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Trend of Maternal Health Care Services in Nepal: Evidence from Nepal Demographic and Health Surveys 2006-2022

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Abstract

This paper analyzes the trend in three components of the utilization of maternal health care-antenatal care, delivery care, and postnatal care in Nepal. Notwithstanding advances in medical science and numerous efforts to improve maternal health care services, maternal health remains a major challenge in developing countries. It relies on data from the Nepal Demographic and Health Survey conducted in 2006, 2011, 2016, and 2022. Data for the present study covered 4,066 women in 2006, 4,148 in 2011, 3,998 in 2016, and 1933 in 2022 who had utilized antenatal care. The analysis confines itself to women aged 15-49 years who had a live birth in the five years preceding the survey. Data on childbirth and postnatal care were obtained from a total of 2,030 women in 2011 and 1,978 women in 2016 who had a live birth in the two years preceding the survey. The utilization of ANC by skilled health providers increased substantially from 44 per cent in 2006 to 84 per cent in 2016, respectively. However, six per cent of women do not seek even one-time ANC care, and the percentage of women who seek four or more ANC care from a skilled service provider is low. Similarly, still, there are two-fifths of deliveries that take place at home. Postnatal service utilization is still very low in Nepal. Hence, there is a need for efforts to improve the utilization of maternal healthcare services, including postnatal checkups and delivery assisted by skilled attendants.

Keywords: *Antenatal care, Antenatal visit, Delivery care, Maternal health, Postnatal care*

Introduction

Maternal health remains a central global health and development priority. Despite considerable progress over the last two decades, maternal mortality continues

to pose substantial challenges, especially in low- and middle-income countries (LMICs), where approximately 94% of global maternal deaths occur (World Health Organization [WHO], 2019). Every day, an estimated 810 women die from preventable pregnancy- or childbirth-related complications, and thousands more experience severe maternal morbidities (WHO, 2019; GBD 2015 Maternal Mortality Collaborators et al., 2016). Ensuring universal access to quality maternal health services, with antenatal care (ANC), skilled birth attendance, institutional delivery, and postnatal care (PNC), is important to making improvements in survival outcomes and reducing preventable deaths. Therefore, the Sustainable Development Goals (SDGs) set ambitious goals to reduce the maternal mortality ratio (MMR) at the global level to less than 70 per 100,000 live births by 2030 (United Nations, 2020).

Nepal has made substantial improvements in maternal health over the past two decades. The national MMR declined from 539 deaths per 100,000 live births in 1996 to 239 in 2016 (Ministry of Health and Population [MoHP] et al., 2017). However, despite this progress, maternal mortality remains above the SDG target, and inequalities persist across geographic regions, caste/ethnic groups, and socioeconomic strata (Devkota et al., 2021; Scarpa et al., 2022). National policies such as the Safe Motherhood Program, the Maternal Incentive Scheme (2005), free delivery care (2009), and promoting skilled birth attendant (SBA) services, have contributed to better-quality maternal healthcare (Bhatt et al., 2018). However, access and quality challenges persist, predominantly in rural, mountainous, and economically disadvantaged areas.

ANC services are the gateway to the continuum of maternal and newborn care, which allows early detection and management of pregnancy risks (Benova et al., 2018). The WHO recommends a minimum of eight ANC visits to reduce perinatal mortality and improve women's experiences of pregnancy care (WHO, 2016), while Nepal's national guidelines recommend at least four ANC visits (MoHP, 2018). Empirical evidence reveals that adequate ANC is strongly associated with health facility delivery, skilled birth attendance, timely PNC, and improved socio-economic status (Barna et al., 2025; Akowuah et al., 2020).

Institutional delivery and promoting SBA care are very important in preventing intrapartum complications and help contribute to safeguarding maternal and neonatal mortality (Campbell et al., 2006). Nepal's efforts to expand free delivery services and transportation subsidies have led to an increase in health facility births; however, nearly one-fifth of births still occur at home (NDHS 2022). Similarly, PNC remains one of the most neglected components of the continuum of care. The maximum risk period for maternal deaths is within the first 24 hours of postpartum (Say et al., 2014). However, although the early PNC coverage has been increasing in Nepal, only some two-thirds of Nepali women receive timely postnatal checks (NDHS 2022), revealing the existence of substantial disparities.

Although previous studies have examined the situation of maternal health care service utilization in Nepal, few have analyzed long-term national trends using multiple rounds of the Nepal Demographic and Health Survey (NDHS), particularly incorporating the most recent 2022 data. There is a need for updated evidence in monitoring progress and informing targeted interventions. This study fills this gap by

analyzing trends in ANC, delivery care, and PNC in Nepal from 2006 to 2022 utilizing the data from the NDHS.

This study examines long-term trends in maternal healthcare services utilization in Nepal from 2006 to 2022, focusing on antenatal care, skilled birth attendance, and institutional delivery. It also analyses changes in the timing and provider of postnatal care and discusses the implications of such trends for maternal health care policies and Nepal's progress toward achieving the Sustainable Development Goal (SDG) goals.

Methods

This This study uses the freely available NDHS datasets from the MoHP, New ERA, and ICF International. Each survey follows a stratified two-stage cluster sampling design. In the first stage, enumeration areas were selected, and households within the selected enumeration areas were selected in the second stage. All ever-married women aged 15-49 years who were residents of the selected households for the survey were considered eligible to participate in the interview. This standardized approach ensures that the NDHS produces valid and nationally representative estimates of key indicators of reproductive, maternal, and child health care services.

Sample Selection

For this analysis, the study population comprised women aged 15–49 years who had at least one live birth in the reference period preceding each survey. Samples for ANC analyses include women who had a live birth within five years before the surveys conducted in 2006, 2011, and 2016, and within two years before the 2022 survey. In detail, ANC analyses consisted of the following number of eligible women: 4,066 in 2006, 4,148 in 2011, 3,998 in 2016, and 1,966 in 2022. Delivery and PNC analyses relied on women with a live birth in the two years preceding each survey. For the 2022 NDHS, this number comprised 1,933 women and 1,949 live births. In earlier survey rounds, recall periods were 5 years for 2006 and 2 years for 2011 and 2016. All analyses incorporate weights to account for differential probabilities of selection and non-response provided by the NDHS.

Study Variables

Antenatal Care Indicators ANC

ANC indicators captured the type of provider and the number of ANC visits received. Providers were categorized as doctors, nurses/midwives, health assistants/AHW, MCHW, FCHV, TBA, and others. The frequency of ANC visits was categorized as: no ANC, one visit, two to three visits, at least four visits (per national guideline), and at least eight visits (per the WHO 2016 recommendation; applicable only to the NDHS 2022).

Care Indicators at Delivery

The care indicators for delivery included skilled birth attendance, defined as deliveries attended by doctors or nurses/midwives; unskilled attendance, involving TBAs, relatives, or no assistance at all; and the place of delivery. Places of delivery were categorized as government health facilities, private facilities, NGO-run facilities, home, and other places.

PNC Indicators

PNC indicators were the timing of the first postnatal check for the mother, which was categorized as within <4 hours, 4–23 hours, 1–2 days, 3–41 days, or no postnatal check. PNC provider categories mirrored those used for ANC and included doctors, nurses/midwives, health assistants/AHWs, MCHWs/village health workers (VHWs), FCHVs, TBAs, and others.

Operational Definitions

In this study, skilled providers included doctors, nurses, and midwives. Institutional delivery refers to any delivery which takes place in a government, private, or other health facility. Home delivery referred to those births that took place either in a woman's residence or in any other locality other than any one of the health facilities mentioned above. Timely PNC was defined as a postnatal check-up performed within 24 hours of delivery, in accordance with WHO recommendations.

Analytical Approach

To investigate the trend in maternal health care utilization across the four waves of NDHS, weighted national percentages were calculated. The analyses used complex survey procedures, including sampling weights, strata, and primary sampling units provided by the NDHS, which produced valid estimates for the population. Furthermore, trends are explored according to the selected key indicators: ANC provider type, number of ANC visits, delivery care provider, institutional delivery, and timing and provider of PNC. These maternal healthcare utilization indicators are compared across the four survey years to express differentials over 16 years, from 2006 to 2022.

Ethical Considerations

The datasets used in this study are publicly available upon request from the DHS Program. Ethical clearance for the original surveys was obtained from the Nepal Health Research Council (NHRC) and the ICF Institutional Review Board. This study thus needed no further ethical approval since only anonymized secondary data were used.

Results

This section presents national trends in maternal healthcare utilization in Nepal from 2006 to 2022. Results are organized into four subsections: (1) antenatal care (ANC) provider trends, (2) number of ANC visits, (3) delivery care and skilled birth attendance (SBA), and (4) timing and provider of postnatal care (PNC).

Antenatal Care Provider Trends

Table 1 shows the percentage distribution of ANC providers for the most recent live birth among women aged 15–49 years. There was a substantial increase in ANC coverage by skilled health professionals, primarily doctors and nurses/midwives, during the study period.

Table 1

Percentage distribution of ANC providers, Nepal, 2006–2022

ANC Provider	2006	2011	2016	2022
Doctor	21.2	26.9	43.0	55.1
Nurse/midwife	22.5	31.4	40.6	39.3
Health Assistant/AHW	12.5	11.4	8.6	2.5
MCHW	13.5	12.9	0.8	0.0
VHW	2.1	1.4	0.0	0.0
TBA	0.1	0.0	0.0	0.0
FCHV	1.6	0.9	0.9	0.3
Other	0.2	0.0	0.2	0.1
No ANC	26.2	15.2	5.9	2.8
Total (%)	100	100	100	100
Number of women	4,066	4,148	3,998	1,966

The proportion of women receiving ANC from doctors more than doubled between 2006 and 2022 (21% to 55%). Moreover, the reliance on mid-level providers (e.g., health assistants, MCHWs) decreased evidently, reflecting increased service availability and preference for skilled providers. The percentage of women receiving no ANC dropped from 26% (2006) to less than 3% (2022), demonstrating near-universal ANC coverage.

Number of Antenatal Care Visits

Trends in the frequency of ANC visits improved substantially over time, with apparent increases in adequate (≥4) and optimal (≥8) ANC visits.

Table 2

Number of ANC visits for the most recent live birth, Nepal, 2006–2022

Number of ANC Visits	2006	2011	2016	2022
No ANC	26.2	15.2	5.9	2.8
1 visit	8.5	6.1	3.6	2.3
2–3 visits	35.8	28.6	21.2	14.7
≥4 visits	29.4	50.1	69.4	74.4
≥8 visits	–	–	–	5.8
Total (%)	100	100	100	100
Number of women	4,066	4,148	3,998	1,966

The proportion of women achieving ≥4 ANC visits increased from 29% (2006) to 74% (2022), reflecting improvements in service utilization. The introduction of the WHO-recommended 8-contact model is visible in 2022, with 5.8% of women achieving ≥8 visits.

Delivery Care and Skilled Birth Attendance

Skilled Birth Attendance (SBA)

There was a consistent increase in the proportion of births attended by skilled providers across all survey years.

Table 3

Delivery care provider for live births, Nepal, 2006–2022

Delivery Care Provider	2006	2011	2016	2022
Doctor	10.4	17.3	31.4	39.0
Nurse/midwife	8.3	18.8	26.7	41.1
Health Assistant/AHW	4.1	3.9	3.9	1.4
MCHW	0.0	2.6	0.3	0.0
FCHV	2.2	3.2	2.9	1.3
TBA	18.8	11.3	5.3	6.3
Relative/other	49.7	40.4	19.6	10.0
No one	6.5	3.1	10.0	0.9
Total (%)	100	100	100	100
Number of births	5,545	5,391	5,060	1,949

SBA increased from 19% in 2006 (doctor and nurse/midwife) to 80% in 2022, reflecting major service improvements. Deliveries conducted by TBAs or relatives decreased sharply, while unattended births declined to less than 1% in 2022.

Place of Delivery

The place of delivery is also an indicator of health service effectiveness. There has been a gradual increase in deliveries at the government facility in recent times.

Table 4

Place of delivery, Nepal, 2006–2022

Place of Delivery	2006	2011	2016	2022
Government facility	13.1	26.0	43.1	61.6
NGO facility	3.7	2.1	0.6	0.7
Private facility	0.9	7.2	10.2	17.0
Outside Nepal	0.0	0.0	3.4	0.0
Home	81.0	63.1	41.4	18.7
Other	1.3	1.6	1.2	2.0
Total (%)	100	100	100	100
Number of births	5,545	5,391	5,060	1,949

Institutional delivery increased from 17.7% (2006) to nearly 80% (2022). Home births dropped dramatically from 81% in 2006 to 18.7% in 2022, representing one of Nepal's most significant maternal health achievements.

Timing and Provider of Postnatal Care (PNC)

There is an increment in PNC check for mothers over time as follows:

Table 5

Timing of first PNC check for mothers, Nepal, 2006–2022

Timing of First PNC	2006	2011	2016	2022
<4 hours	19.7	33.9	45.1	53.5
4–23 hours	7.3	7.2	9.4	12.4
1–2 days	4.4	3.5	2.3	4.4
3–41 days	1.0	9.0	0.14	1.7
Do not know	0.6	0.2	0.3	0.4
No PNC	67.0	46.2	41.5	27.6
Number of women	4,066	2,030	1,978	1,933

Timely PNC (<24 hours) increased substantially from 27% (2006) to 66% (2022). Despite progress, over one-quarter of women still did not receive any PNC by 2022. In addition, the following trend shows that the PNC provider for the first PNC check also increased.

Table 6

PNC provider for the first postnatal check, Nepal, 2006–2022

PNC Provider	2006	2011	2016	2022
Doctor	9.2	16.2	52.5	67.4
Nurse/midwife	9.3	22.7	38.1	27.8
Health Assistant/AHW	2.1	2.7	3.9	2.1
MCHW/VHW	1.1	1.7	0.3	0.0
FCHV	0.0	1.2	1.0	0.2
TBA	11.0	0.0	0.0	0.5
No PNC	67.0	55.5	43.3	29.7
Total (%)	100	100	100	100
Number of women	4,066	2,030	1,978	1,933

The proportion of women receiving PNC from a doctor increased markedly from 9% in 2006 to 67% in 2022, largely due to rising institutional deliveries. However, PNC provided by nurses/midwives decreased in 2022, suggesting underutilization of primary-level providers for follow-up visits beyond the immediate postpartum period.

Discussion

This study focuses on the trends in the utilization of maternal health care services from the four rounds of nationally representative data (2006-2022) collected through NDHS over 16 years. However, while the results demonstrated significant improvement throughout the continuum of maternal health-care services, from ANC through delivery care to PNC, many critical attention and equity gaps remain to be addressed. Such patterns reflect the strengths of Nepal's maternal health care service system, together with the areas requiring targeted policy consideration.

ANC utilization sharply increased in the period from 2006 to 2022. The coverage of skilled ANC rose from 44% to 94%, while completion of ≥4 ANC visits more than doubled to 74% in 2022. These improvements are consistent with the global and regional trends of increasing ANC utilization in South Asia in the context of investments in maternal health and community outreach. This, in turn, reflects the expansion of facility-based services by Nepal, along with improved availability of skilled providers.

The 2022 uptake of the WHO-recommended 8-contact ANC model is visible, though still very low at 5.8%. This also reflects the early trends of implementation elsewhere in LMICs, especially when health system readiness and awareness among providers and women remain some of the barriers. As noted by Tunçalp et al. (2017),

the virtual elimination of "no ANC" cases by the year 2022 testifies to a big public health success but is no guarantee of adequacy, timeliness, or quality of care-dimensions needing strengthening.

The proportion of institutional delivery increased from 17.7% in 2006 to almost 80% in 2022, and skilled birth attendance rose from 19% to 80%. These increases are higher than the improvements observed in several South Asian countries during a similar period. For example, SBA coverage was only 53% in Bangladesh in 2022 (NIPORT et al., 2022), and India has managed to achieve only 88% for institutional delivery even after the Janani Suraksha Yojana (IIPS 2021). Improvement in Nepal is attributed to specific policies such as the Safe Delivery Incentive Program, free delivery services, and expanded birthing centers that were earlier found to improve facility use (Bhatt et al., 2018; Ensor et al., 2017).

At the same time, however, approximately one woman in five still delivers at home, especially in poorer, less educated, and rural households (MoHP et al., 2022). This would mean that structural and socio-cultural barriers to distance, transportation, gender norms, and trust in the health system exist, which fits with findings from other LMICs in the literature (Gabrysch & Campbell, 2009). On the other hand, deliveries assisted by a TBA remain at the same rate between 2016 and 2022, suggesting that traditional care may persist in some communities, which is an indicator of a tailored community-based approach.

PNC increased significantly, with early PNC (<24 hours) increasing from 27% in 2006 to 66% in 2022. This corresponds with increased facility births, because women who deliver in health facilities are more likely to receive an early postpartum checkup (Idris & Syafriyanti, 2021).

However, even in the year 2022, 27–30% of women did not receive any PNC, and timely PNC within 48 hours, necessary to prevent postpartum complications, was below recommended levels. The contributions by nurses/midwives to PNC in 2022 seemed relatively low, despite their lead roles in primary postpartum care, and reveal an emergent dependence on doctor-led postpartum examinations driven by the increase in hospital deliveries. Therefore, the implications for workload sharing and continuity of care have been influential. The utilization of health service providers at the primary level and community health workers, key actors for follow-up visits on days 3 and 7, respectively, remained below expectations, consistent with global evidence exhibiting that PNC is time and again the weakest link in the continuum of maternal health (Chou et al., 2015).

The progress made by Nepal in antenatal care (ANC) and skilled birth attendance (SBA) is mostly equivalent to developments observed in other South Asian

countries. However, its performance in postnatal care (PNC) remains considerably pathetic. For instance, Bangladesh has reached 63% PNC coverage within 48 hours (NIPORT et al., 2022), while India reports 78% early PNC following increases in institutional delivery (IIPS, 2021). By contrast, PNC utilization in Nepal remains low, with only 37% of women and newborns receiving timely postnatal examinations. These figures emphasize the existence of a firm gap in the continuum of maternal care.

Globally, the insufficient PNC utilization has been associated with uneven transitions between health facility-based and home-based care, inadequate awareness of postpartum risks among women and families, and logistical complications in returning to health facilities after discharge (Mascarello et al., 2017). Considering these challenges, consolidating cohesive, community-based postpartum support systems is essential for successful early PNC coverage in Nepal.

Implications for Policy and Programs

The results of the study focus on some significant areas for improving maternal health care policies and programs in Nepal. Improving postpartum follow-up systems is essential, especially by increasing home-based PNC and following the WHO-recommended postnatal visits at 3 and 7 days. Targeted interventions are also necessary to lessen persistent geographic and socioeconomic inequities, including improved outreach to marginalized populations, well-equipped birthing centres in remote settings, and emergency transport and referral systems.

The overall quality of maternal healthcare service provision can be improved through certain tools and mechanisms. There should be a facility of consistent availability of essential medicines, diagnostics, and skilled providers, supported by systematic quality improvement tools such as Maternal Death Surveillance and Response (Ndicunguye et al., 2022; Afulani et al., 2017). Meanwhile, it is essential to promote the uptake of the WHO eight-visit ANC model through provider training and tailored community engagement. Moreover, improved incorporation across the continuum of care involving ANC, delivery, and PNC services through stronger referral systems and synchronized supplements will ensure a comprehensive and continuous maternal health care.

Strengths and Limitations

The strengths of this paper take into account the fact that it draws on four nationally representative datasets, with consistent methodologies, which enable trend analysis. While limitations consist of the dependence on self-reported data, recall bias for earlier births, the nonexistent of all PNC indicators in NDHS datasets, and the absence of multivariate analysis, which excludes causal inference. Despite these

limitations, this evidence of long-term maternal health care trends in Nepal is based on robust methodologies from this study.

Conclusion

This study analyzed 16-year trends in the utilization of maternal health care services in Nepal using data from NDHS surveys between 2006 and 2022. It focuses on unprecedented strengthening across the continuum of maternal health care, particularly in skilled antenatal care, institutional delivery care, and early postnatal care. ANC provided by competent personnel has reached proximate universal levels, institutional delivery has increased approximately fivefold, and early PNC service utilization is substantially better. These improvements reveal Nepal's investment in maternal health care, dating back to the free delivery policies, transportation incentives for pregnant women, and expansion of skilled birth attendants' services. However, nonetheless these advances, inequities and systemic hurdles persist. Almost one out of five births still takes place outside health facilities, and around one-third of women receive no PNC service.

The utilization of the WHO-recommended 8-scheduled contacts model ANC remains low, and PNC services are especially underutilized beyond the first 24 hours. So, community-based postpartum care and the quality and accessibility of services at the primary level must be ensured and strengthened to fill those remaining gaps. The rural residents, low-income households, and disadvantaged groups need proper attention to ensure a basis for equity in maternal health care outcomes. Therefore, there is a need for a focus on integrating full continuum strategies; prioritizing service quality, and expanding outreach to underserved groups for accelerating progress toward national and global maternal health goals in Nepal.

Findings of this study add to the evidence needed for policy and program development to promote both maternal and neonatal health in Nepal. Improved maternal and neonatal health will certainly advance toward Sustainable Development Goal targets of universal health coverage and fewer than 70 maternal deaths per 100,000 live births by 2030. So, it is imperative to have sustained political commitment, investment in resources, and community engagement to ensure that timely, high-quality maternal health care service reaches all women in Nepal.

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