

# Coverage and Quality of Antenatal Care in the Secondary Care Hospitals in Punjab, Pakistan

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## Abstract

**Background:** Antenatal care (ANC) is a globally endorsed strategy for the early identification of maternal and fetal risks and for preventing adverse outcomes, particularly in low- and middle-income countries (LMICs). This study examines ANC coverage and quality in the context of Pakistan, highlighting service gaps and their potential impact on maternal and neonatal outcomes.

**Methodology:** A retrospective descriptive analysis was conducted using data extracted from the District Health Information Reports (2019–2021) and the Electronic Medical Records (EMR) system at Manawan Hospital, Lahore. ANC coverage and service quality were evaluated based on the essential package outlined by the Punjab Ministry of Health's Minimum Standards of Service Delivery.

**Results:** Between 2019 and 2021, a total of 10,921,680 first ANC (ANC-1) visits were recorded across Punjab, with an average of 420 monthly ANC visits and 114 deliveries per Tehsil Headquarters Hospital. Among these, 83% were normal vaginal deliveries and 17% were cesarean sections. Despite this volume, critical service elements—such as medical record documentation, blood pressure monitoring, Tetanus Toxoid vaccination, breastfeeding counseling, and clinical treatment protocols—were inconsistently implemented.

**Conclusion:** The quality and coverage of ANC services in secondary care settings are influenced by systemic issues, including limited accessibility, inadequate EMR adherence, workforce capacity, diagnostic availability, and patient education. The development and integration of performance indicators are recommended to improve early detection, service quality, and pregnancy outcomes. Further research is warranted to address data gaps and strengthen ANC services in Pakistan.

**Keywords:** Antenatal Care; ANC Coverage; Prenatal Services; Maternal Health; Pregnancy Outcome; Electronic Medical Records; Health System Quality; Pakistan

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## Introduction

Good health & well-being, the third Sustainable Development Goal, focused on the reduction in the global maternal mortality ratio to less than 70 per 100,000 live births. Many maternal deaths are due to unsafe care provided in healthcare facilities resulting from missed diagnosis of high-risk pregnancies, poor management of obstetrical complications and unnecessary, obstetrical trauma, and harmful practices during antenatal, natal, and post-natal care (1). Addressing this substantial burden of ill health, the United Nations Global Strategy for Women's, Children's, and Adolescent Health (2016–2030) prioritizes a significant reduction, aligning with mortality reduction targets outlined in the Sustainable Development Goals (2,16).

The World Health Organization (WHO) underscores the disparate maternal death risks between developing and developed countries. In developing countries, the risk is one in sixty-one parturient, contrasting significantly with developed countries where it diminishes to one in twenty-eight hundred. Alarming, ninety-nine percent of the total reported maternal deaths annually originate from developing countries (2).

Studies consistently highlight that insufficient access and underutilization of contemporary ANC



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contribute to unfavorable pregnancy outcomes. The WHO (2016) has taken a crucial step in addressing this concern by publishing updated guidelines on antenatal care and advocating for eight antenatal visits for healthy pregnancy outcomes (3). Factors influencing ANC service utilization are categorized into seven themes: availability, accessibility, affordability, sociodemographic indicators, quality of health services, women's position in the household and society, and women's knowledge, attitudes, beliefs, and culture (4). It is also found that utilization of ANC services is positively affected by health insurance coverage, and in a number of cases, attending healthcare professionals have increased many-fold due to the cost paid under health insurance (5).

Conversely, barriers to compliance with WHO recommendations stem from the identified poor quality of care and negative attitudes exhibited by service providers (6). Women expressed reluctance to be referred to certain hospitals due to unsatisfactory relationships with healthcare providers and encounters with nurses characterized by rudeness and unfriendliness (7). The availability of services for healthcare workers and waiting times for assistance further impact ANC service utilization (8). Parturients with easy access to health workers or nurses were more likely to receive adequate and timely ANC than women living in some far-flung areas where health workers are seldom available (4).

Hence, accessibility of the services is another factor that should be considered while evaluating the utilization of ANC (9). Increased distance or travel time to the nearest healthcare facilities correlates with a higher dropout rate (9). Qualitative studies also underscore that physical access challenges, including distance to services, uncomfortable transport, and poor road conditions, stand out as significant barriers to ANC service utilization (5-8). The World Health Organization's ANC model advocates for visits to skilled healthcare professionals, emphasizing obstetrical examination, screening, testing, health education, and counseling on maternal and neonatal care delivered in a respectful manner (25). A study in Sargodha District, Pakistan, revealed 52% of pregnant women rated public hospital prenatal care as poor quality, citing staff unavailability and long wait times (27). Quality improvements are essential to boost antenatal care utilization and maternal/child health.

Maternal and perinatal morbidity and mortality pose significant challenges to low- and middle-income countries. In 2015, an estimated 303,000 maternal deaths resulting from pregnancy-related causes, 2.6 million stillbirths (half in the third trimester), and 2.7 million neonatal deaths were reported (24). Another study has revealed that 295,000 maternal deaths were reported in 2017 and ninety-four percent occurred in lower middle income and the majority of pregnancy-related deaths are due to inadequate quality of care. (25). Early identification and mitigation of risk factors have the potential to decrease maternal

mortality by 50-70%, providing effective and timely antenatal care is administered to expectant mothers. Recent advancements in global maternal health have prompted a shift in focus from mere coverage to ensuring the quality of antenatal care (ANC), particularly at the healthcare facility level.

The World Health Organization underscores the pivotal role of ANC as an indispensable component of the household-to-hospital care continuum, functioning as a key mechanism to reduce maternal mortality and morbidity (13).

Within the Punjab Health Sector Strategy 2018-2029, Maternal and Child Health, Nutrition, and Family planning emerge as the foremost thematic area (11). The Government of Punjab, in its commitment to enhancing health indicators, particularly in terms of deliveries attended by skilled birth attendants, has made strides in recent years. However, as per the Punjab Pakistan Demographic & Health Survey Report 2017-2018, only half of the women are availing the requisite number of ANC visits (12).

ANC plays a critical role in the identification and management of pregnancy-related or intercurrent illnesses, such as malaria, anemia, and syphilis, which bear significant implications for maternal and neonatal health (13). Moreover, ANC serves as an avenue for expectant individuals and their families to acquire knowledge about the risks associated with pregnancy. This knowledge, in turn, informs health-seeking practices and decision-making, ultimately acting as a preventive measure against maternal and infant morbidity and mortality (13).

A cross-sectional study conducted in Punjab, Pakistan, identified key components influencing pregnant women's perceptions of antenatal care quality during COVID-19, including quality services, accessibility, patient-centered approaches, and adequate staffing (27). However, telehealth services have demonstrated potential benefits in primary and antenatal care settings, particularly during the pandemic, with potential benefits in cost savings and increased accessibility. (28)

Considering the aforementioned, it becomes evident that robust Antenatal Care (ANC) is a formidable factor in averting a majority of adverse maternal and perinatal outcomes, particularly in the context of Low and Middle-Income Countries. The adoption of a human rights-based approach, as advocated by WHO, coupled with the strategic emphasis on Maternal, Neonatal and Child health, Nutrition, and Family planning in the Punjab Health Sector Strategy, underscores the multifaceted nature of efforts required to enhance ANC accessibility and quality, thereby contributing to improved maternal and neonatal health outcomes.

#### **Objectives of the Study:**

- Find a way forward for optimum ANC coverage and quality

in secondary care health facilities, leading to an optimum reduction in prenatal and antenatal morbidity and mortality.

- Reveal the measures to improve the quality of the ANC during contacts regarding assessment, identification of risks, management of those risks, and counseling of the parturient to improve the pregnancy outcomes.
- Identify the gaps in the District Health Information System (DHIS) report that can improve compliance with the latest guidelines on the subject.

## Methodology

This retrospective descriptive study aims to assess the coverage and quality of Antenatal Care services within secondary care hospitals working under Public Private partnerships and Tehsil headquarters hospitals managed by the Health Department, Government of Punjab. The study relies on data extracted from the annual report of the District Health Information System for the period 2019 to 2021, focusing on the utilization of ANC services.

The evaluation criteria for both coverage and quality of ANC services are based on the essential package outlined in the Minimum Service Delivery Standards published by the Government of Punjab.

This research scope centers on the coverage and quality of ANC, reflecting the facility's market share in delivering antenatal services, the competency of healthcare providers within the facility, and the trust the community places in health facilities or providers.

The assessment of ANC coverage utilizes data from the District Health Information System annual report for the period under review (2019 to 2021), encompassing maternal health data, including antenatal coverage in Tehsil Head Quarters, established in the province of Punjab. The parameters for ANC coverage include the number of pregnant women in the catchment area utilizing ANC services (ANC-1 contacts), average numbers of ANC-1 visits per month per health facility (categorized by type), percentage of anemia among parturients attending ANC-1 visits, average number of deliveries conducted per month per health facility, differentiation between normal deliveries and cesarean sections at THQs, data on obstetric complications among parturients, and related admissions and deaths. These indicators collectively offer a comprehensive understanding of ANC coverage and quality within secondary care hospitals in Punjab.

## Results

In the examination of results derived from the Annual DHIS report for the period 2019 to 2021, it is observed that a total of 10921680 Antenatal Care ANC-1 visits were documented during the specified period. This corresponds to an average of

420 parturients per month per Tehsil Headquarters in Government hospitals in the Punjab region, as outlined in Table 1.

During the period under review, 32,705 ANC-1 parturients were registered with a monthly average of 905 which is 53.59% higher than parturients registered for ANC-1 at THQ hospitals Government of Punjab. According to the Annual DHIS reports for 2019-2021, the average No of ANC-1 visits per THQ per month was 420 while 905 parturients were registered at Manawan Hospital. In Manawan Hospital, Follow-up visits conducted during the period under review were 114,467 with an average of 3.5 visits per parturient during the period of gestation while the DHIS report does not contain data on follow-up visits and per parturient visits during ANC. Data on total antenatal visits per year, referral to tertiary hospitals, and dropout is not directly available in the DHIS Report but calculated from the data given on ANC-1 visits and total No of deliveries at THQ level is 33.52% while the Dropout rate at Manawan Hospital was 16.41%. Similarly, data on referrals from THQ hospitals could also not be found in the DHIS Report. At the same time, 930 (10.46%) patients were referred to teaching hospitals for being beyond the capacity of this secondary care hospital.

The average number of deliveries conducted per month per THQ hospital is 118 while deliveries conducted at Manawan Hospital per month are 384 which is 69.27% higher than THQ Hospitals. The ratio of NVD and C-sections were also analyzed and found that the NVD rate at THQ Hospital is 83% while 49.76% at Manawan Hospital. Similarly, the C-section rate at THQ Hospital is only 17%, and 50.23% at Manawan Hospital.

It is, however, noteworthy that the DHIS report lacks comprehensive information concerning medical record documentation related to essential components of Antenatal Care (ANC). Specifically, the report does not encompass details on history taking regarding previous stillbirths, perception of baby movement, occurrences of abortions, incidents of headache/blurring of vision, assisted deliveries, instances of vaginal bleeding, cases of swelling and fever, measurements of blood pressure, findings of breast examinations, counseling for breastfeeding, administration of Tetanus Toxoid (TT) vaccination, adherence to protocols and practices for treatment and service delivery, prescription of anti-malarial drugs, provision of iron and folic acid, and an evaluation of the quality of counseling.

The absence of these crucial elements in the DHIS report limits a comprehensive understanding of the quality dimensions of ANC services provided by THQ hospitals. To address this limitation, future assessments, and reporting mechanisms should incorporate a more exhaustive evaluation encompassing the essential components of ANC to ensure a comprehensive and accurate depiction of the care provided to parturients in the Punjab region.

**Table 1: Comparison of District Health Information System (DHIS) Reports and THQ Hospitals under Public-Private Partnership (2019–2021)**

| District Health Information System Reports |                      |                   |                  |         | Tehsil Head Quarter Hospitals (THQ) working under a public-private partnership |        |        |         |
|--------------------------------------------|----------------------|-------------------|------------------|---------|--------------------------------------------------------------------------------|--------|--------|---------|
|                                            | 2019                 | 2020              | 2021             | Average | 2019                                                                           | 2020   | 2021   | Average |
| ANC-1                                      | 4,284,440            | 3,427,735         | 3,209,505        | 3640560 | 10,935                                                                         | 12,775 | 8895   | 10,901  |
| ANC-1 per month per THQ                    | 475                  | 390               | 395              | 420     | 911                                                                            | 1064   | 741    | 905     |
| No Deliveries per month per THQ            | 110                  | 115               | 118              | 114     | 313                                                                            | 374    | 465    | 384     |
| NVD                                        | 1,338,530<br>(82.7%) | 984453<br>(82.6%) | 976878<br>(83%)  | 1099953 | 2001                                                                           | 2247   | 2621   | 2,289   |
| C SEC                                      | 226579<br>(16.9%)    | 203803<br>(17%)   | 182,519<br>(17%) | 204300  | 1763                                                                           | 2244   | 2926   | 2311    |
| Total Deliveries                           | 1340707              | 1191832           | 1,128,769        | 1220436 | 3764                                                                           | 4491   | 5547   | 4600    |
| Drop Out                                   | 52%                  | 49%               | 49%              | 33.52%  |                                                                                |        |        |         |
| LBW                                        | 3.0%                 | 3.24%             | 2.5%             |         |                                                                                |        | 16.41% |         |

## Discussion

The significance of Antenatal Care in maternal care cannot be overstated, as it serves as a crucial component in addressing the physical and mental challenges associated with pregnancy, mitigating complications, and contributing to the reduction of maternal and neonatal morbidity and mortality (1). A study shows antenatal coverage in selected countries like Indonesia (97%), Jordan (99%), Nepal (86%), Egypt (91%), and Nigeria (65%) that first antenatal visit coverage was more than 75% while it is too low in our country (17). A study in Sargodha District, Pakistan, also highlighted significant gaps in prenatal care, with 52% of pregnant women reporting poor-quality services due to staff unavailability and prolonged waiting times (27). The literature review lacks prior studies specifically addressing ANC in secondary care hospitals in Pakistan. Secondary care hospitals can alleviate the burden on teaching hospitals, ensuring timely care for mothers and neonates, and contributing to a more efficient and well-organized health system.

An important observation from the discussion pertains to the inadequacy of data within the Annual District Health Information System reports 2019–2021 regarding compliance with the essential packages of antenatal care. The absence of information on health history, physical examination, and laboratory investigations raises concerns regarding the comprehensive assessment of ANC quality within Tehsil Headquarters hospitals. The recommended standard, indicating that more than 80% of pregnant women should undergo at least three properly spaced antenatal care assessments supervised by a skilled attendant, lacks substantiating data in the report (13). Despite the reported antenatal care coverage of ANC-1 visits, per month per Tehsil Head Quarter hospital in Punjab (20), the DHIS report falls short in providing insight into crucial aspects such as referrals to tertiary hospitals and dropouts. The effectiveness of coverage, as per the World Health Organization recommended interventions at least once in antenatal care, remains unaddressed (13). The absence of data on follow-up and per-parturient visits during ANC-2 further limits the assessment of

the continuum of care provided.

The reported distribution of deliveries, with 83% normal deliveries and 17% cesarean sections, is noteworthy. However, the discussion introduces findings from another study at a public sector hospital, revealing only a 50% satisfaction level attributed to long waiting times and inadequate medical supplies (22). Additionally, the absence of data on the proportion of deliveries conducted by skilled birth attendants raises concerns, as more than two-thirds of deliveries should ideally be managed by skilled birth attendants (13).

Furthermore, the DHIS report lacks a benchmark for antenatal services at secondary care hospitals, preventing an evaluation of the utilization of ANC services. Establishing benchmarks is crucial for assessing the efficiency and effectiveness of healthcare delivery, guiding future interventions, and ensuring the provision of high-quality maternal care. In conclusion, while the District Health Information System provides valuable information, addressing these data gaps and enhancing the comprehensiveness of reporting are essential steps to advance the understanding and improvement of ANC services in secondary care hospitals in Punjab.

In antenatal care:

- Telehealth has proven safe and effective, with no increased adverse clinical outcomes for mothers or infants.
- Health economics research suggests telehealth can reduce healthcare costs.
- Telehealth in antenatal care is well-accepted by pregnant women and healthcare providers. (28).

In contrast, telehealth services are currently unavailable in our region's secondary care settings and hospitals, highlighting an opportunity for future development and exploration. Quality improvements are essential to boost antenatal care utilization and maternal/child health.

## Conclusion

In conclusion, achieving optimal ANC coverage and quality within secondary care facilities to reduce prenatal and antenatal



morbidity and mortality necessitates a dual focus: enhancing the quality of care during each patient encounter through improved assessment, risk management, and counseling, and addressing critical data gaps within the DHIS report to better monitor service delivery and guideline adherence. This study was limited by the lack of prior research specifically on ANC in Pakistani secondary care settings and significant data deficiencies within the DHIS reports regarding essential ANC components, follow-up care, skilled birth attendance, and the absence of service benchmarks. Addressing these limitations in future research and implementing the proposed improvements in service delivery and data collection are crucial steps towards improving maternal and neonatal health outcomes.

#### Ethical Approval:

This study was approved by the Indus Hospital & Health Network Institutional Review Board, Karachi  
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**Data Availability:** Data supporting the findings are available upon reasonable request.

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**Conflict of interest:** None declared.

#### Authors' Contribution:

**MFA:** Contributed to the concept and design of the study

**MFA & HHH:** Participated in acquisition, analysis, or interpretation of the data, and involved in drafting of the article.

**JS:** Major revision of the intellectual content

All three authors contribute equally to the article, the manuscript has been read and approved by all the three before the submission.

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