

**ENDING
Eclampsia**

LANDSCAPING ANALYSIS ON PRE-ECLAMPSIA AND ECLAMPSIA IN PAKISTAN

November 2016

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List of Abbreviations

ANC	Antenatal Care
BCC	Behavioral Change Communication
BEmONC	Basic Emergency Obstetric and Neonatal Care
BHU	Basic Health Unit
CEmOC	Comprehensive Emergency Obstetric Care
CMW	Community Midwife
DGHS	Directorate General of Health Services
DHQ	District Headquarter Hospital
DHO	District Health Officer
EDO	Executive District Officer
FGD	Focus Group Discussion
FHT	Female Health Technician
FP	Family Planning
IDI	In-Depth Interview
IEC	Information Education and Communication
LHV	Lady Health Visitor
LHW	Lady Health Worker
MgSO ₄	Magnesium Sulphate
MMR	Maternal Mortality Ratio
MNCH	Maternal, Neonatal and Child Health
MO	Medical Officer
MoH	Ministry of Health
MNHSRC	Ministry of National Health Services, Regulations and Coordination
NGO	Non-governmental Organization
PDHS	Pakistan Demographic and Health Survey
PE/E	Preeclampsia/Eclampsia
PHC	Primary Health Care
PNC	Postnatal Care
PPHI	Peoples Primary Health Care Initiative
RH	Reproductive Health

RHC	Rural Health Center
SHC	Secondary healthcare facility
SOGP	Society of Gynecologists and Obstetricians of Pakistan
SP	Service Provider
SPE	Severe Preeclampsia
THQ	Tehsil Headquarter hospital
USAID	United States Agency for International Development
WMO	Women Medical Officer

Introduction

Hypertensive disorders during pregnancy are major causes of severe morbidity, long-term disability, and death of mothers and their babies. Globally, about 10-20 percent of maternal deaths are associated with eclampsia.¹ About 10 percent of women experience increased blood pressure during pregnancy and slightly less than 8 percent of pregnancies get complicated by pre-eclampsia. Among the pre-eclampsia patients, about 10 percent develop pre-eclampsia and eclampsia (PE/E). In resource-poor countries, incidence of eclampsia varies widely. Findings suggest that the incidence rate varies from 1 in 100 to 1 in 1700.²

The majority of deaths of mothers and their babies caused by PE/E are preventable with timely and effective medical care.³ Management of women with PE/E aims at preventing pregnancy-related complications, avoiding unnecessary prematurity, and maximizing maternal and infant survival.⁴ There are a few strategies that are very effective in treating pre-eclampsia/eclampsia.⁵ Among these, magnesium sulphate (MgSO₄) is recommended by the World Health Organization (WHO) as the most effective, safe, and low-cost treatment available for severe pre-eclampsia and eclampsia. A randomized placebo controlled trial in 33 countries involving over 10,000 eligible women (the Magpie trial) showed that MgSO₄ is effective, and it is now considered as the standard of care in preventing convulsions in severe pre-eclampsia and eclampsia.⁶

This report presents the findings of a landscape analysis of the policy, programming, and service environment around prevention and treatment of PE/E in Pakistan. The primary aim of the landscape analysis is to identify the policy and program level of activities, as well as gaps and challenges around prevention and treatment of PE/E and the use of MgSO₄ at the provincial and district levels in Pakistan.

The study was carried out by the Population Council in 2016, with the support of the United States Agency for International Development (USAID) as part of the Project entitled “Ending Eclampsia,” a five-year cooperative agreement between USAID and the Population Council aimed at increasing access to, and use of, effective, underutilized interventions and commodities for preventing and treating PE/E in USAID priority countries.

This program was first implemented in Nigeria and Bangladesh. After validation of the learning, the program is being scaled up in Pakistan. The evidence generated will be fed into the global evidence repository for onward dissemination through knowledge and learning networks to assist USAID

¹ World Health Organization (WHO) Make Every Mother and Child Count. The World Health Report 2005. Geneva: World Health Organization.

² Crowther CA. Eclampsia at Harare maternity hospital. 1985. An epidemiological study. S Afr Med J, 68:927–929.

³ World Health Organization WHO recommendations for prevention and treatment of pre-eclampsia and eclampsia. 2011, WHO. Geneva.

⁴ Steegers EA, von Dadelszen P, Duvekot JJ, Pijnenborg R. Pre-eclampsia. Lancet, 2010, 21;376(9741):631–44.

⁵ Campbell OM, Graham WJ; Lancet Maternal Survival Series steering group. Strategies for reducing maternal mortality: getting on with what works. Lancet, 2006, 368 (9543): 1284–1299

⁶ Magpie Trial Collaborative Group. Do women with Pre-Eclampsia, and their babies, benefit from magnesium sulphate? The magpie trial: a randomised placebo-controlled trial. Lancet 2002; 359: 187790

missions around the globe in reducing maternal mortality and morbidity, particularly in USAID priority countries.

The objectives of the Annual Program Statement (The Emerging Priorities in Reproductive, Maternal and Newborn Health Program: Prevention and Treatment of Preeclampsia and Eclampsia) are to:

- Scale up successful interventions in Pakistan;
- Conduct implementation research to assess and validate underutilized interventions;
- Replicate the proven intervention package in Ethiopia and Pakistan;
- Identify replicable PE/E intervention package from four countries;
- Support additional countries to develop strategic plans to strengthen PE/E programming;
- Contribute to global evidence on scaling up underutilized interventions;
- Pro-actively advance the global agenda on PE/E through knowledge generated evidence; and
- Increase and monitor global uptake of PE/E interventions.

Background

The maternal mortality ratio (MMR) in Pakistan is estimated to be 276 per 100,000 live births. This number ranges from about 227 deaths per 100,000 live births in the Punjab province, to 789 deaths per 100,000 live births in Baluchistan. The Pakistan Demographic and Health Survey (PDHS) 2006-07 reported that eclampsia accounted for more than 12 percent of direct maternal deaths (PDHS 2006-07).⁷ More recently, the Population Council carried out a province-level study to estimate the MMR in Punjab, using a community-based informant network technique being developed by the University of Aberdeen, UK. The study found that slightly more than a quarter of the deaths had occurred due to pregnancy-induced hypertension (Population Council 2015).⁸

While the exact etiology of PE/E is not well understood, MgSO₄ is established as an effective treatment of this condition. Despite this, there has been a lack of information on context-specific health system barriers that have prevented the optimal use of MgSO₄ in the country. Although efforts both at the national and sub-national levels have been ongoing in Pakistan on the prevention and treatment of PE/E, the results were generally seen to be suboptimal and program interventions remained uncoordinated and fragmented.

Injectable MgSO₄ is registered for use and licensed for both severe pre-eclampsia and eclampsia in Pakistan. It is listed as the first line treatment for eclampsia in key policy documents, in particular the National Essential Medicines List (NEML) 2007.⁹ However, a 2013 study found that while international recommendations on MgSO₄ have been adequately translated in to national policies in the country,

⁷ National Institute of Population Studies (NIPS) [Pakistan], and Macro International Inc. 2008. Pakistan Demographic and Health Survey 2006-07. Islamabad, Pakistan: National Institute of Population Studies and Macro International Inc.

⁸ Mir, A.M et al. (2015). Using the Community Informant Based (Made-in And Made-for) Methodology for Estimating MMR in Punjab. Islamabad: Population Council.

⁹ National essential medicines list of Pakistan 2007, 4th revision. Ministry of Health, Labour and Social Welfare, National Government of Pakistan. Islamabad, Pakistan.

gaps remain in implementation.¹⁰ Barriers in access to, and effective use of, MgSO₄ arise at health facilities, where health staff are reluctant to use it; the low price of the medicine and the small market related to its narrow indications were also found to be disincentives for effective marketing.¹¹ The study found the system for registration, procurement and distribution was not fully functional and was at the root of low use of MgSO₄;¹² this is similar to several other countries, where poor procurement and distribution systems are responsible for low availability of the drug.

A recent multi-country study assessed the feasibility of community interventions for preventing and managing pre-eclampsia in Nigeria, Mozambique, Pakistan, and India using a mixed methodology approach.¹³ The study's findings highlighted areas where health system capacity building is most acutely needed, specifically, ensuring availability of MgSO₄ at health facilities; equipping community care providers with blood pressure monitoring devices; and training healthcare providers to diagnose and manage hypertensive disorders during pregnancy. The study found serious knowledge deficits about pre-eclampsia and poor understanding of progression of illness from pre-eclampsia to eclampsia. Myths and misperceptions prevailed widely in the four countries regarding the causes of pre-eclampsia, and were reflected in community practices related to prevention.

Study Goals and Objectives

The primary goals and objectives of this landscape analysis were to identify the policy and program level activities, as well as gaps and challenges around the prevention and treatment of PE/E and use of MgSO₄ at the provincial and district levels in Pakistan. The role of non-governmental organizations (NGOs), development partners, and others, including professional associations, was also reviewed to gauge the extent to which they are involved in PE/E activities, as well as understanding among policymakers and stakeholders regarding PE/E and use of MgSO₄ in its management. Specifically, the landscape analysis has the following objectives:

- **Map PE/E programming and research in Pakistan**
 - Identify all local and international organizations working on PE/E and use of MgSO₄ and the nature and extent of their involvement, including the commitments of the federal/national and state/divisional ministries of health and their current policies and practices.
 - Assess the current practice for PE/E prevention and treatment (including women's antenatal care [ANC] visits), magnitude of PE/E and associated complications, and contribution to MMR.

¹⁰ Bigdeli M, Zafar S, Assad H, Ghaffar A. Health System Barriers to Access and Use of Magnesium Sulfate for Women with Severe Pre-Eclampsia and Eclampsia in Pakistan: Evidence for Policy and Practice. *Middleton P*, ed. *PLoS ONE*. 2013;8(3):e59158. doi:10.1371/journal.pone.0059158.

¹¹ Ibid.

¹² Ibid.

¹³ Khowaja AR, Qureshi RN, Sawchuck D, Oladapo OT, Adetoro OO, Orenuga EA, Bellad M, Mallapur A, Charantimath U, Sevene E, Munguambe K. The feasibility of community level interventions for pre-eclampsia in South Asia and Sub-Saharan Africa: A mixed-methods design. *Reproductive Health*. 2016 Jun 8;13(1):1.

- **Determine the bottlenecks within the health system in Pakistan**
 - Describe the use of anticonvulsants in PE/E;
 - Describe the availability of common preparations of MgSO₄ and procurement, as well as the sources of supply; and potential bottle necks within the general supply chain system;
 - Describe the extent of use of aspirin, during ANC, for women who are at high risk of developing PE/E as prophylaxis, if any;
 - Assess knowledge, attitudes, and practice of physicians and midwives/nurses at hospitals, Lady Health Workers (LHWs)/Community Midwives (CMWs) at primary health centers (PHC) on prevention, detection, and treatment of PE/E;
 - Assess providers' capacity to detect PE, prescribe aspirin and anti-hypertensive drugs, and administer loading dose of MgSO₄;
 - Find out why MgSO₄ is not routinely used by providers to treat PE/E, despite its widespread availability; understand providers' beliefs and reluctance to use MgSO₄;
 - Assess providers' capacity to appropriately diagnose hypertension in pregnancy and provide anti-hypertensive drugs at PHCs and associated policy; and
 - Map the referral system from PHC to health facility and back again and associated transportation.

- **Assess community members awareness, beliefs and experiences on PE/E in Pakistan**
 - Explore community awareness, beliefs, and experience on PE/E. What do communities know and what they do when they are told that a family member is sick with PE/E? Are there any cultural differences in different ethnic groups in Pakistan?

- **Assess awareness, views and experiences on PE/E among PE/E survivors in Pakistan**
 - Assess knowledge, attitudes, views, and experiences on PE/E among survivors, and their experience during ANC with respect to PE/E education and screening; and
 - Assess PE/E survivors' health care seeking pathway (this may also include women who received the loading dose and at home or PHC and were then referred to a hospital and returned back home, if available).

- **Identify recommendations for implementation research**
 - Identify areas for implementation research, such as to screen and prescribe prophylactic aspirin and anti-hypertensive drugs for high-risk women at PHCs;
 - Suggest PE/E preventive strategy for providers, particularly at the PHC level, to screen high-risk women during ANC; prescribe prophylactic use of aspirin to high-risk women; administer a loading dose of MgSO₄; and provide antihypertensive drugs.

Research Questions

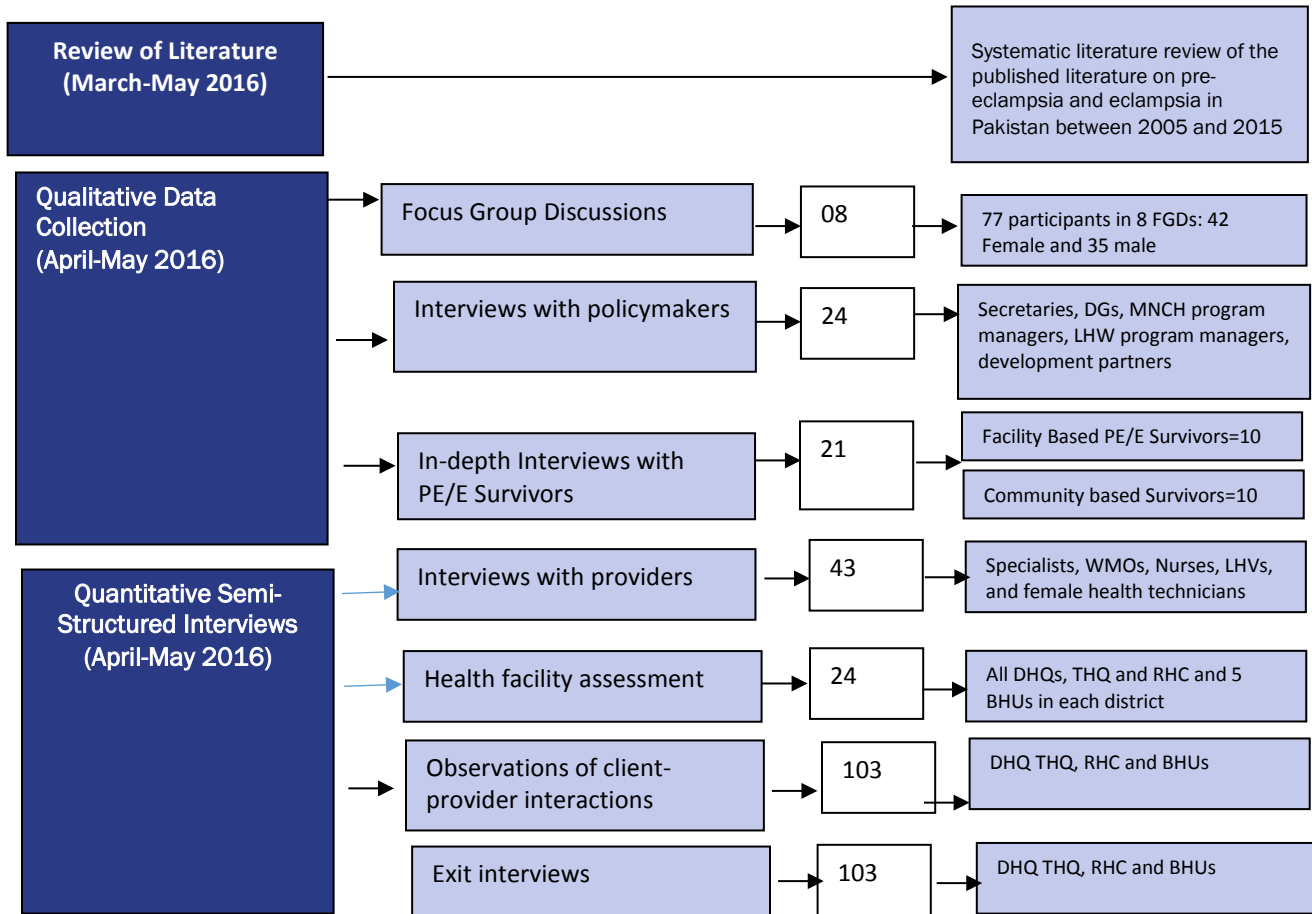
Based on the above objectives, research for this study was based on the following key questions:

- What interventions that have been tested globally to detect, prevent, and manage PE/E are being implemented in Pakistan? What interventions are suggested for detecting, preventing, and managing at PHCs?
- What policies and programs exist in Pakistan with regards to detecting, preventing, and managing PE/E; use of loading dose of MgSO₄ in preventing seizures among PE/E patients; use of aspirin among high-risk pregnant women; and use of antihypertensive drugs during pregnancy?
- Are the obstetrics/gynecology (Ob/Gyn) professionals and PHCs service providers aware, skilled, and interested in adopting global recommendations for detecting, preventing, and managing PE/E?
- What are the communities' and PE/E survivors' levels of awareness, attitudes, views, and experiences of PE/E?
- What are the different health care seeking pathways of women who have experienced PE/E? Including (1) those who ended up in hospital, (2) those who had a loading dose of MgSO₄ at a PHC, were referred and reached a hospital, and (3) those who were referred and did not reach hospital.

Study Design and Methodology

To conduct the cross-sectional research required for this landscaping analysis, three distinct approaches were adopted: Analysis of the literature, qualitative and quantitative data collection, and analysis. Each approach addressed the same topic from a different perspective and study methodology. Triangulation of results during the final analysis allowed for a more comprehensive understanding of the subject matter. The sequencing and timing of the three research approaches is depicted in Figure 1.1.

Figure 1.1: Sequencing of research



BHU=Basic Health Unit, DG=Director-General, DHQ=District Headquarters Hospital, LHW=Lady Health Visitor, MNCH=Maternal, Newborn and Child Health Program, RHC=Rural Health Center, THQ=Tehsil Headquarters Hospital, WMO=woman medical officer.

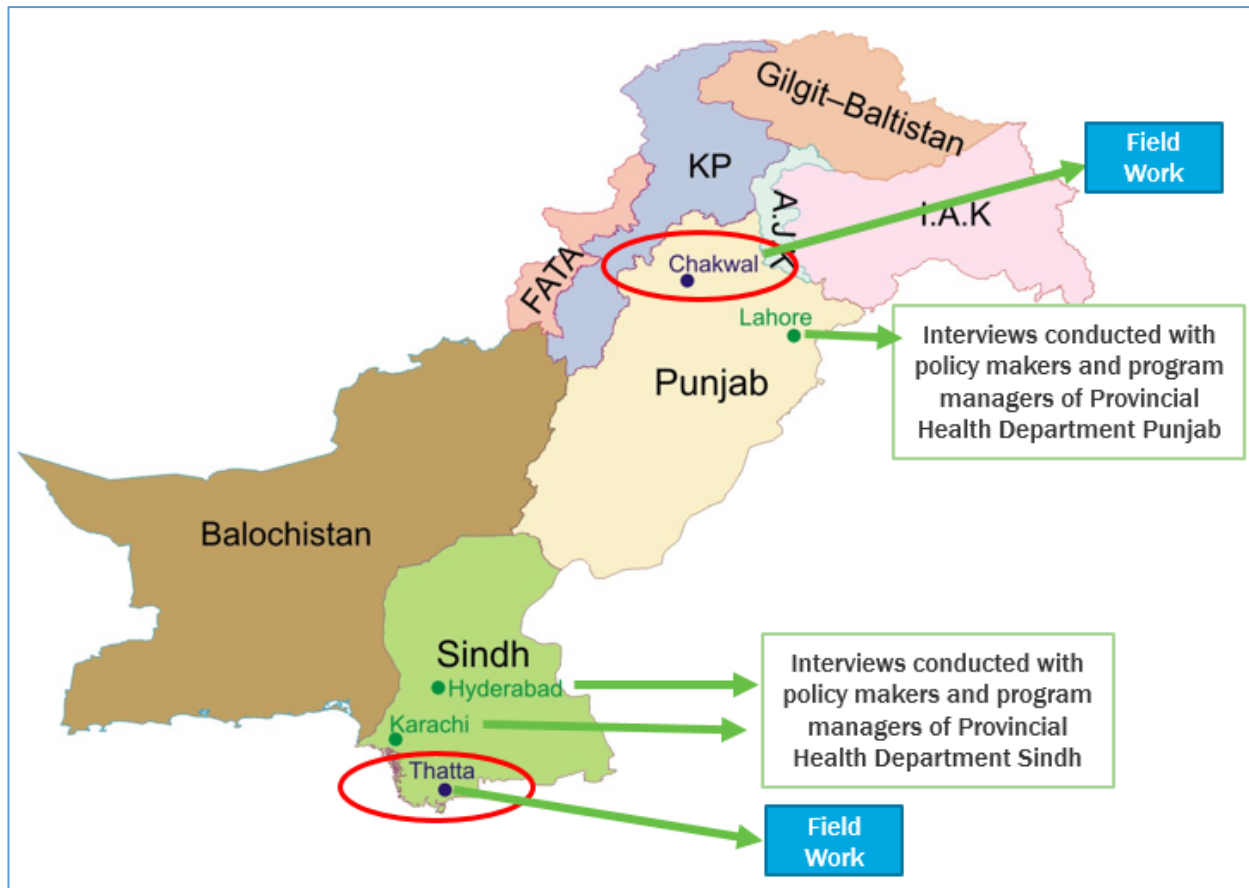
Data Collection: Data collection for this landscape analysis was carried out from April to May 2016 in two districts in two provinces of Pakistan, including Chakwal in Punjab and Thatta in Sindh. Based on the “Districts’ Indices of Multiple Deprivations for Pakistan” developed by the Social Policy and Development Centre¹⁴, we selected one district from the list of districts identified as having High Level of Deprivation and one district from the Low Level of Deprivation. Accordingly, we selected district Thatta from the list of High Deprivation and district Chakwal from the list of Low Deprivation.

According to Sustainable Development Policy Institute’s poverty profile, district Thatta is ranked 3rd in the Sindh districts as having highest incidence of severe poverty, whereas district Chakwal in Punjab is ranked 1st as having the lowest incidence of severe poverty.¹⁵

¹⁴ Jamal H. Districts’ Indices of Multiple Deprivations for Pakistan, 2011. Social Policy and Development Centre; Research Report No.82. 2012

¹⁵ Naveed A, Ali N. Clustered Deprivation: District Profile of Poverty in Pakistan. Sustainable Development Policy Institute. 2012. ISBN: 978-969-8344-17-7

Figure 1.2: Study districts



Data Collection

The Ending Eclampsia team collected information on policy support for PE/E, current programs addressing PE/E in the country, the capacity of antenatal and maternity care facilities to detect and manage PE/E, the availability of essential tools and life-saving commodities at health facilities, communities' beliefs and misperceptions that hinder pregnant women from receiving timely care, and gaps in research for improving prevention and management practices of PE/E.

The data collection activities carried out are briefly outlined below.

Desk Review of Documents

Published as well as unpublished literature on pre-eclampsia and eclampsia in Pakistan produced between 2005 and 2015 was systematically reviewed. The objectives were to identify programs and studies on PE/E; assess the use of aspirin prophylaxis for pregnant women who are at risk of developing PE/E; use of anticonvulsants; and challenges hindering appropriate and timely care, including use of MgSO₄, and to understand the causes of eclampsia and pre-eclampsia in Pakistan

and the impact of these conditions on the lives of women, newborns, and children. We also studied strategies and best practices that have been applied in Pakistan to prevent eclampsia. The results of these studies were synthesized for interpretation and prescribed in a separate report.

The articles published during 2000-2016 were searched and reviewed. The searches were run in bibliographic databases including

- *PubMed*
- *Cochrane*
- *Science Direct*
- *POPLINE*
- *Wiley Online Library*

The search terms included ("preeclampsia"[Mesh Terms] OR "preeclampsia"[All Fields] OR "preeclampsia"[All Fields]) AND [All Fields] ("Pakistan"[Mesh Terms] OR "Pakistan"[All Fields]). Additional searches were conducted using ("hypertension, pregnancy-induced"[Mesh Terms] OR ("hypertension"[All Fields] AND "pregnancy-induced"[All Fields]) OR "pregnancy-induced hypertension"[All Fields] OR ("hypertension"[All Fields] AND "pregnancy"[All Fields]) OR "hypertension in pregnancy"[All Fields]) AND ("Pakistan"[Mesh Terms] OR "Pakistan"[All Fields]).

Qualitative Research

A comprehensive qualitative study was conducted based on in-depth interviews (IDIs) and focus group discussions (FGDs) to gain a better understanding of the knowledge and perception of communities regarding the causes of PE/E, health seeking behaviors when faced with obstetric complications and levels of awareness regarding danger signs during pregnancy. Views of PE/E survivors were also obtained to understand their experiences of PE/E management.

Focus Group Discussions with Communities

Between April and May 2016, eight community FGDs were conducted, four in each of the two study districts. Separate FGDs were conducted for male and female community members, with each FGD including eight to ten participants. In total, 42 married women aged 18 and older participated in four FGDs, while 35 married men, aged 25 and older, participated in four FGDs. The FGDs were conducted in urban and rural communities.

Ending Eclampsia project staff contacted district health managers, who were briefed about the study objectives and methodology. Health managers, through the Lady Health Workers of the area, facilitated the identification of FGD participants, who were selected through purposive sampling.

Each FGD was conducted by a two-member team of trained social scientists, one serving as moderator and the other as note-taker. A written informed consent (shown in Annex 1) was obtained from the respondents for participation and for recording and further use of data prior to the beginning of each session. The FGDs were conducted using a pre-constructed guide (shown in Annex 2) to ensure that all relevant topics were covered. On average, each FGD lasted one-and-a-half hours. The discussion was conducted in the local language and tape-recorded.

In-depth Interviews with PE/E Survivors

IDIs were conducted with women who have experienced PE/E. The main purpose was to understand their knowledge, attitudes, views, and experiences of PE/E; treatment received; experience during ANC with respect to PE/E education and screening; barriers, action taken for the condition, and any barriers in the community in seeking health care during pregnancy, as well as special challenges with regards to PE/E care.

Participants were recruited from health facilities and communities. Facility-based survivors included pregnant women who experienced PE/E and had recently received treatment at the health facility, and had been discharged after delivering and being in stable condition with live babies. Community-based survivors included women who had been managed for PE/E in the past. A total of 20 IDIs were conducted, 10 in each district, with five facility-based and five community-based survivors.

The research team worked with hospital management and care-givers to identify and reach out to the women who had a history of experiencing PE/E. Those who were willing to participate were interviewed. The community-based survivors were identified by the LHWs, who are primary healthcare providers of the area.

A written informed consent (shown in Annex 3) was obtained from the respondents for participation, recording, and further use of data prior to each interview. A separate set of guidelines, shown in Annex 4, was used to conduct the interview. Each IDI took approximately 40 minutes and followed a basic set of topics with probes being used by facilitators when considered appropriate. Information gained helped interpret the quantitative data, and expand upon and explain the findings.

IDIs with Policymakers, Health Professionals, and Other Stakeholders

In-depth interviews were conducted with policymakers, development partners, NGO workers, program managers, and Ob/Gyn professionals to understand their involvement in policies, and programs concerning prevention and management of PE/E. This included the commitments of national, district, and sub-district level program managers, and identified bottlenecks within the health system.

Among policymakers and program managers, provincial and district officials in the Department of Health (DoH) and Population Welfare Department (PWD), Sindh, and Punjab were interviewed. To obtain perspectives of development partners and implementers, the study team interviewed representatives of local and international organizations working in maternal and neonatal health (MHN) and/or support health systems, with a special focus on components pertaining to PE/E and use of MgSO₄. For health professional perspectives, we interviewed members of the Society of Obstetricians and Gynaecologists of Pakistan (SOGP), as well as midwifery associations members. Table 1.1 lists further details.

Before conducting each IDI, the respondent was informed about the purpose and objective of the interview and written informed consent (shown in Annex 5) was obtained for participation and for recording and further use of data. A total of 24 interviews were conducted, 12 in each province. The interviews were conducted privately. Separate guidelines for policymakers, program managers, and health professionals were used (as shown in Annex 6).

Table 1.1: Number of interviews with policymakers by Province

Type of Respondent
Policymakers
<ul style="list-style-type: none">• DG Health (Sindh and Punjab)• Additional Secretary, Population Welfare Department (Sindh and Punjab)• Program Manager, MNCH (Sindh and Punjab)• Program Manager, LHW Program (Sindh and Punjab)• Director, Reproductive Health (Sindh and Punjab)
Development partners
<ul style="list-style-type: none">• Department for International Development, UK (DFID) (Punjab)• USAID (Sindh and Punjab)• United Nations Children’s Fund (UNICEF) (Punjab)• MCMNH (National Committee for Maternal and Neonatal Health) (Sindh)• Jhpiego (Sindh)
Members of SOGP and Midwifery Associations (Sindh and Punjab)
Total 24

Quantitative Research

The quantitative part of the study included interviews with service providers, observation of ANC consultations; exit interviews with clients leaving health facilities; and rapid situation assessment of health facilities for readiness to provide maternal and newborn health (MNH) services.

Semi-structured Interviews with Healthcare Providers

One of the major questions posed in this study was whether obstetrical and gynecological professionals and primary healthcare providers in Pakistan are aware, skilled, and interested for the purposes of adopting global recommendations for detecting, preventing, and managing PE/E. To answer this question, the following specific objectives were pursued in this study:

- Assess knowledge, attitudes, and practices of physicians and midwives/nurses at hospital level, on prevention, detection, and treatment of PE/E;
- Assess providers’ capacity to detect PE, prescribe aspirin and anti-hypertensive drugs, and administer a loading dose of MgSO₄;
- Find out why MgSO₄ is not routinely used by providers to treat PE/E, despite its widespread availability and understand providers’ beliefs and reluctance to use it; and
- Assess providers’ capacity to appropriately diagnose hypertension in pregnancy and provide anti-hypertensive drugs at PHCs and associated policy around this.

Sample Selection and Size

For healthcare provider interviews, we selected all District Headquarter Hospitals (DHQs), Tehsil Headquarter Hospitals (THQs), Rural Health Centers (RHCs), and five Basic Health Units (BHUs) randomly within each of the two districts (i.e., Chakwal District, Punjab Province and Thatta District, Sindh Province). Four providers were interviewed at each DHQ, three at each THQ, two at each RHC, and two at each BHU. As mentioned earlier, this design was based on the numbers of staff allocated to each level of facility and the expectation that we would find more staff to be interviewed at the higher-level facilities, and smaller numbers of staff at the lower-level facilities.

The types of health professionals interviewed included Ob/Gyn specialists, women medical officers (WMO), nurses, LHVs, and midwives working in antenatal clinics, maternity units, postnatal wards, and emergency departments. Unskilled health personnel, health personnel from other departments, and in-training house officers were excluded from the sample.

Service providers who met the study's inclusion criteria were asked to participate in the study in person at their place of work by a trained data collector. Since participants were interviewed during their work hours and did not incur any transportation cost, no compensation was provided for participation.

Written informed consent was obtained from the respondents for participation and further use of data prior to the beginning of each interview. The consent statement is presented in Annex 7. A semi-structured questionnaire was introduced to study participants to assess their knowledge, attitudes, and practices around detection, management, and prevention of PE/E. Annex 8 presents the questionnaire.

Table 1.2 below shows the breakdown of interviewees by cadre, and the number of interviews conducted at each facility, based on staff availability. Overall, 24 facilities were visited and 43 interviews were conducted, including 16 at secondary healthcare facilities (SHCs) and 27 at primary healthcare facilities (PHCs).

Table 1.2: Number of providers interviewed by district, cadre, and type of health facility

	Chakwal, Punjab			Thatta, Sindh			Overall		
	Secondary facility	Primary facility	Total	Secondary facility	Primary facility	Total	Secondary facility	Primary facility	Total
ObGyn	4		4	1		1	5		5
WMO	3	4	7	3	5	8	6	9	15
Others service providers	3	10	13	2	8	10	5	18	23
Total	10	14	24	6	13	19	16	27	43

Observation of ANC Consultations and Exit Interviews

In order to assess the quality of care around ANC, Ending Eclampsia staff observed 103 client-provider interactions at sampled PHCs and SHCs during ANC consultations with pregnant women.

Subsequently, exit interviews were conducted with the same women (103) to understand their knowledge of danger signs during pregnancy.

The selection of respondents was purposive. All pregnant women aged 18-49 years who had come to the selected facilities for ANC on the day of the research team’s visit were invited to participate in the study. They were informed about the purpose and objectives of the interview, informed that it would take 15-20 minutes, and requested to permit observation of their consultation for 15 -20 minutes. After confirming the women’s willingness to participate in the study, the interviewers observed the consultation, recorded their observations against a structured checklist of essential elements of an ANC consultation (Annex 9), and conducted the interview privately, using an exit interview guide (Annex 10).

In all, the study team conducted 103 observations and exit interviews. Table 1.3 provides the breakdown by district and facility type.

Table 1.3 Number of observations and exit interviews by district and type of health facility

District	Type of facility				Total
	DHQ	THQ	RHC	BHU	
Chakwal	8	12	16	19	55
Thatta	8	4	17	19	48
Total	16	16	33	38	103

Health Facility Assessment

At 24 health facilities that qualified as potential maternal, neonatal, and child health (MNCH) service outlets, a rapid situation analysis was conducted to assess whether they were capable and equipped to provide MNCH services. Different levels of facilities, including DHQs, THQs, RHCs, and BHUs, were randomly selected for this assessment in the two study districts.

The situation analysis methodology employed is outlined in Annex 11. The table below shows the number and type of facilities assessed in each province and district. The sampled BHUs and all RHC, THQ and DHQs in the sampled districts were included in the assessment.

Table 1.4: Number of facilities assessed by type and district

District	Type of facility				Total
	DHQ	THQ	RHC	BHU	
Chakwal	1	3	4	5	13
Thatta	1	1	4	5	11
Total	2	4	8	10	24

Data Management and Analysis

Data was managed through a systematic process of quality control. The filled questionnaires first underwent a round of quality checks by the team supervisor. Then, a member from the Council's research team performed random checking in the field. The questionnaires, each bearing a serial number, were then sent to the Population Council office in Islamabad, where they were reviewed again. Any discrepancies identified were referred back to the field.

Data entry was performed using CSpro (Census and Survey Processing System). After data editing and cleaning, the data set was checked against original questionnaires for inconsistencies, and corrected as needed. The analysis was performed using SPSS (Statistical Package for the Social Sciences), version 20. Consistency and range checks were conducted to verify the quality of the data, and original data were recorded as needed to provide data for presentation in tables.

Descriptive statistics was used for analysis, e.g., proportions, means and medians with their measure of dispersion. Tables and charts were developed to summarize the data. Differences between groups were assessed using percentages and, where appropriate, tests of differences were applied. Analysis was performed using SPSS version 20.

In the analysis, service providers were stratified into the following two categories, reflecting the different levels of knowledge and skills:

- **Doctors:** Ob/Gyn specialists, Senior Medical Officers, Medical Officers, Indoor Medical Officers (IMOs), Emergency Medical Officers (EMOs), Resident Medical Officers (RMOs), Women Medical Officers (WMOs), etc.

Other service providers: Nurses, LHVs, and midwives.

The results presented are means, proportions, descriptive statistics, two- and three-way cross tabulation of relevant variables, and aggregate counts of events.

The data collected through IDI and FGD sessions were digitally recorded, and discussions were transcribed and stored in mp3 audio file format along with respondent fact sheets. Data was electronically forwarded on a daily basis to the data manager who collated and prepared it for analysis using N-Vivo. The data manager conducted quality checks on questionnaire completeness and inter-record checks, identified mistakes in data files, and suggested corrections in consultation with the principal investigator.

Study Team

Six teams consisting of four members with sub-teams of two members each conducted the data collection; the teams included LHVs, sociologists, and anthropologists. Facility assessments and service provider interviews were conducted by trained and experienced enumerators.

Quality Assurance

A number of measures were instituted to ensure the maintenance of the highest quality standards in both data collection and data analysis:

- Standard operating procedures (SOP) were developed to assure quality in all data collection and analysis processes.
- Team member and field coordinator roles and responsibilities were clearly identified. Members were provided a written set of roles and responsibilities that they were required to follow.
- The interviewers were trained for five days by the Ending Eclampsia team at the Population Council. Training sessions included research protocol, ethics, informed consent, maintaining privacy during the interview process, sampling methodology, and interviewing techniques. The training focused on adhering to the SOP and familiarized participants with study objectives.
- The principal investigator, study coordinator, and field coordinators regularly visited randomly selected districts in each region to ensure all protocols were being followed. They randomly selected completed questionnaires during monitoring visits to check for completeness, data accuracy, and to determine re-interviewing requirements.

Ethical Considerations

Ethical approval was obtained from the Institutional Review Board (IRB) of the Population Council's headquarters in New York (Annex 12) and from the National Bioethics Committee (NBC) Pakistan (Annex 13). Informed consent was obtained from all study participants after describing to them in detail the issues related to the study. For the structured questionnaire, the interviewers described the scope and purpose of the questionnaire and its approximate length, and stressed that participation was voluntary. The structured questionnaires were administered in private. All data collected in each phase of the study was kept confidential and anonymous. The structured questionnaires and IDs were identified by personal identification numbers rather than participant names.

Limitations of the Study

It is possible that the observed provider-client interactions were affected by the study team's presence; the providers' behavior, generally found to be good, may have been influenced by the fact that they were aware of being observed. Therefore, data collected from observations of provider-client interactions may not fully represent the actual situation at health facilities.

Exit interviews with clients were generally hurried, as the clients were anxious to leave after spending time at the facilities. Clients normally reported that they were satisfied with the care they had received, and it was difficult to persuade them to discuss their responses in more depth.

Policy Environment: Government Policy and Perspectives of Program Managers

This policy analysis is based on the framework provided by Ridge et al., which identifies a set of requirements for ensuring adequate access to, and use of, MgSO₄. These include:

- Inclusion of MgSO₄ in the National Essential Medicines List (NEMC) and standard treatment guidelines;
- Registration of the drug for PE/E treatment use;
- Pursuance of a proper procurement and distribution system;
- Presence of protocols for use in health facilities providing basic and comprehensive emergency obstetric care;
- Awareness and training of health professionals to use MgSO₄; and
- Availability of supplies and health facilities.

Registration and Inclusion of MgSO₄ in National Essential Medicines List

Intramuscular and intravenous injectable MgSO₄ have been registered for use in Pakistan since 2007, and are licensed for management of severe pre-eclampsia and eclampsia. After devolution of powers to the provinces in 2010, each of the provinces developed their own essential medicine list. MgSO₄ is included in the essential medicines lists of all provinces and regions.

In Sindh, MgSO₄ administration is also included in the Essential Health Service Package. Likewise, the Essential Package of Health Services for Primary Health Care in Punjab mandated that all RHCs and BHUs (Primary Health Care Facilities) administer MgSO₄ for PE/E management.

Procurement and Supply of MgSO₄

Currently, the provincial Medical Store Depots (MSDs) are responsible for the acquisition, storage and distribution of MgSO₄ to public health facilities in Sindh and Punjab. At the district level, the Executive District Officer (EDO) can also locally purchase the drug in case facilities are facing a shortfall. However, according to district managers, demand for MgSO₄ is low.

To ensure availability of adequate stocks of MgSO₄ at health facilities in Punjab, the Integrated Reproductive Maternal Newborn, Child Health & Nutrition Program (IRMNCH) Directorate issued a policy directive that five ampoules of MgSO₄ be available at all PHC facilities at all times. The Chief Minister's Road Map includes a traffic light on MgSO₄ availability. Punjab has also developed an Integrated Maternal Neonatal and Child Health (IRMCH) Project document (2013-2016) that lists MgSO₄ stock-outs among key indicators.

In Sindh, data on eclampsia cases has been included in the District Health Information Systems (DHIS) as part of complicated obstetric referrals.

“Very few PHC facilities are using MgSO₄. In some cases, the drug has expired.” - Representative Donor Agency, Punjab

In Sindh, Jhpeigo (supported by USAID) is working with 100 BHUs to ensure MgSO₄ availability though supportive supervision.

Private sector facilities in both Sindh and Punjab acquire MgSO₄ from the commercial market. However, visits to several randomly selected pharmacies in the two districts showed that the drug was not universally available. At present, ZAFPA pharmaceuticals is the only local manufacturers of the drug in Pakistan.

Protocols for Use in Health Facilities

Guidelines/protocols for management of eclampsia and use of MgSO₄ for all health system levels have been developed and are being made available at facilities.

Figure 2.1: MNCH Referral Protocol Slip for RHC's and BHU's





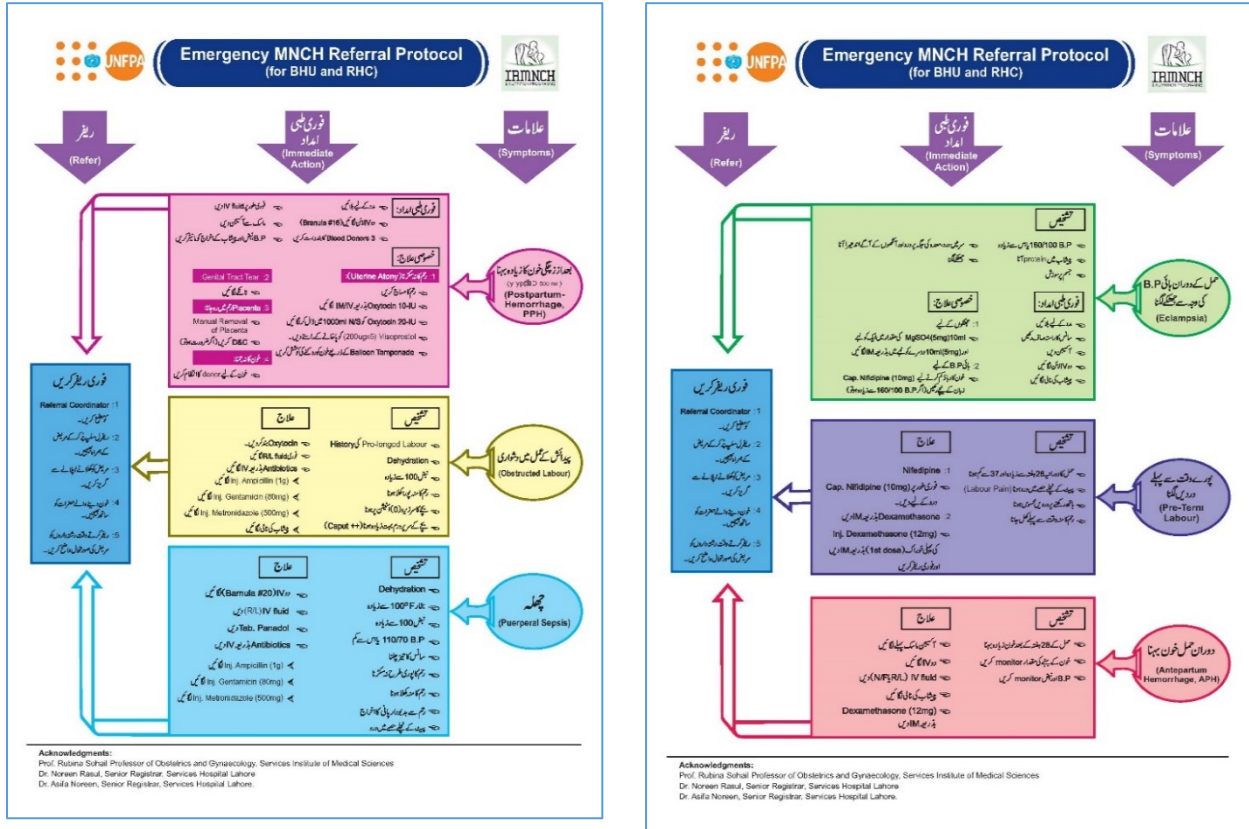
 			 		
Sr. No: _____			Sr. No: _____		
ایمرجنسی ریفرل فارم (بہتر THQ/DHQ کے ساتھ لے جانے ہے)			ایمرجنسی ریفرل فارم (بہتر THQ/DHQ کے ساتھ لے جانے ہے)		
سیکشن - A: کانسٹ کی انفارمیشن (بہتر BHU/RHC پر کرے گا)			سیکشن - A: کانسٹ کی انفارمیشن		
نام: _____			نام: _____		
فون نمبر: _____			فون نمبر: _____		
پتہ گاؤں/علاقہ: _____			پتہ گاؤں/علاقہ: _____		
علاقہ: _____			علاقہ: _____		
سیکشن - B: ریفرل انفارمیشن (بہتر BHU/RHC پر کرے گا)			سیکشن - B: ریفرل انفارمیشن		
ریفر کرنے کی وجہ: _____			ریفر کرنے کی وجہ: _____		
کانسٹ کی ایڈیٹ کی گئی: _____			کانسٹ کی ایڈیٹ کی گئی: _____		
ریفر کرنے والے ہسپتال کا نام: _____			ریفر کرنے والے ہسپتال کا نام: _____		
ریفر کرنے والے نام: _____			ریفر کرنے والے نام: _____		
ریفر کرنے والے فون نمبر: _____			ریفر کرنے والے فون نمبر: _____		
ہسپتال جہاں ریفر کیا گیا: _____			ہسپتال جہاں ریفر کیا گیا: _____		
ریفر کرنے کی تاریخ: _____			ریفر کرنے کی تاریخ: _____		
ہسپتال میں ریفرل کا ریفر کا نام: _____			ہسپتال میں ریفرل کا ریفر کا نام: _____		
سیکشن - C: ریفرل فیڈ بیک (بہتر ریفرل کا ریفر پر کرے گا)			سیکشن - C: ریفرل فیڈ بیک		
ہسپتال میں کتنے کا وقت: _____			ریفرل کا ریفر کو ملے کیا گیا؟ <input type="checkbox"/> ہاں <input type="checkbox"/> نہیں <input type="checkbox"/> وجہ: _____		
ہسپتال میں کی ایڈیٹ کی گئی: _____			ریفرل کا ریفر کو ملے کیا گیا؟ <input type="checkbox"/> ہاں <input type="checkbox"/> نہیں <input type="checkbox"/> وجہ: _____		
کیس ڈاکٹر نے ریفر کی تاریخ: _____			کیا ریفر کرنے والے ہسپتال سے فیڈ بیک کال آیا؟ <input type="checkbox"/> ہاں <input type="checkbox"/> نہیں		
کیا کانسٹ کو ریفر سے ہسپتال ریفر کیا گیا؟ <input type="checkbox"/> ہاں <input type="checkbox"/> نہیں			کانسٹ کو ریفرل ہسپتال میں کی ایڈیٹ ملی: _____		
کیا ہسپتال کا نام: _____			ریفرل کا ریفر/ڈاکٹر کی BHU/RHC کیلئے مہارت _____		
کیا BHU/RHC کو فیڈ بیک کال کی گئی؟ <input type="checkbox"/> ہاں <input type="checkbox"/> نہیں					
Verified by: M.S.			Verified by: Facility In-Charge		
Attending Doctor			LHV/WMO		
Referral Co-ordinator					

Figure 2.2: Emergency Referral Protocol for RHC's and BHU's



Training of Health Professionals in Use of MgSO₄

Training modules for various cadres of providers, including community midwives, on MgSO₄ administration have been developed.

Currently, the United Nations Population Fund (UNFPA) and Maternal and Child Health Integrated Program (MCHIP) project of USAID are training facility-based service providers in Punjab and Sindh, respectively, to improve MNCH capacity. The UNFPA trainings focus on the use of MgSO₄, misoprostol, family planning, manual vacuum aspiration (MVA), and infection prevention

The MCHIP project is training 1,000 public and private sector facility-based providers in MNCH care, which includes management of PE/E. Except for a few ongoing pilot projects in Punjab, none of these trainings target CMWs, who are a frontline cadre for deliveries in communities.

“Due to lack of training on MgSO₄ administration, especially how to monitor toxicity, providers are hesitant to administer MgSO₄.” - Representative, Society of Obstetrician and Gynecologist Pakistan

Policy and Implementation Gaps

Currently, most primary and secondary healthcare facilities are understaffed, as there are not enough trained female providers or specialists. As a result, in some facilities, comprehensive EmONC services cannot be provided. A human resource for health deployment policy is lacking, but could help in identifying and overcoming staff shortages through either an incentive package or task shifting and task sharing mechanisms.

“If all the Rural Health Centers have a woman medical officer, many lives can be saved.” -Former Policy Maker and now an Advisor with a Donor Agency

At present, there is no policy decision on raising awareness about PE/E at community level. There is no policy guideline regarding how LHWs and CMWs can join together to raise awareness within the communities about preventable obstetric complications. As a result, these two cadres are still working discretely. If they could work synergistically, they could play an important role in raising awareness about PE and timely its management within communities, and also remove misperceptions that delay care seeking.

There is no independent MNCH policy. However, each of the provinces have developed their own respective strategies, but health care providers were unclear about the policy on MgSO₄.

While training manuals have been developed and availability of MgSO₄ improved, the trainers have not been trained on changes in the curricula. As a result, the revised and updated concepts are not being used. Lack of training leads to hesitation among providers to administer MgSO₄.

Similarly, there is no policy regarding whole site/onsite trainings in managing obstetric complications or a policy on continuous medical education. This contributes to providers' fear and hesitancy in administering MgSO₄. Although PE/E prevention and management has been included in the curriculum of CMWs; yet they are not being trained on administering the loading dose of MgSO₄. A policy decision in this regard can help save lives lost during transport from a PE/E patient's home to a tertiary care facility.

As none of the private providers are trained on MgSO₄ use. This leads to a reduced demand and low supply from manufacturers to the distributors and chemists. Aspirin prophylaxis has yet not been included in the guidelines and hence few providers are prescribing it, as there are ambiguities in the minds of the providers regarding its administration.

“Aspirin cannot be administered to all pregnant women, it can be given to primi and multigravida. Aspirin must be closely followed through ANC.” - SOGP Representative

The private sector in Pakistan is extensive, and until recently it was unregistered and unregulated. In both provinces, Healthcare Commissions have been established that will license and regulate private providers based on a list of essential pre-requisites that the providers will have to fulfill, but the commissions have not yet included MgSO₄ availability as an essential component for licensing and registering private sector providers.

Presently, not all primary healthcare facilities are providing 24/7 services in Pakistan. It is only recently that a few facilities have been equipped and designated to provide round the clock services. Short

working hours compromise the capability of PHC services to offer basic emergency obstetric care, including an opportunity for providing the loading dose of MgSO₄.

The lack of a functional referral system that allows women to be expeditiously transported from their homes or primary healthcare facility to the appropriate facility in a timely manner is a major impediment in saving maternal lives. Lack of ambulances and over-crowded tertiary care facilities lead to the second and third delay associated with poor maternal health outcomes.

In Punjab, MNCH referral coordinators have been only recently appointed at secondary care facilities to deal with all referred obstetric emergencies.

Public Private MNCH Initiatives

IRMNCH Punjab Program

The Integrated Reproductive Maternal Neonatal Child Health Program (IRMNCH) of the Government of Punjab aims to reduce maternal and newborn child morbidity and mortality, promote family planning services, and improve nutritional status of women and children. The achievement of this objective is also part of the government's commitment to make speedy progress to achieve health related Sustainable Development Goals (SDGs) and set the roadmap toward achieving 'Universal Coverage' of health services in Punjab.

The program's objectives are to reduce:

- Maternal mortality ratio from 227/100,000 live births in 2006-07 to less than 140/100,000 live births by end 2016;
- Under-five mortality rate from 104/1000 live births in 2011 to 52/1000 live births by end of 2016;
- Total fertility rate from 3.6 in 2011 to 3.2 by end of 2016; and
- Prevalence of stunting from 36 percent in 2011 to 32 percent by end of 2016.

The MNCH program includes CMWs, the Lady Health Workers, the immunization and nutrition program.

MNCH Program Sindh

Since 2007, the Maternal Neonatal Child Health Program-Sindh has extended its program goal and vision for reducing maternal, newborn & child death of the population, particularly among its poor, marginalized, and disadvantaged segments. It also includes improvement of accessibility of quality MNCH services through development and implementation of an integrated and sustainable MNCH program at all levels of the health care delivery system.

The major emphasis of the program is to improve quality and accessibility of emergency obstetric and neonatal care, and increase the use of skilled birth attendance by introducing a new cadre of health workers - Community Midwives (CMWs), which are trained health professionals who will gradually replace the traditional birth attendants in the rural areas of Pakistan.

Among non-governmental efforts, Jhpiego an affiliate of the John's Hopkins University through USAID support, and has been actively involved in the province of Sindh in imparting basic emergency obstetric

and neonatal care (EmONC) trainings to skilled birth attendants (SBAs), including CMWs. One component of the trainings focuses on parenteral treatment of PE/E through MgSO₄.

Readiness of Health Facilities for Management of PE/E

A rapid assessment of public health facilities in Thatta, Sindh, and Chakwal, Punjab was carried out to determine their readiness to provide MNH services. The assessment focused on capacities to prevent, detect and treat PE/E, including use of MgSO₄. As discussed in the discussion of the study methodology, primary care facilities (Basic Health Units and Rural Health Centers) and secondary care facilities (District and Tehsil headquarters hospitals) were included in the assessment. Facility readiness was assessed in terms of services offered and the availability of necessary amenities, equipment, medicines, and protocols.

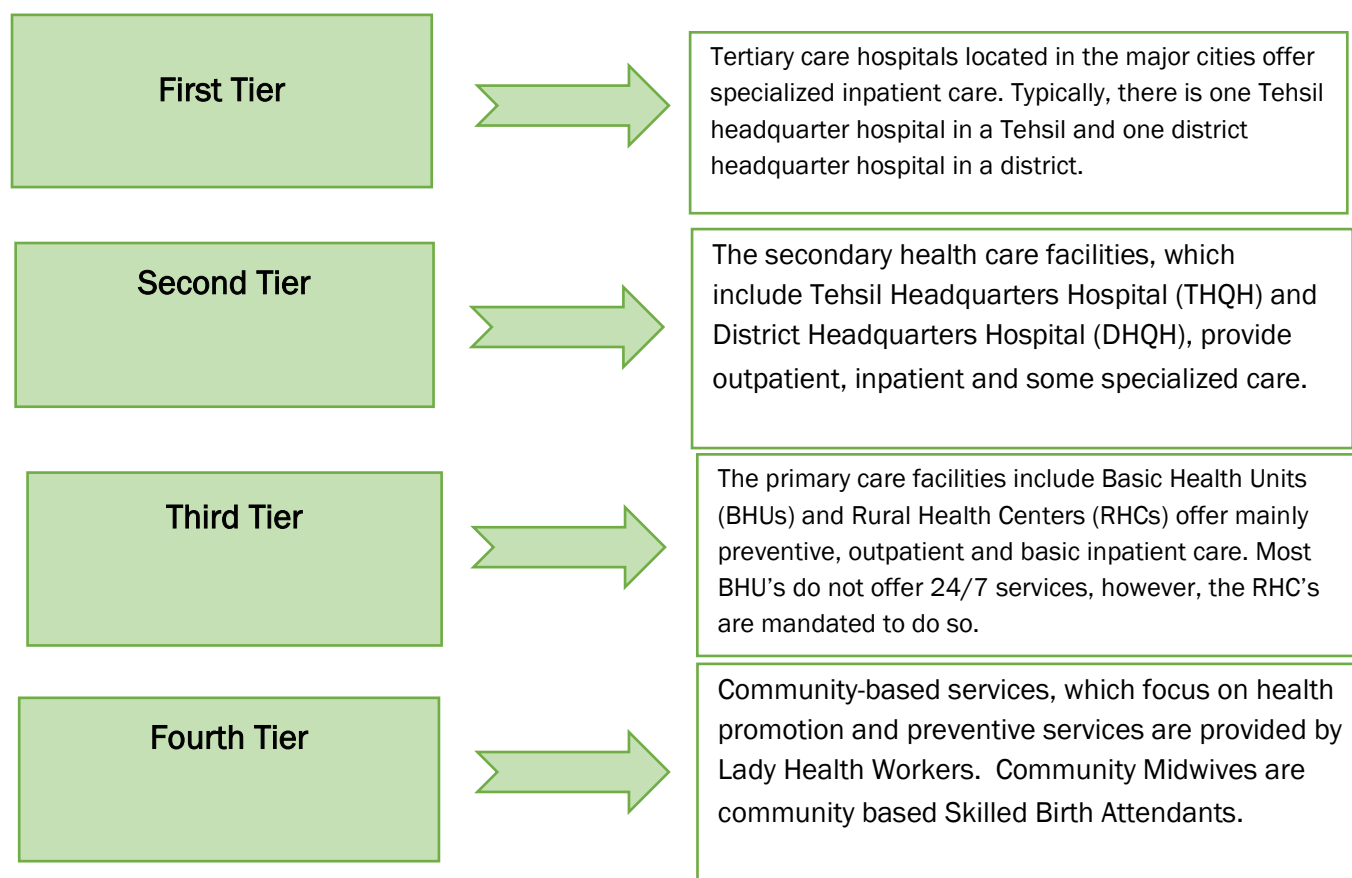
This section provides a brief overview of mandates for public healthcare facilities in Pakistan, and then presents the detailed findings of the assessment of health facilities in the two study districts.

Geographical Scope of the Assessment

The assessment was carried out in Thatta, Sindh, and Chakwal, Punjab. Within each district, all secondary and primary facilities were visited. The sampled facilities included selected BHUs and RHCs, and all THQs and DHQs in the districts. Every facility that was chosen for a provider interview was assessed. A total of 2 DHQs, 4 THQs, 8 RHCs, and 10 BHUs were assessed in the two districts for the purpose of gauging the status of infrastructure, services offered, infection prevention, medicine and equipment availability, and status of basic and comprehensive EmONC service provision.

The Public Healthcare System in Pakistan

Pakistan has an extensive public sector health service delivery infrastructure. The core of the primary healthcare network is comprised of Basic Health Units (BHUs), MCH centers (MCHCs), and Rural Health Centers (RHCs). Secondary healthcare is provided through primary and secondary referral facilities, including the Tehsil Headquarter and District Headquarter hospitals (THQs and DHQs, respectively) and tertiary care teaching hospitals, which provide acute, ambulatory, and inpatient care.



Availability of Amenities

Availability of amenities at health facilities presented a varied picture, which is summarized in Table 3.1.

All primary and secondary care facilities assessed in Chakwal had a 24-hour water supply. This was not the case at the DHQ or at two of four RHCs in Thatta.

Similarly, all assessed facilities in district Chakwal had electricity round-the-clock, while in district Thatta, only six out of 11 facilities had 24-hour power supply. Surprisingly, the Thatta DHQ was among the facilities that did not have an uninterrupted power supply.

Nearly all facilities in both districts had adequate lighting, a functioning delivery bed, and postnatal wards. However, some of the primary facilities in Chakwal and Thatta did not have heaters available in the delivery rooms.

Table 3.1: Infrastructure and MNH logistics

Facility Structure	Chakwal (Punjab)					Thatta (Sindh)				
	DHQ	THQ	RHC	BHU	Total	DHQ	THQ	RHC	BHU	Total
Clean water supply for 24 hours	1	3	4	5	13	0	1	2	5	8
24 hours power supply	1	3	3	4	11	0	1	2	4	6
Adequate lighting	1	3	3	5	12	1	1	3	5	10
Heater for delivery room and nursery	1	3	3	1	8	1	0	1	1	3
Functioning delivery bed	1	3	3	5	12	1	1	4	5	11
Postnatal ward with beds	1	3	4	5	13	1	1	4	5	11
Total (n)	1	3	4	5	13	1	1	4	5	11

Availability of Basic Equipment

Certain essential equipment and commodities are needed for providing PE/E services. Table 3.2 shows that basic medical equipment was available within all facilities assessed in both districts, such as sphygmomanometers, normal saline, and intravenous (IV) cannulas. However, urine testing equipment essential for testing of proteinuria that helps in the diagnosis of PE/E was not available at one BHU in Chakwal and 2 RHCs in Thatta.

Availability of equipment required for diagnosing MgSO₄ toxicity was very low. Only one THQ in Chakwal and one BHU in Thatta reported having a patella hammer, and surprisingly, neither of the DHQs had this instrument.

Calcium gluconate for managing MgSO₄ toxicity was only found at the Chakwal DHQ, while in Thatta, it was not available at the DHQ, but it was available at the THQ and most of the primary facilities. Out of the 24 facilities assessed, 14 had 20-milliliter syringes that are used for MgSO₄ administration.

Table 3.2: Availability of basic equipment by district and type of facility

Basic equipment	Chakwal					Thatta				
	DHQ	THQ	RHC	BHU	Total	DHQ	THQ	RHC	BHU	Total
Stethoscope	1	3	4	5	13	1	1	4	5	11
Sphygmomanometer	1	3	4	4	13	1	1	4	5	11
Clean container/test tube for urine test	1	3	4	2	10	1	1	1	5	8
Patella hammer	0	1	0	0	1	0	0	0	1	1
Calcium gluconate	1	0	0	0	1	0	1	2	4	7
Self-retaining catheter	1	3	4	2	10	1	1	3	5	10
Urine bag	1	3	4	1	9	1	1	4	5	11
20 milliliter syringe	1	3	2	2	8	0	1	2	3	6
Xylocaine/LA	1	3	4	4	12	1	1	4	5	11
Normal saline (IV)	1	3	4	5	13	1	1	4	5	11
IV cannulas	1	3	4	5	13	1	1	4	5	11
Syringes and needles	1	3	4	5	13	1	1	4	5	11
Total (n)	1	3	4	5	13	1	1	4	5	11

Availability of Emergency Response Material

Facility informants were asked whether they had specific obstetric emergency response supplies, such as steroids, misoprostol for preventing PPH, neonatal resuscitation kit and ambulance in working condition at the facility, particularly materials related to provision of PE/E care. All SHC facilities in both districts reported having these materials. Among PHC facilities, however, ambulance services for referral to higher facilities were unavailable at one THQ in Chakwal, three out of five BHUs in Thatta and all five BHUs in Chakwal. Nearly all facilities had 6mg betamethasone/dexamethasone injections available to respond to premature respiratory distress syndrome (PRDS). They also had misoprostol for postpartum hemorrhage (PPH) prevention and neonatal resuscitation kits (Table 3.3).

Table 3.3: Availability of emergency response material by district and type of facility

	Chakwal					Thatta				
	DHQ	THQ	RHC	BHU	Total	DHQ	THQ	RHC	BHU	Total
Oxygen + adult masks	1	3	4	5	13	1	1	4	5	11
6 mg Betamethasone & dexamethasone	1	3	3	5	12	1	1	3	5	10
Misoprostol	1	3	3	5	12	1	1	4	5	11
Neonatal resuscitation kit	1	3	4	4	12	1	1	4	5	11
Ambulance	1	2	4	0	7	1	1	3	2	7
Total (n)	1	3	4	5	13	1	1	4	5	11

Availability of Guidelines and Protocols for Diagnosis and Management of PE/E

Availability of written guidelines and protocols for diagnosing and managing PE/E is a prerequisite for treating women with this condition. Respondents were asked about the existence of any such guidelines, including for the administration of MgSO₄.

The findings, summarized in Table 3.4, show that the Chakwal DHQ had all necessary guidelines and protocols. However, surprisingly, these were not available at the Thatta DHQ. All THQs in Thatta reported having the complete protocols and guidelines, while one THQ in Chakwal did not have the protocol and guidelines for administering MgSO₄.

Three out of four RHCs in Thatta and two out of four RHCs in Chakwal had protocols and guidelines for diagnosing and managing PE/E. However, none of the RHCs in Chakwal had guidelines for administering MgSO₄, and only two had the guidelines in Thatta.

All five sampled BHUs in Thatta and three BHUs in Chakwal had guidelines for diagnosing PE/E. However, none of the BHUs had a protocol for administering MgSO₄.

Table 3.4: Availability of guideline/protocol for diagnosis and management of PE/E

	Chakwal					Thatta				
	DHQ	THQ	RHC	BHU	Total	DHQ	THQ	RHC	BHU	Total
Have protocols or guidelines for diagnosing pre-eclampsia	1	3	2	3	9	0	1	3	5	9
Have protocols or guidelines for diagnosing eclampsia	1	3	2	3	9	0	1	3	5	9
Have protocols or guidelines for managing pre-eclampsia	1	3	1	2	7	0	1	3	5	9
Have protocols or guidelines for managing eclampsia	1	3	1	3	8	0	1	3	5	9
Have a protocol or guidelines for administering magnesium sulphate	1	2	0	0	3	0	1	2	0	3
Total (n)	1	3	4	5	13	1	1	4	5	11

Infection Prevention Arrangements

During the assessment of health facilities, arrangements for decontamination of equipment were also reviewed, specifically in terms of availability of functioning autoclaves/sterilizers, sharp disposal containers/buckets, and chlorine solution.

The findings, presented in Table 3.5, show that sharp disposal arrangements were in place at all assessed facilities in Thatta and at all secondary care facilities in Chakwal. However, none of the BHUs in Chakwal had this arrangement.

All SHC facilities in both districts, and nearly all PHC facilities in Thatta had chlorine solution, but only one BHU of five in Chakwal had this essential commodity.

On the other hand, at the time of the assessment, there was a functional autoclave or sterilizer in all primary and secondary facilities in Chakwal and in 82 percent of facilities in Thatta. The proportion of facilities offering screening for hepatitis was also much lower in Thatta, with only one-fifth providing hepatitis B and C screenings, compared to four-fifths in Chakwal.

Table 3.5: Infection Prevention Mechanisms

	Chakwal					Thatta				
	DHQ	THQ	RHC	BHU	Total	DHQ	THQ	RHC	BHU	Total
Autoclave/sterilizer	1	3	4	5	13	1	1	3	4	9
Sharp disposal	1	3	3	0	7	1	1	4	5	11
Chlorine solution	1	3	4	1	9	1	1	3	5	10
Hepatitis B/C screening test	1	3	4	0	8	0	1	1	0	2
Total	1	3	4	5	13	1	1	4	5	11

Availability of Support Services

Assessment of support services showed that RHCs and BHUs in Chakwal and the DHQ in Thatta do not have a functional laboratory. Thatta fares slightly better in this respect: Out of 13 facilities assessed for support services in Chakwal, only four had laboratory services, compared to seven of 11 facilities in Thatta (Table 3.6). All DHQ and THQs in Chakwal had an operation theater while one THQ in Thatta did not.

Table 3.6: Availability of Essential Support Services

Service	Chakwal					Thatta				
	DHQ	THQ	RHC	BHU	Total	DHQ	THQ	RHC	BHU	Total
Laboratory	1	3	0	0	4	0	1	1	5	7
Operation Theater	1	3	0	0	4	1	0	0	0	1
Total (n)	1	3	4	5	13	1	1	4	5	11

Documentation of MNH Cases

Documentation of cases is important for assessing clients load, as well as helpful for follow-up of cases and in monitoring services. All SHC facilities had registers for documenting antenatal care, delivery, referral, postnatal care, maternity admission, and maternal deaths. The PHC facilities in Thatta had all relevant MNCH-related registers, but two of four RHCs and out of five BHUs in Chakwal did not have maternal death registers. PHC facilities are not mandated for surgical interventions, so they did not have operation theaters or maintain Cesarean section registers (Table 3.7).

Table 3.7: Distribution of facilities by availability of documentation for MNH indicators

	Chakwal					Thatta				
	DHQ	THQ	RHC	BHU	Total	DHQ	THQ	RHC	BHU	Total
ANC and referrals register	1	3	4	5	13	1	1	4	5	11
Maternity admission register	1	3	4	5	13	1	1	4	5	11
Delivery register	1	3	4	5	13	1	1	4	5	11
Operating theatre /CS register	1	3	NA	NA	4	1	0	NA	NA	1
Availability of PNC register	1	3	3	5	12	1	1	4	5	11
Availability of maternal deaths register	1	3	2	1	7	1	1	4	5	11
Total (n)	1	3	4	5	13	1	1	4	5	11

NA=Not applicable

Provision of Antenatal, Delivery and Postnatal Care

The assessment found that all primary and secondary facilities in both districts were providing ANC, delivery and PNC services. All facilities were admitting patients for delivery. The secondary facilities were, on average, providing ANC to 47 clients per day while the average number of clients receiving ANC at primary care facilities was 14 per day.

Provision of Basic EmOC

Emergency obstetric and neonatal care (EmONC) refers to a series of crucial life-saving functions, ideally performed in a medical facility, which can prevent the death of a woman experiencing complications during pregnancy, delivery, or the postnatal period. EmONC is a medical response to a life-threatening condition and is not standard for all deliveries. EmONC functions are often divided into two categories: (1) Basic EmONC can take place at a health center and be performed by a nurse, midwife or doctor, and (2) Comprehensive EmONC usually requires the facilities of a district hospital with an operating theatre and availability of blood transfusion. Table 3.8 shows the numbers of sampled SHCs and PHCs that provide EmONC and CmONC. All SHCs and PHCs, in both districts, were providing parenteral antibiotics and parenteral oxytocin. Half of the SHCs and PHCs were providing parenteral anticonvulsants.

Table 3.8: Number of facilities offering BEmOC and CEmONC

	Chakwal			Thatta		
	Secondary	Primary	Total	Secondary	Primary	Total
Parenteral antibiotics	4	9	13	2	9	11
Parenteral Oxytocics	4	9	13	2	9	11
Parenteral anticonvulsants (MgSO ₄)	2	0	2	1	9	10
Manual removal of placenta	3	9	12	2	9	11
Removal of retained products	4	7	11	2	8	10
Assisted vaginal delivery	4	4	8	2	9	11
Blood transfusion	4	0	4	2	1	3
Caesarean section	4	0	4	1	0	1
Neonatal resuscitation	4	7	11	2	9	11
Total (n)	4	9	13	2	9	11

Provision of Care for Pre-eclampsia and Eclampsia

Informants from all facilities were asked if any woman was diagnosed with PE/E during ANC, delivery, or the postnatal period. They were also asked about the number of women they had seen with this condition in the last six months. The responses are presented in Table 3.9. The overall admission of patients with PE/E was low for all health facilities, and in most of the PHC facilities in both districts, no eclampsia patients were managed. The secondary care facilities are mandated to admit patients with PE/E.

Table 3.9: Number of health facilities reported pre-eclampsia and eclampsia clients seen in the last 6 months, by district and facility

	Chakwal		Thatta	
	Secondary Healthcare Facility	Primary Healthcare Facility	Secondary Healthcare Facility	Primary Healthcare Facility
Number of pre-eclampsia patients admitted in last 6 months				
None	3	9	1	8
Two	-	-	1	-
More than two	1	0	0	1
Number of eclampsia patients admitted in last 6 months				
None	3	9	2	9
Two	1	0	0	0
More than two	0	0	0	0
Total (n)	4	9	2	9

Availability and Administration of MgSO₄

The status of MgSO₄ availability was specifically assessed. In Chakwal, MgSO₄ was available at the DHQ hospital and in one of three THQ hospitals. However, it was not available at any of the RHCs or BHUs. In Thatta, all THQs, RHCs and four of five BHUs reported that they had MgSO₄. However, at the time of the assessment, the research teams physically verified that MgSO₄ was not available at the DHQ (Table 3.10).

Healthcare providers were asked whether they were using MgSO₄ to treat PE/E. It was found that all DHQs and THQ hospitals in Thatta were using the commodity, as were two of four RHCs and four of five BHUs. However, none of the secondary or primary care facilities in Chakwal were using MgSO₄ to treat PE-E (Table 3.10). Those who used MgSO₄ preferred 50 percent solution (four of 24 facilities) over 20 percent solution (one of 24 facilities).

The facilities using MgSO₄ were obtaining it from the Provincial Medical Store Depot (MSD), whereas the private sector purchases it from the open market.

Table 3.10: Availability and Use of MgSO₄ by district and type of facility

	Chakwal					Thatta				
	DHQ	THQ	RHC	BHU	Total	DHQ	THQ	RHC	BHU	Total
MgSO ₄ Available	1	1	0	0	2	0	1	4	4	9
Magnesium sulphate is always used	0	0	0	0	0	1	1	2	0	4
Magnesium sulphate is used but not always	1	2	0	0	3	0	0	1	0	1
Magnesium sulphate is never used	0	1	4	5	10	0	0	1	5	6
20% solution	0	1	0	0	1	0	0	0	0	0
50% solution	0	0	0	0	0	1	1	2	0	4
Others	1	1	0	0	2	0	0	1	0	1
IV	0	0	0	0	0	1	0	0	0	1
IM	0	1	0	0	1	0	0	0	0	0
Both	1	1	0	0	2	0	1	3	0	4
Regular supply	1	1	0	0	2	0	1	1	0	2
Local purchase	0	1	0	0	1	0	0	2	0	2
Client purchases	0	0	0	0	0	0	0	0	0	0
Others	0	0	0	0	0	1	0	0	0	1
Total (n)	1	3	4	5	13	1	1	4	5	11

Service Providers' Knowledge, Attitudes, and Practices on Pregnancy-induced Hypertension

Background Characteristics of Participants

Table 4.1 presents background characteristics of the service providers, who numbered 43 in total. Approximately half of the providers were doctors and the rest were “other service providers.” In total, 24 healthcare providers were interviewed in Chakwal and 19 in Thatta. In Chakwal, 11 doctors and 13 other services providers, and in Thatta 9 doctors and 11 other services providers were interviewed. All providers were female.

More than half (55 percent) of the doctors were working at secondary healthcare facilities, while the majority of the other service providers were working at primary healthcare facilities. The majority of the providers had been working in the same ward for more than five years.

Table 4.1: Background characteristics of service providers (n=43) by type of provider

Characteristics	Type of Service Provider (%)		Total
	Doctor	Other service providers	
Age in years			
<30	20.0	26.1	23.3
30-39	35.0	43.5	39.5
40-49	35.0	17.4	25.6
>49	10.0	13.0	11.6
Type of facility			
Secondary level	55.0	21.7	37.2
Primary level	45.0	78.3	62.8
Duration of work in this ward/unit			
<=1 years	15.0	21.7	18.6
1-5 years	30.0	39.1	34.9
5-10 years	20.0	17.4	18.6
>10 years	35.0	21.7	27.9

Recent Training in MNCH

Table 4.2 shows that slightly more than half of providers at PHCs and SHCs in both districts had received trainings on maternal health, FP, or child health during the last three years. Compared to medical doctors, other service providers had received more MNCH/FP trainings. Stratifying by category reveals that slightly more than a third of doctors and nearly two thirds of other service providers had received training. Of those who received training, more doctors had received training in emergency obstetric care, compared to other service providers. All the other service providers in both districts had received training in antenatal care, safe delivery care, and postnatal care. Nearly all providers in both districts had not received any training in the last three years on laboratory investigations.

Table 4.2: Status of training on MNCH related topics in the last three years

	Chakwal					Thatta				
	SHC		PHC			SHC		PHC		
	Doctors	Other service providers	Doctors	Other service providers	Total	Doctors	Other service providers	Doctors	Other service providers	Total
Received any training in last 3 years	2	2	1	6	11	1	1	4	6	12
Emergency obstetric care (EOC)	2	2	0	0	4	1	0	2	2	5
ANC	2	2	0	5	9	1	0	4	5	10
Safe delivery care	2	1	0	4	7	1	0	3	5	9
PNC	2	1	0	5	8	0	0	4	5	9
Skill Birth Attendant training	1	1	0	3	5	0	0	3	5	8
Family planning	1	2	1	4	8	0	1	3	2	6
Laboratory investigations	0	0	0	1	1	0	0	0	0	0
Total (n)	7	3	4	10	24	4	2	5	8	19

Capacities and Practices of Service Providers in Diagnosing, Treating and Preventing PE/E

Awareness of policy directives on PE/E, administration of MgSO₄, and aspirin prophylaxis

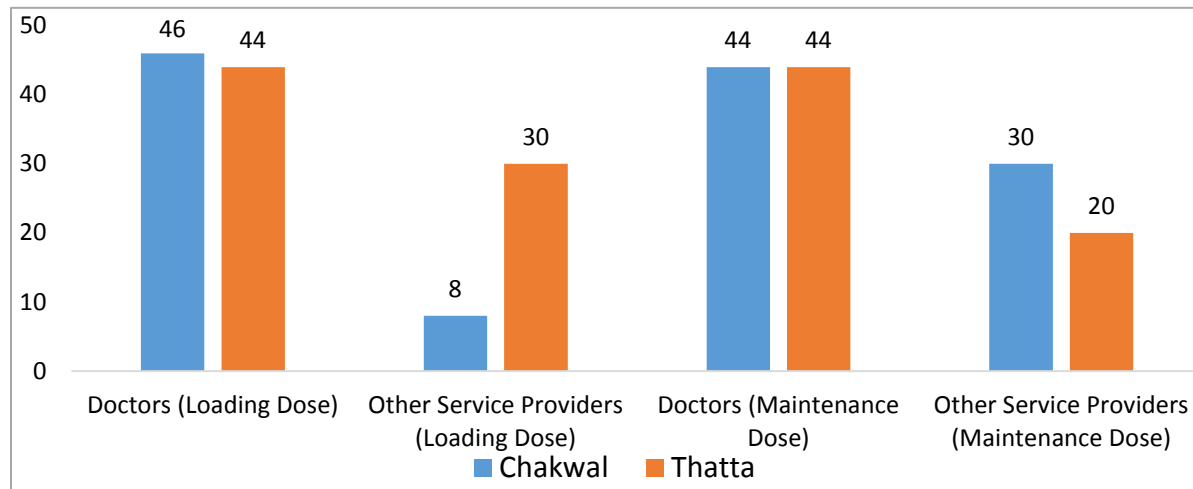
Very few service providers were aware of policy directives (Diagnostic laboratory tests, Use of MgSO₄ and Aspirin as prophylaxis) for preventing, detecting, and managing PE/E. Only three of 24 providers in Chakwal and two of 19 in Thatta were aware of the PE/E policy. In both districts, they were more aware of prophylactic use of aspirin. By district, service providers in district Thatta were better aware of the policy on the loading dose of MgSO₄.

Table 4.3: Proportion of providers who were aware of any policies and programs for detecting, preventing and managing PE/E by district and type of provider

Type of Policy	Chakwal			Thatta		
	Doctors	Other service providers	Total	Doctors	Other service providers	Total
Policies in regards to detecting, preventing and managing PE/E	2	1	3	1	0	1
Loading dose of MgSo4	1	2	3	1	3	4
Prophylactic use of Aspirin	8	3	11	6	0	6
Total (n)	11	13	24	9	10	19

Nearly half of the doctors in both districts were aware of any policy for administering the loading dose of MgSO₄. In comparison, a third of other service providers in Thatta and only about a tenth of other providers in Chakwal were aware. By type of providers, doctors in both districts were more knowledgeable (44 percent) than other service providers about the correct maintenance dose of MgSO₄ (Figure 4.1). In PHCs, the modified Pritchard regime is being followed, while at SHFs the Pritchard regime is being followed.

Figure 4.1: Knowledge of Loading and Maintenance Dose of MgSO₄ for Managing Pre-eclampsia/Eclampsia (%)



Diagnosis of hypertension in pregnancy

Overall in the two districts, 85 percent of doctors and 65 percent of other service providers can correctly define hypertension during pregnancy.

Diagnosis of type of hypertensive disorder in pregnancy

In addition to defining hypertension, service providers' knowledge for categorization of hypertensive disorders in pregnancy was assessed by presenting respondents with three hypothetical situations, and asking them to diagnose it. The scenarios presented were:

Situation (a): A pregnant woman was seen in the antenatal clinic at 30 weeks gestation with blood pressure of 180/115mmHg and proteinuria of 2++. What would be the diagnosis?

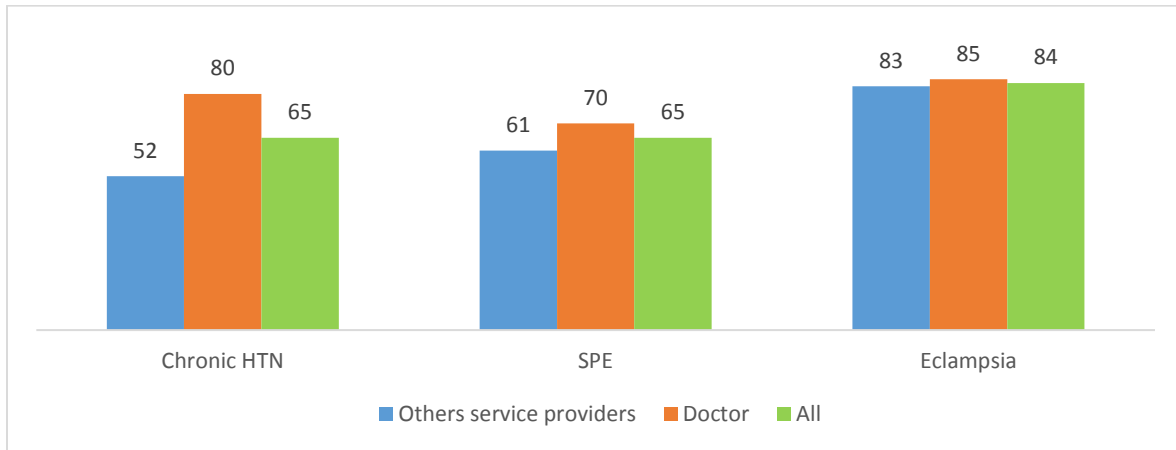
Situation (b): A pregnant woman was seen in the antenatal clinic at 12 weeks of gestation with blood pressure 160/100mmHg with no proteinuria. What would be the diagnosis?

Situation (c): A pregnant woman was found to have developed hypertension and significant proteinuria at 30 weeks of gestation. One week later, her partner brought her to the clinic with complaints of convulsion. What would be the diagnosis?

Figure 4.2 presents the proportions of respondents who correctly identified each disorder. It was found that doctors had better knowledge, compared to other service providers with regard to diagnosis of three hypothetical hypertensive disorders (Figure 4.2). More than four fifths of doctors and other service providers correctly diagnosed eclampsia (85 percent and 83 percent%, respectively) based on the hypothetical scenario presented to them. Slightly more than two thirds of doctors and three fifths

of other service providers were able to diagnose severe pre-eclampsia (SPE), while four fifths of doctors and half of the other service providers correctly diagnosed chronic hypertension.

Figure 4.2: Proportion of providers who correctly defined hypertensive disorders during pregnancy



With regards to service providers' knowledge and ability to detect and classify hypertensive disorders, on bivariate analysis, we found that ability to correctly diagnose hypertensive disorders in pregnancy were not associated with type of provider, duration of work, or receiving any training. (See Table 1-Annex 1)

Management of pre-eclampsia, severe pre-eclampsia, and eclampsia

Service providers must have knowledge and skills to manage PE/E appropriately. Specifically, service providers must know which anti-hypertensive drugs should be used and when (i.e., at what level of blood pressure). They must also know which anticonvulsant to administer and how. In the case of MgSO₄, providers must also have the capacity to monitor and recognize toxicity, and to administer calcium gluconate to treat it.

Service providers were asked about the commonly used anti-hypertensive drug for managing mild to moderate hypertension and severe hypertension in pregnancy, and when these drugs should be administered. The recommended first drug of choice was found to be labetalol. Methyldopa or Nifedipine was the second drug of choice for mild to moderate hypertension in pregnancy.¹⁶ Hydralazine, a peripheral arterial vasodilator, was the drug of choice for severe hypertension in pregnancy⁸. Nearly three fifths of doctors and slightly more than half of the other service providers mentioned methyldopa/aldomet¹⁷ as the preferred drug for managing mild to moderate hypertension in pregnancy. For severe hypertension, only 14 percent of all providers at PHCs and SHCs mentioned hydralazine as the drug of choice. Interestingly, methyldopa/aldomet was found to be the drug of choice for severe hypertension, as well.

¹⁶ UK National Institute for Health and Care Excellence, 2011.

¹⁷ Aldomet is one brand of Methyldopa

With regards to service providers' knowledge of when to prescribe antihypertensive drugs for treating mild to moderate and severe hypertension, researchers found that a very low proportion of doctors and other service providers had sufficient knowledge. One-fifth of doctors and 4 percent of other service providers correctly knew when antihypertensive drugs should be initiated for severe hypertension (159/109). For mild to moderate hypertension, half of the doctors and a third of other service providers knew correctly when to start antihypertensive drugs. There was no correlation between type of provider, facility type, duration of work, or impact of training and knowledge about when to introduce an antihypertensive drug. Knowledge gaps persisted across providers at primary and secondary facilities (See Table 2-Annex 1).

Knowledge of loading and maintenance doses of MgSO₄ and toxicity management

Controlling impending convulsions in cases of severe PE and eclampsia with anticonvulsants is a life-saving intervention for mothers and babies. Evidence recommends the use of MgSO₄ as the 'gold standard' for preventing and treating these convulsions with intramuscular administration of MgSO₄. The Pritchard regimen¹⁸ is the most preferred method. In this regimen, 14 grams of MgSO₄ is injected as the loading dose, followed by five grams injected intramuscularly into alternate buttocks every four hours for maintenance.

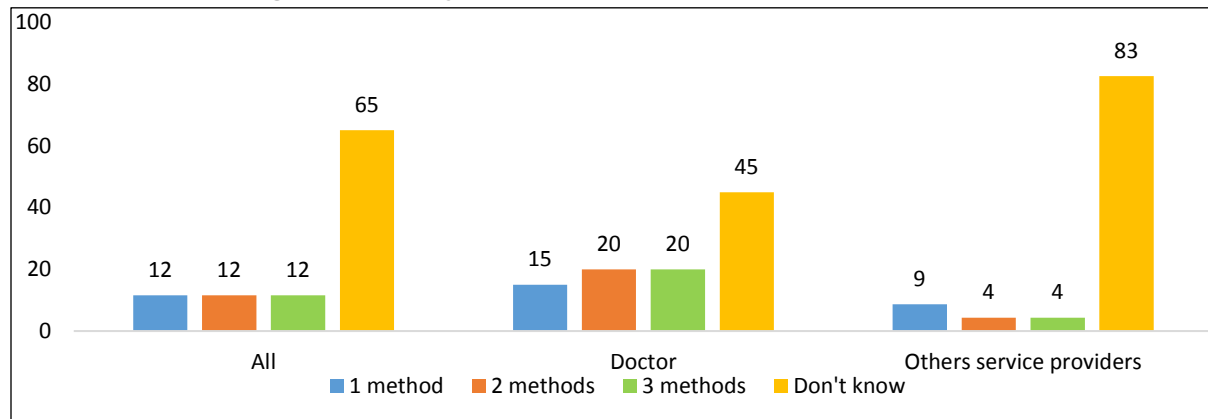
Service providers were asked if they could explain the Pritchard Regime; both the loading and maintenance doses of MgSO₄ (See Table 3-Annex 1). Overall, 45 percent of doctors and 17 percent of other service providers correctly knew the MgSO₄ loading dose; 45 percent of doctors and 13 percent of other service providers correctly knew the maintenance dose. There was no significant association among the types of providers or health facilities to know the Pritchard regimen. Previous exposure to any MCH training also had no significant association with correct knowledge of loading and maintenance doses.

Although rare, toxicity of MgSO₄ can occur and the universal antidote is calcium gluconate. All service providers were asked if they knew of any drug used to treat MgSO₄ toxicity. Two thirds of doctors (70 percent) and nearly half (43 percent) of the other service providers knew of calcium gluconate as the antidote for MgSO₄ toxicity.

Toxicity of MgSO₄ may manifest as depressed respiratory rate (< 16/min), absent patellar reflex, or decreased urine output (< 30 ml/hour), either in isolation or in any combination of the three symptoms. Slightly more than a tenth of all providers knew all three methods of monitoring for MgSO₄ toxicity while the majority—more than two thirds—were unaware of any method (Figure 4.3). Doctors were relatively more aware of the different ways of monitoring MgSO₄ toxicity than other service providers.

¹⁸ Pritchard Regimen: a. Loading dose: Initially: 4 gm of 20% MgSO₄ IV over not less than 3 minutes *immediately followed by*: 10 gm of 50% MgSO₄ IM (5 gm in each buttock) *If convulsion persists after 15 minutes*: 2 gm of 50% MgSO₄ IV bolus over 5 minutes. Maintenance dose: 5 gm of 50% MgSO₄ IM 4 hourly in alternate buttocks Continue for 24 hours after the last convulsion or delivery whichever is later.

Figure 4.3: Proportion of providers who correctly defined methods of monitoring for MgSO₄ toxicity



There was no statistical difference among the providers working either at primary or secondary facilities and length of service to know how to monitor for and treat MgSO₄ toxicity. One third of doctors and more than half of the other service providers had no knowledge about the use of calcium gluconate as the drug of choice for treating MgSO₄ toxicity. About four-fifths of the doctors did not know how to monitor for toxicity and neither did nearly 95 percent of other providers (See Table 4-Annex 1).

Use of MgSO₄

Service providers were asked about current practices in MgSO₄ use, its supply, and its availability at their facility, as were alternative drugs used to control seizures and barriers to MgSO₄ use.

Only 15 percent of all providers (25 percent of doctors and 9 percent of other service providers) reported that they were currently using MgSO₄. Of those who were using MgSO₄, 40 percent reported having a sufficient supply, while nearly half reported inadequate supply, and the remaining 12 percent were not aware of the supply chain situation or mechanism.

When asked whether MgSO₄ was currently available at the facility, 40 percent of all service providers (30 percent of doctors and 52 percent of other service providers) reported that it was. Among the rest of the respondents, the reasons given for non-availability of MgSO₄ were no supply (28 percent), no training (16 percent), and no demand due to poor client load (16 percent). About 40 percent of the providers did not know the reason for non-availability. Nearly four fifths of doctors and three fourths of other service providers reported use of alternative drugs for controlling convulsions with PE/E patients. Among those who reported using alternative drugs, 47 percent of doctors and 33 percent of other service providers reported using appropriate (though less safe and effective) drugs like diazepam to control convulsions in PE/E patients. Slightly more than a quarter of doctors reported using the anti-hypertensive drug methyldopa to control convulsions.

Slightly more than one third of doctors and other service providers mentioned barriers to administering the loading dose of MgSO₄ to PE/E patients. These barriers included lack of training (75 percent), lack of knowledge about side effects (14percent), and difficulty in managing the toxicity (14 percent). In addition, slightly more than a third of other service providers reported that they were not prescribing MgSO₄ as only doctors are authorized to prescribe the drug.

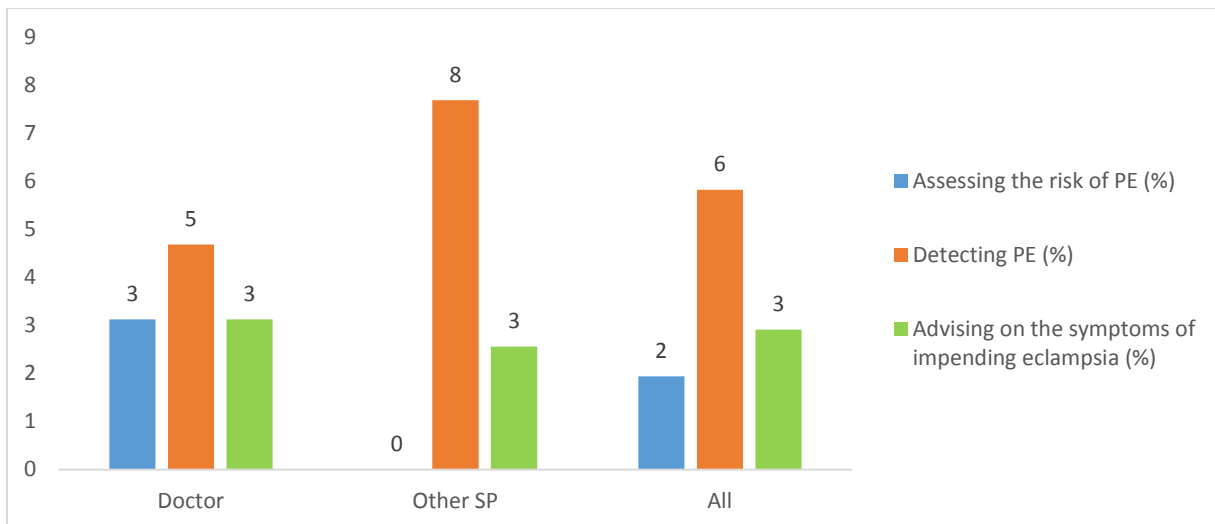
Assessment of PE Risk and Detection of PE

Service providers' knowledge of proven risk factors for PE/E, including history of hypertension, diabetes, obstetric history, maternal age, and others, was assessed during observations of ANC consultations. Only 3 percent of the providers observed looked for risk factors related to PE/E during ANC consultations while none of the other service providers assessed the risk (Figure 4.4).

The following indicators were used to measure provider knowledge regarding prevention of eclampsia:

- **Assessing risk of PE**
 - Asked about client's age
 - Asked about number of pregnancies (gravida)
 - Measured weight
 - Checked for edema
 - Took history of hypertension
 - Took history of diabetes
- **Detecting PE**
 - Measured client's blood pressure
 - Tested urine for protein/albumin
- **Advising on the symptoms of impending eclampsia**
 - High blood pressure
 - Generalized edema
 - Proteinuria
 - Severe headache
 - Blurring of vision
 - Upper abdominal pain.

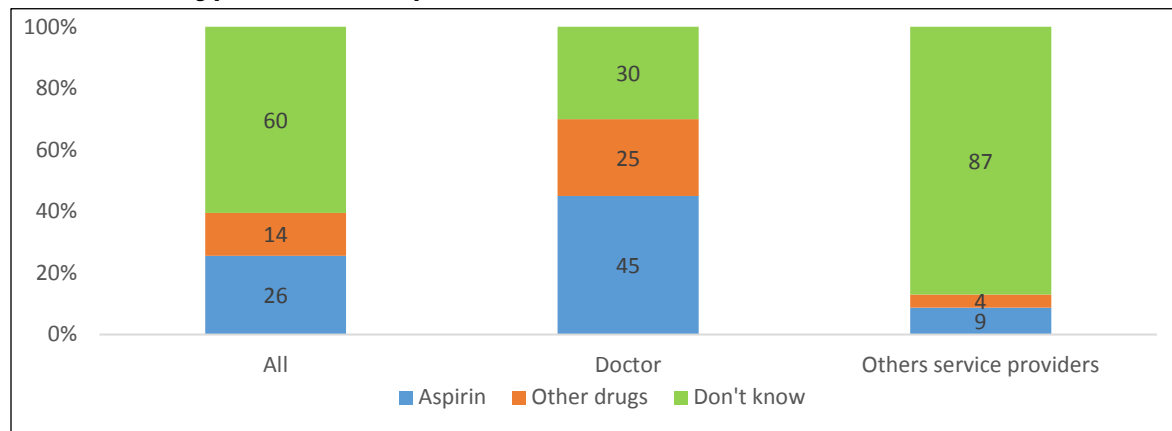
Figure 4.4: Proportion of service providers observed to take measures to assess risk of and detect PE



Prophylactic Treatment of PE/E

Researchers investigated service providers' knowledge about the availability of guidelines for giving a prophylactic drug to prevent PE in pregnancy. According to WHO recommendations, aspirin is the drug of choice for PE/E prophylaxis. Nearly half of the doctors and a tenth of other providers correctly mentioned aspirin as a drug for prophylaxis. However, a third of doctors and four-fifths of other service providers did not know about the prophylactic use of aspirin for PE/E.

Figure 4.5: Use of aspirin among women who are at risk of developing PE/E by type of service provider



None of the providers interviewed mentioned use of calcium supplements as prophylaxis. About one-third of doctors and other service providers mentioned other drugs as prophylaxis. A quarter of doctors and a fourth of other service providers mentioned the use of methyldopa/aldomet (blood pressure lowering drug) and MgSO₄ as prophylactic drugs to prevent PE/E in pregnancy.

Doctors were more knowledgeable with regard to the risk factors that are associated with the occurrence of PE/E and when to prescribe prophylactic drugs. Previous obstetric complications (50 percent), high blood pressure (25 percent), family history (10 percent) and pregnancy associated comorbidities (10 percent) were identified as the three common conditions requiring aspirin prophylaxis. Overall, knowledge of other service providers was poor, as no providers in district Thatta identified any of the risk factors for which aspirin prophylaxis should be given. In Chakwal district, nearly a quarter of other providers reported high BP as risk factor. Overall, less than half of the doctors and more than four-fifths of other providers did not know any risk factors when aspirin prophylaxis should be given (See Table 5-Annex 1).

Doctors and providers in secondary facilities were significantly more likely to know the use of aspirin prophylaxis among pregnant women at risk of developing PE. Duration of work experience in the same unit and previous training on maternal health, family planning (FP), or child health had no effect on whether a provider would give aspirin prophylaxis for high risk women (See Table 6-Annex 1).

Similar findings were also observed for use of antihypertensive drugs among pregnant women who had high blood pressure. No statistical differences were found among the doctors of PHCs and SHCs to administer antihypertensive drugs to pregnant women who had high blood pressure. There was no

correlation with training and years of experience on the use of aspirin and other antihypertensive drugs for pregnant women who were at risk of developing PE/E.

Practices in Provision of Antenatal Care

To assess the quality of ANC services, a total of 103 ANC client-provider interactions were observed at the selected facilities, and the same number of exit interviews were conducted with the clients whose interactions had been observed.

Client Characteristics

Background characteristics of the 103 ANC clients who participated in the exit interviews. More than half of the respondents were 20-29 years old while only 4 percent were younger than 20 years of age. Over half of the respondents had not received any education, and nearly a quarter completed primary education. Only 7 percent completed higher secondary education. Slightly less than a third of ANC clients were of low socioeconomic status (SES), slightly more than a third were of middle SES, and a third were of high SES.

Table 4.4: Background characteristics of ANC exit clients

		Chakwal	Thatta	Total
Age in years	<20	3.6	4.2	3.9
	20-24	29.1	25.0	27.2
	25-29	30.9	27.1	29.1
	>29	36.4	43.8	39.8
Education	Never attended school	21.8	95.8	56.3
	Primary	43.6	2.1	24.3
	Secondary	21.8	2.1	12.6
	College	12.7	0.0	6.8
Socio-economic status	Lower tercile	10.9	50.0	29.1
	Middle tercile	32.7	43.8	37.9
	Upper tercile	56.4	6.3	33.0
Pregnancy duration (week)	<13	7.3	8.3	7.8
	13-20	36.4	29.2	33.0
	21-28	29.1	33.3	31.1
	>28	27.3	29.2	28.2
Current ANC visit	1	18.2	27.1	22.3
	2	10.9	25.0	17.5
	3	16.4	14.6	15.5
	4 and above	49.1	33.3	41.7
	Don't know	5.5	0.0	2.9
Total (n)		55	48	103

Observations of Provider Practices

The study team carried out detailed observations of service providers' inquiries and history taking, performance, and discussion with clients. Three areas of practice—taking client histories, performing physical examinations, and prescribing essential laboratory tests to diagnose PE/E—were the main focus of these observations.

History Taking

Overall, history taking—the essential element of any medical diagnosis—was found to be a very weak area of performance among most service providers all surveyed facilities. As shown in Table 4.5, most service providers inquired about the total number of pregnancies, date of last delivery, duration of gestation, and any current medication. However, they rarely attempted to find out whether the client had any history of hypertension or other diseases, or was experiencing any signs and symptoms of PE/E. Two-thirds of providers in Thatta and one-fifth in Chakwal asked about history of hypertension.

Only a tenth of providers in Chakwal and none in Thatta inquired about diabetes, an important risk factor associated with PE/E. More than half of the providers in Thatta asked about type of previous delivery in comparison to only one-fifth of providers in Chakwal. None of the providers in either district discussed previous history of miscarriage/abortion, sexually transmitted infections (STIs), or malaria. Two-thirds of all providers at PHCs and SHCs in Chakwal discussed the date of the last menstrual period (LMP), compared to nearly one-third of providers in Thatta. Nearly half of the providers in Chakwal and a third in Thatta asked about the expected delivery date (EDD).

Observations of client-provider interactions (CPIs) showed that service providers are capable of reasonably good service, except for providing behavioral change communication (BCC) materials. These findings were not uniform across the facilities.

Physical Examination

Physical examination is not consistent among all service providers at all facilities. Although there were inconsistencies, slightly more than one-third of providers measured clients' weight, while none measured height. More than two-thirds of all providers checked blood pressure, slightly more than a quarter checked for anemia, and only one-tenth of providers examined clients for signs of edema.

More than half of the providers conducted the abdominal examination. Two-thirds of providers at PHCs did the abdominal examination for fetal presentation, in comparison to 37 percent of providers at SHCs. Slightly more than a quarter auscultated for fetal heart rate. Nearly a quarter recorded their observations on the client's ANC card (Table 4.6).

Table 4.5: Knowledge of providers in history taking to detect PE/E

Information asked by provider	Chakwal			Thatta		
	Secondary HF	Primary HF	Total	Secondary HF	Primary HF	Total
Date of last menstrual period (LMP)	80	71.4	74.5	0	38.9	29.2
Expected delivery date (EDD)	60	40	47.3	16.7	36.1	31.3
Menstruation related problems	5	0	1.8	16.7	5.6	8.3
Duration of gestation/conception	45	57.1	52.7	100	94.4	95.8
Any current medication	20	17.1	18.2	58.3	77.8	72.9
History of hypertension/HBP	25	8.6	14.5	8.3	72.2	56.3
History of diabetes	20	2.9	9.1	0	0	0
Type of last delivery	10	2.9	5.5	58.3	52.8	54.2
History of asthma	15	2.9	7.3	0	2.8	2.1
Date of last delivery	25	20	21.8	8.3	36.1	29.2
Place of last delivery	10	2.9	5.5	0	0	0
Duration of last labor	5	8.6	7.3	0	25	18.8
Previous miscarriage/abortion	0	0	0	0	0	0
Previous stillbirth(s)	35	31.4	32.7	33.3	50	45.8
Previous early neonatal deaths	5	11.4	9.1	8.3	25	20.8
Previous history of Caesarean delivery	0	2.9	1.8	0	0	0
Previous MH symptoms/signs/treatment	20	5.7	10.9	0	5.6	4.2
History of tuberculosis (TB)	0	0	0	16.7	16.7	16.7
History of malaria	0	0	0	0	0	0
History of STIs/RTDs	0	0	0	0	0	0
Provider asked about - STIs/RTDs	0	0	0	0	0	0
N	20	35	55	12	36	48

HF=healthcare facility, RTD=**, STI=sexually transmitted infection

Table 4.6: Practice of providers in physical examination

Tests carried out during ANC visits	Chakwal (%)			Thatta (%)		
	Secondary HF	Primary HF	Total	Secondary HF	Primary HF	Total
Measured weight	20	25.7	23.6	0	58.3	43.8
Measured height	0	0	0	0	0	0
Recorded blood pressure	60	94.3	81.8	16.7	94.4	75
Checked pulse	0	8.6	5.5	16.7	27.8	25
Checked anemia	20	17.1	18.2	50	50	50
Checked for dehydration (eye, tongue, skin)	0	0	0	0	0	0
Measured body temperature	0	2.9	1.8	0	11.1	8.3
Checked for edema: face/hands/legs/ankles	10	5.7	7.3	8.3	13.9	12.5
Checked abdomen for any mark of operation	10	0	3.6	0	0	0
Checked breasts for pain or lump	0	0	0	0	0	0
Asked about burning sensation when urinating	10	8.6	9.1	0	2.8	2.1
Palpated abdomen for fetal presentation	45	42.9	43.6	8.3	77.8	60.4
Checked fetal movement	50	28.6	36.4	0	75	56.3
Listened to fetal heart rate	45	28.6	34.5	0	47.2	35.4
Performed internal examination for vaginal discharge	0	0	0	0	5.6	4.2
On the client's ANC card	5	11.4	9.1	0	52.8	39.6
On the client's slip/referral slip	30	45.7	40	50	41.7	43.8
Total (n)	20	35	55	12	36	48

Advising of Laboratory Tests

Urine tests for protein, glucose, albumin, and hemoglobin are essential for the diagnosis of PE/E and other obstetric complications. During the ANC consultation only 17 percent of providers at PHCs in district Thatta advised testing of urine for protein, glucose, and albumin. None of the providers in Chakwal or at SHCs in Thatta advised this test. Hemoglobin tests were not prescribed to ANC clients at any SHC facility in Thatta, though they were advised by 28 percent of providers at PHC facilities, and approximately one-third of providers at SHC and PHC facilities in Chakwal.

Client Experiences at the Facility

To understand women's perspectives of the quality of their ANC visits and their knowledge of the services received, exit interviews were conducted with 103 ANC clients after observing their interaction with their service provider. Table 4.7 shows the proportion of clients who replied in the affirmative when asked whether they received nine specific components of antenatal care during their current consultation. The analysis shows that clients attending PHC facilities received more of the ANC service components than those attending SHC facilities. In Thatta, PHC facility staff performed better in terms of diagnosing PE/E and filling records than SHC facility staff. Similarly, compared to Chakwal, primary healthcare facility staff provided better ANC care, compared to Chakwal.

Table 4.7: ANC Visit: Procedures Performed by Providers (%)

Provider practices confirmed from client	Chakwal			Thatta		
	SHC	PHC	Total	SHC	PHC	Total
Measured weight	25	25.7	25.5	0	61.1	45.8
Checked blood pressure	55	94.3	80	16.7	94.4	75
Performed abdominal examination	55	48.6	50.9	8.3	86.1	66.7
Checked anemia	30	31.4	30.9	41.7	72.2	64.6
Listened to the baby's heartbeat	55	25.7	36.4	0	58.3	43.8
Checked urine for protein and sugar	10	25.7	20	0	13.9	10.4
Talked about the progress of pregnancy	75	62.9	67.3	41.7	61.1	56.3
Gave you a chance to ask questions	80	85.7	83.6	41.7	52.8	50
Advised follow-up visit	70	80	76.4	58.3	88.9	81.3
Total (n)	20	35	55	12	36	48

None of the clients reported receiving all nine essential ANC components (listed in Table 5.1) during the current visit. Table 4.8 shows composite responses to the questions about the nine essential ANC components. The demographic characteristics (age, education, and socio-economic status) had no association with a client's likelihood to receive all nine ANC components during this visit.

Table 4.8: Required services and information during ANC consultation

		Proportion of clients who received 6+ ANC components during current visit		Proportion of clients who received 6 ANC components during any ANC visit		N
		Yes %	p-value	Yes %	p-value	
Age	Up to 24 years	3.1		0.0		32
	25 or more years	12.7	0.121	2.8	0.473	71
Education	None	13.8		3.4		58
	Primary	0.0	0.053	0.0	0.572	25
	Secondary	7.7	0.632	0.0	0.662	13
	Higher	14.3	0.522	0.0	0.868	7
Socio-economic status	Low	16.7		3.3		30
	Middle	7.7	0.432	2.6	0.616	39
	High	5.9	0.295	0.0	0.447	34
Total (n)		9.7		1.9		103

*Fisher's exact test

Client Knowledge of Danger Signs in Pregnancy

The exit interviews revealed that ANC clients have very poor knowledge of danger signs during pregnancy. About a quarter of the clients were aware that they should be alert to high blood pressure; however, only 3 percent mentioned convulsions and one-tenth reported vomiting as danger signs in pregnancy, indicating the need to strengthen health educational efforts.

Client Perception of ANC Visit

Nearly four-fifths of the ANC clients had consulted with health care providers at SHC facilities and two-thirds at PHC facilities. Nearly two-fifths of clients at SHCs and PHCs received services from a nurse or LHV, while the rest consulted doctors.

In order to assess their perceptions and satisfaction concerning their current ANC visit, clients were asked about the waiting time for services, time spent with provider, and satisfaction with the service received. Client satisfaction was also indirectly measured by asking the women if they would recommend their friend to visit this center for ANC care.

Table 4.9 shows that most ANC clients (55 percent) thought the waiting time and time spent with service provider were of a reasonable duration, while more than two-fifths said the consultation time had been too short. Most of the clients were satisfied with the services provided to them and 87 percent said they would recommend the facility to their friends for ANC.

Table 4.9: Client perceptions of ANC visit

		Chakwal (%)			Thatta (%)		
		SHC	PHC	Total	SHC	PHC	Total
Duration of waiting period before consultation (minutes)	<15	45	80	67.3	41.7	63.9	58.3
	15-29	5	8.6	7.3	25	8.3	12.5
	>29	50	11.4	25.5	33.3	27.8	29.2
Perception about waiting time	Too long	25	0	9.1	16.7	8.3	10.4
	Reasonable	70	60	63.6	16.7	2.8	6.3
	Too short	5	37.1	25.5	66.7	88.9	83.3
	Don't know	0	2.9	1.8	0	0	0
Time spent with the health care provider (minutes)	<6	25	45.7	38.2	33.3	13.9	18.8
	6-10	70	40	50.9	25	33.3	31.3
	11-15	0	8.6	5.5	41.7	41.7	41.7
	16-30	5	5.7	5.5	0	11.1	8.3
Perception about adequacy of time spent with the service provider	Reasonable	80	85.7	83.6	8.3	27.8	22.9
	Too short	15	11.4	12.7	91.7	72.2	77.1
	Don't know	5	2.9	3.6	0	0	0
Quality of service received that day	Satisfied	65	88.6	80	58.3	86.1	79.2
	Somewhat satisfied	30	2.9	12.7	41.7	13.9	20.8
	Not satisfied at all	5	8.6	7.3	0	0	0

Would recommend facility to friend for ANC	Yes	75	85.7	81.8	100	91.7	93.8
	No	25	14.3	18.2	0	8.3	6.3
	N	20	35	55	12	36	48

Findings from Focus Group Discussion

Table: 5.1: Community Respondents Profile

Socio-economic Characteristics of Community Respondents					
	Chakwal		Thatta		Total Respondents N=77
	Men	Women	Men	Women	
Mean Age (Years)	41 (30-50)	29 (25-45)	32 (22-43)	30 (22-37)	33 (22-50)
Mean number of children	3	2	3	4	3
Level of Education					
None	0	2	6	16	24
1-5 grades	2	3	6	2	13
6-8 grades	2	8	1	1	12
9-10 grades	5	3	2	2	12
11 grades and above	8	5	3	0	16
Occupation					
Labor	4	1	6	0	11
Private Job	4	1	1	0	6
Govt. Job	2	1	1	0	4
Business/Self-employed	4	0	9	3	16
Housewife	NA	18	NA	18	36
Teaching	2	0	1	0	3
Retired/ Unemployed	1	0	0	0	1

Poor recognition and management of pre-eclampsia at community level, while Eclampsia perceived as medical emergency

The respondents were not familiar with the two pregnancy-related diseases/conditions, i.e. {E/E. The respondents, however, referred to women commonly suffering from high blood pressure during pregnancy. Some who had experienced fits/convulsions during pregnancy referred to fits being a serious problem. The communities largely perceived the former as a normal symptom of pregnancy, for which mostly home remedies were preferred. The alarming nature of eclamptic fits (referred to as fits in following sections) made people perceive them as an emergency, for which women were rushed to the health facilities. The sub-themes contributing to the main theme are detailed hereunder:

Perceived Severity of Illness

Communities from both the districts reported diabetes, hypertension, heart disease, hepatitis, malnutrition, and anemia as common ailments among women. In addition, seasonal diseases like allergies, diarrhea, malaria, and fever were also included. Hypertension (often referred to as blood pressure) was perceived as a health issue commonly prevalent among adults.

Poor recognition of pre-eclampsia and eclampsia as a common problem of pregnancy

The participants from both districts identified malnutrition, bleeding, blood pressure, and anemia as common pregnancy related issues.

"Mostly women eat dry roti (bread) with lassi (Curd drink) so the rest of the necessary foods are skipped, causes deficiency among women... women work in the fields and usually they cannot afford proper food, which creates serious problem during deliveries." (MFGD Rural, Thatta).

They shared that nausea, vomiting, and blood pressure during pregnancy were treated at home by taking cold food items, such as cold milk. The reason given for taking such measures at home in communities was their inability to seek care because of the cost implications, and also because they considered such symptoms a norm during pregnancy. Lack of awareness about pre-eclampsia was particularly evident in all the FGDs. Respondents expressed that family members did not pay heed to the complaints of headache or symptoms of high blood pressure during pregnancy. They considered them an insignificant symptom of pregnancy, and hence treated them with home remedies.

"This is a common practice during pregnancy that if a woman suffers with high blood pressure then mothers or sisters in-law offer her a glass of cold milk to get relief of BP problem. This practice is common among uneducated families. This is so because they cannot afford expenses of seeking care at the hospitals. Those who seek care are only a few." (FFGD Rural, Chakwal).

"If a woman has a headache then family members do not take pregnant women to the hospital immediately. They give priority to home remedies and ask her to take some rest." (FFGD Rural, Chakwal).

Only a limited number of respondents were aware of high blood pressure as the cause of eclampsia.

"Eclampsia emerges among pregnant women due to high blood pressure," - FFGD Rural, Chakwal

"I have experienced high blood pressure during pregnancy. I became unconscious, and was then taken to hospital," - FFGD Rural, Chakwal.

"High blood pressure and weakness becomes a cause of eclampsia among pregnant women. Similarly, this problem developed due to deficiency of blood and food," - FFGD Rural, Chakwal.

Male respondents reported the problem of high blood pressure (hypertension) during pregnancy to be common. Men attributed the high prevalence of hypertension to the stresses in life, such as financial hardships and clashes between household members. Other causes described were anxiety, malnutrition, women involved in agriculture labor despite pregnancy, lack of birth spacing, and lack of ANC.

“High blood pressure and heavy bleeding occurs among the majority of women during pregnancy. The reasons for these problems are due to depression, quarrels within households, and low income,” - MFGD Rural, Chakwal.

When referring to serious ailments during pregnancy, heavy bleeding leading to the death of a woman was frequently mentioned. Only four female respondents stated that with the passage of time, people were gaining awareness of eclampsia (fits, convulsions) as a medical problem that can be treated only by getting proper medical treatment from private or public sector, instead of traditional methods.

“Previously people were superstitious and thought that fits took place due to some misfortune, but now people consider eclampsia a serious problem caused by high BP. Education and awareness has changed the minds of people so they are well aware that high blood pressure is a dangerous problem for a woman,” - FFGD Rural, Chakwal

“If a woman gets fits or high BP then she is taken to Ma kli Hospital or Karachi immediately (District or divisional headquarter hospital),” - FFGD Urban, Thatta

Only a few respondents mentioned that women suffered from fits during pregnancy. None of the male respondents perceived fits as a disease related to pregnancy or mentioned the name of the disease as pre-eclampsia or eclampsia. However, a few female respondents were aware of the condition. The few respondents who had experienced fits themselves or had seen others experience fits believed that this affected the health of the baby in the womb.

“We never heard about convulsions caused by high BP,” - FFGD Rural, Chakwal

“Blood pressure problem is common among pregnant women, but they are given cold milk to get it normal,” - FFGD Rural, Chakwal

The respondents shared that when families saw women in the community suffer from fits or convulsions during pregnancy, they deemed it an emergency and would rush them to a health facility.

Role of Traditional/Spiritual Healers

Some families considered fits “a supernatural phenomenon,” which warranted intervention by a spiritual healer. Respondents referred to fits as ‘saya’, influence of ‘jinnat’, ‘luggat’ (Sindh province), as effect of magic. These beliefs led people to seek treatment from different spiritual healers, like ‘pirs’ and ‘faqeers’. Some pay visits to shrines and are given amulets to wear or recite verses from the Holy Quran. A few respondents believed that by visiting the shrines they would rid of themselves of the disease. This was more apparent in the FGDs with participants from very rural areas of Sindh.

“People think that jinn have entered the body of a woman and that is why she is experiencing jerks. So people start questioning her. During fits a woman does not behave normally and talks haphazardly... then people think that she has got some supernatural influence,” - MFGD Rural, Thatta

Dynamics of Decision Making

Once the decision makers perceived symptoms of blood pressure as worrisome they would take steps to seek care. However, the decision to seek care was largely determined by the interaction between decision makers. Perceptions of the mothers-in-law compared the health seeking behavior of the daughters-in-law with their own experiences during pregnancies; the decision of the husband was based on his ability to pay and their understanding of the severity of the disease.

“Role of husbands vary because some husbands are careless and show negligence for this type of problem in their wives... Many husbands become worried for their wives and take them to hospitals for proper checkup,” - FFGD Urban, Thatta

Many respondents shared that now the situations are changing, and generally people would prefer medical care over seeking treatment from the religious and traditional healers.

Husbands were the primary decision makers in deciding when and where to seek treatment for their wives. Respondents shared that husbands understood their role and took all responsibilities for the treatment of their wives. This was the reason that the TBA were no longer as popular, as there have been many cases that were reportedly mishandled by them.

“To seek treatment is the entire responsibility of husband and he decides about the health facility for treatment according his financial status,” - MFGD Rural, Chakwal

However, some respondents believed that the main decision maker was in fact the mother-in-law, and the husband took care of the logistics once the decision to seek care was taken.

“Husbands realize their responsibility and they are always worried about hiring vehicles. They arrange money to hire a vehicle for taking the woman for treatment. Mothers in-law also make hurry to take the woman in the hospital,” -FFGD Rural, Thatta

“People have awareness, and mostly husbands and wives mutually decide, but poverty becomes a cause of any complication during pregnancy,” - MFGD Rural, Chakwal

The casual attitude of the mothers-in-law toward the deliveries of daughters-in-law was more frequently reported by respondents from Sindh, compared to Punjab. In addition, respondents expressed that sisters and brothers-in-law also create hurdles for women to seek treatment from the proper health facilities. Male respondents were of the opinion that mothers in law were cooperative when a women suffered from any ailment. However, this view was supported by few female respondents.

“It depends on the domestic environment because in many houses some conservative mothers-in-law pass comments that they had given birth to 10 children without the assistance of service providers, and nowadays women cannot give birth to a single child,”-FFGD Rural, Chakwal

“According to mothers-in-law, girls make excuses to just go outside the home and they compare it with their own times. For example, mothers-in-laws say that they gave birth to four children while working as a laborer in the fields without getting any medical assistance,” -FFGD Urban, Thatta

“Some mothers-in-laws thoroughly take care of their daughter in-laws, but most show ignorance,”-FFGD Urban, Thatta

Respondents expressed that women were valued on the basis of male heirs they had. A woman would get better care if she had an older male child and faced negative attitudes from the husband and mother-in-law if the woman had a daughter.

Barriers to Medical Healthcare

The main barriers to seeking care at a health facility were the financial constraints and awareness of available health facilities. The respondents preferred to seek care at a health facility close to their residence. Public sector facilities in close proximity lacked the equipment and supplies to provide care. As a result, patients shuttled from one facility to another without receiving quality health services. People who had the resources went to the private sector.

*“Some women also go to Rawalpindi, Khor, Chakwal, Fateh Jang, Balkassar and Talagang for these types of treatments. Those people who have better financial conditions prefer to go to private sector. Otherwise DHQ, RHC Balakassar and rest of the government facilities are visited like BHU Warwal, Kot Chaudrian and Ranjha etc,”
- FFGD Rural, Chakwal*

Respondents shared that during contact with healthcare providers, patients or their families were never informed about the presence of pre-eclampsia or prepared for any signs of eclampsia. They expressed that were they informed about these conditions, they would have been prepared where to seek care from.

*“During pregnancy the blood pressure of my wife went high, so I took her in the hospital and doctors referred us to another hospital procedure repeated in second hospital then went to third hospital she was treated but doctor’s behavior was not facilitative,”
- MFGD Rural, Chakwal*

Non-availability of transport on time, bad conditions of the roads and long travelling time to health facilities were also mentioned as barriers.

“Government doctors do not pay attention to poor people and ordinary treatment is given if the patient has any reference then all protocols are provided. Some doctors are considerably good by nature because they thoroughly check the patient,”-MFGD Rural, Thatta

Quality of Care

It was also mentioned that majority of the service providers do not share the results of blood pressure examinations to their clients. They just prescribe medicines, but do not mention the precaution of pre-eclampsia or eclampsia during pregnancy.

Experiences of Eclampsia Survivors

Result / Findings of study:

Twenty eclampsia survivors were interviewed from communities and health facilities. The detailed narration of each case is given in Annex 1. Pseudo-names have been used and their accounts transcribed verbatim have been given in italics. The background description is followed by their experiences with the health care providers and how eclampsia was managed.

Socio-demographic characteristics

Out of 20 respondents, 10 each belonged to the Chakwal and Thatta district. Interviews were conducted with patients who were referred from sampled districts to tertiary level hospital like Holy Family Hospital Rawalpindi and Jinnah Hospital Karachi, respectively. The majority of respondents who survived eclampsia were between the ages of 18 and 30 years (Table 5.2), except one woman who was 40 years old. Survivors of eclampsia from Punjab province were comparatively older (25-40 years) than the survivors from Sindh province (18-30 years).

The respondents' age at marriage ranged from 14-27 years. One respondent, however, was married at 36 years, whereas in Sindh three were married at the age of 14 years. Of the respondents who were selected from health facilities, their age ranged from 18-30 years and age at marriage ranged from 12-27 years.

Overall, age at first pregnancy ranged from 14-27 years except, for one woman who became pregnant at the age of 37. Age at first pregnancy was comparatively higher in Punjab province (21-24 years), compared to Sindh province (14-24 years). One respondent who was selected from health facility was 13 years old at first pregnancy.

Overall, 16 out of 20 women had between one and three pregnancies, three women had between four and five pregnancies, and one woman from *Bajhor Agency* had 10 pregnancies. Twelve women had fewer than two living children. Out of 2000, 15 women were currently pregnant. There were no considerable differences between the number of pregnancies and living children at provincial or facility level. Out of 20, 11 women were from rural areas. Mostly women were illiterate.

Table 5.2: Respondents Profile

	Chakwal	Thatta	Total Respondents
	N	N	N (%) 20 (100)
Background Information			
Respondents			
Facility Based	5	5	10 (50)
Community Based	5	5	10 (50)
Current pregnancy status			
Pregnant	8	7	15 (75)
Not Pregnant	2	3	5 (25)
Education			
Illiterate	5	4	9 (45)
Up to Primary (5 years of schooling)	0	3	3 (15)
Above Primary	5	3	8 (40)
Travel time up to one hour to final facility where care was given	3	5	8 (40)
Blood Pressure checked at ANC	7	5	12 (60)
Results of BP shared at ANC	7	4	11 (55)
	Mean (Range)	Mean (Range)	Mean (Range)
Age	27.7 (21-40)	29.9 (18-30)	25.3 (18-40)
Age at marriage	21.1 (12-36)	17.2 (14-23)	19.2 (12-36)
Total pregnancies	3.6 (2-10)	2.1 (1-5)	2.9 (1-10)
Number of Living Children	1.8 (0-5)	1.2 (0-4)	1.5 (0-5)
Total Number of ANC visits	3.3 (0-4)	2.5 (0-5)	2.9 (0-5)
Age at time of first experience of eclampsia	25 (20-38)	21.5 (16-30)	23.3 (16-38)

Each of the narratives of the 20 respondents, while unique, had many common themes with some differences, which are described here:

Experiences from ANC Visits

All women from both provinces had at least two ANC visits. Only one respondent at facility level did not receive any ANC during pregnancy. Respondents from Punjab Province were more likely to receive regular ANC during their pregnancies, compared to those from Sindh Province. Moreover, respondents from Punjab knew they should attend at least four ANC visits during pregnancy.

Overall, eight of 20 women consulted only one service provider for ANC care, while the remaining 12 visited more than one service provider. The main reason stated by these respondents for switching providers was poor-quality services. Women from Sindh more often switched service providers, compared to respondents from Punjab. Of 10 respondents, three sought care from more than one service provider in Sindh, compared to one in Punjab.

For the first ANC visit, most respondents (except two) went to private providers. One respondent commented on the selection of service provider for ANC:

“I feel satisfied with the treatment given at private health facilities, so I consulted a private practitioner for ANC.” - FIDI Urban, Chakwal

Another woman also showing her satisfaction, and said:

“I will not blame or insult the doctor for my poor health and having eclampsia. The doctor examined me well during my ANC visits and gave me proper medicine.” - FIDI Urban, Chakwal

Three respondents from Sindh mentioned financial barriers to seeking ANC care. Except for one woman, all mentioned that their blood pressure was measured during ANC, but five women mentioned that their blood pressure results were not shared with them. Twelve women had their blood and urine test done during ANC visits. Physical examination was performed by the service providers during the ANC visits for most of the respondents. The majority of the respondents (13) were not informed about the danger signs or future complications during pregnancy by the service providers. This is reflected in the respondents' statements.

“I was suffering from hypertension since the beginning of my pregnancy. I went for ANC regularly, but doctors at the private clinics didn't diagnose my problem.” - FIDI Rural, Chakwal

“The doctor checked her BP, which was 180/120 at that time, but the doctor considered it normal and stated so, too. The doctor further said that since it was my first pregnancy and that was why I was taking everything more seriously.” - FIDI Rural, Thatta

“The doctor did not recommend that I go to another doctor for ANC. She always said that she was treating my seizures according to her capability, and that if I wanted and could afford to seek care elsewhere I could go.” - FIDI Urban, Thatta

One respondent suggested:

“Women should seek proper ANC to prevent eclampsia. Awareness should be raised about this during the ANC visits so that pregnant women and their families are able to cope with it.” - FIDI Urban, Chakwal

Eclampsia Management

Fourteen respondents experienced eclampsia once. Six women who suffered from eclampsia during more than one pregnancy were mainly from Sindh Province. Half of the respondents had suffered from eclampsia during their first pregnancy, seven women in their second pregnancy, and three in their third pregnancy. Only one respondent suffered from eclampsia during her tenth pregnancy. The majority of respondents (13) were taken to facilities (first contact with community midwives, secondary or tertiary care level facilities) that were close to their residence.

Only three women were treated at a first contact facility. In one case, this happened to be a private facility, whereas two respondents were treated at tertiary facilities. The remaining 12 respondents were referred to other facilities. These referrals were to different types of health facilities; 15 were referred to the public health facilities (nine at tertiary level, five at secondary level and one at primary level), and two women were referred to private facilities. Among these 12 referrals, six were again referred to tertiary facilities. Thus, out of 20 women, 16 were treated at tertiary facilities and four were treated at private health facilities. The gravity of the situation was explained to the attendants.

“Doctor saw her condition and referred her to a hospital in Rawalpindi. The doctor said that they could not manage her and that she might even die on her way to the hospital. We were so scared for her and fearing for her life, immediately arranged for an ambulance and brought her to Holy Family Hospital, Rawalpindi.” - Sister in law
“The doctor refused to treat me. She said that since they did not have neonatal nursery to cope with the complications of the baby in the hospital (Civil Hospital, Raja Bazar), it was necessary to refer me to Holy Family Hospital or Benazir Hospital of Rawalpindi.” - FIDI, Rural, Chakwal

Survivors of eclampsia were neither aware of the severity of the disease, nor did they know about which was the appropriate health facility to go to for treatment. Many were rushed to the available health facility at the time of emergency. Families accurately perceived sudden convulsions a dire emergency. Some families, mainly in Sindh, associated the presence of fits with supernatural phenomenon and resorted to seeking treatment from the spiritual healers.

“Some elder ladies from the community also advised me that I am suffering from “Lughat” or “SAYA” (possession by supernatural being), and that I should visit a spiritual healer so her mother-in-law took her to a Murshad (spiritual healer). - FIDI Rural, Thatta

“Despite the referral advice by my service provider to Jinnah Hospital, I was taken back home and treatment was sought from a spiritual healer, who treated me for Lughat.” - FIDI Rural, Thatta

Public sector health facilities near the communities

Although public health facilities were available near the communities, respondents rarely sought ANC services due to poor-quality services. Only three respondents went for first ANC at public sector health facilities. Mostly, respondents sought the ANC care from the private service providers due to their availability in the evenings, better quality of services, and less waiting time. The private practitioners, however, referred women with eclampsia to another tertiary level facility. Sixteen of the 20 respondents received eclampsia management at public tertiary level health care facilities. Treatment was delayed, as many respondents went to the private practitioners first and then were referred to the tertiary hospitals.

“If the primary and secondary level facilities would have capacity to treat eclampsia, then women would receive timely treatment and not suffer the hassle of being referred from one facility to the next.” - FIDI Rural, Thatta

Quality of care and experiences with service providers and facilities

At most secondary level health facilities, doctors did not attend to the patients and without giving any first aid or documentation, referred them to tertiary level hospital. Even at the tertiary facility, there was no arrangement of blood transfusion to cope with emergencies. Moreover, in some cases treatment was delayed.

Most of the respondents lived in rural areas.

“We belong to rural areas and are not familiar with the city. The hospital staff did not guide us properly. The condition of our patient worsened and we were in great tension. The attitude of hospital staff was very bad with us.” - FIDI Rural, Thatta

None of the providers clarified their queries or provided information about their condition. Medicines were purchased from outside the hospital, and respondents who were interviewed at the tertiary facilities stated that they were satisfied with the treatment of doctors and services of hospital.

“Doctors are giving very good treatment and are very caring ... My experience of treatment at this hospital is very good, as my doctor dealt with me very well. I am very satisfied with behavior of the doctor.” - FIDI Urban, Chakwal

Another respondent said:

“Doctor attended to me very well when I arrived here. They routinely visited and checked on me.” - FIDI Urban, Chakwal

Most private facilities were reluctant to deal with emergencies or complicated cases, and preferred to refer them to a public facility.

Barriers in seeking treatment for eclampsia

The majority of respondents resided in rural areas. Due to a lack of appropriate health facilities to deal with such cases, most respondents were referred. Arrangements to reach the referral facility for quality services were made by the families themselves. Mothers-in-law and husbands were the major decision makers regarding where to seek treatment. Time was lost in arranging for the money. Episodes of seizures were perceived as dire emergency by the families, so not much time was lost in making the decision to seek health services.

“In the morning when she suddenly had seizures, we were all frightened for her life. We did not waste any time, and on doctor’s advice moved her to Rawalpindi.” - FIDI Rural, Chakwal

“I consulted a private doctor for seizures. I wanted to go to any big hospital in Karachi for treatment, but could not afford to do that. I have spent a lot of money in seeking care. I have spent all my savings and sold my jewelry. I took a loan to pay the doctor’s fee. We had just one cow, which we had to sell to get treatment for this disease.” - FIDI Urban, Thatta

“I just visited a private doctor for ANC, but for delivery I did not avail her services as I cannot afford the expenses. She takes 40 to 50 thousand rupees for delivery.” - FIDI Urban, Thatta

“Although my mother-in-law was at home, she did not take me to hospital because she did not have money for my treatment. They called my mother from Peshawar and when she arrived, she then took me to hospital.” - FIDI Rural, Chakwal

Discussion

This landscape analysis on pre-eclampsia and eclampsia is perhaps the first of its kind in Pakistan, blending multiple perspectives on provision of care through the public health system for pregnant women facing, or at risk of, PE/E. The analysis is based on interviews with key stakeholders, including policymakers, as well as service providers and ANC clients at public health facilities; a structured rapid assessment of health facilities; observations of client-provider interactions; and focus group discussions with community members, including women who had suffered from, and who had been treated for, PE/E. The main strength of this analysis is that we have adopted a health systems approach, seeking to understand the gaps at policy, management, service provision, and community levels that hinder timely detection, treatment, and prevention of PE/E. This report has a especially focused on identifying the barriers that contribute to underutilization of globally recommended drugs and interventions for managing this life-threatening condition.

Health systems barriers impeding the use of MgSO₄ have been identified at the provincial and the district level, and key policy and programmatic recommendations framed are based on this.

As is well understood, health system functionality is to a large extent dependent upon the working and availability of health infrastructure. Through this analysis, we have identified a number of basic infrastructural weaknesses. For example, the District Headquarters Hospital in Thatta and one Rural Health Center do not have a regular water supply, and primary healthcare facilities in Thatta and Chakwal do not have heating arrangements in delivery rooms. For diagnosing proteinuria in suspected eclampsia patients, the availability of urine testing equipment is an important prerequisite; yet, in both districts, some facilities did not have urine testing equipment. In Chakwal, none of the primary healthcare facilities sampled had calcium gluconate available for use in the rare but possible event of MgSO₄ toxicity. The lack of such basic necessities severely compromises the quality of services.

A positive finding was that protocols for preventing and managing eclampsia have been developed and are widely available at all health facilities. However, protocols on how to administer MgSO₄, although developed, have still not been widely distributed.

Utilization of MgSO₄ is also negatively affected by inconsistent availability. The extent of this issue can be gauged from the fact that the District Headquarter Hospital in Chakwal, which is the main referral facility in the district, did not have MgSO₄ in stock at the time it was assessed. Compared to PHC facilities, MgSO₄ was being used only at SHC facilities (45 percent) and the Pritchard regime was being used. Similarly, all of the primary healthcare facilities in Thatta reported a stock-out of MgSO₄. To tackle the situation in Punjab, the IRMNCH Program in the province has specifically directed all PHCs and SHCs to maintain a stock of five ampules of MgSO₄ at all times. While this is a step in the right direction, the issue can be addressed on a surer footing by ensuring that the health management information system (HMIS) captures how frequently MgSO₄ is administered. New metrics must accordingly be added and monitored regularly. At present, the private sector has not been fully engaged in PE/E prevention and management activities. Involving them through trainings will greatly help in ensuring the widespread diffusion of this innovation and will help in boosting demand and supply by the manufacturers.

In terms of provider capacities, the analysis found that while training curricula for PHC staff have been updated to include management of PE/E, the capacity of the instructing staff has not yet been developed. UNFPA and Jhpiego have taken the lead in training providers but the training is broad-based and does not focus specifically on PE/E management. Until or unless the providers receive focused training on MgSO₄ administration within hospital settings, their fear of using the drug will not diminish. Another area that impacts MgSO₄ use is the availability of a functional referral system. Until very recently the lack of an effective referral system was a major reason why women could not receive appropriate and timely care. The recent appointment of referral coordinators at tertiary facilities who will manage clients, referred from lower facility is a step in the right direction. In addition, the government must make a policy decision to enable the community midwives to give the intramuscular loading dose of MgSO₄ and then refer patients to the referral coordinators for continued care. This will greatly help women who reside in rural areas. The key element that will influence the integrity of the referral system is transport mechanism that allows women to reach the referral coordinators on time once they have received the loading dose. For this a community based transport system and functional ambulances at PHC facilities are critical. We found that in Chakwal district, none of the PHCs had a functional ambulance.

The pathogenesis of PE/E varies from one woman to the next, depending upon underlying risk factors. Therefore, it is important that the ANC examination be geared toward improving the identification of the various risk factors that can predispose women to PE/E, such as nuliparity, family history of PE/E, diabetes, increased body mass index, maternal age, renal disease, and hypertension on booking the case. We found critical gaps in provision of ANC: Service providers frequently omitted important steps, such as taking a proper history of the patient, advising urine tests (protein) and blood tests (hemoglobin), measuring height, and checking for edema. This was the most common among providers at secondary healthcare facilities. Provision of an ANC checklist and making laboratories functional at all PHCs must be a priority of the government. A supervisory model that includes onsite training imparted by tertiary care providers who visit PHCs periodically can also be introduced to improve the quality of maternal healthcare.

Documentation of ANC visits and patient record keeping were identified as another area of weakness by this analysis. Records indicate quality of care and are important for monitoring interventions. Review of records should therefore be a part of the routine supportive supervision carried out by the district managers. On the whole, we found that primary healthcare providers were more thorough in providing ANC, compared to secondary healthcare providers. This could be attributed to the fact that the client load at PHCs is lower than that at secondary facilities. However, SHC doctors were more knowledgeable in identifying risk factors associated with PE/E, and were using anti-hypertensive drugs, mainly (Methyldopa/Aldomet), for treating hypertension.

Our research clearly highlights the knowledge differences between medical doctors and the other medical service providers. The main differences that exist are identifying hypertensive disorders in pregnancy, correct dosage of MgSO₄, how to deal with MgSO₄ toxicity, and danger signs of pregnancy. Doctors based at SHCs were better informed about monitoring MgSO₄ toxicity, use of aspirin and use of antihypertensive drugs. However, doctors and the other service providers had sound knowledge regarding diagnosing PE/E based on signs and symptoms. This knowledge now needs to be converted into good management practices through proper trainings specifically focusing on MgSO₄. This will

help providers overcome their fears and hesitancy in routine use of MgSO₄. Notably, policymakers, program managers, and service providers were unclear about the role of aspirin prophylaxis, as there are no guidelines available. Even members of the Society of Obstetricians and Gynecologists of Pakistan (SOGP) showed some ambiguity about the efficacy of aspirin prophylaxis.

At the community level, while there is a better understanding regarding the medical cause of convulsions during pregnancy and people perceive it as a medical emergency, the symptoms of pre-eclampsia are still not understood, and therefore danger signs are missed or not taken seriously by the relatives of pregnant women. For instance, in some rural communities in Sindh with high levels of illiteracy, convulsions in pregnancy are still attributed to supernatural causes and people resort to spiritual healers instead of seeking healthcare services. Community awareness and health education sessions must be enhanced to improve the knowledge base regarding the danger signs of pregnancy and to remove misconceptions about PE/E so women can access timely and appropriate care. Such awareness can be created through existing forums, such as the lady health workers and by developing better linkages between the Lady Health Workers and community midwives, who can synergistically work toward improving the continuum of care from home to hospital. Communities can also be motivated to access care more frequently if the widespread concern about the rude and unhelpful behavior of public sector providers, which is currently a major barrier, is addressed. Other barriers, such as lack of transport and medical expenses incurred while seeking facility-based care can be reduced through community-based emergency funds, helping communities make prior arrangements with transporters and if the government introduces voucher and health insurance schemes for the rural poor.

Recommendations

For implementing the following key recommendations, the Ending Eclampsia project suggests the establishment of a task force comprising of members of professional bodies, health providers, civil society, and researchers who can periodically engage with policymakers to advocate for policy and programmatic changes:

- To remove ambiguities in the minds of providers and ensure administration of the correct dose of MgSO₄, there is a need for introducing a uniform policy clearly outlining the dosage, route of administration of MgSO₄, and cadres mandated to give the loading and maintenance dose.
- A policy decision is required to enable CMWs to give the loading dose of MgSO₄ and then refer clients to the higher care facilities for management. Global evidence can influence such a policy.
- All PHCs must be well-equipped, with basic amenities, supplies, and trained healthcare providers. This will enable them to provide round-the-clock basic emergency obstetric care. Empower the established District Technical Committees to monitor service provision.
- Develop human resources for health policy to ensure that facilities do not have staff shortages.
- Encourage task sharing between the community-based LHWs and CMWs to achieve deeper uptake of services and information. Establish forum of women support groups for health education sessions by LHWs to create general awareness about PE/E and the use of MgSO₄.
- Create awareness through networks of influential community members, such as religious leaders, elected representatives, and school teachers.
- Policy decisions and guidelines must be prepared for the prophylactic use of aspirin and antihypertensive drugs.
- Develop a comprehensive pre- and in-service competency-based MNCH training strategy for all levels of providers to enhance provider competence in the use of MgSO₄. The strategy should include training schedules for new and refresher trainings, onsite training approaches, and a mechanism for assessing competence.
- Initiate a behavior change training to support public sector providers to deliver more client centered services that incorporates clients' needs and how best to meet their needs in an empathetic manner. This will help rural women overcoming a major barrier that currently prevents them from seeking care at public facilities.
- Include a section on management of obstetric complications in the Health Management Information System (HMIS). With this, program managers can gauge to what extent each level facility is providing obstetric care, including use of MgSO₄.
- As part of supportive supervision, district managers should ensure that all MNCH care providers use a checklist while providing ANC. This will ensure that none of the essential components of an ANC visit are missed and PE/E cases are diagnosed early.

- PE/E management protocols, especially how to administer MgSO₄, should be widely distributed to ensure they are universally available, and should be prominently displayed at health facilities.
- CMWs must be provided with competency-based training in administering MgSO₄, putting into practice their theoretical knowledge and linking to higher facilities through a functional referral system.
- A policy decision for the inclusion of PE/E management and use of MgSO₄ at all facility levels in the list of key performance indicators.
- The health care commissions must ensure that PE\E management is included in the minimum standards for registration and licensing of private practitioners.

Annex: 1

Table 1: Factors influencing correct diagnosis of chronic hypertension in pregnancy, severe pre-eclampsia and eclampsia

		Type of facility		Duration of work in this ward/unit				Received any training on maternal health, FP or child health care		Total
		Secondary level	Primary level	<=1 years	1-5 years	5-10 years	>10 years	Yes	No	
Doctors	Severe Pre-eclampsia	81.8	55.6	66.7	50.0	100.0	71.4	50.0	83.3	70.0
	Chronic hypertension	81.8	77.8	66.7	83.3	100.0	71.4	87.5	75.0	80.0
	Eclampsia	90.9	77.8	66.7	83.3	100.0	85.7	100.0	75.0	85.0
	N	11	9	3	6	4	7	8	12	20
Others service providers	Severe Pre-eclampsia	80.0	55.6	40.0	88.9	25.0	60.0	53.3	75.0	60.9
	Chronic hypertension	60.0	50.0	80.0	44.4	0.0	80.0	40.0	75.0	52.2
	Eclampsia	80.0	83.3	80.0	66.7	100.0	100.0	73.3	100.0	82.6
	N	5	18	5	9	4	5	15	8	23
Overall	Severe Pre-eclampsia	81.3	55.6	50.0	73.3	62.5	66.7	52.2	80.0	65.1
	Chronic hypertension	75.0	59.3	75.0	60.0	50.0	75.0	56.5	75.0	65.1
	Eclampsia	87.5	81.5	75.0	73.3	100.0	91.7	82.6	85.0	83.7
	N	16	27	8	15	8	12	23	20	43

Table 2: Proportion of providers who knew correctly when to initiate anti-hypertensive drug use for mild to moderate and severe hypertension in pregnancy

		Type of facility		Duration of work in this ward/unit				Received any training on maternal health, FP or child health care		Total
		Secondary level	Primary level	<=1 years	1-5 years	5-10 years	>10 years	Yes	No	
Doctor	Mild hypertension	63.6	33.3	66.7	50.0	25.0	57.1	62.5	41.7	50.0
	Severe hypertension	27.3	11.1	0.0	33.3	25.0	14.3	12.5	25.0	20.0
	N	11	9	3	6	4	7	8	12	20
Others service providers	Mild hypertension	40.0	27.8	40.0	22.2	50.0	20.0	40.0	12.5	30.4
	Severe hypertension	20.0	0.0	0.0	11.1	0.0	0.0	6.7	0.0	4.3
	N	5	18	5	9	4	5	15	8	23
Overall	Mild hypertension	56.3	29.6	50.0	33.3	37.5	41.7	47.8	30.0	39.5
	Severe hypertension	25.0	3.7	0.0	20.0	12.5	8.3	8.7	15.0	11.6
	N	16	27	8	15	8	12	23	20	43

Table 3: Factors associated with service providers' knowledge of loading and maintenance doses of MgSO4

		Type of facility		Duration of work in this ward/unit				Received any training on maternal health, FP or child health care		Total
		Secondary level	Primary level	<=1 years	1-5 years	5-10 years	>10 years	Yes	No	
Doctor	Total loading dose of MgSO4	54.5	33.3	33.3	66.7	50.0	28.6	62.5	33.3	45.0
	Maintenance dose of MgSO4	54.5	33.3	33.3	66.7	50.0	28.6	62.5	33.3	45.0
	N	11	9	3	6	4	7	8	12	20
Others service providers	Total loading dose of MgSO4	20.0	16.7	20.0	22.2	0.0	20.0	13.3	25.0	17.4
	Maintenance dose of MgSO4	20.0	11.1	0.0	33.3	0.0	0.0	13.3	12.5	13.0
	N	5	18	5	9	4	5	15	8	23
Overall	Total loading dose of MgSO4	43.8	22.2	25.0	40.0	25.0	25.0	30.4	30.0	30.2
	Maintenance dose of MgSO4	43.8	18.5	12.5	46.7	25.0	16.7	30.4	25.0	27.9
	N	16	27	8	15	8	12	23	20	43

Table 4: Service providers' knowledge on monitoring for and treating MgSO4 toxicity

		Type of facility		Duration of work in this ward/unit				Received any training on maternal health, FP or child health care		Total
		Secondary level	Primary level	<=1 years	1-5 years	5-10 years	>10 years	Yes	No	
Doctor	Ways to monitor for MgSO4 toxicity	0.0	11.1	0.0	0.0	25.0	0.0	0.0	8.3	5.0
	Drug is used to treat MgSO4 toxicity	72.7	66.7	66.7	66.7	100.0	57.1	75.0	66.7	70.0
	N	11	9	3	6	4	7	8	12	20
Others service providers	Ways to monitor for MgSO4 toxicity	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Drug is used to treat MgSO4 toxicity	100.0	27.8	40.0	66.7	25.0	20.0	46.7	37.5	43.5
	N	5	18	5	9	4	5	15	8	23
Overall	Ways to monitor for MgSO4 toxicity	0.0	3.7	0.0	0.0	12.5	0.0	0.0	5.0	2.3
	Drug is used to treat MgSO4 toxicity	81.3	40.7	50.0	66.7	62.5	41.7	56.5	55.0	55.8
	N	16	27	8	15	8	12	23	20	43

Table 5: Maternal risk factors for developing PE, and for which aspirin prophylaxis is desirable

		Type of facility		Duration of work in this ward/unit				Received any training on maternal health, FP or child health care		Total
		Secondary level	Primary level	<=1 years	1-5 years	5-10 years	>10 years	Yes	No	
Doctor	Previous history	72.7	22.2	33.3	50.0	50.0	57.1	37.5	58.3	50.0
	Family history	9.1	11.1	33.3	16.7	0.0	0.0	0.0	16.7	10.0
	High risk pregnancy	18.2	0.0	0.0	16.7	0.0	14.3	12.5	8.3	10.0
	Obesity	9.1	0.0	0.0	0.0	25.0	0.0	0.0	8.3	5.0
	High BP	36.4	11.1	66.7	16.7	0.0	28.6	12.5	33.3	25.0
	Anemia	9.1	0.0	0.0	0.0	0.0	14.3	0.0	8.3	5.0
	Chronic HTN	9.1	0.0	0.0	0.0	25.0	0.0	0.0	8.3	5.0
	Don't know	27.3	66.7	33.3	50.0	50.0	42.9	62.5	33.3	45.0
	N	11	9	3	6	4	7	8	12	20
Others service providers	High BP	20.0	11.1	40.0	11.1	0.0	0.0	13.3	12.5	13.0
	Don't know	80.0	88.9	60.0	88.9	100.0	100.0	86.7	87.5	87.0
	N	5	18	5	9	4	5	15	8	23
Overall	Previous history	50.0	7.4	12.5	20.0	25.0	33.3	13.0	35.0	23.3
	Family history	6.3	3.7	12.5	6.7	0.0	0.0	0.0	10.0	4.7
	High risk pregnancy	12.5	0.0	0.0	6.7	0.0	8.3	4.3	5.0	4.7
	Obesity	6.3	0.0	0.0	0.0	12.5	0.0	0.0	5.0	2.3
	High BP	31.3	11.1	50.0	13.3	0.0	16.7	13.0	25.0	18.6
	Anemia	6.3	0.0	0.0	0.0	0.0	8.3	0.0	5.0	2.3
	Chronic HTN	6.3	0.0	0.0	0.0	12.5	0.0	0.0	5.0	2.3
	Don't know	43.8	81.5	50.0	73.3	75.0	66.7	78.3	55.0	67.4
	N	16	27	8	15	8	12	23	20	43

Table 6: Use of aspirin and antihypertensive drugs for pregnant women who are at risk of developing PE/E

		Type of facility		Duration of work in this ward/unit				Received any training on maternal health, FP or child health care		Total
		Secondary level	Primary level	<=1 years	1-5 years	5-10 years	>10 years	Yes	No	
Doctor	Use aspirin among women who are at risk of developing PE/E	54.5	33.3	33.3	66.7	25.0	42.9	37.5	50.0	45.0
	Use anti-hypertensive drugs with pregnant women who have high BP	81.8	77.8	0.0	83.3	100.0	100.0	100.0	66.7	80.0
	N	11	9	3	6	4	7	8	12	20
Others service providers	Use aspirin among women who are at risk of developing PE/E	20.0	5.6	40.0	0.0	0.0	0.0	6.7	12.5	8.7
	Use anti-hypertensive drugs with pregnant women who have high BP	100.0	33.3	40.0	77.8	25.0	20.0	40.0	62.5	47.8
	N	5	18	5	9	4	5	15	8	23
Overall	Use aspirin among women who are at risk of developing PE/E	43.8	14.8	37.5	26.7	12.5	25.0	17.4	35.0	25.6
	Use anti-hypertensive drugs with pregnant women who have high BP	87.5	48.1	25.0	80.0	62.5	66.7	60.9	65.0	62.8
	N	16	27	8	15	8	12	23	20	43