

# Identifying coverage bottlenecks in the Maternal, Neonatal and Child Health Care Services in Panjgur District, Pakistan

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## ABSTRACT

**Background:** Ensuring access to Maternal, Neonatal and Child Health (MNCH) services is of great importance for the life of pregnant women and newborns.

**Objectives:** This study is aimed to identify coverage bottlenecks in MNCH services at PHC facilities in Panjgur District, Balochistan province, Pakistan.

**Methods:** Tanahashi Model of Health Services with six coverage stages was used for identifying bottlenecks in MNCH services. Through two-stage sampling, the data were collected from 262 married women of reproductive age 15-49 in the catchment areas of eight selected PHC facilities. Descriptive statistics were used to measure the coverage bottlenecks.

**Results:** The findings indicated that almost two-third (64.9%) of women were 20-34 years old. Out of the total, more than half (58%) were housewives and 34% were illiterate. Two-fifth of respondents belonged to the lower-middle income group. The findings of this study indicated major coverage bottlenecks in the availability, acceptability, contact and effective coverage. For availability coverage, the unavailability of lady medical officers, essential medicine, and delivery services were the major bottlenecks. In the case of acceptability coverage, seeking permission to access MNCH services and non-responsiveness of staff were important bottlenecks. Similarly, major bottlenecks were also found in the contact coverage. This study also confirmed bottlenecks in effective coverage: insufficient general check-up for MNCH services, shortage of human resource, insufficient laboratory services, almost non-existing delivery services, lack of health education and less service timing of PHC facilities.

**Conclusions:** The poorly managed MNCH services in Panjgur District have adverse implications for the life of pregnant women and newborns. Integrated actions are needed for revamping the MNCH services delivery strategies at district level and ensuring availability of skilled birth attendants, particularly the lady medical officers, provision of essential medicines, improving laboratories at PHC facilities, taking serious initiatives for ensuring delivery services at the PHC facilities.

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## 1. INTRODUCTION

Ensuring access to Maternal, Neonatal and Child Health (MNCH) services is of great importance for the life of pregnant women and new-borns. Although, Pakistan has made progress in reducing maternal mortality rates (MMRs) from 533 in 1991 to 140 deaths per 100,000 women in 2017 and has increased the percentage of skilled birth attendants (SBAs) from 28% in 2000 to 68% in 2017 ([Economic Survey of Pakistan, 2015](#); [MMEIG, 2019](#)). However, the country has failed to achieve the health-related Millennium

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Development Goals (MDGs). Pakistan has the highest infants (69/1000) and under-five mortality rates (85.5/1000) compare to the neighboring countries in South Asia ([Economic Survey of Pakistan, 2015](#)). The situation is worse than the neighboring countries in the case of maternal deaths. Pakistan is one of the six countries where one out of every 38 women dies of birth-related complications and some 0.3 million women developed pregnancy-related disabilities each year ([Asim et al., 2017](#)).

Maternal, neonatal and child health (MNCH) is stipulated as one of the significant areas in the health policies of Pakistan. The MNCH policy of the country aims at improving the accessibility of quality MNCH services through a set of integrated MNCH services at primary, secondary and tertiary levels of the health care system in order to cater the maternal and child health needs. The basic objective of MNCH policy is to improve the health of mothers and children through provision of Emergency Obstetric and Neonatal Care (EmONC) and family planning services. With the technical support of world health organization (WHO), the health departments at federal and provincial levels have initiated action plans under National Health Vision (2016-2025) to mobilize resources to support maternal, newborn and child healthcare programs in the country ([World Health Organization, 2020](#)).

In Pakistan, MNCH services are provided through a countrywide network of MNCH centers and basic health units (BHUs) ([Panzai et al., 2017](#)). Besides, broad network of primary health care (PHC) facilities, Government of Pakistan also provides MNCH services through a vertical program, named National Maternal and Child Health Program, focusing the poor and marginalized segments of the population. This program aims to provide mothers and children the health services through community based primary health care (PHC) network. MNCH program is aligned with health related sustainable development goals (SDGs) to improve the status of MNCH indicators such as life expectancy at birth, total (years), infant mortality rate (per 1,000 live births), maternal mortality rate (per 100,000) and under 5 mortality rate (per 1,000) ([Economic Survey of Pakistan, 2019](#)). While facing challenges of low health care financing and shortage of human resource, the country is struggling to improve the coverage of MNCH services.

Many studies have reported poor indicators of MNCH services in Pakistan. For instance, in Pakistan, 30,000 deaths occur annually caused by the child-related complications. Moreover, one out of every 93 has a risk to maternal death ([Khan et al., 2013](#)). The country has MMR of 260/100,000 which is highest in the South Asian region ([Asim et al., 2015](#)). Balochistan province has the poorest MNCH indicators compare to other province of the country. However, the province has made some improvements in service delivery in the last decade. For example, in Balochistan, only 18% of the births were assisted by skilled birth attendants during 2006-07 ([NIPS, 2006-07](#)). Similarly, Pakistan Demographic and Health Survey (PDHS) 2018 also reports poorest MNCH indicators. According to the PDHS survey report, more than half (56%) of the women get antenatal care by a skilled provider, around one-third (35%) of births are delivered in a PHC facility and 38% of the total births are attended by skilled providers ([NIPS, 2017-18](#)). These figures show that the province still has to go long way to improve the MNCH related health indicators.

In the case of Balochistan, research studies report low utilization of primary health care (PHC) services ([Panzai et al., 2017, 2020; Panzai et al., 2019](#)), lowest antennal care utilization ([Ghaffar et al., 2015](#)), weak maternal care ([Fikree et al., 1997](#)), lowest prenatal care seeking ([Mahmood & Bashir, 2012](#)), highest maternal mortality rates ([NIPS, 2006-07](#)), causes of high maternal mortality ([Sami & Baloch, 2002](#)). Less is known about the coverage bottlenecks that restrict access to and utilization of MNC services. To fill the gap in literature, this research study is aimed to assess the MNCH services and identify the coverage bottlenecks in the MNCH services delivery in the PHC system at district level in Balochistan, particularly in the rural area like Panjgur district.

## 2. METHODS

### 2.1 Study design

This study has used a descriptive case study research design and quantitative research approach.

### 2.2 Setting

Panjgur district is located in the western part of Balochistan province of Pakistan (Map 1). Panjgur is located from 26°-14' to 27°-18' north latitudes and from 63°-07' to 65°-24' east longitudes. It is bounded on the north by Kharan district, on the east by Awaran district, on the south by Kech (formerly Turbat) district and on the west by the neighbouring country Iran. Total area of the district is 16,891 square kilometers. Panjgur was granted district status in 1977, and Chitkan was declared as its headquarter. Panjgur is a district of Makran division along with other two districts: Kech (Turbat) and Gwader. The main tribes in the district are Baloch, Brahvi, Pushtun, Punjabi and others. The Baloch tribe is the overwhelming majority. The major spoken language in the area is Balochi (Planning and Development Department, 2011). The district has a population of 316385 with 166731 males and 149654 females. One-fifths (74.61%) of the district's population is rural. There are 42628 households in the district. The district is divided into three tehsils known as Panjgur tehsil, Gichk tehsil and Parome tehsil (Pakistan Bureau of Statistics, 2017). In Panjgur District, according to the data provided by district health officer (DHO) office, four lady doctors, 23 female medical technicians (FMTs), 18 lady health supervisors (LHS), 426 lady health visitors (LHVs) and 51 Daees (traditional birth attendants) (District Health Office, 2019).

### 2.3 Participants

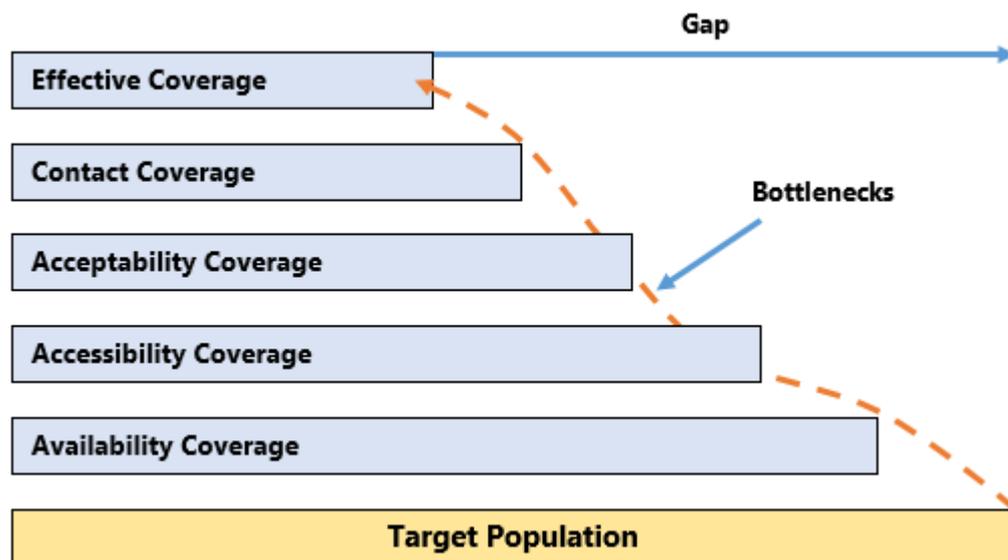
In the current study, the participants were the women of reproductive aged 15 to 49 years.

### 2.4 Tanahashi Model

Tanahashi proposed his model of coverage stages in 1978 (Tanahashi, 1978). He described coverage as interface between the health care system and the individuals who supposed to be served (Figure 1). The use of Tanahashi model for health services coverage is effective for policymakers and health care managers for addressing service delivery bottlenecks, the factors which cause these bottlenecks and choosing alternative strategies for improvements in service delivery (Bivol et al., 2012). Tanahashi proposed a set of five coverage stages in a hierarchal order that are defined in Table 1.

**Table 1** Definitions of Tanahashi Model of Coverage Stages

Availability coverage	This first coverage deals with the volume of obtainable resources which include the health specialists like (doctors, nurses and CHWs) and the quantity of facilities which may be available to the people is dealt in this initial stage which is known as availability coverage.
Accessibility coverage	The main concentration of the second stage is the number of people with the capability to utilize the health services in a sensible reach of the target population.
Acceptability coverage	It deals with the readiness and receiving of the people to utilize the health facilities built on the cost of the services and the religious conviction.
Contact coverage	Fourth is the contact coverage that deals with the interaction between facility supplier and the client and the capacity of population that contact with service supplier and truly utilize the health facilities constitute the contact coverage.
Effective coverage Bottlenecks	The fifth is the effective coverage deals with the number of population who received the expectable services and the quality services provided The problems and constraints in service delivery are termed as 'bottlenecks'.



**Figure 1** Tanahashi Model of Service Coverage and Bottlenecks (Tanahashi, 1978)

## 2.5 Variables

This study has used six sets of variables. For socio-demographic information, age, educational level, marital status, family type, occupation, and average monthly income were used. Variables for availability coverage include MNCH checkup, laboratory tests, medicines, TT vaccines, and child delivery services. Variables for laboratory services were the availability of blood test, urine DR, pregnancy test, blood sugar were assessed. Likewise, for availability of human resource (HR), lady medical officer, lady health visitor (LHV), female medical technician (FMT), skilled birth attendant (SBA) and visits of LHV to home were used as variables. For accessibility coverage, important variables such as travel cost, distance to PHC facility, and travel time were assessed. Moreover, for assessing acceptability coverage, permission for going to PHC facility alone, PHC facility as usual source of care, privacy of medical records, satisfaction with quality of care and responsiveness of medical staff were the variables used. For assessing contact coverage, patients' visits for general check-up, laboratory tests, TT Vaccines, medicines, child immunization, health education and for availing delivery services were the variables. Lastly, for effectiveness coverage, satisfaction with general MNCH services, availability of staff, laboratory services, delivery services, immunization services, health education, service timing, staff responsiveness, privacy of medical records and quality of MNCH services were the prominent variables.

## 2.6 Data sources

The primary data were collected at household level from the women of reproductive age (15 to 49 years). The structured questionnaire was used as a tool for the collection of primary data in the field. The questionnaire was pre-tested and modified accordingly. The data were collected from respondents in the catchment areas of eight selected PHC facilities in the months of January and February 2019.

## 2.7 Sample design

The sample was selected through a two-stage sampling design. According to the National Census of 2017, the population of Panjgur district was 316385 (166731 males and 149654 females), with 42628 households (Pakistan Bureau of Statistics, 2017). This study is intended to explore women access to MNCH services. Due to this reasons, from the total population, the male population were excluded. By using the formula given by Yamane (1967), a sample of 262 households were selected. At the household level, married women aged 15 to 49 years were selected through two stage sampling. In the first stage, 8 PHC facilities were selected through simple random sampling, whereas, in the second stage, the houses

were selected through systematic sampling by choosing every fourth house initiating from the building of PHC facility.

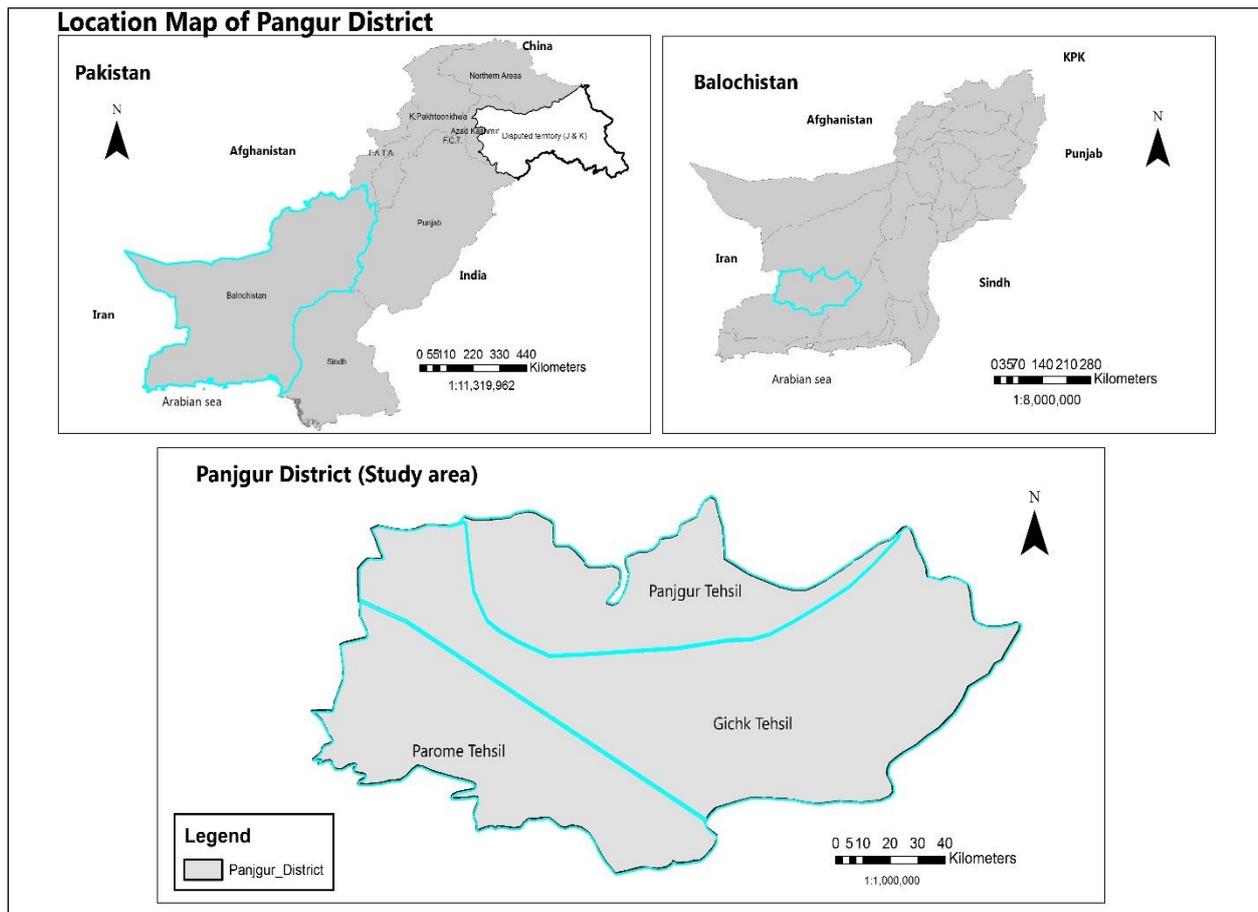


Figure 2 Location map of Panjgur district.

## 2.8 Data analysis methods

Tanahashi Model of Health Services having six stages of coverage was used for identifying coverage bottlenecks in MNCH services. Descriptive statistics were used to assess the MNCH services and associated coverage bottlenecks. ArcGIS 10.2.2 was used for producing the map of Panjgur district.

## 3. RESULTS

### 3.1 Socioeconomic characteristics of the participants

The results in Table 2 shows the demographic characteristics of respondents. The results for age indicated that almost two-third (62.9%) of respondents belonged to age group 20-34 years. Respondents in age groups 35-49 years and <20-32 years were almost one-fifth (22.9%) and one-tenth (12.2%) of the total respectively. Regarding education level of respondents, out of 262 women, one-third (34%) of them were illiterate, 21% had done matriculation, 16.4% were having bachelor degrees, 8.8% were middle passed, 7.6% were master degree holders, 7.3% had done intermediate and the reaming 3.4% had primary education. The entire (100%) selected women were married. Out of the total, little more than half (55.3%) had large families whereas less than half (44.7%) had small families. Almost three-fifth (58%) of the selected women were housewives but few of them had jobs i.e. government employment (20%), personal business (15.2%) and private employment (1.1%). In the case of average monthly income of respondents, 13% were living with less than 20,000 PKR, whereas almost one-third had income 20,000-

40,000 PKR and 40,000-60000 PKR respectively. One-fourth of the total had average monthly income more than sixty thousands.

**Table 2** Socioeconomic characteristics of the participants

Socioeconomic Characteristics	Frequency (f)	Percentage (%)
<i>Age (in years)</i>		
< 20	32	12.2
20 – 34	170	64.9
35 – 49	60	22.9
<i>Educational Level</i>		
Illiterate	89	34.0
Primary	9	3.4
Middle	23	8.8
Matriculation	57	21.8
Intermediate	19	7.3
Bachelor	43	16.4
Master	20	7.6
Post-Graduation	2	0.8
<i>Marital Status</i>		
Married	262	100.0
<i>Family Type</i>		
Nuclear	117	44.7
Extended	145	55.3
<i>Occupation</i>		
House Wives	153	58.4
Wage Labor	13	5.0
Personal Business	40	15.2
Government Employment	53	20.2
Private Employment	3	1.1
<i>Average Monthly Income (PKR)</i>		
< 20000	34	13.0
20000 – 39999	74	28.2
40000 – 59999	88	33.6
60000+	66	25.2
Total	262	100.0

Source: Survey data, 2019; Abbreviation: PKR= Pakistani Rupee

### 3.2 Availability coverage

The findings shown in Table 3 are about the availability coverage of MNCH services at the public health facilities in the study area. Four-fifths (80.9%) of respondents reported the availability of general checkup facility at the health facilities. Similarly, almost all of the respondents showed a positive response about

the availability of laboratory tests. The deficiency of medicines was reported as a major bottleneck. The availability coverage for medicines was only reported by only two-fifths of respondents. Similarly, majority (90%) of the respondents reported the availability of vaccines. However, respondents were not satisfied with the availability of delivery services. For instance, little more than four-fifth (84%) of them reported the unavailability of child delivery services at the health facilities in Panjgur district. In the case of availability coverage of Tetanus Toxoid (TT) vaccine, majority (91%) of the respondents were positive.

**Table 3** Availability coverage of MNCH services

Availability of MNCH Services	Frequency (f)	Percentage (%)
<i>MNCH Check Up</i>		
No	50	19.1
Yes	212	80.9
<i>Laboratory Tests</i>		
No	7	2.7
Yes	255	97.3
<i>Medicines</i>		
No	158	60.3
Yes	104	39.7
<i>TT Vaccines</i>		
No	24	9.2
Yes	238	90.8
<i>Child Delivery</i>		
No	220	84.0
Yes	42	16.0
Total	262	100.0

Source: Survey data, 2019

### 3.3 Availability of laboratory tests

The findings in Table 4 are about the availability of laboratory tests at the selected PHC facilities. The results indicated that most of the tests were available at the PHC facilities. Most of the respondents have shown positive response towards the availability of laboratory tests. For example, according to the results blood group test (75%), urine DR (69%), pregnancy tests (99%), blood sugar (75%) and others such as Typhoid and Malarial Parasite (MP) and Tuberculosis (TB) etc. (58%) were available in laboratories of health facilities. However, the analysis of results show that there are still space for improving laboratory services which can surely improve the quality of care provided.

### 3.4 Availability of human resources

Results about the availability of human resources at the health facilities in Panjgur district are presented in the Table 5. The analysis of the data shows that there is shortage of human resource throughout the health facilities. The availability of lady doctors is of most important for the delivery of MNCH services. Out of the total, two-fifths (60%) respondents reported the unavailability of lady medical officers (LMOs) in the selected PHC facilities. In addition to that, one-fifth (22%) did not even know about the availability of LMOs which showed that they did not go to avail the MNCH services from doctors in health facilities. Moreover, two-third (66%) of the respondent informed that that never found lady doctor when they ever went to avail MNCH services. The second most important human resource is medical technician. Among

respondents, almost half reported the unavailability of female medical technician (FMT) in the PHC facilities compared to 38% who reported their availability. However, 85% of the respondent were able consult any skilled birth attendant including Daae (a traditional birth attendant) during delivery services. The main healthcare provider at community level is lady health visitor (LHV) and they are appointed in almost each and every health facility. In the case of availability of LHVs, the responses were positive, and majority 92% of the respondents reported the availability of LHVs in the health facilities. Two-third (66%) knew LHV personally which help them get MNCH services easily in the needy times.

**Table 4** Availability of laboratory tests at health facilities.

Laboratory Tests	Frequency (f)	Percentage (%)
<i>Blood Test</i>		
No	68	26.0
Yes	194	74.0
<i>Urine DR</i>		
No	80	30.5
Yes	182	69.5
<i>Pregnancy Test</i>		
No	2	0.8
Yes	260	99.2
<i>Blood Sugar</i>		
No	64	24.4
Yes	198	75.6
<i>Others*</i>		
No	109	41.6
Yes	153	58.4
Total	262	100.0

Source: Survey data, 2019; Note: \*Others: Typhoid, Malarial Parasite and Tuberculosis etc.

### 3.5 Availability of delivery services at health facilities

The availability and access to basic emergency and obstetric care is very important for the life of pregnant women and newborns. The results indicated that four-fifth (79%) of the total respondents could not deliver their last child in the nearest PHC facilities. Only 21% had a chance to avail obstetric care at their health facility. The analysis of the findings showed weak obstetric care services in the District. Serious actions are required to be taken by health department and PPHI for improving obstetric care.

**Table 6** Location of last delivery

BHU as location of last delivery	Frequency (f)	Percentage (%)
Yes	55	21.0
No	207	79.0
Total	262	100.0

Source: Survey data, 2019

**Table 5** Availability of human resource at PHC facilities

Categories of human resource	Frequency (f)	Percentage (%)
<i>Lady Medical Officer Now</i>		
Yes	46	17.6
No	159	60.7
Not Sure	57	21.8
<i>Lady Medical Officer Ever</i>		
Yes	88	33.6
No	174	66.4
<i>Female Medical Technician</i>		
Yes	100	38.2
No	126	48.1
Not Sure	36	13.7
<i>Skilled Birth Attendant</i>		
Yes	224	85.5
No	38	14.5
<i>Lady Health Visitor</i>		
Yes	242	92.4
No	10	3.8
Not Sure	10	3.8
<i>PR with Lady Health Visitor</i>		
Yes	174	66.4
No	23	8.8
Not Sure	65	24.8
<i>LHV Visits (during last 6 months)</i>		
Yes	54	20.6
No	208	79.4
Total	262	100.0

Source: Survey data, 2019; PR=Personal Relations

### 3.6 Accessibility coverage

The findings in Table 6 show the accessibility coverage of MNCH services in Panjgur district. Accessibility coverage basically depends upon distance, travel time and the travel cost paid by respondents while reaching to the PHC facilities for availing MNCH services. In the catchment areas of the PHC facilities, almost two-third (65%) of the respondents had to travel from 2-3 kilometers to reach to health facility for availing MNCH services. A significant proportion (15.3%) of the respondent had to travel less than one kilometer in reaching to the PHC facility. Whereas, only 17.9 % and 1.9% of the respondents had to travel 4-5 kilometers and more than 6 kilometers respectively to avail MNCH services. In the case of travel time, little more than half (54.2%) had to spend less than 20 minutes to reach the PHC facility which shows that the PHC facilities are near to their homes. Around two-fifth (39%) of the respondent used to take less than 30 minutes to reach the PHC facility, whereas only 6.5% of them used to travel more than 30

minutes. Regarding travel cost paid by respondents to reach the PHC facilities, almost two-third (65%) and one-fourth (23%) of respondents had to pay less than 100 PKR and 100-199 PKR respectively. Out of the total, only 11% had to pay more than 200 PKR as travel cost. The travel cost is not high and can be paid by respondents. The analysis of the above findings show that PHC facilities are within the reach of majority of respondents. But accessibility coverage is not the only factor which could make sure that respondent get MNCH services they need at the PHC facilities, other bottlenecks in availability coverage, acceptability and contact coverage are also considered to be addressed for improving MNCH coverage.

**Table 4** Accessibility coverage

Accessibility coverage	Frequency (f)	Percentage (%)
<i>Distance to PHC facility (in kilometer)</i>		
<= 1	40	15.3
2 - 3	170	64.9
4 - 5	47	17.9
6+	5	1.9
<i>Travel time to PHC facility (in minutes)</i>		
<= 10	25	9.5
11 - 20	117	44.7
21 - 30	103	39.3
31+	17	6.5
<i>Travel cost (in PKR)</i>		
< 100	171	65.3
100 - 199	61	23.3
200+	30	11.5
Total	262	100.0

Source: Survey data, 2019

### 3.7 Acceptability coverage

The results in Table 8 shows the acceptability coverage of the MNCH services at PHC facilities in Panjgur district. The basic variables which assess the acceptability coverage include permission to go to PHC facility alone, having PHC facility as usual source of care (USOC), trust in privacy of medical records, satisfaction with MNCH services and responsiveness of the staff.

The findings show that almost three-fifths (62%) of respondents needed permission of their husbands for going to PHC facility alone. Likewise, 7.63% had to seek permission from their mother-in-law before they step out of home for seeking care. In contrast, one-fourth (26.34%) of the respondents did not need any permission and they could go to PHC facility alone. The coverage depends on the relationship between PHC facility and their patients which can be determined by how many people make PHC facility as their usual source of care (USOC). USOC is the facility which is mostly consulted for availing MNCH services. The higher number of people with PHC facility as their USOC shows the strength of the services provided by that facility. The results show that PHC facility was not at all (9.9%), to small extent (32.1%), and to moderate extent (52.7%), a USOC of the respondents. This implies that PHC facility do not serve as their USOC for a majority of the respondents. Only few respondents (5.3%) reported PHC as their USOC to a large extent. For acceptability coverage, another important variable is whether patients trust their health care providers for keeping the privacy of their medical records. The findings showed that almost half (50.8%) of the respondents had trust in privacy of medical records managed by staff of PHC facility.

However, contrarily, in the case of satisfaction with the quality of MNCH services, little more than half (55%) reported dissatisfaction. Their dissatisfaction shows that efforts are required to enhance trust of people and improving the quality of care. Lastly, regarding responsiveness of PHC facility staff, the findings of current study indicated negative responses because two-fifth (39%) and almost half (48%) of respondents were not at all and partly satisfied with the services provided by the PHC facilities.

**Table 5** Acceptability coverage

Categories	Frequency (f)	Percentage (%)
<i>Permission to go to PHC facility alone</i>		
Husband	163	62.21
Mother-in-Laws	20	7.63
Permission not needed	69	26.34
Others	10	3.82
<i>Usual Sources of Care (USOC)</i>		
Not at all	26	9.9
To small extent	84	32.1
To moderate extent	138	52.7
To large extent	10	3.8
To great extent	4	1.5
<i>Trust in privacy of medical records</i>		
Yes	133	50.8
No	29	11.1
Not Sure	100	38.2
<i>Satisfaction with MNCH services</i>		
Yes	34	13.0
No	144	55.0
Not Sure	84	32.1
<i>Responsiveness of the staff</i>		
Not at all Satisfied	103	39.3
Partly Satisfied	126	48.1
Satisfied	31	11.8
Very Satisfied	2	0.8
Total	262	100.0

Source: Survey data, 2019

### 3.8 Contact coverage

The results in Table 9 are about the contact coverage of MNCH services. The respondents were asked whether they contacted their PHC facilities for general checkup, laboratory tests, TT vaccines, essential medicines, child immunization, health education, delivery services and utilization of MNCH services. The findings showed that almost two-fifth (63%) of the respondent's contacted PHC facility for general check-ups, 59% for laboratory tests, 40.5% for TT vaccines and 45% for child immunization. The analysis indicate that the above mentioned services were availed by almost half of the total respondents. However,

regarding health education, majority 96% of the respondents did not contact PHC facility, 90.8% for delivery services and most importantly 88% of the total respondents did not contact PHC facility for overall MNCH services. Most important in the delivery of MNCH services is visits of LHVs at household level. For home visits of LHV during the last six months, four-fifths (79.4%) of respondents reported negative response, and thus, was a major bottleneck. This shows space for improvement in the outreach services of LHVs.

**Table 9** Contact coverage

Utilization of MNCH Services	Frequency (f)	Percentage (%)
<i>Checkup</i>		
No	96	36.6
Yes	166	63.4
<i>Laboratory Tests</i>		
No	106	40.5
Yes	156	59.5
<i>TT Vaccines</i>		
No	156	59.5
Yes	106	40.5
<i>Medicines</i>		
No	261	99.6
Yes	1	.4
<i>Immunization</i>		
No	144	55.0
Yes	118	45.0
<i>Health Education</i>		
No	253	96.6
Yes	9	3.4
<i>Utilization of MNCH services</i>		
No	231	88.2
Yes	31	11.8
<i>Delivery Care</i>		
No	238	90.8
Yes	24	9.2
<i>LHV Visits (during last 6 months)</i>		
Yes	54	20.6
No	208	79.4
Total	262	100.0

Source: Survey data, 2019

### 3.9 Effective coverage

The effective coverage deals with the number of population who received the expectable services from the PHC facilities in Panjgur district. The findings for effective coverage are given in Table 10. This last stage of Tanahashi model actually indicated the major bottlenecks in the MNCH services delivery. For effective coverage, the respondents were not at all satisfied with general MNCH services (50.8%), availability of human resource (39.3), laboratory services (37.8%), delivery services (87.4%), health education (63.4%), service timing of PHC facility (70.6%), responsiveness of staff (39.3%), trust in privacy of medical records (32.1%) and quality of MNCH services (15.3%). Furthermore, the findings demonstrated that the respondents were partly satisfied with general MNCH services (41.2%), availability of staff (53.1%), laboratory services (42.4%), health education (33.2%), service timing of PHC facility (25.6%), responsiveness of staff (48.1%), trust in privacy of medical records (39.7%) and quality of MNCH services (52.3%). However, the significant proportion of respondents were satisfied only with the laboratory services (19.8%), immunization (87.4%), trust in privacy of medical records (28.2%) and quality of MNCH services (32.4%).

The major bottlenecks were identified in the availability of staff, particularly the LMOs, laboratory services, delivery services, availability of essential medicine and service timing of PHC facility. The most important among all were the availability of staff such as LMOs, FMTs and LHV along with the functioning of labour rooms and delivery services which are considered the backbone of MNCH services.

**Table 6** Effective coverage

Variables	Not at all Satisfied f (%)	Partly Satisfied f (%)	Satisfied f (%)
General MNCH Services	133(50.8)	108(41.2)	21(8.0)
Availability of Human Resource	103(39.3)	139(53.1)	20(7.6)
Laboratory Services	99(37.8)	111(42.4)	52(19.8)
Delivery Services	229(87.4)	13(5.0)	20(7.6)
Immunization	1(0.4)	32(12.2)	229(87.4)
Health Education	166(63.4)	87(33.2)	9(3.4)
Service Timing of PHC facility	185(70.6)	67(25.6)	10(3.8)
Responsiveness of staff	103(39.3)	126(48.1)	33(12.6)
Trust in Privacy of Medical Records	84(32.1)	104(39.7)	74(28.2)
Quality of MNCH Services	40(15.3)	137(52.3)	85(32.4)
Total	262	100.0	

Source: Survey data, 2019

## 4. DISCUSSION

This research was carried out to assess and identify the bottlenecks in the coverage of Maternal and Neonatal and Child Health (MNCH) services at PHC facilities in Panjgur district, Pakistan. The findings of this study have explored the MNCH services coverage in the study area through Tanahashi Model of Health Services (Tanahashi, 1978). Tanahashi model is effective and has been used widely to identify the barriers, the factors which cause them in accessing health care services and selecting the alternative strategies for service delivery improvements (Bivol et al., 2012). The findings of this study indicated that major bottlenecks were identified in the availability coverage, acceptability coverage, contact coverage and effective coverage.

In the availability coverage, the bottlenecks were found in the supply side e.g., two-fifths (60%) of the respondents reported the unavailability of lady medical officers (LMOs), almost half (48%) of them reported the unavailability of female medical technician (FMT) in the PHC facilities. Contrarily, majority

(92%) of them reported the availability of LHVs in the PHC facilities that shows the strength of outreach services. In addition to that, inadequate supply of essential medicines and unavailability of skilled birth attendants (SBAs), particularly the LMOs for delivery services were major bottlenecks. The findings of this study support those of [Panzai et al. \(2017\)](#), and [Panzai et al. \(2020\)](#) who also reported shortage of staff at BHUs including LMOs and FMTs at BHUs level in Pishin district of Balochistan. The findings of this study showed that only one-fifth (21%) of the respondents had delivered their last child at the nearest PHC facilities. This low level of service delivery puts question mark of the performance of district health system, particularly the PPHI. The unavailability of basic emergency and obstetric care EMOC at PHC facilities have severe health implications of both pregnant women and new-borns. Therefore, PPHI needs to address the bottlenecks in availability coverage.

A study conducted in rural Uttar Pradesh, India confirmed that bottlenecks in accessibility coverage cause delays in seeking prenatal and post-natal visits ([Pandey, 2010](#)), that increases the risks of maternal deaths ([Safdar et al., 2002](#)). Moreover, long distances to health care facilities negatively affect seeking care ([Majrooh et al., 2013](#)). In the case of accessibility coverage, our findings show that majority of the respondents used to live within the five kilometers radius of PHC facilities, within walking distance of the PHC facility. This implies that accessibility coverage had no prominent bottlenecks. The findings of current study are in line with those of previous studies by [Ali et al. \(2014\)](#), [Panzai et al. \(2017\)](#) who reported that majority of respondents were living within the five kilometers radius. However, availability of timely transport to PHC facility is still required, particularly for pregnant women seeking obstetric care.

Cultural restrictions and seeking permission by women before seeking care hinder access to MNCH services. In the current study, the findings showed that majority of the women were required to seek permission before going to PHC facility for seeking care. In Pakistan, studies have consistently reported that women essentially require permission from their family members such as husband, mother-in-law etc. before seeking MNCH services ([Panzai et al., 2017](#); [Safdar et al., 2002](#)). Moreover, the findings also showed that respondent were having usual source of care (USOC) other than their PHC facility for MNCH care. This is a major bottleneck of the acceptability coverage. This implies that the respondents have lack of trust in the quality of services provided by the PHC facilities. In addition to that, unavailability of LMOs and FMTs ([Table 5](#)), almost non-existing delivery services ([Table 10](#)) and low to non-availability of essential medicine ([Table 3](#)) demonstrate the reasons why respondents had USOC other than PHC facilities. Similar to the findings of current study have been reported by [Panzai et al. \(2020\)](#).

The findings of this study showed that almost two-third of the respondents mostly visited PHC facilities for general check-ups, laboratory tests, TT vaccines and child immunization. However, major bottlenecks were found to be in utilization of MNCH services (low utilization), health education and delivery services. The findings of our study also support those who reported low utilization of PHC services ([Memon et al., 2015](#); [Panzai et al., 2020](#); [Sultana & Shaikh, 2015](#); [Yunus et al., 2013](#)). This low utilization shows the poor operational capacity of PHC facilities in the District. In rural Balochistan, LHVs are considered as the frontline human resource for providing outreach MNCH services to married women, particularly the pregnant ones at household level. Their home visits for antenatal and postnatal MNCH services delivery are crucial, particularly for pregnant women of lower income. The findings also showed that for home visits of LHV during the last six months, four-fifths (79.4%) of respondents reported negative response. This a major bottleneck shows space for improvement in the outreach services of LHVs.

Effective coverage include the number of people who receive satisfactory service ([Tanahashi, 1978](#)). The findings of current study confirmed major bottlenecks: insufficient general check-up for MNCH services, shortage of human resource, insufficient laboratory services, almost non-existing delivery services, lack of health education and less service timing of PHC facilities. The aforementioned

bottlenecks identified through this study are crucial to be addressed by policymakers and health care providers for effective management and delivery of MNCH services.

#### 4.1 Limitations of the study

This study has few limitations. Since this study was conducted in a rural District of Balochistan and majority of the selected PHC facilities were the basic health units (BHUs). The coverage of MNCH services is weak at BHUs level compared to the MNCH centers where complete emergency and obstetric care (EmOC) services are provided 24/7. Therefore, the findings of this study may not be generalizable to MNCH services provided by MNCH centers in the province. Second limitation is related to recall bias. This study is purely dependent on the recall of respondents. Thus, caution is needed in generalization of the results.

### 5. CONCLUSION

The findings of the current study assessed the coverage bottlenecks in MNCH services. The bottlenecks analysis of the district's primary health system revealed major shortcomings in the coverage of MNCH services. The noticeable coverage bottlenecks were found in the availability, acceptability, contact and effective coverage. More specifically, the unavailability of lady medical officers, essential medicines, lack of delivery services, less service timing of PHC facilities, low utilization of MNCH services were the significant bottlenecks in majority of the selected PHC facilities. The MNCH services provided by PHC facilities are generally availed by the lower and lower-middle income groups of the community, thus lack of access to MNCH services mostly affects the financially weak and marginalized groups. The poorly managed MNCH services in Panjgur district have adverse implications for the life of pregnant women and newborns. Pakistan Demographic and Health Survey (PDHS) 2018 have reported that compared to other provinces in the country, Balochistan has shown the poorest performance in antenatal care by a skilled providers, births delivered in a PHC facilities and birth attended by skilled providers. The findings of the current study endorse those of PDHS. Our findings suggest the need for taking integrated actions by provincial health department, district health officer (DHO) office and PPHI Balochistan for improving the coverage of MNCH services in the PHC facilities of the District. Sustainable strategies are required to be adopted for addressing the major coverage bottlenecks identified by this study. Specifically, serious initiatives should be taken to ensure the availability of lady medical officers, provision of essential medicines, improving laboratories at PHC facilities and most importantly the provision of basic Emergency and Obstetric Care (EmOC) services at the PHC facilities for saving life of pregnant women, new-borns and children and achieving the health-related sustainable development goals (SDGs).

### DECLARATIONS

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**Author contributions:** Ms. Sumera Naseem designed the study, collected the data and wrote the article. Dr. Sanullah Panezai supervised the entire research work and wrote the introduction and discussion sections. Dr. Shahab E Saqib helped in analysis and proofread the article

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**Ethical considerations:** The study was approved by the Institutional Bioethics Committee, University of Balochistan, Quetta. The bio-ethical approval number was UoB/ORIC/19/11, dated 13 January 2019.

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