Review Article

Provision Of Round The Clock Basic Obstetric And Neonatal Care Services In Rural Settings: A low cost, high impact intervention in Punjab, Pakistan

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Abstract

Punjab province has a maternal mortality ratio of 180/100,000 live births and neonatal mortality rate of 41/1,000 live births. There are 2,512 primary care facilities (basic health units, BHUs) across the province. The Government of Punjab upgraded these BHUs to provide round the clock obstetric services over the past decade. Currently, 1195 of these 2512 BHUs are functional 24 hours a day, seven days a week. A number of interventions were done, especially around the monitoring of staff presence, availability of minimum inputs and real-time reporting of data based. These interventions ensured provision of a standard set of services across all the 24/7 BHUs. In addition to this, a transport solution was provided in the shape of rural ambulance service for maternal and child health related issues. These interventions have now started showing results in the form of improved coverage for skilled birth attendance, and a decline in mortality rates. The impact is expected to be more evident with the passage of time.

Key Messages

1. Round the clock availability of obstetric services is essential to improve the situation of maternal and neonatal health in rural areas.
2. Government of Punjab has upgraded 1195 BHUs to round the clock functionality for obstetric and newborn care over the past few years.
3. Robust monitoring mechanisms are the key to success of this program.
4. Quality of care remains a challenge; which needs to be addressed.
5. The myth that women of rural areas of Southern Punjab will never visit a health facility was busted – women accessed health services once the communities were confident that the offered services are available for sure; and that the health facilities won't be locked during evening or late-night hours.

Introduction

Pakistan has a population of 207 Million while the province of Punjab alone accounts for more than half of this population i.e. 110 Million; out of which 70 Million reside in rural areas.[1] Traditionally, the rural areas have been devoid of quality health services in developing countries and same is the case with Punjab province. According to the latest Multiple Indicators Cluster Survey (MICS 2018), the maternal mortality rate in Punjab stands at 180 deaths per 100,000 live births while the neonatal mortality rate stands at 41 deaths per 1,000 live births.[2]

In the recent years, a number of initiatives have been taken by the Government, with support of development partners as well as donor organizations. One of the most needed initiative which was taken in this regard was the piloting and scale up of round the clock basic emergency obstetric, newborn and child (BEmONC) services at selected basic health units of the province.

Basic Health Units (BHUs) are the primary level health facilities situated in rural areas of the province,

at the level of union councils. There are a total of 2,512 such units spread across Punjab.[3] These BHUs are a single bedded unit with basic out-patient services; both curative and preventive. The curative services are provided through a medical officer (male or female) and supporting paramedical staff. The preventive services are provided through paramedical staff / allied health staff. Obstetric services are provided through midwifes (called as Lady Health Visitors, LHVs). The usual timings for these units across all provinces of Pakistan are from 8 AM to 2 PM, six days a week (commonly called 6/6 model).[4]

In the year 2010, massive floods hit Pakistan along the Indus River. Seven districts of Punjab were also affected by this flood. As a response to this humanitarian crisis, the global community came to support Pakistan. The Government of Punjab decided to utilize the funds received for health sector from United Nation's agencies i.e. UNICEF and UNFPA to convert the BHUs along the river belt into round the clock health facilities so that the people could access maternal and child care during evening and night hours. The initiative was started from 20 health facilities and increased to 85 health facilities from the humanitarian funds within a few months.[5] The performance reports reflected a manifold improvement in patient turnover with a limited input in terms of finances and human resource. The BHUs which rarely performed a single delivery in a month were now catering to an average of 40-50 deliveries a month.[6] The results of this pilot were show cased at the end of the first year of implementation. Later on, stakeholders from partner organizations as well as other provinces conducted study visits to some of these BHUs. The Government, on observing the massive success of this pilot, decided to scale it across other BHUs of the province. Therefore, this intervention was clubbed with other primary care interventions under the integrated Reproductive, Maternal, Newborn & Child Health and Nutrition Program (IRMNCHNP). At the time of writing of this article, 1,195 such BHUs are functional while 115 additional BHUs have been proposed for similar up-gradation.[7]

Methodology

This article is based on programmatic data and experience of the Primary and Secondary Healthcare Department, Government of the Punjab, Pakistan. The article also quotes data from an independent survey i.e. the Multiple Indicators Cluster Survey (MICS) conducted in the Punjab province every four years.

Key Interventions

A number of basic interventions were implemented, and are still ongoing, since November 2010. These interventions include:

1. The Core Intervention – Human Resource Availability and Capacity Building

Two LHVs, two ayas (female support staff) and two security guards were provided in addition to the already existing staff at the BHUs. The additional staff was assigned to evening and night shifts. Each of the newly hired LHV is sent for at least ten days attachment at the District or Tehsil Head Quarter Hospital where she attends class room lectures as well as hands-on experience in the labor room. The hands-on training is recorded in the form of log-books to ensure that each participant has performed the minimum number of prescribed procedures under supervision as well as independently.[8] These trained LHVs are responsible for provision of basic obstetric care, early newborn care, family planning (FP), immunization and malnutrition treatment as per the schedule of services in morning, evening or night shift.

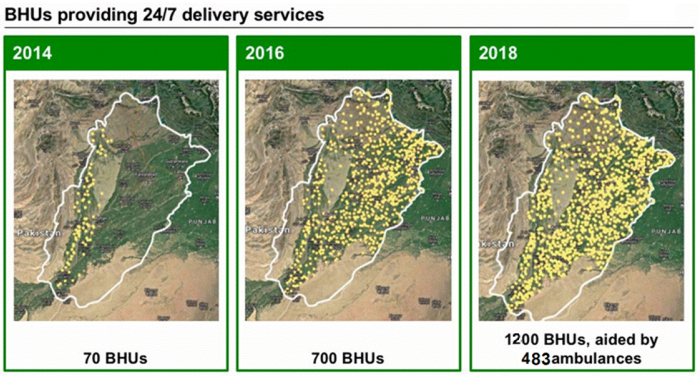


Fig: 24/7 *BHUs spread across the province (GIS locations)*

2. Provision of Additional Medicines and Supplies

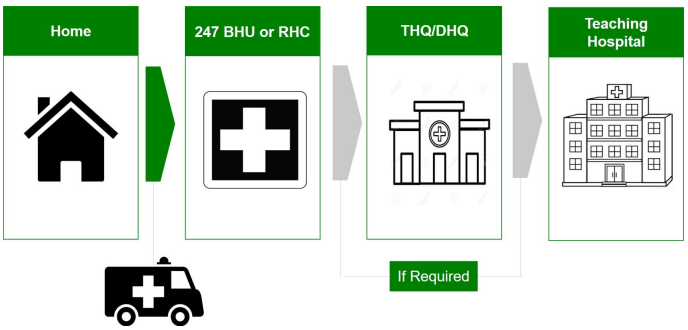
As the BHUs were catering to an average of just one or two deliveries a month, the sudden rise in this number to 50 per month seriously hampered the supply of obstetric medicines and consumable items. Therefore, the additional requirement for these

supplies was met from the funds allocated for this project.

3. A transport Solution

Second, delay has always been reported as a major contributor to maternal and neonatal mortality in rural areas of Punjab. In order to improve access to health facilities, to encourage women to deliver with the help of a skilled birth attendant at a properly equipped health facility, and to ensure immediate availability of transport in case of a complication, the Primary & Secondary Healthcare Department, Government of the Punjab launched the Rural Ambulance Service (RAS) with the name of "Mahfooz Maan Ambulance Service".

IRMNCHNP is running this ambulance service for pregnant women, newborns and children of rural areas across all 36 districts of Punjab. The service was launched in May 2017 with a fleet of 193 ambulances, increasing to 220 in December and 433 in March 2018. Fifty additional 4X4 ambulances were added in January 2019, totaling to 483 vehicles.[9] This ambulance service provides free of cost pick up service to all pregnant women who call 1034 for a delivery at any nearby functional public sector health facility, providing Basic EmONC services. Round the clock drop back service is provided to women who deliver at a primary level health facility (24/7 BHUs and RHCs) given that she had stayed for at least six hours in the health facility, subject to availability of ambulance at that given time. RAS is also used for severe pneumonia, diarrhea and complicated Severe Acute Malnutrition (SAM) cases in children.[10]



An important feature of the ambulance service is to focus on emergency referrals of life threatening complications during a delivery case. Through it, access is given to patients to reach secondary and tertiary level facilities. The ambulance service thus provides pick-up service to delivery patients, drop off service after 6 hours of stay at a facility and transfer to a higher-level facility in case of a critical case. Since the expansion of the ambulance service in the latter half of 2017, it also caters to the following: transfer of complicated SAM child from home to Stabilization Center (SC), transfer of complicated SAM child from outdoor therapeutic program center (OTP) to SC, transfer of complicated pneumonia and diarrhea child to nearest secondary or tertiary level hospital and direct transfer of complicated delivery cases (especially post-partum hemorrhage) from home to comprehensive EmONC level health facility (THQH, DHQH or teaching hospital; whichever is nearest).

The entire ambulance service is centrally controlled through a call center which is outsourced to a leading telecom operator of the country under a public-private partnership model. Similarly, the day to day running of the vehicles (i.e. driver availability, fuel, repair & maintenance, etc.) is outsourced to a car rental company. Performance of these companies is tracked through a real-time dashboard, and the ambulances have GPS enabled trackers installed in them.[11]

The ambulance service has shifted 671 thousand women from their homes to health facilities for normal delivery since the service was launched in May 2017 till the end of June 2019. More importantly, approximately 125 thousand emergency transfers were done from primary to secondary or tertiary care level during the same period (table 2). These are the cases which could have ended up in a mortality or morbidity if a transport solution was not available.

4. Integrated Service Delivery Model – Linking Community and Health Facility for Continuum of Care

An integration was done between the existing structures at the community level. These include the Lady Health Workers (LHWs) and Community Midwifes (CMWs). Linkages were also strengthened between the primary care facilities i.e. the Basic Health Units (BHUs) and Rural Health Centers (RHCs) and the secondary care facilities i.e. the Tehsil Head Quarter Hospitals (THQHs), District Head Quarter Hospitals (DHQHs) and teaching hospitals.

Performance based incentives were given to the best

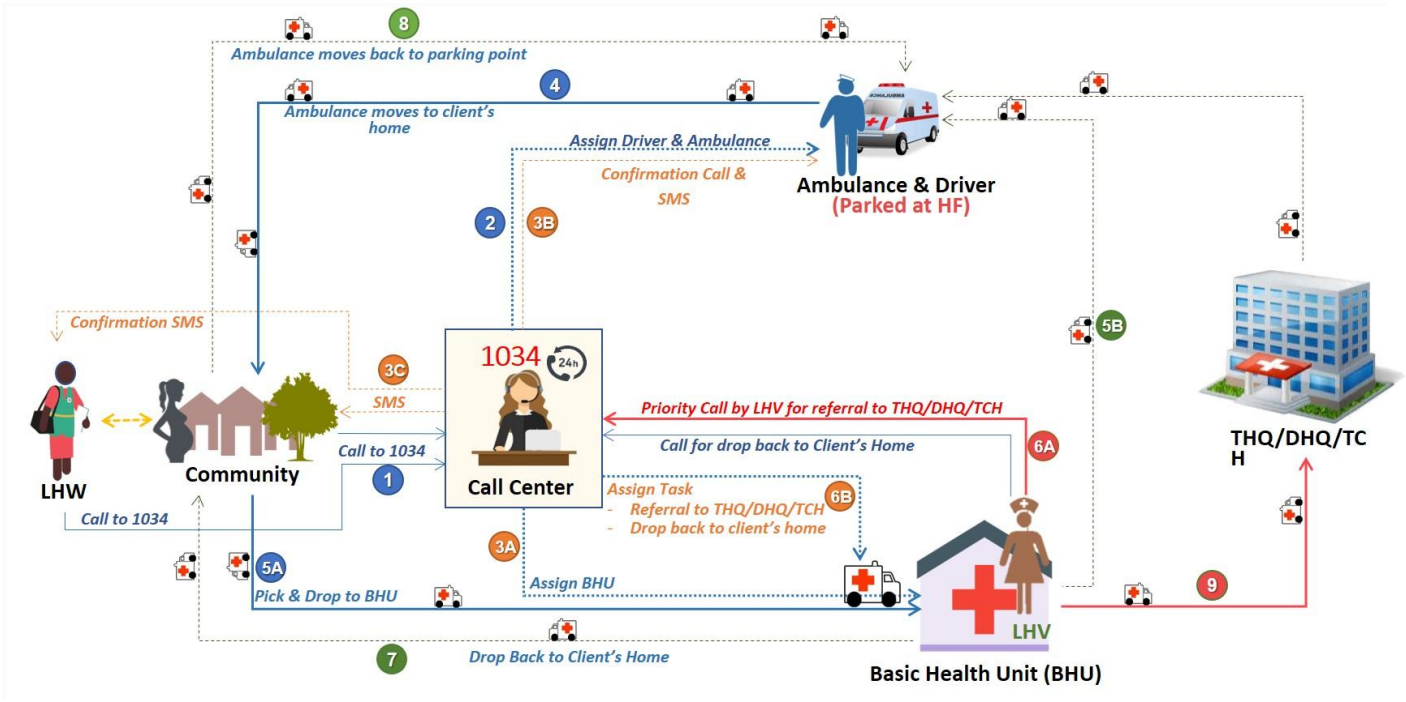


Fig: *Rural Ambulance Service Operational Mechanism*

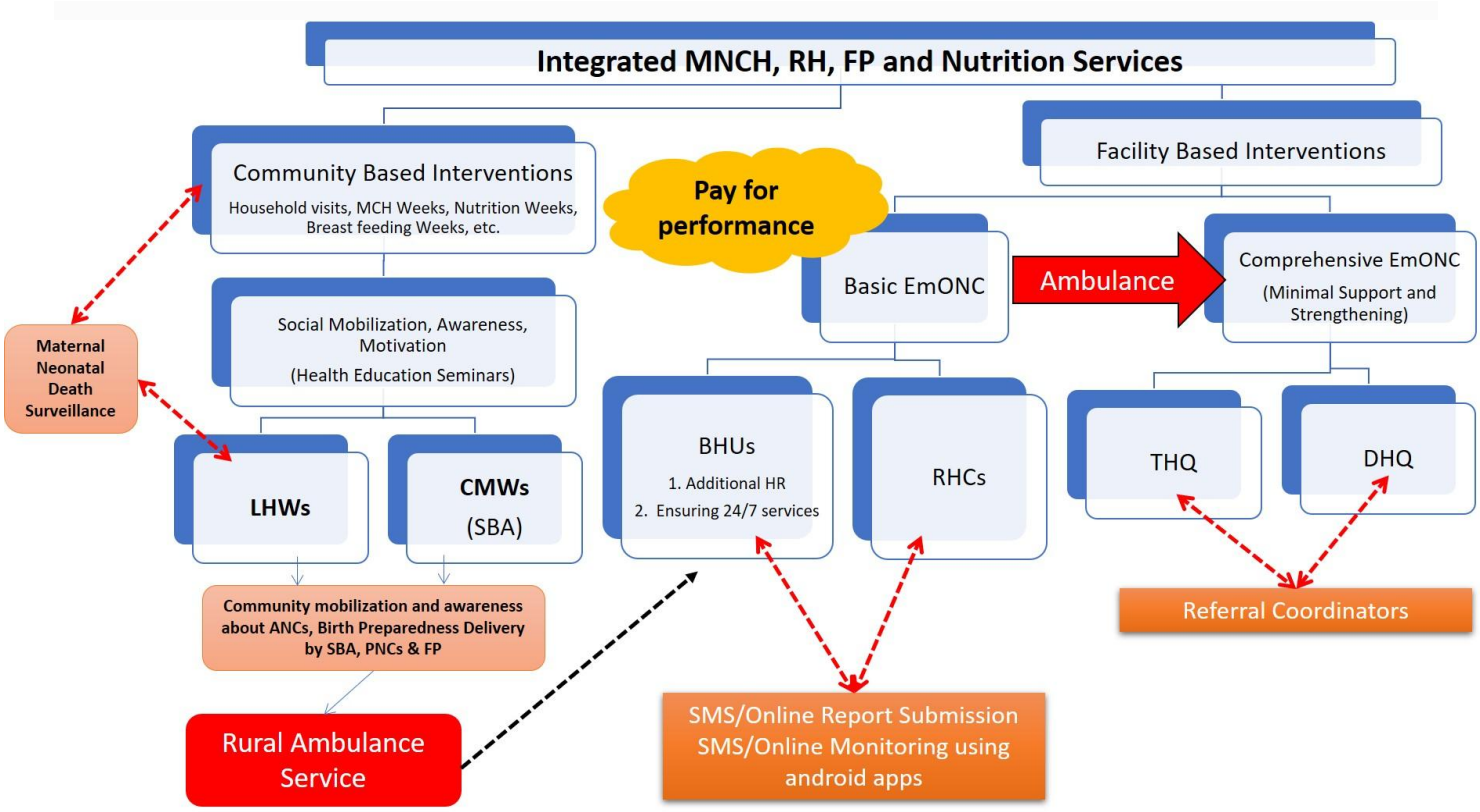


Fig: *Integrated Service Delivery Model*

performing health facilities to encourage a healthy competition and to improve the service delivery. This incentive included a cash prize for two health facilities per district.

5. Tracking Performance through E-Reporting

A number of innovative approaches were used to track the performance of staff. The most successful of these was a text messaging based reporting system for

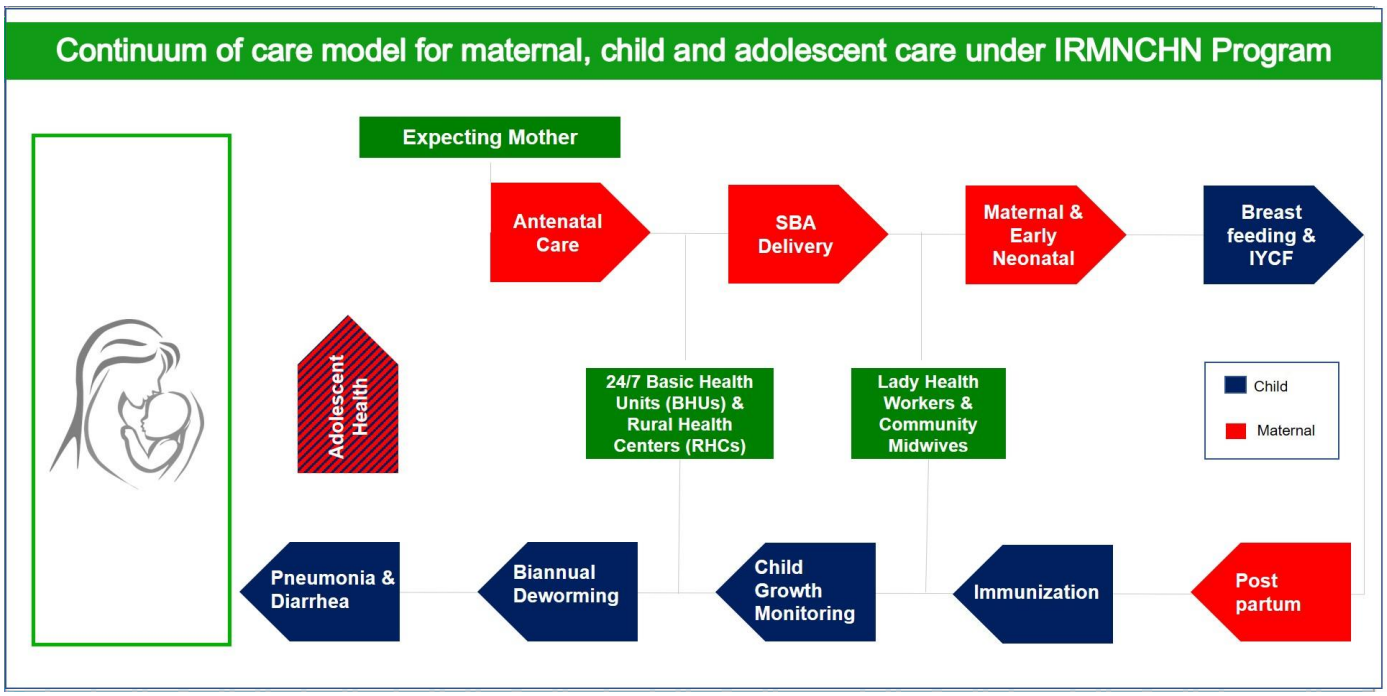


Fig: *Continuum of Care Model for IRMNCHNP*

every birth that happens at the 24/7 BHUs. The system was launched to avoid fake reporting of delivery cases. A format for text messaging was developed in which the staff conducting the delivery was mandated to enter the name, contact details, and basic information of the mother and child in the form of a short message which was then sent by the staff to the central server. As a response to this message, the staff would get a confirmation message and the mobile number of the woman / her family would get a congratulatory message followed by reminder messages for breast feeding, and immunization. Later on, this system was further strengthened to improve the quality of data. In this upgrade, each case of child birth was tagged with two messages from the staff. The first message (called check-in) was sent by the staff as soon as the woman reached the health facility for delivery. This was followed by a second message (called check-out) after the delivery was completed or at time of discharge. The same system was also linked with the monitoring software whereby a message was sent to the area monitor (known as Monitoring and Evaluation Assistant) who could then physically visit the health facility and confirm the presence of the woman at the health facility at random. This further minimized the reporting of falsified data and also helped in tracking the average time of stay within the health facility.

As a next step, the IRMNCHP with support from Punjab Information Technology Board (PITB) is developing an electronic medical records (EMR) based reporting software that would capture detailed history, physical examination findings and lab reports through an android device. The beta-version of this software is currently being tested out at selected basic health units. Once fully operational, this software shall provide data by individual women / children starting right from the first antenatal visit till the child is born. Childhood immunization data, growth monitoring and milestone tracking has also been made part of the software. Similarly, other aspects of RMNCH services i.e. malnutrition treatment, family planning, post-natal visits, etc. have also been made part of the same software.

6. Monitoring to Ensure Availability of Minimum Input – The Functionality Index for Facility Readiness

In order to improve the quality of services and to give a good impression of the health facilities to the public visiting the health facilities, a system for monitoring of input indicators has been set up in the form of health facility functionality index. The index is measured on the selected indicators on knock down style i.e. if even one item is missing, the facility gets a zero score. This has proven to be a very effective tool in improving the availability of the bare minimum inputs for a respectable maternity care. The perfor-

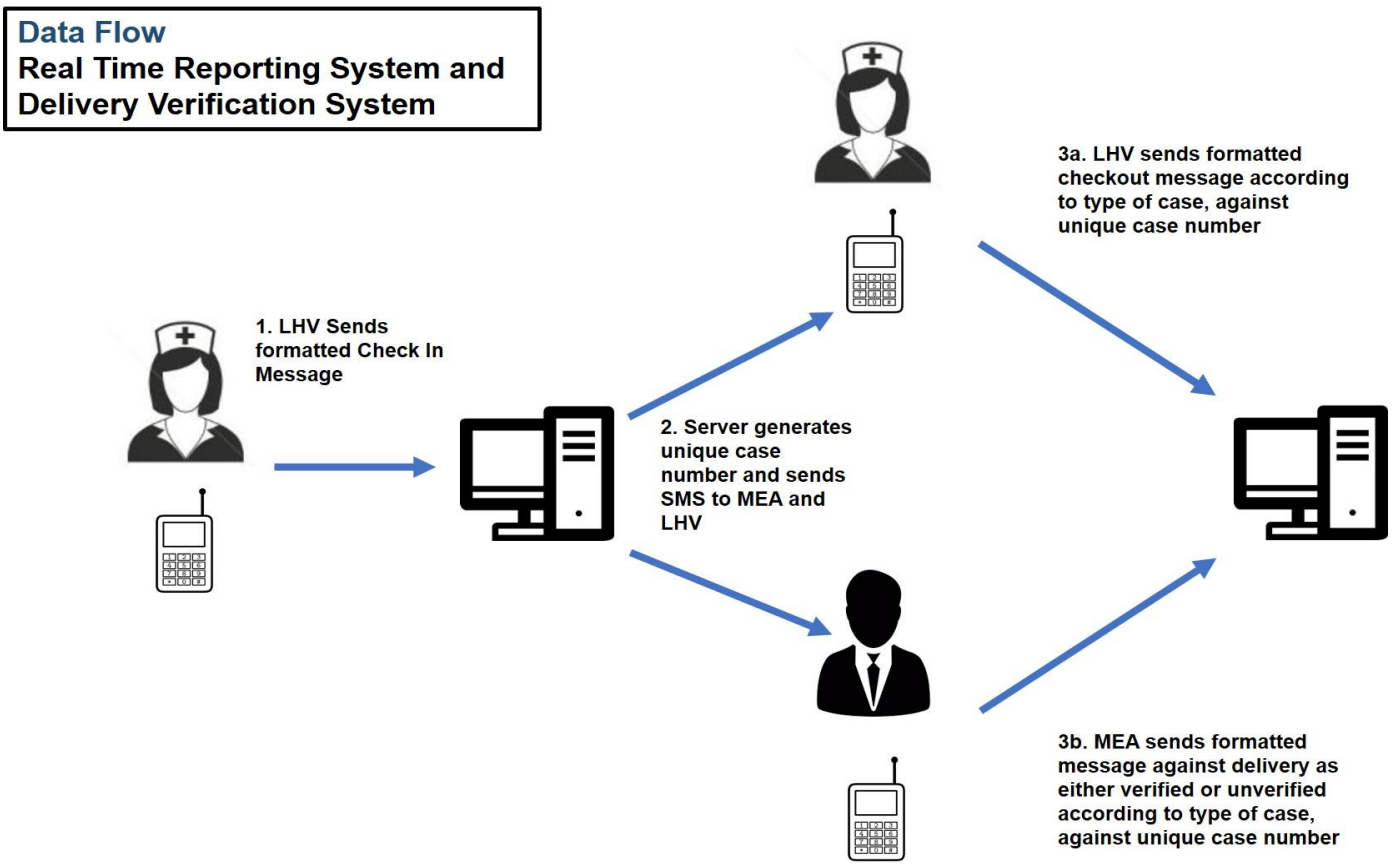


Fig: *Flow of Data for Real Time Reporting of Deliveries*

mance of health facilities improved from 34% in October 2016 to above 90% from December 2017 onwards. There have been minor dips in performance regarding availability of human resource due to intermittent bans on hiring of staff.

Table 1: *Performance on Knockdown Criteria*

24/7 BHU Knockdown criterion	Baseline (Oct 2016)	December 2017	December 2018	June 2019
Functional patient toilets	81%	99%	97%	97%
Skilled birth attendant availability	79%	97%	96%	98%
Emergency tray	98%	99%	96%	98%
Backup power	60%	99%	98%	98%
Delivery light	91%	99%	100%	98%
BP apparatus	97%	100%	100%	100%
Water supply functional	96%	99%	100%	100%
Delivery table	99%	100%	100%	100%
Electricity functional (main supply)	99%	100%	100%	100%
% facilities fully functional on basis of knockdown	**34%**	**94%**	**89%**	**92%**

7. Flexible Funding to Health Councils

In order to achieve the targets of functionality index and to offer a respectable environment for the people visiting the health facilities, a special flexible funding mechanism in the form of health council funds was established to ensure availability of petty cash / flexible budgets at the disposal of the health facility in-charge. Under this mechanism, commercial accounts were opened for each health facility. Utilization of these funds is not governed by the routine Governmental procedures and have resulted in efficient and effective utilization of the given amounts. A detailed guidance note was shared with the districts for utilization of these funds. These funds were used for the following purposes:

1. Improvement in facility outlook
2. Ensuring availability of inputs for quality of care such as availability of clean drinking water, comfortable waiting area with appropriate lighting and ventilation, clean and tiled labor room
3. Basic repair and maintenance of female staff residences in selected health facilities

Performance Charts

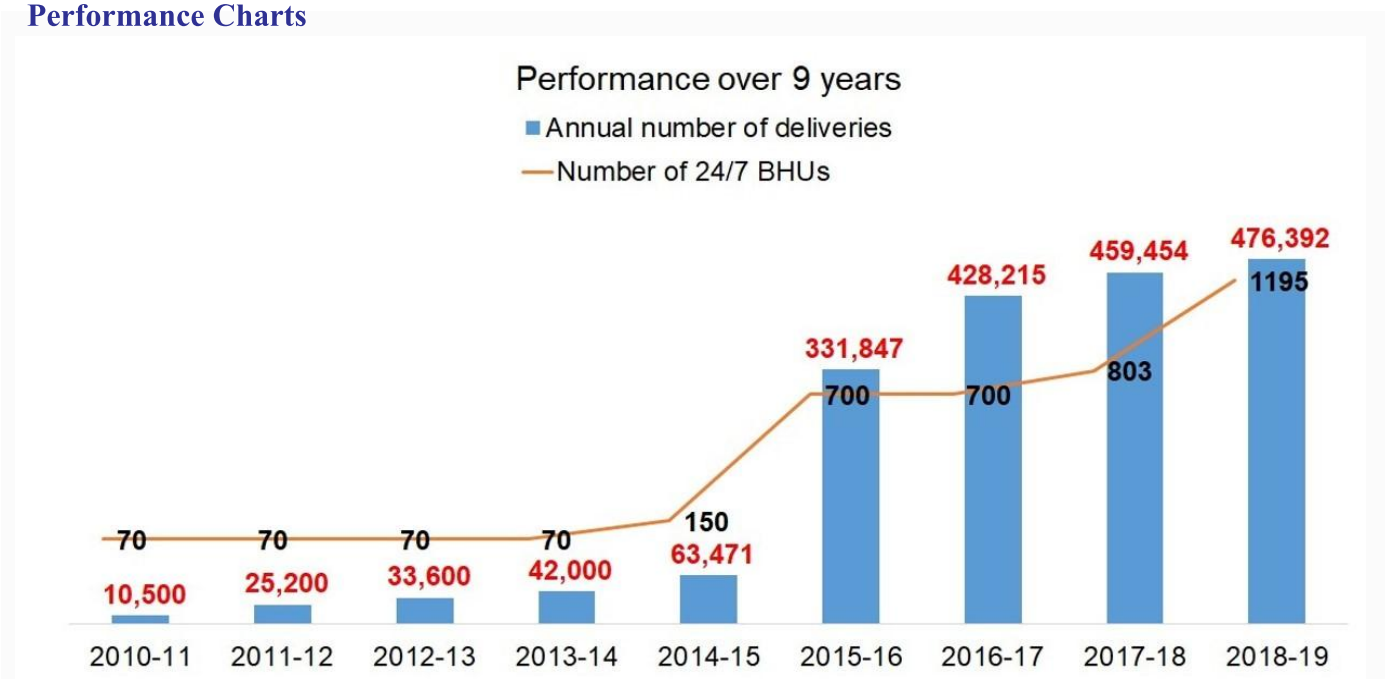


Fig: *Performance of 24/7 BHUs for normal delivery cases*

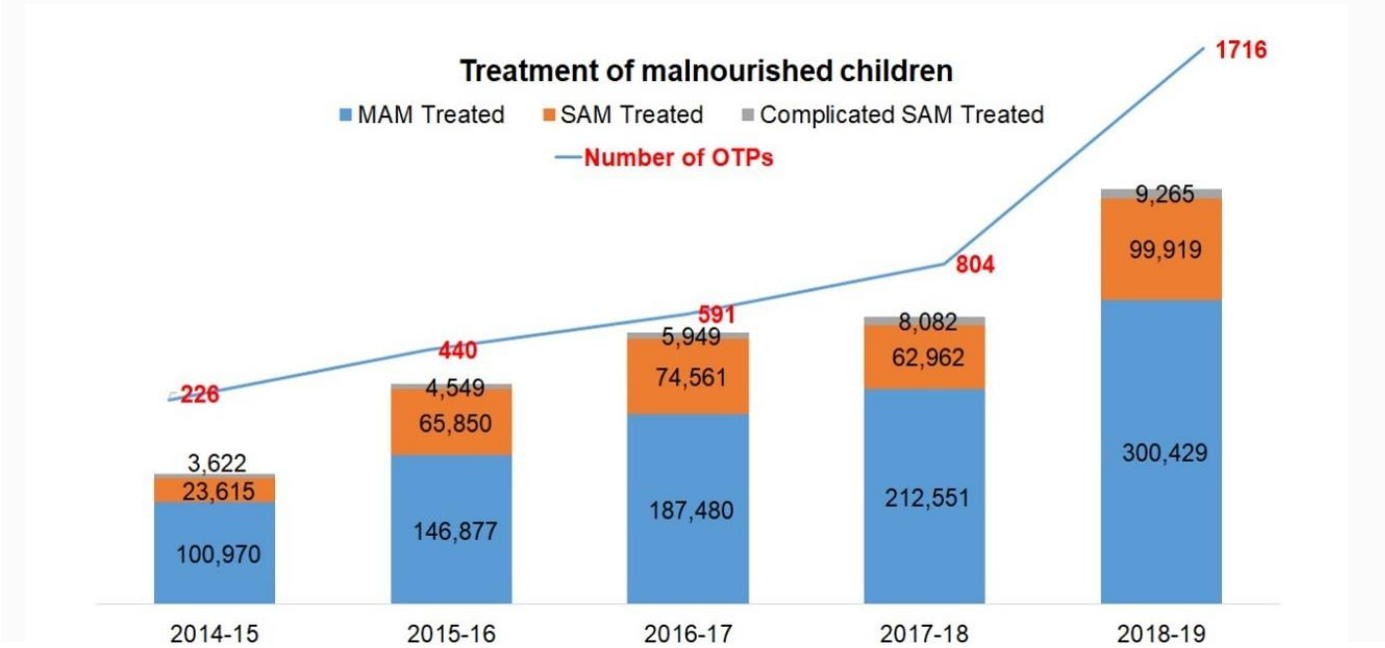


Fig: *Performance of Outdoor Therapeutic Program (OTP) Sites at BHUs and RHCs*

Evidence of Improvement through Household Surveys

Multiple Indicators Cluster Survey is conducted in the province of Punjab every four years with support of the United Nations' Children's Fund (UNICEF). The latest round of this survey was conducted in the years 2017-18. The results show improvements in key indicators related to maternal, newborn and child health.

As evident from these figures, the mortality rates have gone down while the coverage indicators have improved. According to the MICS 2018, the increase in deliveries happening in the public sector has increased by 11.8 percent points while the increase in

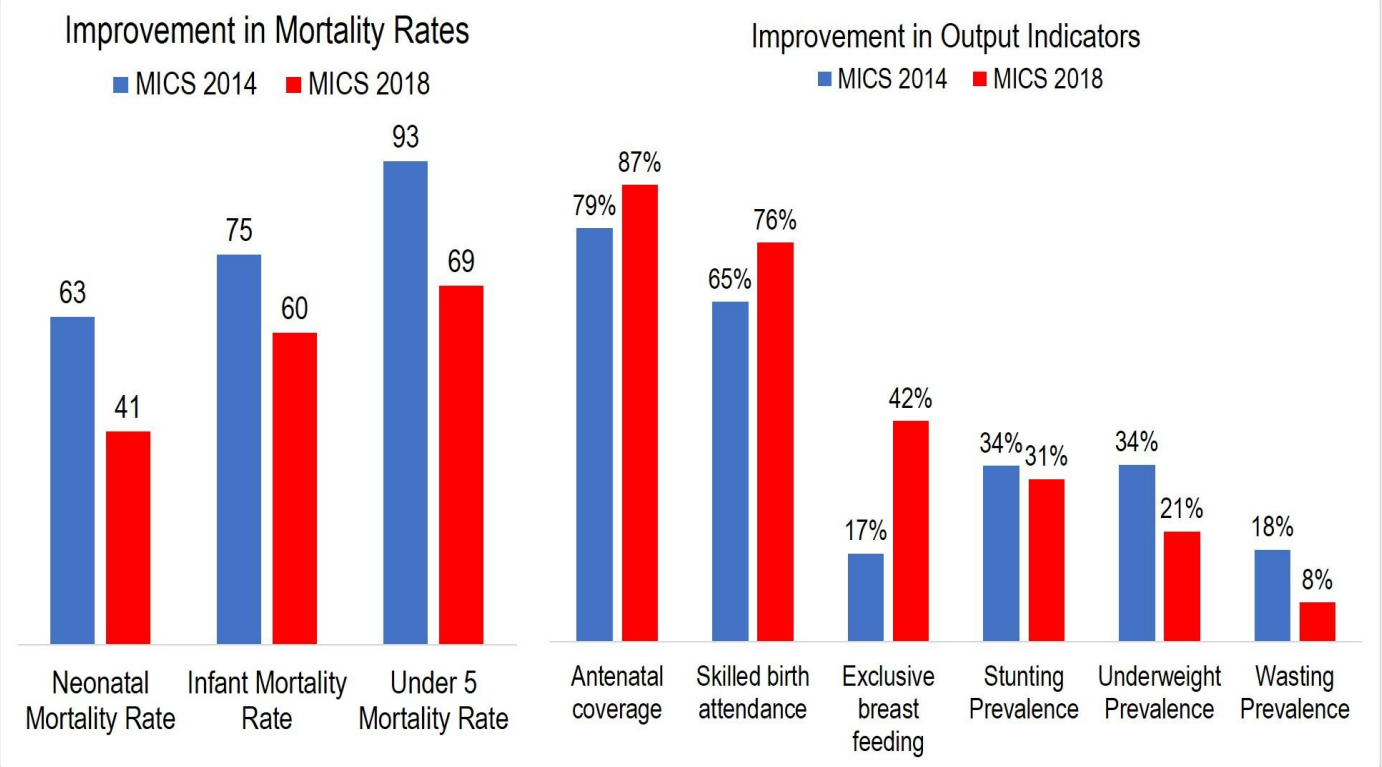
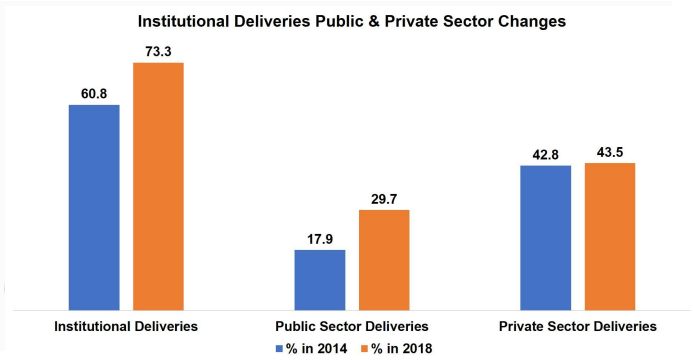


Table 2: *Performance of Rural Ambulance Service*

Month	Home to primary facility	Referrals to hospitals
Jun-17	2,300	600
Jul-17	9,700	2,600
Aug-17	16,200	4,100
Sep-17	18,300	3,700
Oct-17	21,500	3,700
Nov-17	16,400	3,200
Dec-17	18,900	3,900
Jan-18	19,000	3,900
Feb-18	19,400	4,000
Mar-18	26,800	5,700
Apr-18	27,100	6,300
May-18	29,300	7,000
Jun-18	28,600	6,700
Jul-18	32,300	7,300
Aug-18	31,200	7,000
Sep-18	32,200	6,600
Oct-18	30,100	6,300
Nov-18	31,800	5,900
Dec-18	33,900	6,200
Jan-19	37,265	5,277
Feb-19	33,895	4,579
Mar-19	36,829	5,081
Apr-19	32,849	4,779
May-19	41,993	4,925
Jun-19	43,438	5,341
Total	**671,269**	**124,682**

private sector was merely 0.7 percent points in the same duration.[12,13]



Value for Money

A value for money assessment study was conducted for the 24/7 BHUs of Punjab, commissioned by UKAID through Technical Resource Facility (TRF+) in the year 2017. This study proved the effectiveness of the program in the following words:

"As a result of the increase in uptake of services, it is estimated that the intervention is able to save 1,580 lives of mother and children in Punjab. It is further estimated that approximately 2.3 deaths are averted for 1 million PKR spent on this intervention. The intervention was accordingly found to be highly cost-effective with the cost per Disability Adjusted Life Year (DALY) averted calculated as PKR 13,100 or twelve times lower than Pakistan's current GDP per capita. The cost to benefit ratio was calculated at 12 –

representing a return 12 PKR for 1 PKR invested."

Conclusion

Interventions like those under the IRMNCHNP, Punjab have proven to be successful. It is one of the few examples from Pakistan where a donor supported project was scaled up and sustained by the Government. The results are visible not only to the technocrats but to the general public and the political circles as well. This is evidenced by the increasing demand from the elected members of the provincial and national assemblies to up-grade the BHUs in their respective constituencies. The newly formed Government has also shown its commitment to sustain and further expand these interventions by allocating funds.

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