 (2 - 295.5)
Number of facilities conducting CS -- N (%)	8 (17%)	90 (81%)	36 (89)	54 (77%)
Av. num of CS Deliveries recorded per month in last six months	6.8 ^a (0.3 - 23.2)	8.2 (0.2- 47.2)	6 (0.17 - 38.5)	10.8 (0.17 - 47.2)
Costs charged by PPs ^a (Rs)				
Normal Delivery Costs				
Median cost	0	2500	2500	2750
Cost range		0 - 9000	0 - 4500	250 - 9000
Inter quartile range		2500 -- 3250	1750 -- 2800	2000 -- 3250
CS Costs				
Median cost	0	8000	6500	8000
Cost range		0 - 25000	550 -- 12000	1000 - 25000
Inter quartile range		5750 - 10000	5000 -- 8500	7000 -- 10000
^a Average of CS recorded across 8 public facilities				
^b Private Practitioners				

3.4 Differences in characteristics of public and private high load facilities.

Of the high load public facilities, 45% were situated at rural/peripheral locations where there were only 5% of private high load facilities (Table 3). Of all high load private facilities, 30% were located in the three district headquarter towns while the remaining 65% were clustered in 14 of 30 sub-district headquarter towns. Interestingly, 44% of private high load obstetric facilities admitted non-obstetric patients. Only 13% of public facilities and 19% of private facilities conducted more than 2 to 3 deliveries per day (60 deliveries per month, >180/3months). Participation in the National Health Insurance Program was quite high at 70% of public and 45% of private high load facilities. All public facilities had qualified nurses while 95% of private facilities were functioning with unqualified nurses.

Finally, of these high load facilities, 13% (6/47) public and 81% (90/111) private had performed the crucial CEmOC functions of caesarean sections (CS) with or without blood transfusion in the past three months.

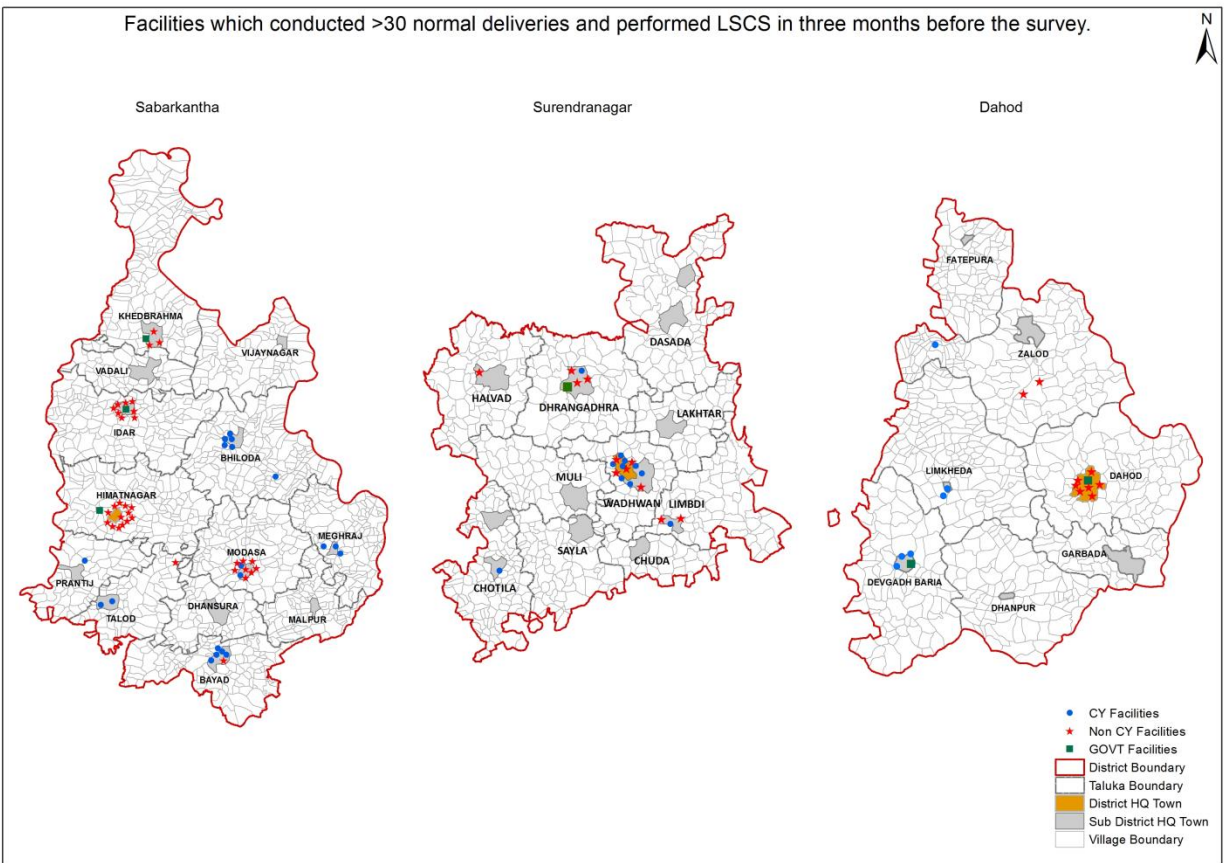
Table 3 here

Table 3: Comparison of characteristics of public vs private high load facilities

Facility Characteristics	Row Totals	Public		Private	
	158	N =47	% of all publicfacilities	N=111	% of all pvt facilities
DistHQ / SubdistHQ					
Dist HQ town	35	3	6.4	32	28.8
Sub-dist HQ	97	23	48.9	74	66.6
Rural/ Peripheral	26	21	44.6	5	4.5
Hospital Type					
Maternity	67	0	0	67	60.4
General with Maternity	91	47	100	44	39.6
RSBY* Provider					
No	74	14	29.8	60	54.1
Yes	84	33	70.2	51	45.9
Facilities with following staff					
Obstetricians/Surgeons	--	8	17	88	79.3
Qualified Nurses	--	47	100	25	22.5
Unqualified Nurses	--	0	0	105	94.6
Proportions of facilities performing CEmOC functions in the last 3 months					
CS and BT	91	6	13	85	76.5
CS but no BT	5	0	0	5	4.5

The distribution of these CEmOC facilities is shown in Figure 4. Public heavy load CEmOC facilities functioned in 6 large towns (2 of them being district capitals) out of 27 district and block capital towns in the three districts. These towns also had a number of private CEmOC facilities in close proximity to each other. However, in four of these towns, 3 in Sabarkantha and one in Dahod, public facilities were the only providers of free CEmOC services because the private providers were not participating in the CY program at the time of our survey.

Figure 4: Geographical distribution of high load facilities which also conducted Caesarean sections.



3.4 Differences between CY participant and non-participant facilities. In order to identify the factors that characterized facilities which chose to participate in the CY program, the following analysis was carried out on 90 private facilities, 36 participants and 54 non-participants of the CY program. A larger proportion of CY participant facilities (78%) tended to be located in sub-district headquarter towns and were significantly more likely to be general practices combined with maternity care. Bed strengths of CY participant and non-participant facilities were very similar. CY participant facilities tended to conduct more than 75 deliveries and less than 10 CS per month compared to non-participants. A larger proportion of CY providers partnered with the National Health Insurance scheme and were run by obstetricians with less than 5 years of experience.

In the final multivariate model, only two characteristics retained significance: conducting more than 75 normal deliveries per month and obstetrician's experience being less than 5 years.

Table 4 here

Table 4: Comparison between CY participant and non-participant facilities, which provided CS services in three study districts in the last three months: Bivariate and Multivariate Prevalence Ratios using a Poisson Regression Model

Facility characteristics	CY		NonCY		Bivariate		Multivariate	
	N	%	N	%	PR	95% CI	PR	95% CI
DistHQ / SubdistHQ								
DistHQ town	8	22.2	24	44.4		Ref		Ref
Sub-dist HQ town	28	77.8	30	55.6	1.9	0.99 – 3.73	1.2	0.56– 2.46
Hospital Type								
Maternity	22	61.1	43	79.6		Ref		Ref
General with Maternity	14	38.9	11	20.4	1.6	1.01 – 2.70	1.2	0.68 – 1.96
Total Bed Strength								
<15	22	61.1	23	42.6	1.7	0.92 – 2.7	1.8	0.93 – 3.56
>15	14	38.9	31	57.4		Ref		Ref
Ave # of Normal Deliveries per month								
<75	23	63.9	43	84.3		Ref		Ref
>75	13	36.1	8	15.7	1.8	1.10 – 2.85	1.6	1.002 – 2.6
Ave # of C-sections per month								
<10	25	71.4	22	43.1	2.1	1.14 – 3.78	1.4	0.71 – 2.74
>10	10	28.6	29	56.9		Ref		Ref
RSBY provider								
No	13	36.1	28	51.8		Ref		Ref
Yes	23	68.9	26	48.2	1.4	0.86 – 2.5	1.5	0.93 – 2.55
Obstetrician's yrs of experience								
Less than 5 yrs	16	44.4	7	13	2.3	1.48 – 3.68	2.2	1.3 – 3.6
More than 5 yrs	20	55.6	47	87		Ref		Ref

4. Discussion:

This study empirically demonstrates the relative sizes of the public and private obstetric care sectors in three districts of Gujarat, their rural and urban distribution and characteristics of providers who participate in the Chiranjeevi program. Comprehensive obstetric care (CEmOC), which encompasses caesarean sections and blood transfusion, is

indisputably provided by the private sector in these districts. CY participant private facilities tended to be owned by young obstetricians and conducted more normal deliveries than CY non-participants.

As the world transitions towards Universal Health Coverage[17], there have been numerous calls from significant quarters, both national and international, for Universal Health Coverage in India too [18]. Notable among these has been a call for incorporating the private sector into an Integrated National Health System, guided by principles of equity enhancement[19]. Latin American countries, which implemented similar programs to improve population health in the early 90s, have recorded regressive disparities in the health gains made due to poor targeting of benefits to the neediest populations [20, 21]. India must avoid the possibility of similar regressive disparities on the pathway to quickly attaining population health gains.

This Chiranjeevi experiment, under which nearly 1 million women have already delivered can provide insights into the types of instruments and the administrative levels at which these instruments need to be designed for an effective stewardship role by the state as well as district level health authorities.

4.1 Extent of Public and Private Care for normal delivery and referral services: Although public facilities were older, larger and more numerous than private facilities, there were two and a half times more performing private (111) than public facilities (47). Our analysis showed that 80% of the private facilities had begun less than 20 years ago and were clustered in 17 out of 27 district and sub-district headquarter towns. Of the performing public facilities nearly half were located in rural areas. They provided normal delivery services and referral services to half of the population of these three districts which have as yet not been reached by private obstetricians. Strengthening of public sector needs to be targeted at these performing public facilities rather than general plans for expansion of the health infrastructure by state level health authorities. Focused strengthening of public infrastructure such as 24x7 Primary Health Centers has been very successful in Tamil Nadu [22]. Ashtekar et al suggest the formation of “on-call specialist squads” since this strategy has worked for most private hospitals in rural areas of Maharashtra[23].

4.2. Caesarean facility: The pattern of availability of CEmOC care in the three districts was illustrative. For the six million population in these districts, the WHO recommends 12 CEmOC centres. Our study found eight times more CEmOC centers (96) than the recommended level, clustered in 17 of 30 towns, leaving half of these three districts without caesarean services – “starvation in the midst of plenty”. Researchers from other developed provinces have also recorded this lack of CEmOC services, thus indicating an urgent need to redistribute skills available in the private sector to underserved areas [24-26]. India needs to build national guidelines which can be used by district level authorities to categorize

towns and sub-districts according to the need for particular services or beds. Large scale health care re-imbusement programs such as the national health insurance and the provincial Chiranjeevi programs could further augment the equitable distribution of private providers by setting differential pricing policies based on such sub-district health service needs. Countries where such 'Certification-of-Need' and 'Moratoria on new beds/practices' regulations exist have reported variable results while other countries with mixed health systems have been recommended to build such instruments into their health policy framework[27-30].

4.3. Skill mix and incentive environment: While the skill mix at almost all of the private facilities was of specialist obstetricians with unqualified nurses, that at all public facilities (except the 8 which performed caesareans), was of general physicians (MBBS and/or AYUSH) with qualified nurses. The fact that it is the private facilities that are performing deliveries much more than public, indicates that the combination of a qualified obstetrician with unqualified nurses is the norm. Admittedly, the competitive impulse to attract and retain clients is also responsible for the higher performance of private facilities[31]. Further research into the skill mixes and incentive environments of privately run obstetric practices through sector-wide appraisal exercises would provide valuable evidence for a comprehensive human resource policy in the country[32-34].

4.4. Participation in CY: CY participants were significantly different from non-participants on two parameters. Firstly, they conducted more than 75 normal deliveries per month and secondly, they were run by obstetricians who had begun private practice within the last 5 years. A third non-significant factor was that 80% of CY participant facilities were located in the less urban, sub-district headquarter towns. This combination of three characteristics could probably be explained by the fact that young obstetricians, early in their careers, choose to begin their private practices in more remote and less competitive towns. Often, people's paying capacity in these areas is less, much lower than that offered in the CY package. Not only are caesarean deliveries expensive; along with episiotomy, they are also unpopular[35]. These dynamics probably prompt private providers to partner with the public sector and also conduct more normal than caesarean deliveries. Since these outcomes are advantageous to population health, the factors driving these outcomes need to be leveraged through appropriate policies which encourage young practitioners to firstly, establish practices in unserved areas and secondly, discourage unindicated caesarean sections.

4.5. Clinical Practice guidelines: Beyond national and regional planning for provisioning of services, wholesome policies to guide monitoring of clinical practice at local level are essential since these practitioners often provide other general and specialist services included in insurance packages. Our study found that while private facilities providing delivery care in district headquarter towns were exclusively maternity homes, half of the facilities in sub-district headquarter towns also provided general practice services. Within

obstetric practice itself, we found that CY non-participants not only conducted more caesareans than CY participants, they also charged significantly more for the caesarean procedure. Consequently, on the ground, there appears to be considerable variance in types of patients attended, clinical decisions taken and sums charged by practitioners. For a successful partnership with the private sector, there is thus a need to involve these front-line practitioners in formulating relevant clinical practice guidelines which will be crucial for regulating quality of medical practice in the country[36, 37].

Strengths and Limitations:

The average rural population in our study districts was 82%, against the overall rural population rate of Gujarat province at 57%. Our purposive selection of districts was successful in detecting a noteworthy difference in CEmOC availability in the three districts. The variability captured in our study makes our results reasonably generalizable to similar less developed districts in the country. The southern states are more urbanized and have higher numbers of private practitioners than Gujarat. Thus it is possible that the penetration of private obstetricians into small towns in other districts of India with better Human development Indices and more medical colleges (with graduating obstetricians), may be leading to much better availability of private CEmOC facilities than seen in our study districts. The availability of private CEmOCs and possibility of PPPs would be better than this in the more developed districts.

Our study included all obstetric facilities in 3 out of 26 districts in the province. Out of more than 2000 obstetricians in the province, approximately 130 were located in our study districts. There were 35 CY participants in our sample and they constituted 10% of the obstetricians participating in the CY program at the time. Despite the width of our coverage, our final model could include 90 private facilities out of which 36 were CY participants. These latter accounted for 10% of the 360 CY participants in the entire province in September 2012. Promising variables, like location in sub-district headquarter towns, bed strength of less than 15 beds, performance of less than 10 CS per month and concurrent participation in the national insurance program lost significance in our final model. An analysis across more than 3 districts would have yielded more definitive results, especially regarding the tendency of these facilities to conduct more normal and less caesarean deliveries. At present, it is not discernible whether the significant difference in average normal deliveries and CS rates in CY and non-CY facilities, are a result of the CY program itself or are due to self-selection by private practitioners into the program.

5. Conclusion:

The Chiranjeevi Yojana did not institute an evaluation plan at the time of its inception. At the lowest rate of Rs 1800 per delivery, the state has already paid out more than 30 million dollars to private providers in the state. The need for well-constructed evaluation plans when such huge expenditures from the public exchequer are involved is hardly debatable.

In a wider context, the total absence of life-saving services in some areas and their clustering in some indicates a need for a central policy to encourage more even distribution of life saving services through the public and private sectors. India needs to build national guidelines based on which district level authorities may categorize towns and blocks according to the need for particular services or beds, akin to the Certification-of-Need policy in some countries. All future planning for public and private health services could use such a categorization to set differential pricing or incentive policies based on block-level health service needs. This may be crucial to help India avoid the pitfalls of regressive disparities on the pathway to quickly attaining population health gains.

The data from this paper points to the need for the program to 1) carefully select providers for the partnership based on geographic location and expected patient load at that location. 2) closely monitor rates of and indications for caesareans at partnering providers' facilities 3) create flexible mechanisms, like sub-district level 'certification-of-need' and differential pricing policies to expand the reach of health services.

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