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Department of Health Services
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Responding to Increased Demand
for Institutional Childbirths
at Referral Hospitals in Nepal:
Situational Analysis and Emerging Options



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On behalf of the study team

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Summary

A. BACKGROUND AND OBJECTIVES

The Government of Nepal (GoN) is committed to providing skilled care to women during childbirth, and to ensuring that, in line with Millennium Development Goal (MDG) targets, 60% of births are assisted by a Skilled Birth Attendant (SBA) by 2015. The Safe Motherhood Long-term Plan (2006-17), the National Policy on Skilled Birth Attendants (2006), and the Second Nepal Health Sector Programme (2010-15) (NHSP-2) envisage the availability of basic delivery services in 70% of all Health Posts (HPs), Basic Emergency Obstetric and Neonatal Care (BEONC) services in 80% of Primary Health Care Centres (PHCCs), and Comprehensive Emergency Obstetric and Neonatal Care (CEONC) services in 60 districts (out of the total 75 districts). To reduce financial barriers, the Aama Surakshya Programme (Aama) provides free delivery care to women, fixed payments to institutions to provide services, and transportation costs to mothers. The country has made significant progress in maternal health in the last 20 years with the reduction of the Maternal Mortality Ratio (MMR) from 539 to 170 deaths per 100,000 live births. In addition, the proportion of deliveries at health institutions increased almost fourfold from 9% in 1996 to 35% in 2011.

Increased utilisation of facilities in Nepal reflects the success of the GoN's policies to promote institutional childbirth and Emergency Obstetric Care (EOC). However, in recent years, concerns have been raised that the changed demand for services may not have been matched by the distribution of supply. The purpose of this study is to assess the utilisation patterns of childbirth services in selected health facilities and to propose evidence-based options for reducing overcrowding in referral hospitals in order to inform Ministry of Health and Population (MoHP) policy and planning.

B. STUDY METHODS

Six hospitals (out of a national total of 17) were selected purposively to represent the country's development and ecological regions (Box A). Two Birthing Centres (BCs) (one PHCC and either a HP or Sub-Health Post (SHP)) were also selected in each the districts where the referral hospitals were situated. In addition, four private medical colleges participating in Aama were selected purposively.

The study used quantitative and qualitative approaches to achieve its objectives. The study methods comprised desk review, formation, and engagement of a Key Informant Group (KIG) of experts, and fieldwork. The main role of the KIG was to facilitate and guide the review process throughout.

Information from both primary and secondary data sources was used. Maternity and Operating Theatre (OT) registers for the four-year period from

Box A: Sampled Referral Hospitals

Terai:

Seti Zonal Hospital (SZH), (Far Western Development Region, Kailali District).

Bheri Zonal Hospital (BZH), (Mid-Western Development Region, Banke District).

Bharatpur Hospital (BH), (Central Development Region, Chitwan District).

Janakpur Zonal Hospital (JZH), (Central Development Region, Dhanusa District).

Koshi Zonal Hospital (KZH), (Eastern Development Region, Morang District).

Hills:

Western Regional Hospital (WRH), (Western Development Region, Kaski District).

2008/09 to 2011/12 were analysed. The profile of 8,681 maternity service users from sampled referral hospitals for two Nepali months (Bhadra (August/September 2011) and Falgun (February/March 2012)) was also studied. Facilities' financial records for 2011/12 were analysed in detail, and over 80 interviews were conducted with stakeholders (hospital managers, health workers, mothers and families) at referral hospitals and BCs. Quantitative information was cleaned and analysed using Statistical Product and Service Solutions (SPSS) and a Geographic Information System (GIS). A step-down approach, as recommended by the World Health Organization (WHO), was used for the economic analysis. Content analysis and summaries were prepared for the qualitative information. The limitations of the study were to do with the quality of the recording and reporting, and its inability to capture the realities of the district hospitals and the voices of the non-users of services.

C. MAJOR FINDINGS

Demand for maternity services in hospitals has increased dramatically in the past four years

The study found that in Terai and easy-access hill areas, hospitals were the most common destination for institutional childbirths, with 88% of all institutional births taking place in hospital. Public hospitals (65%) were more commonly used than private hospitals (23%) and only 12% of births took place at BCs.

The annual total number of childbirths in the six sampled hospitals had increased from 34,198 births in 2008/09 to 49,227 in 2011/12. The utilisation for normal childbirths at the hospitals had increased by 43% overall, with a greater than 80% increment observed at SZH and BZH. The trend of Caesarean Sections (CSs) had also increased by more than 44% (SZH having tripled the number of CSs performed), with the number of complications managed showing variability across all the hospitals. The service utilisation at private medical colleges collaborating with the Aama Programme was also found to have gradually increased, with a higher CS rate at the private hospitals (28%) compared to public hospitals (18%).

Analysis of the maternity registers for the two selected Nepali months of Bhadra (August/September 2012) and Falgun (February/March 2012), revealed that out of 8,681 mothers who used referral hospitals for childbirth during this period, 60% came from the same district as the hospital, with the majority coming from the municipal area and adjoining Village Development Committee (VDC).

Maternity wards are seriously overstretched

The implications of increased demand on service utilisation were assessed in terms of bed occupancy rates. The bed occupancy rates of maternity wards were found to be higher than the all-department bed occupancy rates in all the studied hospitals. Maternity ward bed occupancy rates in 2011/12 ranged between 80-145%. The monthly maternity bed occupancy rates were also found to be consistently higher than World Health Organization (WHO) standards (80% occupancy rates) for most months, indicating that Quality of Care (QoC) may have been compromised. At JZH, maternity bed occupancy rates were consistently more than 100%. This study was not a full QoC assessment, but field observations and the responses of users and staff strongly suggest that managing high

volumes of births in under-resourced facilities has compromised the QoC. There is an urgent need to make an additional 426 beds available to accommodate the existing and future demand until 2015.

Many reasons for overcrowding were identified. Ninety-eight percent of hospital users were self-referred, indicating a tendency of clients to come directly to the referral hospitals, by-passing lower level facilities altogether. The lack of a functioning referral system meant that if complications occurred, the family had to take the responsibility of arranging the transport and finding the appropriate hospital. It was prudent, therefore, to come directly to the referral hospital to save time and duplication of transport costs. Other reasons for preferring to deliver at referral hospitals included: greater client trust in referral hospitals; a general belief that bigger hospitals provide better quality and safer services; round-the-clock opening times; the availability of a wider range of investigation and treatment services at hospitals; ease of access via roads and travel networks; and the preference of ambulance drivers to come to referral hospitals.

The implications of overcrowding were widespread. All hospitals, except BH, were over 30 years old and had been built for a much smaller population and patient load. The high client load meant that basic facilities such as water, beds, and toilets were in short supply or poor repair, compromising the basic hygiene and infection prevention practices. Hospitals coped with the shortage of beds by taking unused beds from other departments, and using locally fabricated cots and floor mattresses to accommodate the excessive number of mothers.

High caseload was also had implications in terms of Human Resources (HR). The sanctioned staffing levels for health workers, which determine the number and skill mix of hospital staff, were created more than twenty years ago and were clearly inadequate for the current needs. However, although the number of sanctioned posts is too few, many positions lay vacant, including all senior posts (Medical Superintendents (MSs), matrons, and nursing supervisors) across all six referral hospitals. Similarly, only 45% of the positions of gynaecologist/obstetricians were filled, while at JZH, both the positions for gynaecologists lay vacant. More than 60% of the anaesthetists' positions were vacant, and three hospitals (SZH, BZH, JZH), managed without an anaesthetist.

Hospital Development Boards (HDBs) were found to have hired health workers locally to address staff shortages, but a gap of 277 SBAs and 28 obstetricians and doctors remained in these referral hospitals. Owing to lack of funds, specialists (obstetricians/gynaecologists) were hired as medical officers, and locally hired staff were given much lower allowances and benefits than they would have received on the government scale, even though these member of staff were engaged to provide services at night. Students and volunteers were also used to ease the workload.

Birthing centres are substantially underused

The BCs included in the study were relatively new, and there was limited awareness in the community about the range of services they offered. Mothers and their families generally believed that the BCs provided poorer quality services than hospitals, citing their limited amenities and the young, inexperienced nurses whom they felt were unwilling to take responsibility for ensuring a safe childbirth. A lack of round-the-clock availability of services also limited uptake of care at BCs.

The unit cost of normal deliveries is low at hospitals and high at birthing centres

In 2011/12, the average unit cost of a normal delivery at a referral hospital was 1,847 Nepalese Rupees (NPR), around half the cost of a normal delivery at a BC (NPR 3,625). The lower unit cost at hospitals arose from the very high bed occupancy rates, old infrastructure, and low staffing levels. If

these costs were re-estimated based on international standards and zero vacancies, the 'normalised' average unit cost of childbirth at hospitals would rise by 33% to NPR 2,458.

Some BCs had recently been established and were heavily underutilised; there was a 12-fold difference between the unit cost of a normal birth within the sample of BCs studied. At better-performing BCs, which were achieving utilisation rates of 60%, the unit cost of a normal childbirth was NPR 1,873, excluding the cost of referral.

The study estimated that the average unit cost of a complicated delivery was NPR 3,227, and NPR 11,153 for a CS at the referral hospitals. The breakdown of the cost of normal childbirth at hospitals shows a low share of buildings and equipment costs, reflecting the advanced age of the hospital infrastructure and hence low annualised cost. The average annualised building cost was 3.7%, with the lowest at JZH (1.6%) and the highest at BH (6.4%). Similarly, the personnel cost was also smaller, reflecting under-resourced staffing, in terms of both numbers and salary. JZH has particularly low personnel costs (27%), compared to 48% in BZH. The cost for drugs and medical supplies ranged from 38% to 66% of the total costs.

Aama payments are an important and increasing source of income for public hospitals

The share of hospital income which came from Aama payments increased from 12% in 2008/09 to 22% in 2011/12. Although the total income of the hospitals had nearly doubled since 2008/09, Aama income had increased more than three times over the same period. Contrary to common belief, use of Aama payments was not restricted to funding maternity services. Aama funds were deposited in a pool fund managed by the HDB and used to cover general recurrent expenditure. Aama payments were considered a lifeline for the cash-strapped hospitals. The levels of Aama payment were set in 2009 to cover hospitals' non-salary costs only, since public sector salaries are paid centrally. There were also examples of poor practice in the private sector, especially prescribing diagnostic tests not covered by Aama for which women had to pay directly.

There is significant potential to meet additional future costs through efficiency improvements

Extrapolating the recent growth trends in Terai population and institutional births to 2015 produced a 62% increase in total institutional births by 2015. It was assumed that, realistically, 42% of childbirths will occur at hospitals and 20% at BCs. Using actual unit costs, the total cost of births at the hospitals from 2012/13 to 2015/16 would be NPR 1,950.06 million; the normalised cost of the same would be NPR 2572.92 million, requiring, therefore, an additional NPR 622.86 million to meet the benchmark. If existing capacity continued, NPR 764.42 million would be needed to cover the 20% of childbirths occurring at BCs. If capacity of BCs were increased to 60%, to cover the 20% share of childbirths, it would cost NPR 395 million, thus making a saving of NPR 369.45 million. With better allocative and technical efficiency, therefore, the required expansion in hospital beds in the Terai could be more than met by better planning of the BCs.

The adjusted unit cost estimates are tentative and incomplete; since they do not include some potentially significant costs necessary to effect change, such as salary increases or a better referral system. However, they do suggest that major efficiency improvements in BCs are possible, and that the resulting savings will go a long way to cover the cost of tackling hospital overcrowding: using the difference between the actual and adjusted costs for 2011/12, the estimated cost of raising the standard of care for projected births in all Nepal's hospitals for the four years 2012/13-2015/16

would be NPR 625 million.¹ Using a similar calculation for the BCs, an increase in average capacity utilisation at the BCs to 60% capacity by 2015/16 could generate a saving of NPR 369.50 million, over half the additional costs for the hospitals.

D. KEY ISSUES AND EMERGING OPTIONS

The options proposed by the study, based on its findings, are as follows. The options, however, are not mutually exclusive. Local realities must be taken into consideration during local planning. The emerging options derived by this study are:

- To enhance the capacity of the hospitals to accommodate the increased number of childbirths by expanding current maternity wards, or by establishing new birthing units at the hospitals.
- To work out an investment plan for new birthing units in the zonal hospitals.
- Review the expansion plan of BCs (Second Nepal Health Sector Programme (NHSP-2)) in the Terai to raise utilisation of BCs at strategic locations, with a BC package that ensures 24/7 services with 80% capacity utilisation of SBAs, and support and ownership of local stakeholders and community.
- Ensure effective referral mechanism, including free transportation with linkage to the referral hospitals for technical backup.
- Review the level and use of Aama funds for improving maternity services at the facility level.
- Enhance the utilisation of the capacity of the private sector with appropriate guidelines and monitoring mechanism in place. Establish coordination and collaboration between public and private hospitals and the District Public Health Office (DPHO).

¹ At current prices.

Acronyms

Aama	Aama Surakshya Programme
ANC	Antenatal Care
ANM	Auxiliary Nurse Midwife
BC	Birthing Centre
BEOC	Basic Emergency Obstetric Care
BEONC	Basic Emergency Obstetric and Neonatal Care
BH	Bharatpur Hospital
BOR	Bed Occupancy Rate
BPP	Birth Preparedness Package
BZH	Bheri Zonal Hospital
CEA	Cost Effectiveness Analysis
CEONC	Comprehensive Emergency Obstetric And Neonatal Care
CI	Confidence Interval
CN	Certificate of Nursing
CS	Caesarean Section
DDC	District Development Committee
DFID	Department For International Development
DoHS	Department Of Health Services
DPHO	District Public Health Office
DSF	Demand-side Financing
DUDBC	Department of Urban Development and Building Construction
EOC	Emergency Obstetric Care
FCHV	Female Community Health Volunteer
FGD	Focus Group Discussion
FHD	Family Health Division
FY	Fiscal Year
GIS	Geographic Information System
GoN	Government Of Nepal
HDB	Hospital Development Board
HDI	Human Development Index

HFOMC	Health Facility Operation and Management Committee
HMIS	Health Management Information System
HP	Health Post
HR	Human Resources
JZH	Janakpur Zonal Hospital
KIG	Key Informant Group
KII	Key Informant Interview
KZH	Koshi Zonal Hospital
LHGSP	Local Health Governance Strengthening Programme
MCH	Maternal Child Health
MDG	Millennium Development Goal
MMMS	Maternal Mortality And Morbidity Study
MMR	Maternal Mortality Ratio
MoHP	Ministry of Health and Population
MS	Medical Superintendent
NDHS	Nepal Demographic Health Survey
NGO	Non-governmental Organisation
NHSP-2	Second Nepal Health Sector Programme
NHSSP	Nepal Health Sector Support Programme
NPR	Nepalese Rupee
OT	Operating Theatre
PAM	Physical Asset Management
PHCC	Primary Health Care Centre
PPP	Public-private Partnership
QoC	Quality Of Care

Background

1.1 Introduction

Policy and service availability in Nepal

The Government of Nepal (GoN) is committed to improving the health status of Nepalese women; impressive health gains have been made in recent times despite conflict and other difficulties. The Maternal Mortality Ratio (MMR) has reduced from 539 to 170 deaths per 100,000 live births in the last 20 years [1], and the proportion of childbirths at health institutions has almost doubled from 18% in 2006 to 35% in 2011

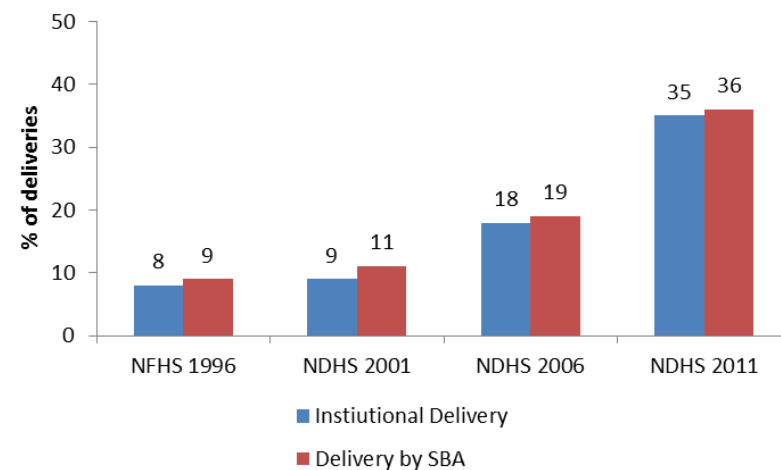
[2] (Figure 1). The 2011 Nepal Demographic Health Survey (NDHS) also indicated better access to Emergency Obstetric Care (EOC), with 4.6% of deliveries by Caesarean Section (CS) (urban 15.3%, rural 3.5%) compared with 2.7% (urban 8.4%; rural 1.9%) in the 2006 NDHS [2].

In order to achieve its Millennium Development

Goal (MDG) target of 60% of births being assisted by Skilled Birth Attendants (SBAs), and to accommodate the increasing number of childbirths, the GoN has invested heavily in improving access to skilled care during childbirth. As per the National Safe Motherhood and Newborn Health Long-term Plan, birthing rooms have been added to existing peripheral health institutions since 2006, resulting in increasing numbers of Birthing Centres (BCs). There has also been a focus on improving the availability of EOC. Currently, 17 referral hospitals (zonal, regional, and central) and some district hospitals provide Comprehensive Emergency Obstetric and Neonatal Care (CEONC) across the country. By 2010/11, CEONC services were available in 43 districts, Basic Emergency Obstetric and Neonatal Care (BEONC) services were available in 112 Primary Health Care Centres (PHCCs) (53% of all PHCCs), and basic delivery services in 533 Health Posts (HPs) (60% of total HPs) and 326 Sub-Health Posts (SHP) (10% of total SHPs). Altogether 1,565 public facilities and 55 non-state facilities participate in the Aama Surakshya Programme (Aama) [3]. Aama aims to reduce financial barriers to delivery care through the provision of free delivery care to women, fixed payments to institutions that provide delivery services, and transportation costs to mothers.

It is important to note that the referral hospitals were established at different time periods, with varying bed capacities, and have progressed at different rates depending upon the local needs and engagement of stakeholders. The bed capacity, in turn, determines the allocation of human and financial resources. The current bed capacities in these referral hospitals have outgrown the standards set for these resources.

Figure 1: Pattern of institutional childbirth in Nepal 1996-2011



Overcrowding

While progress in service provision has generally been good overall, there is emerging evidence to suggest that there have been major distortions in service usage. Overcrowding has been reported at some referral hospitals, and there is concern about apparent under-utilisation at many lower-level birthing facilities, resulting in the inefficient use of available resources.

The demand for institutional childbirths in Nepal has increased fourfold from 9% in 1996 to 35% in 2011 [2]. The 2001 NDHS showed that 9% of births were institutional, while the bed occupancy rate in 2002 was 56%, allowing more births to be accommodated in hospitals [5]. While the general bed occupancy rate for hospitals has itself reached full capacity² in recent years, increasing from 56% in 2002 to 81% in 2010 [3, 5], the bed occupancy rate for maternity has risen even higher. This is particularly the case for referral hospitals, which cater for more births compared to district hospitals.

The supply side, however, has not complemented the increment in demand, with very few additional beds,³ infrastructure, or Human Resources (HR) made available in referral hospitals in the last 15 years.

Referral hospitals are finding it difficult to respond to the increasing demand for institutional births. Analysis of service utilisation data, and anecdotal reports, indicate that out of the 17 higher-level hospitals providing CEONC, 12 were overcrowded, with patient numbers exceeding available beds, leading to women being given makeshift beds on the floor. There was also a reported shortage of beds, nurses, and doctors in offering birth care [6].

A general definition of overcrowding is when demand exceeds supply. However, for institutional births, we need to define our terms further. According to the Census 2011, Terai populations have been growing at a higher rate (1.75%) than the national average (1.35%), while the growth in urban populations is significantly higher, at 3.8% per annum [4]. A significant part of overcrowding may be the result of this 'natural growth'.

There may also be conditions and incentives within the health system which are leading health professionals to over-refer; further, conditions outside the health system, e.g. the preferences of and information available to mothers, may be causing them to self-refer. We need to understand the relative importance of these three elements in order to understand what is going on and what sort of responses may be necessary.

Within each of these three elements of overcrowding, there will be both demand-side and supply-side factors. These may include:

- Availability of multi-skilled services for obstetric complications at higher levels, coupled with reduced availability of specialists at lower levels;
- Insufficient beds in relation to population growth;
- Reputation of individual providers at different facilities;
- Location of facilities and ease of access to transport routes; and

² World Health Organization (WHO) definition of full capacity is 80%.

³ Indicative figures, based on 2011 estimates from Nepal's Health Management Information System (HMIS), suggest a deficit of over 28,500 bed days to accommodate women for institutional delivery. Quoted in Options Demand side financing and coping strategy for institutional deliveries. Literature Review, February 2012.

- Changing expectations and preferences of women and their families about the medical care during delivery.

It is therefore imperative to better understand the problem by gathering empirical evidence and proposing evidence-based options to address the problem of overcrowding at referral hospitals to help achieve Nepal's the MDG target.

1.2 Problem Statement

This study aims to address the question of whether increasing utilisation of referral hospitals for delivery care has outstripped supply and is potentially compromising Quality of Care (QoC).

1.3 Purpose and Objective of the Review

The purpose of this assignment was to assess the utilisation pattern of childbirth services in selected health facilities and propose evidence-based practical options for reducing overcrowding in referral hospitals in order to inform Ministry of Health and Population (MoHP) policy and planning.

The main objectives of the assignment were to provide the evidence needed to enable managers and policy makers to:

- assess current utilisation patterns in referral hospitals and neighbouring BCs in order to understand the factors contributing to the current patterns of demand;
- describe the impact of overcrowding on QoC (capturing the perceptions of mothers, staff, and managers);
- analyse the impact of current utilisation patterns on income and investment by facilities;
- determine the unit cost of a normal, complicated, and Caesarean childbirth services at the facilities; and
- understand the current strategies being employed to cope with the increased demand for services.

Review Process and Methodology

This section details the process and methodology used in the review. Two aspects of the study are described: the formation of a Key Informant Group (KIG) and the collection and interpretation of primary and secondary data through fieldwork.

2.1 Formation and Engagement of a KIG

A KIG consisting of experts in the field of maternal health was formed by the Family Health Division (FHD) to facilitate the review process. KIG meetings were used to discuss and define the study's rationale, objectives, methodology, approaches, and variables. The group also provided input to decisions about site selection, and helped identify appropriate policy recommendations based on the study findings.

2.2 Methodology for the Fieldwork

The study used quantitative and qualitative approaches to achieve its objectives.

2.2.1 Sampling Frame and Sample Selection

Data were collected from six of the 12 referral hospitals that were reportedly overcrowded. Hospitals were selected purposively to represent the five development regions and ecological zones, with five hospitals located in the Terai and one in the hills:

Terai:

- Seti Zonal Hospital (SZH), (Far Western Development Region, Kailali District).
- Bheri Zonal Hospital (BZH), (Mid-Western Development Region, Banke District).
- Bharatpur Hospital (BH), (Central Development Region, Chitwan District).
- Janakpur Zonal Hospital (JZH), (Central Development Region, Dhanusa District).
- Koshi Zonal Hospital (KZH), (Eastern Development Region, Morang District).

Hills:

- Western Regional Hospital (WRH), (Western Development Region, Kaski District).

Two BCs (one located at a PHCC and one at either a HP or SHP) were also purposively selected in each the districts where the referral hospitals were situated. This was done to better understand the factors influencing BC functionality and to identify opportunities for sharing the client load at referral hospitals. Selection was based on consultation with the District Public Health Offices (DPHOs), giving consideration to utilisation and distance from the referral hospitals.

Four private medical colleges that were participating in Aama were also selected purposively to represent different geographic areas, from east to west:

- Nobel Medical College and Hospital in Biratnagar, Morang District;
- College of Medical Sciences and Teaching Hospital in Bharatpur, Chitwan District;

- Manipal Medical College in Pokhara, Kaski District; and
- Nepalgunj Medical College in Nepalgunj, Banke District.

Figure 2: Map showing six selected hospitals



2.2.2 Sources of Quantitative Information

For the collection of information related to service utilisation, both primary and secondary data sources were used. Facility records (maternity registers and Operating Theatre (OT) registers) and Health Management Information System (HMIS) reports (numbers 32 and 34) provided information on service utilisation trends between 2008/09 and 2011/12.

For the cost appraisal, information was collected from the different departments of the sampled hospitals and BCs. Information related to the health workforce was taken from the administration sections, and financial information (salary, income, expenditure) was collected from the finance section. Information on the equipment and instruments of the maternity and other departments was collected from the respective departments, and reviewing the stock books for non-consumable goods in the store section provided the cost and purchasing date of equipment.

Physical data were collected from the medical records section and maternity ward, and the stores and financial data were collected from the financial sections of hospitals. Financial cost estimates were grouped into the two categories of capital and recurrent costs:

- Capital costs were grouped into building and equipment/instruments/furniture costs.
- Recurrent costs were comprised of personnel, drugs, and medical supplies, as well as overhead costs (utilities, housekeeping, stationery, communication, fuel, and other consumables).

2.2.3 Sources of Qualitative Information

Key Informant Interviews (KIIs) were conducted with Medical Superintendents (MSs) and Chairs of the Hospital Development Boards (HDBs) to gather their impressions on service utilisation trends, reasons for and implications of overcrowding (including its impact on QoC), the existing approaches to accommodate and manage overcrowding, and future plans to address the problem. Similarly, at the private medical colleges, the Directors, matrons, and the Heads of Department of Gynaecology and Obstetrics were interviewed to explore their experiences of Aama, problems encountered during its implementation, bed allocations for obstetrics, and the possibilities for future expansion to address increasing patient load for delivery care.

In-depth interviews were conducted with mothers at referral hospitals and BCs. While purposively selecting the mothers for interview at the referral hospital, preference was given to those who had bypassed their local BC in favour of the referral hospital, mothers who belonged to marginalised communities, and those who came from other/distant districts.

In-depth interviews were also conducted with the SBAs and matrons or nurses in-charge of referral hospitals, and SBAs at the BCs, to explore the factors for change in utilisation patterns of institutional delivery, their impressions on overcrowding, its reasons, and implications, including on QoC. The enablers for service provision were also explored, along with the present constraints and the possible future measures to address the problem.

Focus Group Discussions (FGDs) were conducted with visitors/attendees at maternity wards of referral hospitals to explore their impressions about changes in service utilisation patterns and their drivers. FGDs with visitors and maternity clients were also used to explore opinions about the difficulties encountered in the hospital through overcrowding, the impact of overcrowding on perceived QoC, and the reasons for bypassing, and changes that would attract mothers to, the peripheral BCs.

In total, 16 KIIs, 28 in-depth interviews with service providers, 38 in-depth interviews with mothers, and six FGDs with the visitors were conducted.

Tools were developed in consultation with the KIG for collecting quantitative and qualitative information.

2.2.4 Data Collection

Fieldwork was conducted between August and October 2012. A study team with experience in qualitative research, health economics, and Nepal's health system carried out data collection.

2.2.5 Data Analysis

Service utilisation and other quantitative hospital data were analysed using Microsoft Excel and Statistical Product and Service Solutions (SPSS). A Geographic Information System (GIS) was used to map service users from the different Village Development Committees (VDCs).

The step-down approach, as recommended by the World Health Organization (WHO), [7] was used for the economic analysis, with the following consecutive steps:

- Normal childbirths, complications managed, and CSs performed were defined as the final products.
- The cost centres — the output-producing (maternity and OT) and support units (administration and finance) — were ascertained.

- The full cost of each input was identified.
- Costs were assigned to each cost centre, linking them with the service outputs (normal delivery care, complication management, and CSs).
- All costs were allocated to the final cost centres (maternity ward).
- The unit cost for each defined output was computed.

Capital costs are the annual costs of resources that have a life expectancy of more than one year. As many of the hospital buildings are already more than 30 years old, the life of the buildings was taken as 30 years [7]. The replacement cost of the building per square foot was taken from the Department of Urban Development and Building Construction (DUDBC)/Nepal Health Sector Support Programme (NHSSP). Researchers worked with facility staff to prepare lists of equipment, instruments, and furniture. The date of purchase and price of these items was collected from the store sections of the hospitals. For two hospitals, the data were cross-verified with the data sheets of the Physical Asset Management (PAM) unit of the Department of Health Services (DoHS). For the rest, the items were cross-verified with ward and store records. Replacement cost, which is the cost of the item if it were to be replaced at current market price for capital items, was used for calculation. The study used the latest purchasing price of equipment by DoHS; in the case of local purchasing, the local purchasing price by hospitals was used. The life of equipment was taken from DoHS's PAM unit. The study used a 3% discount rate to annualise the capital items [7].

Regarding personnel costs, the gross earnings (12 months' salary, plus one month Dasain bonus, and one month gratuity) [8] were included; the health care providers' incentives and allowances were also taken into account. Drug costs and overhead costs were collected from the accounts section of the hospitals. In the case of BCs, the costs of locally purchased drugs were ascertained from the respective BCs; additional drugs and medical supplies provided by the DPHOs were also costed.

Building costs were apportioned on the basis of space used by the departments. The floor space assigned to each department was taken as including space within the department, and an allocation of the special corridors. However, this excluded the doctors' and nurses' quarters and other infrastructure. The measurement of rooms was taken as that reported by the providers. Instrument and personnel costs of OTs were assigned to CSs on the basis of the surgeries. Drugs and medical supplies used for OTs were directly assigned to CSs.

Personnel costs were allocated to a cost centre on the basis of duty rosters and reported time for delivery care. OT costs were assigned to CSs on the basis of the proportion of CSs to total surgeries. There is a common practice of offering a package of drugs to clients. The costs of the packages of drugs for normal, complicated deliveries, and CSs were calculated using the local price lists of the hospitals. They were explicitly assigned to the respective cost centres. Overhead costs were apportioned on the basis of space used by the departments [9]. In the case of BCs, costs were directly assigned to the delivery care.

For analysing the qualitative data, the recorded interviews were transcribed and translated into English, complemented with the information noted down during the interviews. The transcribed data were analysed using the content analysis technique, in which major themes were identified after reviewing the transcripts. In subsequent reviews of the transcripts, the data were organised as per the major identified themes, with categories and sub-categories, to enable further analysis of the major themes and dialogues in the data analysis framework. The range of views from the emerging themes was interpreted and the relationship between themes explored. The categorised

information was then summarised and presented along with the direct quotes. Quotations illustrating the views of the majority of respondents, or in contradiction to the majority, were extracted from the interview transcripts.

2.2.6 Ethical Considerations

The study objectives were clearly shared with respondents, and confidentiality was assured prior to collecting information. Prior consent was taken from interviewees and participants of the FGDs for recording the interviews. Notes were taken for the mothers and interviewees who did not want their voice recorded. The mothers and other stakeholders were under no obligation to participate in the interviews. Anonymity of results was maintained.

A letter from the FHD, introducing the team and stating the study objectives and methodology, was shared with hospital and DPHO leadership before starting data collection.

2.2.7 Limitations of the Study

The service utilisation data were based on the records maintained by the hospitals. Some of the desired information, however, was not available; this was especially true for the addresses of the mothers in JZH, which affected the mapping of its service users.

Although district hospitals provide referral CEONC services, only Morang District had a district hospital (which unfortunately did not provide CEONC services). Kailali District had a community hospital, and there were no district hospitals in the remaining districts. The realities of the district hospitals, therefore, are not reflected in this study. Findings from the CEONC functionality study [10] were used to inform the options for ensuring comprehensive maternity services.

The views expressed are of the users of institutional childbirth services; the voices of non-users are not represented.

Only two BCs were visited in each of the districts, as agreed with the KIG, since time was limited; it would have been better to have visited more facilities.

The exact surface area of maternity wards of the hospital could not be measured. The information made available by the providers was used for the analysis.

Findings

This chapter presents the study findings. First, service utilisation pattern for institutional childbirth in sampled districts are discussed, and then utilisation patterns at referral hospitals are described. Section 3.3 reviews the implications of overcrowding in terms of infrastructure, HR, and QoC, and Sections 3.4 and 3.5 respectively outline the possible reasons for overcrowding and the measures adopted locally to cope with overcrowding. Utilisation patterns at BCs are described, and the last section deals with the unit costs of hospital and BC deliveries, and resource implications.

3.1 Utilisation Pattern of Institutional Childbirth by District

Service utilisation data across six districts show that public hospitals were the most common destination for institutional childbirths. Overall, 88% of institutional childbirths took place at a hospital, two-thirds (65%) at public hospitals, and almost a quarter (23%) at private hospitals in 2011/12 (Table 1). Only 13% of institutional births took place at BCs, with the lowest proportion in Chitwan District (3%) and the highest in Kailali District (46%).

Table 3: Childbirth by type of facility (DPHO, Fiscal Year (FY) 2011/12)

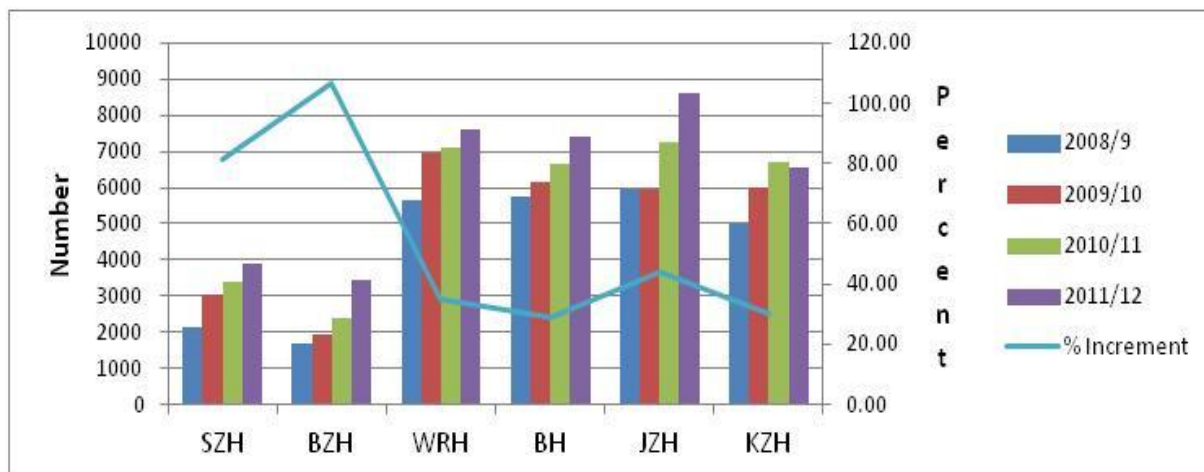
District	BCs		Public hospital		Private hospital		Total (entire district)	
	Births	%	Births	%	Births	%	Births	%
Kailali	5,068	45.5	4,953	44.4	1,124	10.1	11,145	100.0
Banke	1,844	15.8	4,421	38.0	5,376	46.2	11,641	100.0
Kaski	451	3.7	9,747	80.3	1,945	16.0	12,143	100.0
Chitwan	349	2.5	9,699	69.6	3,888	27.9	13,936	100.0
Dhanusha	846	7.6	10,276	92.4	0	0.0	11,122	100.0
Morang	912	5.7	10,025	62.9	4,999	31.4	15,936	100.0
Total	9,470	12.5	49,121	64.7	17,332	22.8	75,923	100.0

3.2 Utilisation Pattern at Referral Hospitals

3.2.1 Normal Childbirths

The number of normal childbirths which occurred in the studied referral hospitals increased from 26,168 in 2008/09 to 37,454 in 2011/12, an increment of 43% in four years. The number of normal childbirths was considerably higher in WRH, BH, and JZH in 2011/12 (Figure 3). Although the overall number of normal births was lower in SZH and BZH than in the other four sampled hospitals, the increment between 2008/19 and 2011/12 was noticeably higher. In SZH, the number of normal childbirths increased from 2,150 in 2008/09 to 3,897 in 2011/12 (an increment of 80%), while growth in normal childbirths was more than 100% in BZH (a growth from 1,670 to 3,447 normal childbirths during the same time period).

Figure 3: Trend of normal childbirths in six study hospitals (2008/09-2011/12)

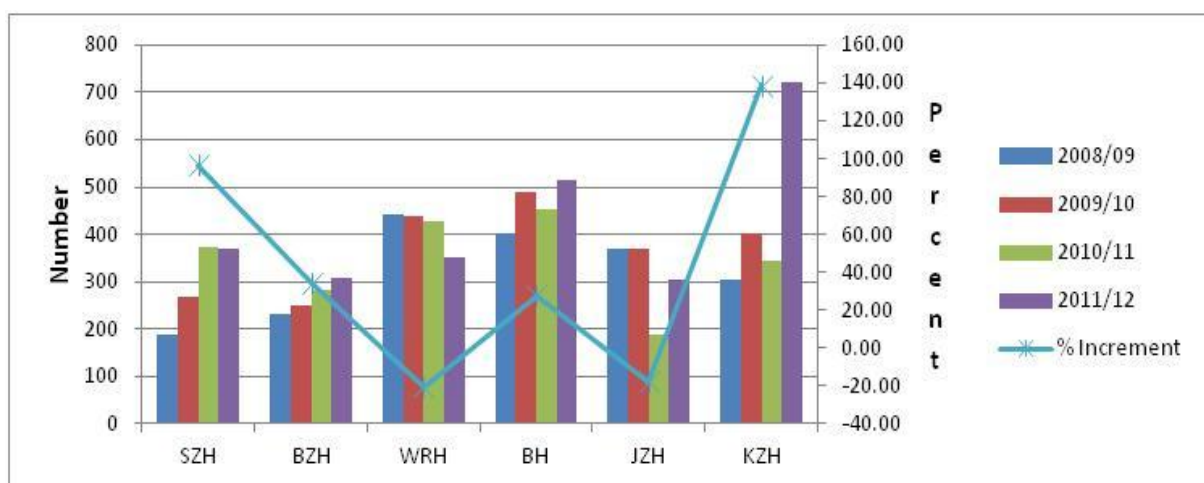


Source: Field survey 2012

3.2.2 Complications Managed

Trends in the number of complications managed by individual hospitals between 2008/09 and 2011/12 varied between facilities. Increases were observed in four hospitals (SZH, BZH, BH, and KZH) and in KZH, the number of complicated deliveries performed more than doubled between 2008/09 and 2011/12 (from 344 to 723). However, there was a decrease in the number of complicated deliveries performed in WRH and JZH (Figure 4).

Figure 4: Trends of complications managed in six study hospitals (2008/09-2011/12)



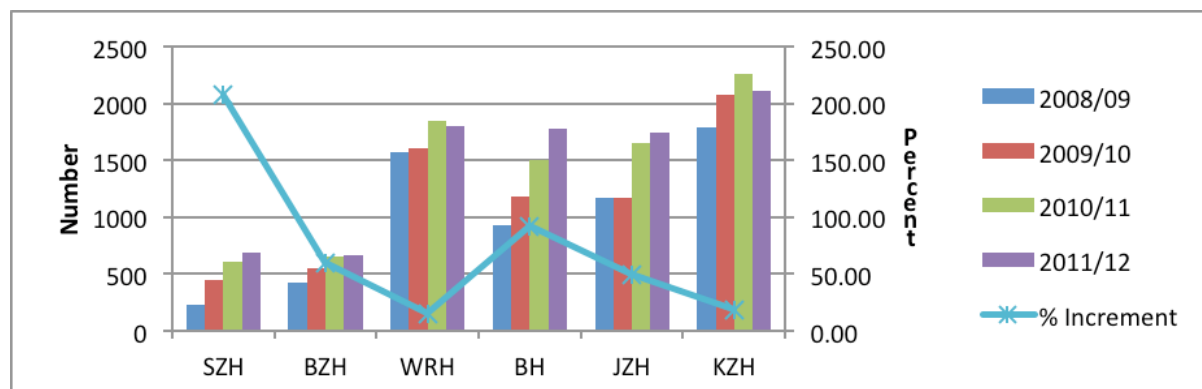
Source: Field survey 2012

Possible reasons for these irregular trends in complications managed were explored during interviews with SBAs and nurses in-charge. Some staff reported that excessive workload and shortage of staff had affected data entry and limited the completeness of the records. The Aama Guidelines clearly classify complications, so there should be uniformity in understanding of what comprised complications across health facilities. This variability in recording and reporting complications has implications for the institutional Aama income as well as monitoring of complications managed.

3.2.3 CS Rates

Overall, there was a 44% increase in the number of CSs performed in referral hospitals included in the study between 2008/09 and 2011/12. However, there were differences in trends between hospitals (Figure 5). In SZH, the number of CSs increased from 224 in 2008/09 to 688 in 2011/12, (an increment of 207%). At WRH and KZH, the number of CSs had decreased slightly in 2011/12 as compared to 2010/11, while at the other hospitals it had increased.

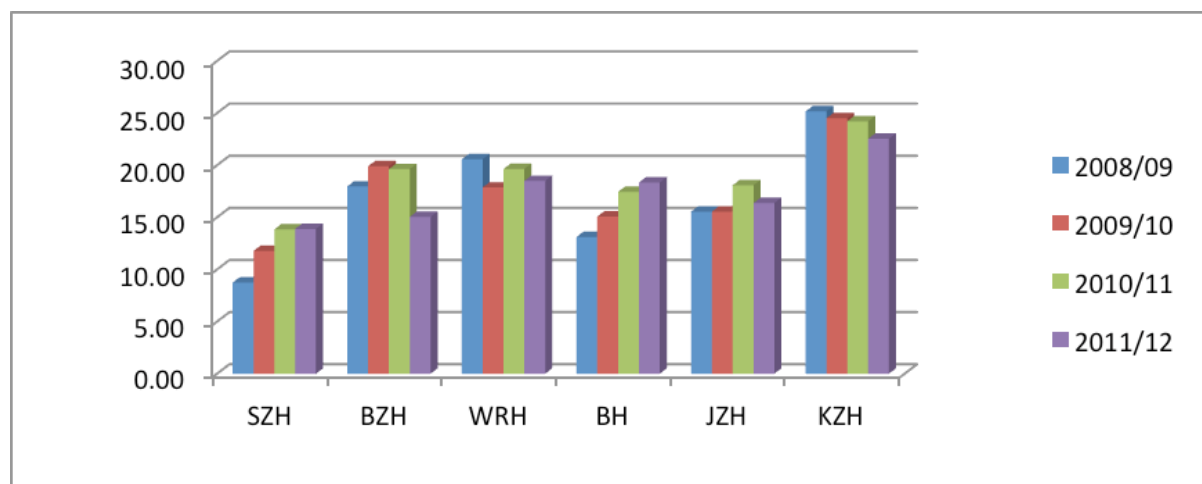
Figure 5: Trend of CS in six study hospitals (2008/09-2011/12)



Source: Field survey 2012

The proportion of all deliveries performed by CS increased between 2008/09 in SZH and BH, but decreased in BZH, WRH, and KZH (Figure 6). This may have been due to the irregular availability of obstetricians. The proportion all deliveries performed by CS was higher for KZH (>20%) than for other hospitals.

Figure 6: Percentage of total institutional childbirths performed by CS in the six study hospitals (2008/09-2011/12)

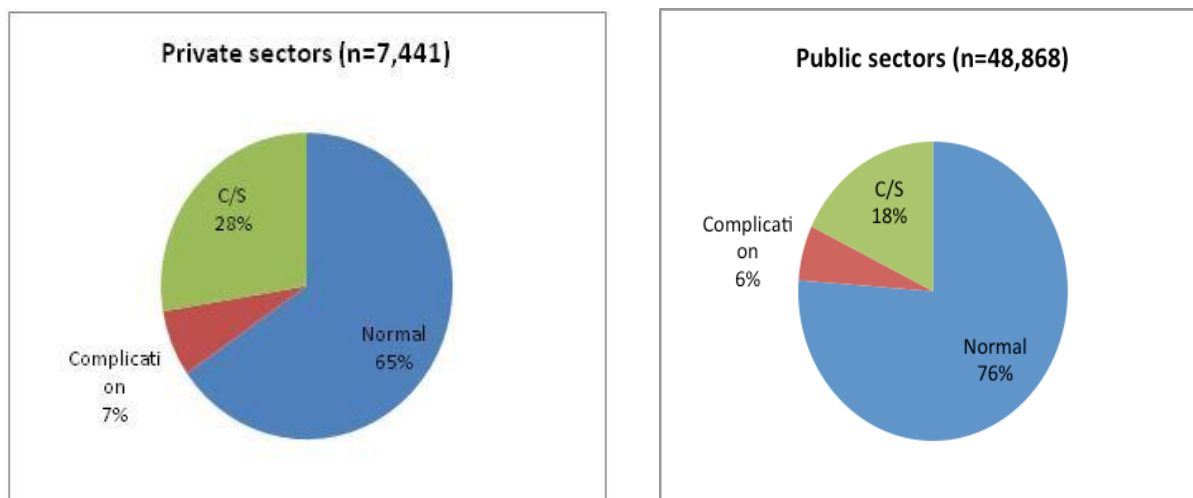


Source: Medical Record Section

3.2.4 Trends in Utilisation in Private Medical Colleges

The four sampled private medical colleges participating in the Aama Programme (see Box 1) were at different stages of implementation. Service utilisation was increasing across all the private hospitals studied. In 2011/12, the number of normal childbirths was 11% higher in public sector hospitals (37,223) than in private sector hospitals (4,886), but the CS rate was 10% higher in the private sector (2,063) than the public sector (8,731).

Figure 7: Type of deliveries in public and private hospitals partnering with Aama in six study hospitals (2008/09-2011/12)



Source Field survey 2012

Box 1: Overcrowding: Experiences of Private Medical Colleges with Aama

The Aama Programme has been extended to the private sector in the spirit of Public-private Partnership (PPP). Four such private medical colleges that were participating in the Aama Programme and that were situated in the same cities as the selected referral hospitals were included in the study. The objective of including these facilities in the study was to explore the possibility of further expansion of services and collaboration in order to reduce the patient load at the public hospitals. Interviews were conducted with Hospital Directors, Heads of Department of Gynaecology and Obstetrics, and the matrons at the private facilities.

The disbursement of funds to private facilities was based on the number and type of maternity services rendered on a monthly basis, as reported to the DPHO, where overall responsibility for coordination of Aama lay. The rates for normal delivery, complicated delivery, and CS were the same as for public sector hospitals. Managers at the private facilities were happy to participate with the Aama Programme despite incurring losses (the current Aama rates being insufficient to cover the cost of services) as it allowed them to have more patients for teaching purposes.

The modality of service provision at private hospitals was different from that seen in public facilities, as only doctors provided maternity services, without the engagement of the SBAs. Investigations such as routine blood and urine examinations were provided for free as part of Aama, but ultrasonography and routine blood tests for HIV and hepatitis B had to be paid for by patients. These procedures, along with the use of neonatal intensive care for sick newborns and longer duration of stay for mothers, increased the cost of maternity care incurred by families. Service users were aware of the cost implications and avoided going to private facilities where possible.

The main challenge identified was the lack of a communication and coordination between private and public sector hospitals. Poor communication/coordination affected all the aspects of patient management, including patient transfer and QoC. A large number of patients were reportedly sent to private hospitals at difficult hours (late evening and night) and during public holidays and festivals without any notice for facility preparation. Neither was there any communication or referral mechanism in place, with the patients having to resort to their own means for transportation to private hospitals and making use of their services.

Box 1 continued: Overcrowding: Experiences of Private Medical Colleges with Aama

All of a sudden, as the night falls, you would see mothers with complications needing surgery sent to us from the public hospital, without any communication or referral. There is no formal linkage between us. (Matron, private hospital)

Except at one private medical college hospital, there was mistrust between the two sectors. This was particularly true for those working in the public sector, as expressed during interviews:

The private medical colleges fleece all the money from the poor patients till they can pay no more and then send them to us eventually. (HDB)

They ask for unnecessary investigations, keep the patients much longer than needed, and even keep the baby in the neonatal intensive care unit. (Nurse in-charge)

The involvement of private medical colleges with Aama was relatively new and the hospitals were at different stages of programme implementation. Service utilisation was found to have increasing following the introduction of Aama. There is room to increase awareness about the availability of Aama benefits in the private sector in order to attract more women to these hospitals, but concerns about the extra cost of care, the possibility of over medicalization (as shown by higher CS rates) and equity concerns remain a challenges. Other options for partnering with regards to the beds as well as human resources have not been explored.

3.2.5 Background Characteristics of Maternity Service Users at Referral Hospitals

The data from referral hospital maternity registers for two selected months in 2069, Bhadra and Falgun (six months apart), were analysed. Age, ethnicity, referral status, and the mothers' residence were analysed for 8,681 mothers, to better understand service users' background characteristics.

a. Age of Referral Hospital Service Users

Sixty-six per cent of women delivering in referral hospitals were 20 to 35 years of age, while a third (33%) were under 20. The mean age of mothers was 23.2 years (standard deviation 4.39).

Table 4: Age-wise distribution of service users (n=8,681)

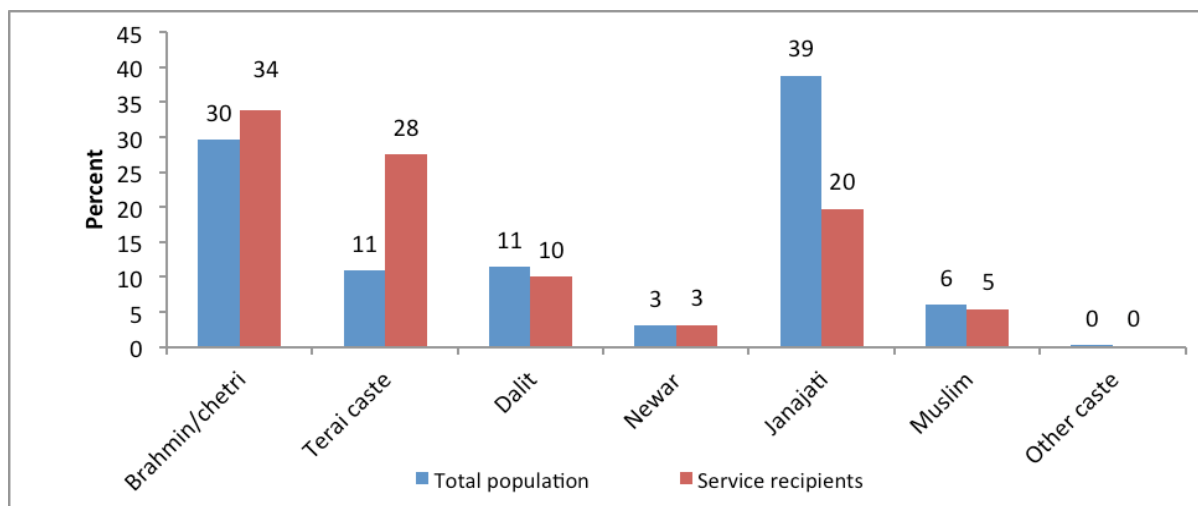
Age categories	Frequency	%
Less than 20 years	2,836	32.7
20 to 35 years	5,743	66.2
More than 35 years	102	1.2
Total	8,681	100.0

Source: Maternity register

b. Caste/ethnicity of Service Users

More than a third (34%) of service users were Brahmin/Chhetri, followed by Terai caste (28%), and Janajati (20%). Compared to the total population, Terai castes used services proportionally more than the other castes, while fewer Janajatis used the referral hospital for birthing services. (Figure 8).

Figure 8: Utilisation of institutional childbirth by caste/ethnicity in the six study hospitals

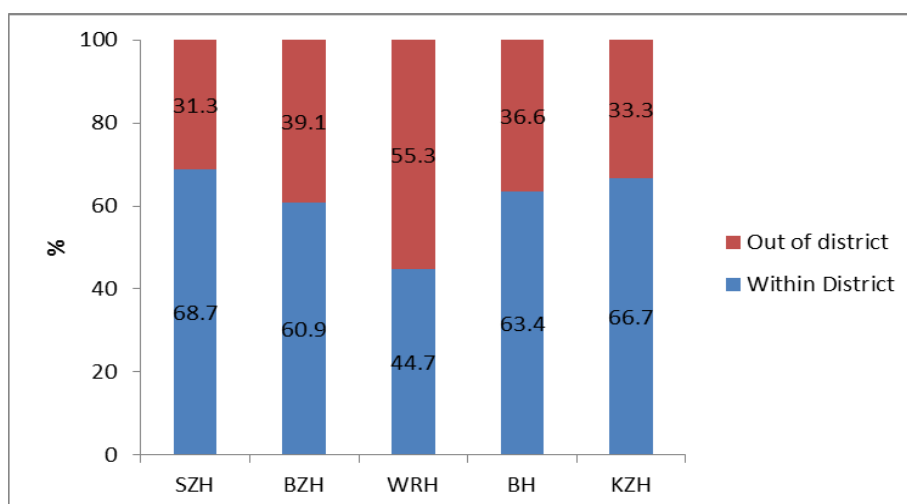


Source: Maternity services register

c. Users of Institutional Childbirth Services at Referral Hospitals by District and VDC

More than 60% of the mothers at the referral hospitals came from the same district where the hospitals were situated. At WRH, however, only 45% of mothers came from Kaski District (where WRH is located). The remaining 55% came from 46 other districts (Figure 9). WRH is a regional (rather than zonal) hospital, and its greater bed and HR capacity may have contributed to the diversity of clients in terms of district representation. In BH, BZH, KZH, and SZH, clients came from 30, 21, 17, and 11 different districts respectively. Most service users came from the surrounding municipalities and VDCs, irrespective of the availability of BCs.

Figure 9: Users of institutional delivery within and outside districts



Source: Maternity register of hospitals, 2012

3.3 Overcrowding at Referral Hospitals and its Implications

To assess overcrowding, maternity ward size and bed occupancy rates were calculated from the hospital records. The opinions of managers, health workers, patients (mothers), and their families (visitors) were also explored to understand the reasons for overcrowding and its implications.

3.3.1 Total and Maternity Bed Strength

The total number of beds in the surveyed hospitals ranged between 145 (SZH) and 400 (BH) (Table 3). On average, 22% of beds were allocated for maternity care. One-third (33%) of beds at KZH were allocated to maternity care, compared to just 17% of beds at SZH, which had the least capacity (25 beds) for maternity.

Table 5: Total and maternity beds in six referral hospitals, 2011/12

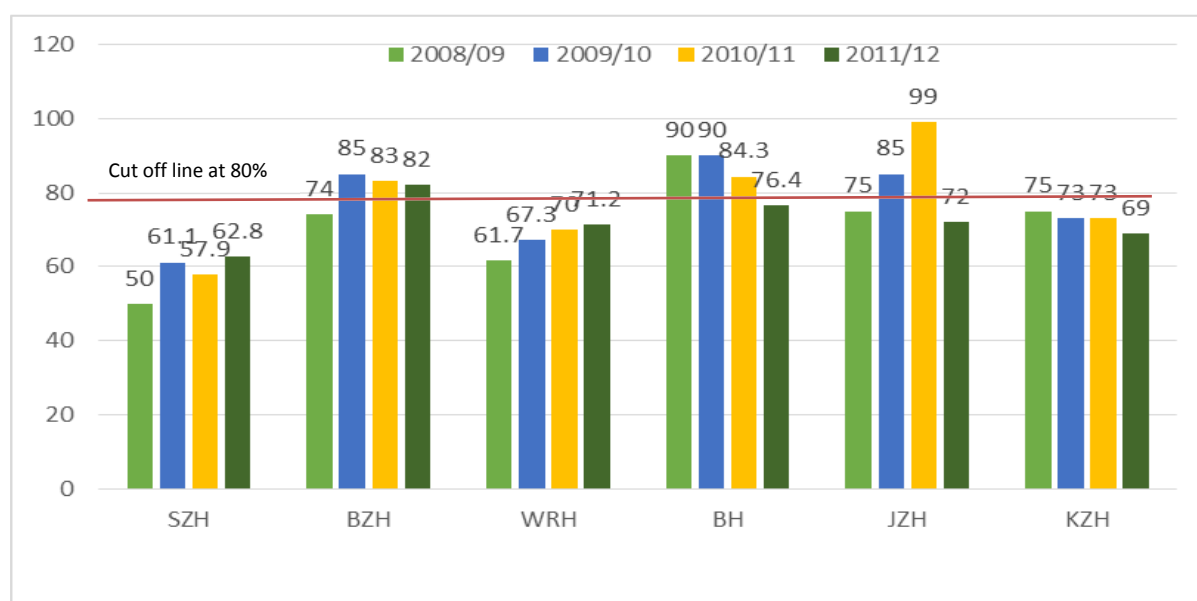
Hospital	Total beds	Maternity beds	%
SZH	145	25	17.2
BZH	150	28	18.7
WRH	300	72	24.0
BH	400	75	18.8
JZH	200	35	17.5
KZH	300	99	33.0
Total	1,495	334	22.3

Source: Medical record section

3.3.2 Total and Maternity Bed Occupancy Rates

The general (all departments) bed occupancy rates at SZH and WRH showed an increasing trend between 2008/09 and 2011/12, albeit with fluctuations (Figure 10). In BZH, BH, and JZH, bed occupancy rates were higher than 70% in all years, and increased to more than 90% in some years. The WHO international benchmark for bed occupancy is 80%.

Figure 10: Referral hospital bed occupancy rate: all departments

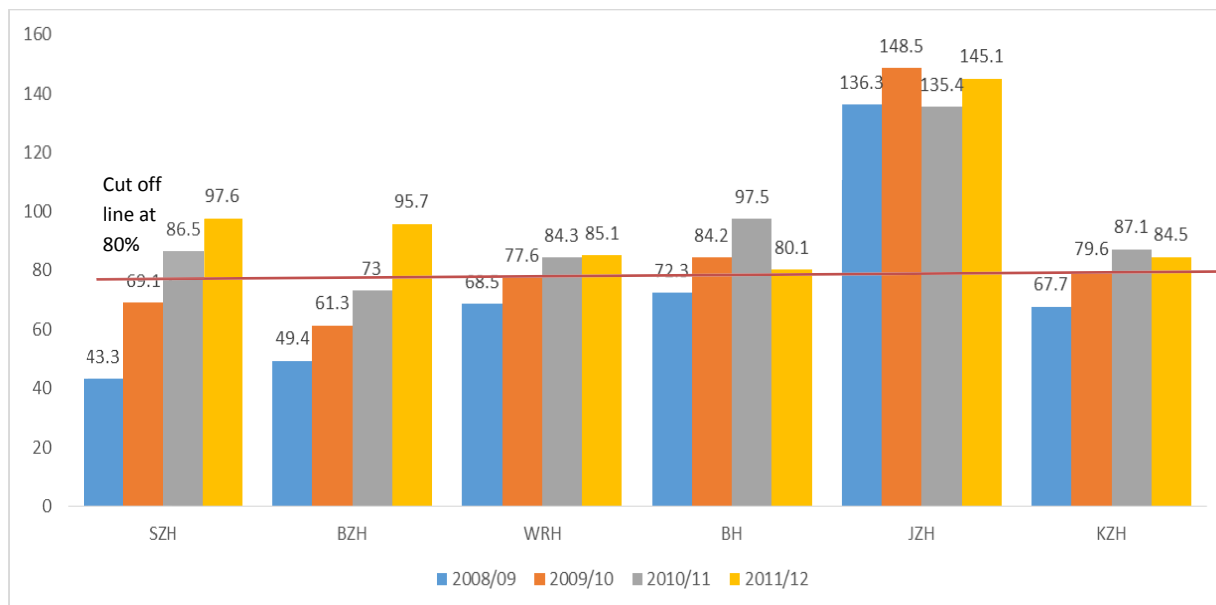


Source: Medical record section

The bed occupancy rate of maternity wards was found to be higher and increasing faster than the general bed occupancy across all the studied hospitals (Figure 11). At SZH, maternity bed occupancy

rates progressively increased between 2008/09 and 2011/12, with a remarkable increase from 43% to 98% observed during this period. Similar trends were seen in BZH (49% to 96%), WRH (69% to 85%), and KZH (64% to 85%). There was decreased bed occupancy at BH between 2010/11 and 2011/12 (from 98% to 80%) as maternity ward beds were added when a new building was constructed. Bed occupancy rates of more than 100% at JZH in all years since 2008/09 may indicate the possibility that service quality was compromised.

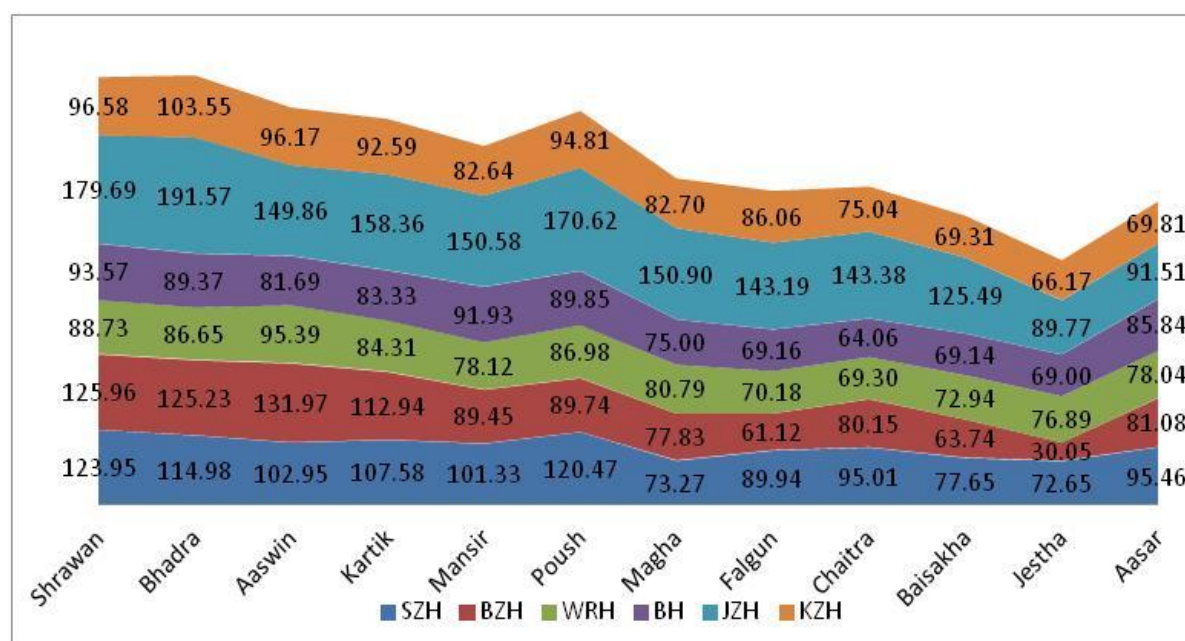
Figure 11: Referral hospital bed occupancy rates: maternity wards



Source: Medical record section

There was a clear seasonal trend in maternity ward bed occupancy rates. Irrespective of monthly variations, the hospitals' maternity ward bed occupancy rates were shown to be higher than the WHO standard of 80% in most months (Figure 12). The bed occupancy rate of JZH was found to be more than 100% for most months.

Figure 12: Seasonal trend of bed occupancy rate of maternity wards by months (2011/12)



3.3.1 Reasons for Overcrowding

a) Referral Status of the Clients

The tendency for clients to come directly to referral hospitals was one of the main reasons identified for overcrowding. Almost all (98%) mothers were self-referred, meaning that they had come directly to the referral hospitals without having visited a peripheral BC first.

b) Preference of Clients for Referral Hospitals

The analysis of the qualitative information from the interviews with the service providers, managers, and the users shows that for many, referral hospitals were the clear choice for childbirth (Box 2).

The availability of uninterrupted, round-the-clock services, the backup of doctors and specialists, and facilities for investigation and emergency surgery for mothers and babies were all important considerations for families. These were reportedly the key ingredients for building trust, the most common reason cited for preferring the referral hospitals. Families also trusted that unnecessary investigations or procedures, especially CSs, would not be performed unless needed.

Public demand was observed to favour bigger hospitals and more specialised care.

This was more of a reality for those who were educated and/or belonged to wealthier families.

Women also referred to previous positive experiences at the referral hospitals, especially the behaviour of the service providers (nurses as well as the nursing students), which was perceived by mothers at SZH, BH, BZH, and WRH to be good, despite their workload.

Lack of adequate services and facilities at the district hospital meant that the distant referral hospitals were the only option for many families.

Many expectant mothers from distant districts preferred to travel to their relatives in the bigger cities closer to the expected date of delivery and chose the reputed referral hospital for childbirth. This was especially true in SZH, BZH, WRH, and in BH.

3.3.2 Reasons for Bypassing BCs

The mothers who chose referral hospital for childbirth and their families were asked their reasons for bypassing the BC. The service providers and managers also provided their perspectives (Box 3).

Box 2: Reasons for preferring referral hospitals: The words of mothers, families and health service providers

Most of our patients are self-referred: better facilities for investigation and treatment, and trust in this hospital are important for patients who come from long distances, preferring to stay on the floor if there are no beds and refuse going anywhere else. (Nurse in-charge)

Pregnancy is a time when anything can happen anytime; we have to make sure that we are in a safe place with facilities for investigation and surgery at the moment needed. This hospital therefore is best as you are safe here. (FGD Participant)

Those who are aware are always looking for better alternatives and better services. Uneducated mothers deliver at home in our village, while those who are educated go directly to the hospital and nowhere else. (FGD Participant)

The nurses here are trying to do their best: they attend to us and do not shout despite being busy. (Mother, maternity ward)

Some service providers felt that the BCs were relatively new, and that there had not been enough advocacy and awareness regarding the range of services that were offered. They felt that there were unrealistic expectations and a lack of clarity in the community about the need to make referrals for complications.

Mothers and family members, on the other hand, believed that the BCs provided poorer quality services, with fewer amenities and less expertise for safe childbirth. They commented on the lack of round-the-clock service availability at BCs.

A number of interviewees also felt that service providers at the BCs were generally young, inexperienced, lacked confidence, and were unwilling to take responsibility for assuring a favourable outcome. A lack of ambulances at BCs was a concern, particularly for those who lived in distant/remote areas, as finding a vehicle at night could be a daunting challenge. For some, the BCs were too far to travel and had poor access. Women also commented that private practitioners

and medical shops usually advised women seeking their assistance to go directly to the hospital and not to the BC.

3.3.2 Referral Practices between BCs and hospitals

A number of referral issues limiting the effectiveness of referral systems were observed:

- No formal referral mechanisms were in place. Instead, informal referral practices, based on personal preferences, were used. For example, SBAs trained at the local referral hospitals used their relations, linkages, and mobile phones to confer treatment options as well as referral.
- SBAs and Female Community Health Volunteers (FCHVs) occasionally accompanied mothers to the hospital.
- The onus of responsibility for transport lay on the families.
- Higher rates were charged for transporting women in labour.
- Ambulance drivers used their discretion to decide where to take mothers. One Nepal Red Cross Society Staff member commented:

Box 3: Reasons for bypassing birthing centres: The words of mothers, families, and health service providers

There are no provisions for the baby at the health post. What is the point of taking all the trouble if at the end of the day; your baby is unsafe? (Mother)

Services have to be available round-the-clock; it is not enough to open one just for namesake! (Nurse In-charge)

There is no doctor at our PHCC and only young inexperienced nurses provide services. They do not want to take any risk and therefore refer most cases to hospitals. (Mother)

The nurses at the health post refused to accept me for delivery. I don't blame them; they are alone and therefore

What if you develop a complication during childbirth? It could be at night and you may actually be a long way from a hospital. The only recourse would then be to call for an ambulance, but they are expensive. That is the problem with giving birth at the health post. (FGD participant)

I did not go to Dubarkot because there are no roads. How could I've walked all that way in this condition? I came to the hospital easily in a jeep. (Mother)

The ambulance drivers have their income in mind and often influence the family in favour of distant bigger hospitals instead of the local BC, as it earns more mileage for them. **(Red Cross Society Staff)**

3.3.3 Implications of Overcrowding

a) Infrastructure and Amenity Shortages

All the hospital buildings except at BH were over 30 years old, constructed with few beds, and had been designed to cater for a much smaller population. There was a shortage of 426 beds across the six hospitals, which urgently required placement (Table 4).

Even buildings that were fairly recently built suffered from inadequate planning with regards to the increasing number of service users, and therefore had insufficient capacities to accommodate the current demand. This was true for BH, BZH, and WRH. In BZH, the design did not consider the local (warm) weather.



Photo: Mothers on floor owing to bed shortages at hospital

Such is patient load; I have seen babies being born in the passage and at the doorway. Toilets are impossible to enter, there is no lavatory provision for visitors, nurses are irritated all the time and we only get to see the young student nurses (FGD Participant)

Table 6: Implications on infrastructure

Hospital	Total deliveries	Additional demand (%)	Existing beds	Existing bed days	Required bed days	Required total beds	Required extra beds	Tentative size of building (sq ft)	Additional Cost (million NPR)
SZH	4,953	100	25	9,861	20,440	70	45	8,400	25.2
BZH	4,421	100	28	9,490	20,440	70	42	7,840	23.52
WRH	9,374	100	72	21,569	43,800	150	78	14,560	43.68
BH	9,692	100	75	21,627	43,800	150	75	14,000	42
JZH	10,276	100	35	20,568	42,340	145	110	20,533	61.6
KZH	9,365	100	99	25,431	51,100	175	76	14,187	42.56
Total	48,081	100	334	108,546	325,637	760	426	79,520	238.56

Source: Field survey 2012

The infrastructure, backup facilities, and supporting conveniences, such as water supply, toilets, and other amenities including drinking water, were all in short supply. There was an acute shortage of functioning toilets in JZH, SZH, and BZH, where even the available toilets were blocked and overflowing with faecal matter; this is not just unhygienic but introduces a source of infection for the mothers, babies, and visitors. The recently refurbished toilets were already inadequate and suffered from faulty design. In BH, the pans of the available toilets in the postnatal ward were broken. In BZH, commodes were installed instead of the squatting pans that most mothers were used to. Faecal matter was seen all over the commodes, including the floor of the toilets. The doors of the toilets in

SZH were heavy, tight, and could not be opened by the patients. Some toilets that could have been used were kept locked without the knowledge of the management, reportedly to reduce the amount of work for the cleaners. The management across all the hospitals were either oblivious or complacent about the sorry state of these basic amenities.

The lack of a mechanism for visitor control meant that anyone could walk freely inside the hospital, to the wards, and even inside the labour room (at JZH). The maternity wards were teeming with visitors at JZH, KZH, and BZH, interfering with service provision.

Visitors were found sitting and even lying on the patient's bed. In JZH, one visitor per patient was allowed inside the labour room, to support the mother during childbirth. Instead, everyone from the family tried to get inside, totally disregarding the measures for infection prevention that should have been in place. The nurses were irritated, exhausted, and exasperated, shouting at the excessive number of visitors inside the labour room. The management, on the other hand, seemed aware of the reality and their role in controlling the excessive number of visitors, and yet complacent about it.

Excessive number of visitors who come along with the patients is affecting the quality of services. The nurse must perform procedure in the ward with the visitors watching over her. Can you expect a nurse to concentrate in her work and provide good quality services in this chaos? (Chair, HDB)

Cleanliness maintenance was also becoming difficult. In BH, the floors were mopped three times a day and kept clean; however, the reality of JZH, KJH, and SZH left much to be desired.

b) HR Shortages

The sanctioned positions for health workers, which determine the number, the skill mix, and expertise of the personnel assigned for the hospitals, were created more than 20 years ago (guided by the National Health Policy, 1991). These positions had not been revised since and therefore did not address the present-day realities of increased demand for services.

However, although reported to be grossly inadequate, even these sanctioned positions were not filled, adding to the chagrin of the very limited number of health workers who actually provide services. All the senior matron, MS, and senior nursing sister (supervisor) positions lay vacant across all six referral hospitals. Less than half (45%) of the gynaecologist/obstetrician positions were filled, while at JZH, both gynaecologist/obstetrician positions lay vacant. More than 60% of the sanctioned anaesthetist positions also lay vacant, with three zonal hospitals (SZH, BZH, and JZH) out of the six managing without an anaesthetist. Anaesthetic Assistants were providing services, defying the rule that allows them to provide services only under the supervision of an anaesthetist or a doctor trained in anaesthesia.

To make up for the dearth of personnel, the HDB hired HR locally. However, a number of problems with this system were observed:

- The circular from MoHP, limiting the number of local appointments to within the numbers of positions sanctioned for the category, was reportedly interfering with the hiring of the personnel required to address local needs in order to address the shortage of staff.



Photo: Poorly managed toilet at maternity ward of the hospital

Though I am poor but my home is cleaner than this hospital. (Mother)

- The current budgetary allocation was not sufficient to support hiring specialists.
- There was a lack of clarity in the HDB guidelines on the responsibility and authority for financial management and local recruitment.
- In order to save money, specialists (obstetricians/gynaecologists) were hired as medical officers.
- The salary scales and benefits (night and uniform allowance) of SBAs hired through the HDB were lower than they would have been on government scales, except at BH. The SBAs at JZH were paid less than a third of their government counterparts' salary. Underpayment of the SBAs hired through the Health Facility Operation and Management Committee (HFOMC) was observed at the peripheral BCs as well. This practice unfairly disadvantaged SBAs known as 'chaubisghante' (the 24-hour ones) who were hired through management committees (HDB and HFOMC at the BCs) to provide providing night duty care, but were paid less than government-appointed SBAs who worked during the daytime.

Box 5: HR shortage: In the words of health service providers and managers

There has been an unprecedented increment in maternity services, but no increase in the number of health workers from the government. (Nurse in-charge)

Earlier, we had 53 doctors for 100 beds, now we are running 300 beds and the number of doctors working here has decreased to 27! (HDB)

HR is a huge challenge as the governmental allocation is clearly inadequate. Even these sanctioned positions are not filled. There are no anaesthetists in the western part of the country across the river Narayani, does it not surprise anybody! (MS)

This cannot go on: if the government is serious about service provision, it must ensure the availability of appropriate personnel – or transfer the salary of the doctors of vacant position to enable us to hire such specialists locally. (HDB)

c) QoC

Managers, service providers, and mothers all agreed that patient load was impacting quality. Excessive workload coupled with the limited number of nurses available meant that even basic and essential procedures such as use of partographs to monitor progress of labour, and regular checking of vital signs, were not being routinely carried out.

Students, Auxiliary Nurse Midwives (ANMs), and nurses provided care in the postnatal wards. There was practically no care or counselling, except at BH, where a room had been allocated for this purpose especially to train the students.

Box 6: Impact of overcrowding on QoC: The words of service providers

We are not able to provide postnatal care or counselling; there is no time to even talk to the mothers, we only attend to those having excessive postpartum haemorrhage. (SBA)

I wish I could revisit the mother whom I delivered to see how she was doing, but I can't even follow the complicated cases that I manage.

There is such a rush to discharge; mothers leave within 2-4 hours following normal delivery (MS)

Quality is seriously being compromised due to the numbers. You finish one Caesarean and another one is waiting. We do not even have enough towels! We are only playing with the numbers! (SBA)

Except at BH, where postpartum mothers were asked to stay for at least 12 hours before being discharged, it was customary for mothers to be sent home within a few hours of childbirth, and across all the referral hospitals, women were asked to sit outside or walk around the hospital corridor until the cervix was 4cm dilated before being admitted. This was done to avoid the maternity ward becoming overcrowded.

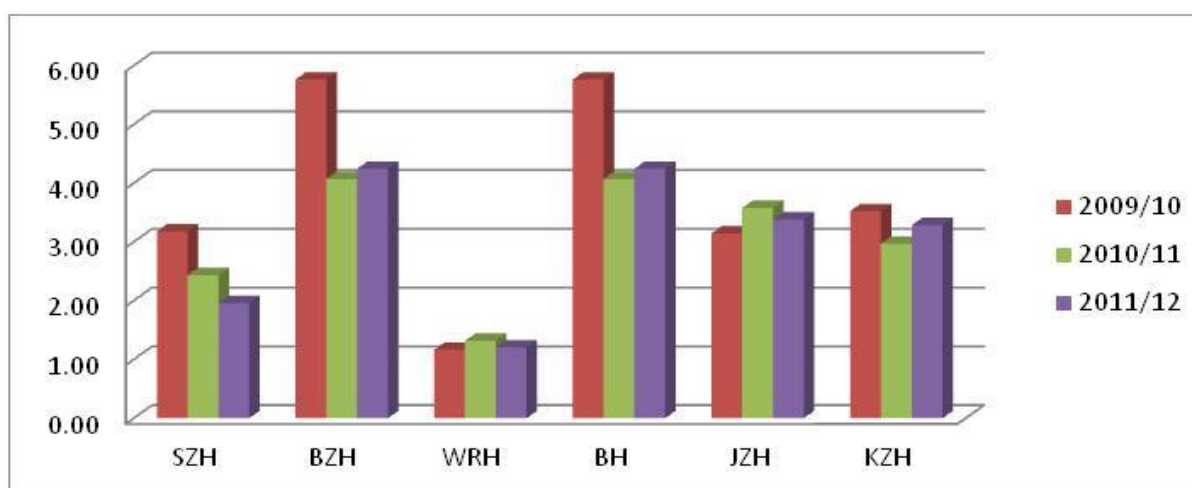
Infection prevention practices such as sterilisation were also reported to have been compromised.

Health Outcomes

Health outcomes (stillbirths and maternal death) were assessed as a measure of quality of services. Stillbirths as a percentage of total live births in referral hospitals were more than 3% at KZH, JZH, BH, and BZH, whereas in WRH and SZH, they were less than 2%. A decreasing trend was observed in three hospitals (Figure 13).

The analysis of maternal deaths shows that nearly half of all the maternal deaths in 2011/12 (20 out of 42 deaths in total) occurred at JZH, raising serious concerns regarding QoC.

Figure 13: Stillbirths as percentage of total births



Source: Medical record section

d) Implications for Other Departments

The underused beds of other departments had been reallocated to allow more beds for maternity. In KZH, 30 beds from the medical ward and 28 beds from the general cabins were used by maternity. In JZH, the beds of the surgical ward, and in BH and WRH, beds allocated for gynaecology were similarly being used. The expansion of maternity services had therefore been at the cost of gynaecology and some other specialties.

3.4 Local Responses to Address Overcrowding

One objective of the study was to understand the current strategies being employed locally to cope with the increased demand for services. The role of the HDB, and coping strategies adopted to accommodate the increased number of childbirths and manage the excessive workload, are described below.

3.4.1 Role of the HDB in Addressing Overcrowding

The role of the HDB was generally perceived to be supportive by managers and service providers at SZH, WRH, BH, and JZH. At KZH, the HDB was perceived to be more interested in hiring HR, while in BZH, there was a considerable gap between the board and the MS. A number of issues that prevented HDBs from responding effectively to overcrowding and other issues were identified through stakeholder interviews:

- The political nature of the appointment of the Chair of the HDB was perceived to promote favouritism while recruiting HR or allocating opportunities/perks to the staff.
- In addition, nurses were not represented on the Board, and therefore did not have access to senior management to share the problems resulting from overcrowding and to work towards their mitigation.
- Frequent changes in leadership and a lack of management knowhow were felt to have reduced the role of the HDB to recruiting personnel and managing hospital income only. Adequate attention was not paid towards staff supervision or appraisal of their performance. The irregularity of HDB meetings, the lack of follow-up to decisions taken, and poor institutionalisation presented some other challenges.
- There were considerable gaps in communication between the Chair and the hospital management

Overcrowding as a problem has not been discussed with me. The medical superintendent should be discussing the issue with the staff and updating me about it. Since no one raised the issue, I thought there was no problem with handling the excessive crowd and the workload.

I have no idea about Aama incentives. I do not know how much money actually comes to the hospital, its distribution among staff or how much is spent and under which heading! (HDB Chair)

- The Chairs of the HDBs of all the hospitals desired more support from the MoHP to address the increasing demand for services. To this effect, ensuring the availability of HR by filling the vacant positions, increasing the number of beds, and ensuring availability of extra funds to hire appropriate HR locally in order to match current demand were on their list of urgent top priorities for MoHP to address.

3.4.2 Local Coping Strategies: Responding to Excess Demand

a. Reporting Overcrowding to Managers

The first response to overcrowding identified by service providers had been to report problems to their supervisors and managers. Those who faced the problem (nurses and doctors), however, felt that the management was not paying heed to their concerns, while the management (HDB) considered the role of MoHP to be of paramount importance, and only saw a solution in MoHP assigning appropriate HR to address the problem.

The problem of overwork as a result of overcrowding, coupled with the limited number of service providers and aggression from demanding visitors, frequently lead to discontentment between the nursing staff, the MS, and the Board. The MS, usually a clinician, was bogged down with patient care, his own job responsibilities, and the realities of overworked colleagues, and could often not see the

way out. Health workers were clearly frustrated with the unresponsiveness of their seniors to the concerns they raised:

How much can one complain? Besides, what is the point in complaining; the management always turns a deaf ear. I am fed up and tired of complaining; sometimes it gets so strained, I stop talking to the superintendent! (Nurse in-charge)

I have to wait for hours to share my problems with secretary or the Director-General. They don't even receive my phone calls. Is it only my responsibility to assure services here? (MS)

3.4.3 Measures to Accommodate Patients

The following measures were taken to accommodate the growing number of mothers:

- Extra hospital beds were added in the maternity wards of all the hospitals. In JZH, seven extra beds in the space meant for 25 beds, and 10 additional beds in SZH in a space meant for 15 beds, had made the wards look congested, and had significantly reduced the space between two beds to less than three feet.
- Two waiting (antenatal) mothers were kept in one bed at BH, SZH, BZH, and WRH.
- Floor mattresses were used in all the hospitals. JZH ran out of mattresses, forcing postpartum mothers to use their personal sheets, cartons, and even shawls for sleeping with their babies on the floor.
- Locally fabricated cots were used between the hospital beds in BZH, WRH, and BH. In BZH, their design allowed neat stacking under the patient's bed when not in use. In JZH, five beds had been put in the corridor and two in the eclampsia room; in WRH, 18 low beds were used for postnatal mothers.
- The management at BH allowed the beds in its paying wards and cabins to be used by mothers willing to pay (NPR 200, 500, 700, 1,000 or 1,500 per day, depending on the type of room) while the rest of Aama benefits were provided to the mother as usual.
- The private cabins at WRH had been converted to general wards with the addition of extra beds.
- Once the medical ward at KZH moved to a new building, its space was taken up by the postnatal ward.



Photo: Accommodating additional beds at maternity wards with reduced space between beds

- An extra operating table was added in the theatre at KZH to accommodate more CSs.
- Free beds in other wards (surgery and orthopaedics) were used to keep postpartum mothers in SZH.
- Most hospitals have plans to reorganise the wards in order to find space for maternity. For example, at SZH, once the surgical ward had moved to the newly constructed building, its space was to be used for maternity. An unused room at KZH was to be used for expanding maternity services, and the library at JZH moved to another building, freeing space for maternity. JZH, WRH, and BZH have no facility expansion plans so far.

3.4.3 Measures to Manage Workload

a. Using Volunteers, Students and Trainees

- Doctors, SBAs, nurses, and ANMs were allowed to work as volunteers at the maternity ward in all the hospitals.
- SBA trainees, and nursing as well as ANM students posted for their clinical practice at the hospital, were extensively used for providing nursing care, filling the registers, distributing medicines, and checking vital signs. Students (under supervision) managed the postnatal wards in all the hospitals.

b. Hiring of HR by HDBs

The HDB funds were used to hire extra nurses, SBAs, and doctors. At SZH and WRH, the Aama fund was also used for this purpose. At WRH and JZH, the Aama fund was supporting a doctor each.

c. Nurse Pooling

The availability of the Aama incentive had enabled nurses and nursing supervisors to be attracted from other less busy wards if the maternity ward became excessively busy.

3.5 Utilisation Patterns of the BCs

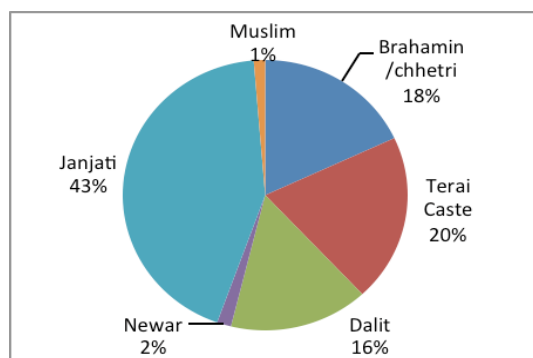
The overall utilisation of BCs for institutional childbirth was low, at 12% in the six study districts. In areas with transport facilities, health workers usually chose to commute to work and avoided staying at the BC, affecting round-the-clock service availability. Women from rural and remote areas, especially if poor, favoured the BCs close to their homes for childbirth. During interviews, it was apparent that the only opportunity for institutional births for these poor and marginalised women lay at the BC.

The poorest women in our village deliver at home, those with some money go to the Health Post, while the rich ones, go directly to Dhangadhi hospital. (Mother)

The women from squatter settlements, and the poor Chepang people from the very remote hills, come to us for delivery. (SBA, BC)

Background Characteristics of Service Users at BCs

Figure 14: Caste/ethnicity of service users at BCs (n=308)



Source: Maternity service registers, 2012

Table 7: Age groups of service users at BCs

Age categories	Number	%
Less than 20 years	122	39.6
20 to 35 years	179	58.1
More than 35 years	7	2.3
Total	308	100.0

Source: Maternity service registers, 2012

The analysis of the service utilisation at BCs showed that nearly three-fifths (58%) of mothers at BCs were aged from 20 to 35 years, and two-fifths (40%) were less than 20 years of age, with a mean age of 22.62 years (standard deviation of 4.68) (Table 5).

Users of childbirth services at BCs were most commonly Janajati (43%), followed by Terai caste (20%) (Figure 14). A greater proportion of service users at BCs (16%) than at referral hospitals (10%) were Dalits.

Some of the factors that were found to be important for utilisation of services were as follows:

- Round-the-clock availability of services
- Support of management, other health workers, and community stakeholders.
- Behaviour of the service providers, especially ownership and accountability

Box 4 : Ensuring maternity services at a BC



Photo: Interaction with mother at Betahani VDC, Banke District



Photo: Labour room at Betahani SHP

Durga (SBA), 28 years, became inspired to dedicate her life to serving women during childbirth when she was saved from a near miss following the birth of her son. Though originally from the hills of

Rukum, she found her professional home in the plains of Betahani, Banke District. She speaks like a native, and the pride of this ownership reflects when she says, "*Malai ta sabai le madhesinaibhanchhan*" (everyone thinks I am Madhesi).

Prior to her appointment, nothing much happened at Bethahani SHP. With the help of the DHPO in facilitating the involvement of partners, she provides all entitled preventive and promotive services. Support from the Nepal Family Health Programme created the environment at the health facility and enabled her to reach out to the community; Plan Nepal provided some equipment. Now she provides 24/7 delivery care that most women in the community are happy to access. They trust her and are confident that she would call the ambulance if needed and take you to the big hospital in Nepalganj.

Durga stays in a room at the BC with her husband and their three-year-old son. Her husband, a contracted Auxiliary Health Worker, supports her, especially while managing complications. Her training at BZH has helped the linkage between the BC and the referral hospital. She has a list of phone numbers to summon an ambulance, and is happy to accompany the mothers there. Her sense of accomplishment is reflected in the cleanliness of the facility and the optimal use of resources: a rice-cooker is used to sterilise the equipment for want of an autoclave. She is happy and grateful to have the opportunity to help women who are less fortunate than her.

Her commitment towards maternal and newborn health services, the trust and ownership of the health facility by the community, the support from community stakeholders including partner agencies, the DPHO, and the linkage with the referral hospital have all contributed to this success story.

3.6 Unit Costs of Hospital and BC Deliveries and Resource Implications

3.6.1 Unit Costs

This section uses the cost data collected at each of the facilities to estimate the actual unit cost of normal, complicated, and CS deliveries in 2011/12. A comparison is made of the actual cost of normal childbirth at BCs and hospitals in two ways: (i) against each other, and (ii) against alternative 'normalised' unit costs when the distorting effects of current under- and over-utilisation are removed. The resource implications of shifting to normalised costs are estimated. The growing importance of Aama payments to hospital recurrent funds is briefly explored.

Breakdown of Costs of Normal Childbirth at Hospital

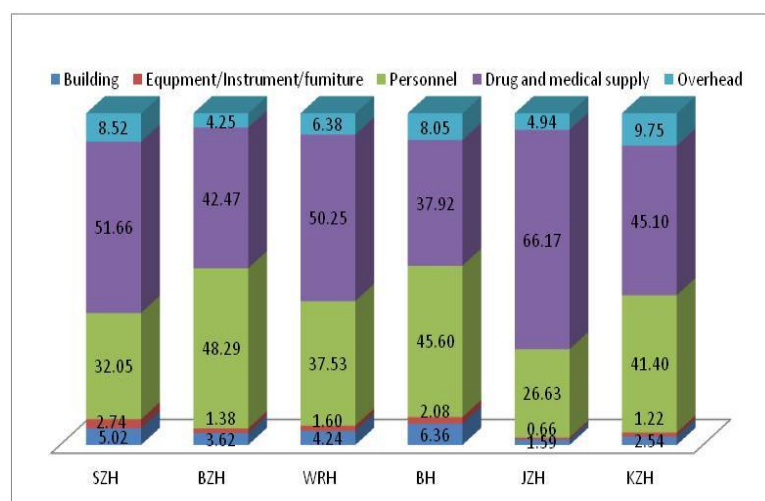
The breakdown is based on actual costs reported by the hospitals, attributed as explained in the methodology. Two main points stand out:

Firstly, the very low share of costs attributed to buildings and equipment in hospitals was mainly due to the longer useful life years (30 years in case of building and 5-15 years in case of equipment) and the low annualised costs that were generated as a result. The annualised building cost was lowest at JZH (1.6%) and highest at BH (6.4%), as it had allocated a relatively large building for maternity (Figure 15).

Secondly, the salary component at hospitals was smaller than expected and more variable. This confirms the well-known fact that staffing is under-resourced, in terms of both actual numbers of staff and the low salaries paid to them. JZH has particularly low personnel costs (27%). The costs for drugs and medical supplies ranged from 38% to 66% of a hospital's total costs (Figure 15).

Many positions at the referral hospitals had remained vacant for over three years, resulting in under-representation of personnel costs. In JZH, for example, the posts of gynaecologist/obstetrician, matron, nursing supervisor, and ward in-charge were all vacant at the time of the visit. Nurse posts were also often vacant and filled by staff recruited by the HDB at rates one-third lower⁴ than the government scale in some cases.

Figure 15: Breakdown of costs of normal childbirth at six referral hospitals



Source: Field survey, 2012

Unit Cost of Normal Childbirth at Referral Hospitals

The estimated cost of a normal childbirth in 2011/12 in the six hospitals averaged NPR 1,847 (Table 6), with a variability of around 26% between the hospitals. The lowest unit cost (NPR 1,652) was found at WRH, and the highest at KZH (NPR 2,082).

Table 8: Unit cost of a normal childbirth at six referral hospitals 2011/12 (NPR)

Cost component	SZH	BZH	WRH	BH	JZH	KZH	Total
Capital costs							
Building	309,481	279,938	477,729	932,941	213,047	344,858	2,557,994
Equipment/instruments/furniture	169,090	106,545	180,684	305,030	88,582	165,723	1,015,654
Subtotal of capital costs	478,572	386,483	658,413	1,237,971	301,628	510,581	3,573,648
Recurrent costs							
Personnel	2,660,167	3,736,322	5,503,958	6,689,573	3,559,482	5,629,937	27,779,438
Drugs/medical supplies	3,183,849	3,285,876	5,659,091	5,563,296	8,843,292	6,133,548	32,668,952
Overheads	525,374	328,952	718,397	1,180,712	659,918	1,325,792	4,739,144
Subtotal of recurrent costs	6,369,389	7351,149	11,881,445	13,433,581	13,062,692	13,089,277	65,187,533
Total (capital + recurrent)	6,847,961	7,737,633	12,539,858	14,671,552	13,364,320	13,599,857	68,761,182
Total normal deliveries	3,897	3,751	7,591	7,398	8,054	6,532	37,223
Unit cost for a normal delivery	1,757	2,062	1,651	1,983	1,659	2,082	1,847

Source: Field survey, 2012

⁴ Nurses hired through HDB at JZH were paid only NPR 5,000 per month, two-thirds less than the government scale.

Unit Cost of Complicated Deliveries at Referral Hospitals

The average unit cost of a complicated delivery managed at the referral hospitals was NPR 3,227 (Table 7). The highest cost was at BH (NPR 3,855), with 150 beds, followed by KZH (NPR 3,603), with 300 beds. The lowest unit cost for management of a complication was at JZH (NPR 2,613), where an understaffed service combined with the second highest number of complications recorded.⁵

Table 9: Unit cost of complicated deliveries at the six referral hospitals 2011/12 (NPR)

Cost component	SZH	BZH	WRH	BH	JZH	KZH	Total
Capital costs							
Building	29,751	34,089	27,113	74,884	18,779	41,466	226,083
Equipment/instruments/furniture	25,364	12,210	10,255	24,484	7,808	19,927	100,048
Subtotal of capital costs	55,116	46,300	37,368	99,367	26,586	61,393	326,130
Recurrent costs							
Personnel	315,880	454,976	312,377	536,947	313,744	717,924	2,651,848
Drugs/medical supplies	579,968	727,875	636,812	1,258,008	1,114,575	1,666,515	5,983,753
Overheads	50,506	37,699	40,773	94,771	58,167	159,415	441,331
Subtotal of recurrent costs	946,354	1,220,550	989,961	1,889,726	1,486,486	2,543,854	9,076,932
Total (capital + recurrent)	1,001,470	1,266,850	1,027,330	1,989,093	1,513,072	2,605,247	9,403,062
Total complicated deliveries	368	375	353	516	579	723	2,914
Unit cost for a complicated delivery	2,721	3,378	2,910	3,855	2,613	3,603	3,227

Source: Field survey, 2012

Unit Cost of CS at Referral Hospitals

The average unit cost of a CS was NPR 11,152 (Table 8). The highest cost was NPR 13,669 at KZH, where the number of CS cases was also the highest. The lowest cost was at WRH (NPR 9,344), and SZH (NPR 9,643); the number of vacant positions and lower drug costs in these hospitals may reduce the unit costs of CSs. Individual hospital unit costs for CSs varied by about 46%. Length of stay was an important determinant of these cost variations. The average length of hospital stay for a CS in JZH and KZH was over seven days, compared six days in WRH.

⁵ The high level of maternal mortalities at JZH is undoubtedly linked to this situation.

Table 10: Unit cost of a CS at six referral hospitals 2011/12 (NPR)

Cost component	SZH	BZH	WRH	BH	JZH	KZH	Total
Capital costs							
Building	354,544	300,022	775,567	1,528,056	852,112	807,858	4,618,158
Equipment/instruments/furniture	309,574	343,974	894,853	659,844	326,593	2,807,641	5,342,479
Subtotal of capital costs	664,118	643,996	1,670,420	2,187,900	1,178,704	3,615,499	9,960,637
Recurrent costs							
Personnel	3,750,896	4,319,650	9,200,242	9,256,625	8,369,128	14,960,901	49,857,442
Drugs/medical supplies	1,609,920	2,438,251	4,716,287	6,400,800	6,502,994	6,965,110	28,633,362
Overhead	609,726	557,332	1,259,691	1,884,167	1,313,131	3,299,342	8,923,388
Subtotal of recurrent costs	5,970,542	7,315,232	15,176,220	17,541,592	16,185,253	25,225,353	87,414,192
Total (capital + recurrent)	6,634,660	7,959,229	16,846,640	19,729,492	17,363,957	28,840,852	97,374,830
Total CSs	688	709	1,803	1,778	1,643	2,110	8,731
Unit cost for a CS	9,643.401	11,225.99	9,343.671	11,096.45	10,568.45	13,668.65	11,152.77

Source: Field study, 2012

Unit Cost of a Normal Childbirth at BCs

Only the cost of normal childbirth at the BCs was estimated since complications were referred out. BCs were in their infancy and heavily underutilised. The average unit cost of a normal delivery in 2011/12 was NPR 3,625 (Table 9), with a wide range of variability. At Betahani SHP, the unit cost of normal childbirth was NPR 1,450, while at Naudada HP it was NPR 18,021. The factor influencing unit cost at BCs in our sample was the number of deliveries, which varied by a factor of 20 from 18 to 388 in a year.

Table 11: Unit cost estimates of normal deliveries at surveyed BCs 2011/12

BC	Deliveries	ANMs	Deliveries per ANM	Capacity used %	Total cost (NPR)	Deliveries	Unit cost (NPR)
Fulbari SHP	208	2	104.0	59.4	389,672	208	1,873
Malakheti HPCC	321	4	80.3	45.9	779,934	321	2,430
Bankatuwa PHCC	146	3	48.7	27.8	606,914	146	4,157
Betahani SHP	161	1	161.0	92.0	233,421	161	1,450
Naudada HP	18	1	18.0	10.3	324,373	18	18,021
Jutpani PHCC	91	5	18.2	10.4	819,010	91	9,000
Meghauli HP	123	3	41.0	23.4	879,455	123	7,150
Yadukua PHCC	161	3	53.7	30.7	880,930	161	5,471
DhanusaSewaSamiti	89	1	89.0	50.9	235,590	89	2,647
Dadarbairia HP	18	3	6.0	3.4	273,799	18	15,211
Mangalbare PHCC	388	4	97.0	55.4	997,475	388	2,570
Total	1,724	30	57.5	32.8	6,420,573	1,771	3,625

Source: Field study 2012

Comparison between Hospital and BC Actual Unit Costs

Based on actual costs reported by the facilities in 2011/12, the average unit cost of a normal childbirth at the hospitals was estimated at NPR 1,847, while it was NPR 3,625 at the BCs. Low staffing levels, longer useful life years (30 years) of infrastructure, and very high bed occupancy rates drive the low cost at the hospitals. Conversely, the high costs at the BCs were driven by low utilisation rates. Based on the WHO workforce planning guideline of 175 births per SBA, the BCs in the sample averaged an utilisation rate of only 33%.

3.6.2 Normalised Unit Costs

For planning purposes it was necessary to compare hospital and BC unit costs on a more appropriate basis, reflecting the accepted health care standards and a more efficient use of resources. It was therefore necessary to re-estimate ('normalise') the unit costs for childbirths.

As there were no norms of staffing pattern and physical facility for childbirths set by MoHP, the WHO international benchmark of 80% bed occupancy was used. All vacant staff posts were assumed to have been filled (at current salary levels) and the cost of additional infrastructure that was needed to achieve these norms was estimated. These are set out below.

3.6.3 Estimated Costs of Additional HR

For maintaining quality, WHO 2005 has set a benchmark of four doctors and 20 nurses for 3,500 births [11, 12]; there was therefore a gap of 148 nurses and 28 doctors in these six hospitals. The cost of filling these posts amounted to NPR 50 million per year (Table 10).

Table 12: Implications of overcrowding for HR

Hospital	HR	Existing	WHO norm	Gap	Additional cost for HR per year (million NPR)
SZH	Nurses	8	28	20	5.68
	Doctors	2	7	5	1.54
BZH	Nurses	13	25	12	3.43
	Doctors	2	5	3	0.92
WRH	Nurses	34	56	22	6.08
	Doctors	4	11	7	2.16
BH	Nurses	27	55	28	7.95
	Doctors	6	11	5	1.54
JZH	Nurses	13	59	46	12.8
	Doctors	7	11	4	1.23
KZH	Nurses	34	54	20	5.46
	Doctors	7	11	4	1.23
Subtotal					50.03

Source: Field survey, 2012

*According to WHO norms

Using these new estimates, the average 'normalised' unit cost of a normal childbirth in referral hospitals increased to NPR 2,458. See Table 11.

Table 13: Normalised cost of normal childbirth in referral hospitals (NPR)

Cost component	SZH	BZH	WRH	BH	JZH	KZH	Total
Capital costs							
Building	381,913	322,828	531,837	932,941	678,308	403,136	3,250,962
Equipment/instruments/furniture	174,103	109,197	182,955	305,030	111,431	167,439	1,050,155
Subtotal of capital costs	556,016	432,026	714,792	1,237,971	789,738	570,575	4,301,118
Recurrent costs							
Personnel	5,123,653	4,990,652	10,569,901	10,510,997	10,609,113	7,844,462	4,964,8779
Drugs/medical supplies	3,183,849	3,285,876	5,659,091	5,563,296	8,843,292	6,133,548	32,668,952
Overheads	525,374	328,952	718,397	1,180,712	780,748	1,358,296	4,8924,78
Subtotal of recurrent costs	8,832,876	8,605,480	16,947,388	17,255,005	20,233,153	15,336,306	87,210,208
Total (capital + recurrent)	9,388,892	9,037,505	17,662,180	18,492,976	21,022,892	15,906,881	91,511,326
Total normal deliveries	3,897	3,751	7,591	7,398	8,054	6,532	37,223
Unit cost for a normal delivery	2,409.26	2,409.36	2,326.73	2,499.73	2,610.24	2,435.22	2,458.46

Source: Field survey 2012

Normalised Unit Costs at BCs

There were no national or international standards for bed occupancy rates at BCs. However, the WHO workforce planning guideline of 175 births per ANM per year could be used to indicate acceptable target utilisation rates. Table 9 shows that the BCs achieving the highest ANM utilisation rates (Fulbari at 59% and Betahani at 92%) had unit costs of NPR 1,450-1,873. In the absence of more detailed estimates, this has been taken as a proxy for a normalised unit cost for the BCs.

Normalised unit costs are the reverse of the current actual estimates. Normalised hospital unit costs rise to NPR 2,458, while normalised BC costs could fall to NPR 1,450-1,900. It is important to note that these estimates are incomplete, as they neither include any additional salary costs for attracting or retaining additional staff, nor the cost of establishing an effective referral system. The costs of these and other additional components could be quite substantial.

Normalised Hospital Costs for Complications and CS

The normalisation exercise was repeated for complication management and CS at the hospitals, adding in the estimated cost of filling vacant staff posts. The normalised cost of a complicated delivery at the referral hospitals increased from NPR 3,227 to NPR 3,922. The average normalised cost for a CS similarly increased from NPR 11,153 to NPR 14,606.

3.6.4 Implications of Normalised Unit Cost Estimates on Projected MoHP Resource Needs

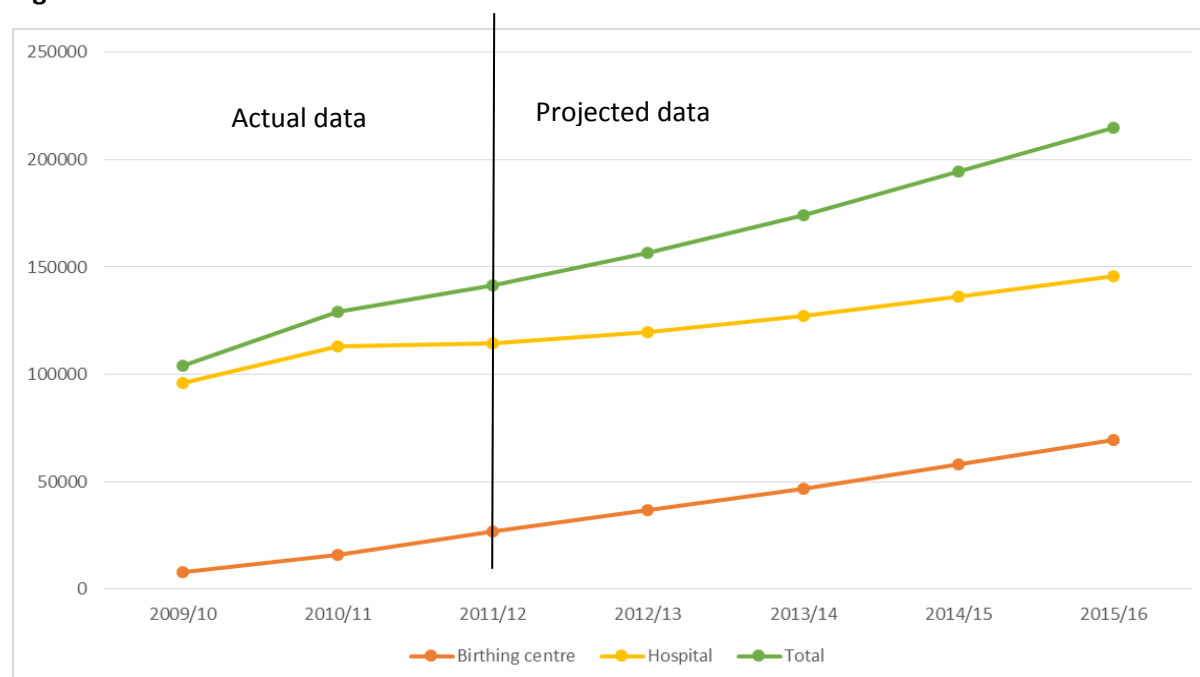
Extrapolating the recent growth trends in Terai population⁶ and institutional births⁷ to 2015 (the date for the achievement of the MDG target of 60% births to be institutional) produced a 52% increase in total institutional births by 2015 (from 141,510 in 2011/12 to 215,072 in 2015/16)

⁶ Preliminary results of Census 2011

⁷ Taken from HMIS Service Utilisation Report, 2011

realistically split into 42% (145,694) at the hospitals and 20% (69,378) at BCs. See Figure 16 and Table 12.

Figure 16: Trends in number of institutional childbirths in Terai



Source: HMIS reports and its projection

Table 14: Projection of institutional childbirths based on current trends in the Terai region

Facility type	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16
BC	8,079	16,158	26,954	36,630	46,909	57,957	69,378
Hospital	96,112	113,015	114,556	119,881	127,323	136,370	145,694
Total	104,191	129,173	141,510	156,511	174,232	194,327	215,072

Source: HMIS reports and its projection

Based on the above projected figures, costing was done by comparing the estimates for actual and normative unit costs. Using the actual unit costs, the total cost of births in hospitals for the four years (2012/13 to 2015/16) would be NPR 1,950.06 million (Table 13). Applying the normalised cost, the estimates would increase to NPR 2572.92 million, an additional NPR 622.86 million in total.

For the BCs, on the other hand, applying the actual unit cost estimate produced a total cost of NPR 764 million for projected births at the BCs up to 2015/16. Applying the normalised BC cost estimate by assuming an increase in average capacity utilisation at the BCs to 60% capacity by 2015/16, the total cost for childbirths at BCs would go down to NPR 395 million, a saving of NPR 369.45 million.

Thus, with better allocative and technical efficiency, the required expansion in hospital beds in the Terai could be more than met by better planning of the BCs. The total actual cost of institutional childbirth in the Terai region is estimated at NPR 2,714.48 million⁸; the normalised cost is estimated to be NPR 2,967.88 million.

⁸In 2011/12 prices

Table 15: Resource envelope for institutional childbirth in the Terai region 2012/13-2015/16
(million NPR)

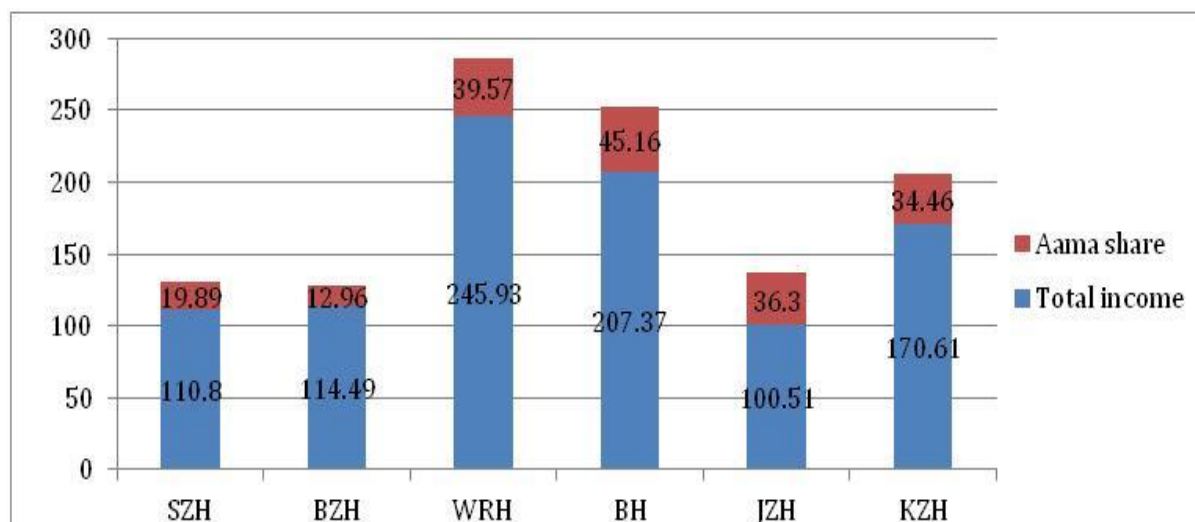
Costs	2011/12	2012/13	2013/14	2014/15	2015/16	2012/13 to 2015/16
BCs						
Actual cost	97.71	132.78	170.04	210.09	251.50	764.42
Normalised cost	50.49	68.61	87.86	108.55	129.95	394.97
Difference	-47.22	-64.18	-82.18	-101.54	-121.55	-369.45
Hospital						
Actual cost	422.08	441.69	469.12	502.45	536.80	1,950.06
Normalised cost	556.89	582.77	618.95	662.93	708.26	2,572.92
Difference	134.81	141.08	149.84	160.48	171.46	622.86
Total of normalised	607.37	651.38	706.81	771.49	838.20	2,967.88
Total of actual cost	519.78	574.48	639.16	712.54	788.30	2,714.48
Difference	87.59	76.90	67.65	58.94	49.91	253.41

Source: Field Survey, 2012

4.6.5 The Effect of Aama Payments on Hospital Income

Aama payments are an important and increasing source of income for the hospitals, accounting for a fifth of their total income in 2011/12. At JZH, Aama payments contributed 36% of the total hospital income (Figure 17). Aama payments are deposited in a pooled fund managed by the HDB. The pooled fund was used to cover general recurrent expenditure.

Figure 17: Share of Aama payments in total income of surveyed hospitals, 2011/12



Source: Field survey, 2012

All managers (MSs and HDB Chairs) admitted the importance of Aama payments, as expressed below:

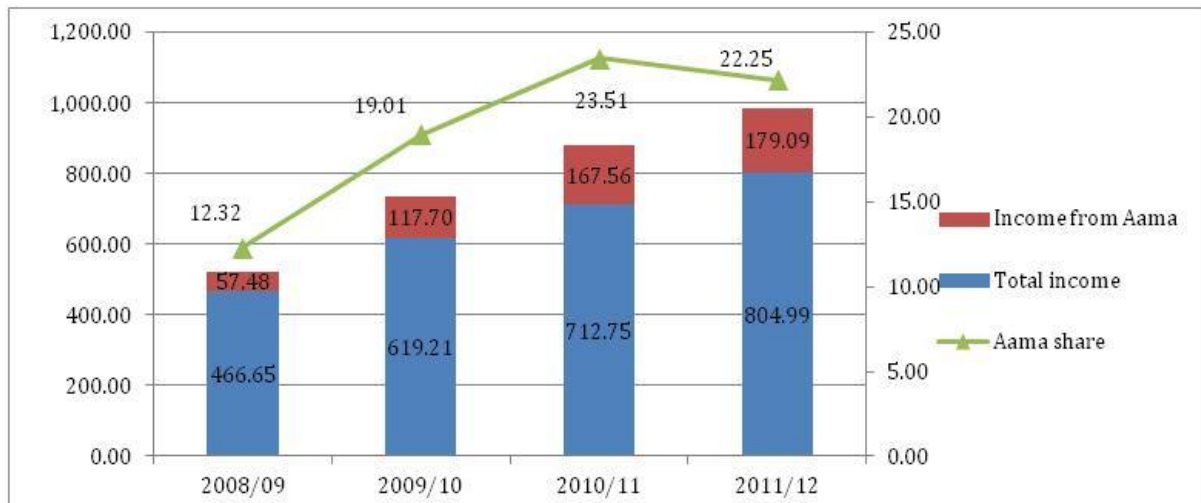
Aama is the lifeline (Sanjivani) for this hospital. The plight of this hospital without Aama income would be like that of a newborn baby who does not get her mother's milk. (HDB)

Without Aama income, the hospital would not be able to pay salary to its staff. (MS)

Trends of Aama Programme Budget

The share of Aama in total income had increased from 12% to 22% between 2008/09 and 2011/12. Although the total income of the hospitals had nearly doubled in this period, Aama income had increased more than three times during the timeframe (Figure 18).

Figure 18: Trend in total income and income from Aama payments 2008/09-2011/12



Source: Field survey, 2012

Discussion

4.1 Service Provision

4.1.1 BCs

As suggested by the WHO, providing professional but demedicalised care through midwife-led BCs located close to people's homes may be a key approach to meet increased global demand for institutional childbirth [12].

In accordance with the MoHP's plans to make basic delivery services available in 70% of all HPs [16] and establish BCs at HPs and SHPs, the number of HPs has increased in recent years, and by 2010/11 there were over 850 BCs across Nepal [17]. The international benchmark for the establishment of a BC is to provide one such unit for an area serving 1,750 births per year [12]; this benchmark has not been applied in Nepal, however. In some places, new BCs have been built in response to local need, and FCHVs have been able to use incentives and strong community networks to bring women to BCs for delivery. However, this has not universally been the case. Equipment and drugs are often in short supply, and the limited availability of SBAs has affected service provision. As evidenced by this study, some new BCs have extremely low service utilisation rates.

While the overcrowding at referral hospitals prompted this study, its findings open the door to a review of options for delivery care in Nepal based on current trends and opportunities. Health care provision is evolving, and current plans to upgrade SHPs to HPs and ensure that 70% of HPs become BCs may be contrary to utilisation preferences, and efficiency and quality considerations. It is therefore important to consider the factors which affect the success of BCs in service provision.

Firstly, it is notable that BCs appear to be better attended in areas with poor transport and communication networks, and in areas where women are relatively poor, such as Kailali District, where 45% of births took place in BCs. In Morang District, on the other hand, which is economically better off and has better road and transport network, 95% of childbirths took place in hospital, because women bypassed BCs in favour of the referral hospital. This raises the question of whether BCs should be considered a transitional strategy towards hospital childbirth, or as a selective strategy for underserved and remote areas. If this strategy were to be pursued, it would be important to ensure that BCs were able to provide BEONC services, and had a means of providing referral support for complications in order to ensure equity.

The productivity of BCs also largely depends on the population density, topography, number of VDCs with BCs, access to the hospital and other health institutions, mobilisation of local resources, and the willingness and ability of the community to support to BCs. The average number of deliveries per SBA in the selected BCs is 58, which is much lower than that prescribed (350, for two SBAs) [18]. A minimum standard must be worked out and planned, to accommodate additional deliveries, as the capacities of these BCs are currently underutilised.

This study shows that there is a clear preference among women who have decided in favour of institutional childbirth to come directly to the bigger hospitals, bypassing lower-level facilities altogether. Big hospitals are perceived to provide a wider range of better quality services, including, most importantly, access to emergency surgery and newborn care. As a larger proportion of mothers prefer referral hospitals, it is important to consider whether the policy of ensuring that 70% of HPs become BCs is appropriate [16].

Women not only feel that referral hospitals offer high quality services, but also perceive nearby, lower-level clinics to be low quality. Women and their families raised concerns about the poor availability of trained service providers and medical supplies at BCs, and their restricted opening times. These findings are similar to issues reflected in similar studies [19] [20]. If the government continues to invest in the development of BCs, concerns about service quality must be responded to, and negative perceptions of QoC must be addressed. Regular monitoring of services to ensure sufficient QoC is important to attract more deliveries at BCs, as there is a large proportion of mothers who continue to deliver at home and who could be attracted to BCs [19]. Community awareness about the role of BCs and the availability of SBAs in ensuring safe childbirth is an important consideration. Ownership and support from community stakeholders, and facility management, are instrumental enabling factors in improving access to BCs. There are problems on both sides, however. Increasingly, mothers want safety, specialised care, and access to investigations; SBAs, on the other hand, are often working in isolation with limited skills: they find it difficult to deal with exacting families, who demand the safety of the mother and the baby be guaranteed, and are therefore unwilling to take responsibility.

4.1.2 Referral Hospitals

Access to referral hospital care to deal with complicated cases is a vital component of all successful maternity care programmes [33]. Both CEONC and BEONC service availability in Nepal have improved in recent years [3], but in selected districts, referral hospitals are the only facilities providing CEONC services. There was neither a BC in the municipal area, nor a district hospital in the districts where the referral hospitals in this study were located, except for Rangeli Hospital in Morang District, which unfortunately however, did not provide CEONC services. These referral hospitals were, in effect, functioning as birthing units for the residents of the municipal area and neighbouring VDCs.

This, coupled with the lack of birthing facilities in the urban/municipal areas, means that referral hospitals are often functioning as BCs for the municipal area and adjoining VDCs, as well as providing referral services. This dual role, amongst other factors discussed in more depth in section 4.3, is contributing to considerable overcrowding in referral hospitals.

4.1.3 Referral System

Pregnancy complications are unpredictable and many women in Nepal live far away from where life-saving care is available. In this context, a functioning referral mechanism is crucial to enable effective management of maternal complications. Maternal and neonatal deaths could be prevented if pregnant women could reach adequate care when complications occur [15, 28].

The result of this study suggests that there is an urgent need to strengthen referral mechanisms between lower-level facilities and referral hospitals in Nepal. This would both improve emergency access to care, and help build the trust of women. The users of referral hospital maternity services frequently expressed their desire to deliver safely closer to home, especially if there was access to emergency transportation in the form of ambulances.

4.1.3 The Private Sector

In recent years, the FHD has partnered with private hospitals and medical colleges to increase the reach of Aama. However, although 55 non-state facilities currently participate in the Aama Programme [17], the private sector could potentially contribute to the national supply of delivery care to a much greater extent. Private medical colleges have unused beds and they could be used to

accommodate additional deliveries through the Aama Programme. In addition, a quick inventory of private hospitals suggests that the Aama Programme could be further expanded to 52 private hospitals [6] to help reduce overcrowding at government-owned referral hospitals.

However, the current dearth of clear implementation and monitoring guidelines for Aama in the private sector has resulted in confusion, delays in programme implementation, and differential interpretation of the programme, leading to variable provision of services. Any expansion of Aama within the private sector would therefore need to be carefully managed.

In addition, the general perception that private hospitals are meant for rich people would need to be addressed to increase the uptake of services. Greater efforts are needed to create awareness amongst poor and marginalised people about the availability of the Aama Programme at private hospitals.



Photo: Unused hospital beds at a private medical college implementing the Aama Programme

4.1.4 Service Mix

CS Rates

Since 1990, overall CS rates have also been increasing globally [22, 12], and this pattern has also been observed in Nepal. NDHS 2011 reports that 4.6% of births were delivered by CS (urban 15.3%, rural 3.5%) compared with 2.7% in 2006 (urban 8.4%, rural 1.9%) [2].

This study found that an average of 18% of births in public sector referral hospitals were and 28% of births in private sector hospitals performed by CS. It is not clear why there is such a large discrepancy between public and private facility CS rates, and it is possible that high private facility CS rates may reflect the profile of service users, referred from public sector hospitals, due to overcrowding or complications. However, there is evidence from Egypt and Brazil to suggest that medical need and women's preference are not the only factors behind the reported high CS rates in private facilities [23, 24]. In light of this, there may be a need to develop monitoring guidelines for district-level managers to check the potential over-medicalisation of childbirths.

Although CS is crucial for saving lives, unnecessary CSs put women at unnecessary risk, and also have opportunity cost implications. The study results suggest that the avoidance of one unnecessary CS could accommodate nearly five normal childbirths; in terms of costs, more than six normal childbirths could be conducted for the cost of one CS.

4.2 Service Utilisation and Equity

The proportion of total births which occur in health institutions has increased from 11% to 35% in the decade 2001 to 2011, and has doubled in the last five years. However, rising national institutional delivery rates mask inequalities. In the low-lying Terai, institutional deliveries have risen to 41% (and 50% in the Eastern Terai). NDHS 2011 found that 78% of women in the highest wealth quintile, but only 11% of women in the lowest quintile, had delivered in an institution. Similarly, over 71% of urban women, compared to 32% of women from rural areas, had given birth in a health institution [2].

There is also evidence to suggest that patterns of service utilisation differ between facility types. It has been found that women from lower wealth quintiles tend to use BCs, and that hospital users tend to be better off. In high-Human Development Index (HDI) districts, only 1% of childbirths took place at HPs, compared to 24% at hospitals. In low-HDI districts, by contrast, nearly half of all births took place at BCs [17]. This may be the result of limited road access in poorer areas, fewer health facilities, and other barriers to care which limited choices for women in economically deprived areas.

The analysis of service users' caste/ethnicity at referral hospitals and BCs in this study also reveal differences in utilisation patterns. Brahmin/ Chetri were slightly over represented among hospital users (34% use; 30% population share) but under represented among BC users (18% use). The Janajati, on the other hand, who make up 39% of the population, used referral hospitals proportionately less (20% of users) and BCs proportionately more (43% of users). Muslims, who make up 6% of the population, were under represented among BC service users but proportionally represented among referral hospital users (5%). Dalits (11%) of the population on the other hand, were over represented among BC users (16%). This suggests that proportionally, Janajati and Dalit communities are the greatest BC service users.

The comparison of service users at referral hospitals and BCs by age shows that service use also varies by mothers' age group. NDHS found that 41% of young mothers (aged 20 years or less) delivered in a health facility [2], and this study found that young mothers were slightly more likely to use BCs (40%) than referral hospitals (33%). It is unclear whether this reflects preferences of young women to use BCs over RHs, or a lack of access to higher level facilities among women aged less than 20. Women aged 20-35 on the other hand, were shown to represent 66% of service users at the hospitals, and 58% at the BCs – this is higher than the 35% of women aged 20-34 reported having had an institutional delivery in NDHS 2011, [2].

In light of these differences, it is important that future interventions should be aimed at bridging and not widening the equity gap. It is expected that the utilisation of services at BCs would gradually improve if consideration were given only to efficiency; however, inequity would be further increased. Though equity and efficiency are equally important considerations, there should be a trade-off between equity and efficiency in care during childbirth.

There is a growing concern regarding the disparity in the quality of services, which is likely to most acutely affect poorer women and women from particular castes who are make up the majority of BC service users. If the GoN chooses to pursue a policy of establishing BCs, rather than expanding maternity wards in hospitals, it is imperative that QoC be assured by backup is provided by hospitals to support difficult deliveries, and that SBAs are rotated between hospitals and BCs to ensure skill transfer. Unless quality is assured at BCs, poor, women will be disadvantaged.

4.3 Overcrowding

There is no benchmark for referral hospital bed occupancy rates in Nepal. However, occupancy rates above 85% have been identified to have a negative impact on the safe and efficient operation of a hospital [26], and the WHO has used 80% capacity utilisation as the norm for its sectoral analysis, consistent with recommendations made in previous Cost Effectiveness Analysis (CEA) guidelines [25].

This assessment found bed occupancy rates above 80% in all studied referral hospitals. The average bed occupancy rate of 97% raises serious quality concerns. At JZH, the rate stands at 145%, and this

has serious implications in the QoC at that hospital, as suggested by the number of stillbirths and maternal deaths, which are measured as the outcome for quality.

There are a number of reasons for overcrowding of the hospitals.

Change in Population Structures and Service Utilisation

The proportion of institutional deliveries in Terai districts is exceeding the expected 40%, and the pace of increase over the last five years makes it likely to reach 70-80% if it follows the pattern in similar settings in South Asia. Over the past decade, the population of the Terai region has increased disproportionately, from 48.4% of Nepal's total population in 2001 to 50.2% in 2011 [4]. In light of this population growth, the pressure on referral hospitals in the Terai, especially in urban areas where referral hospitals are located, is likely to increase further.

The share of urban population increased from 14.2% of the total population in 2001 to 17.1% in 2011. The population density also increased from 157 per square kilometre in 2001 to 180 in 2011 [4]. Many referral hospitals are the only birthing facility for the urban population, and a significant part of the overcrowding may be due to this 'natural growth' of the urban population.

Limited Investment in Maternity Ward Capacity at Referral Hospitals

Referral hospitals are mostly old; most except BH were constructed around a quarter of a century to half a century (BZH) ago, and were designed for much smaller population and care needs. In the course of time, beds have been added to maternity wards, or taken from other departments to accommodate the increasing patient load, but mothers continue to sleep on the floor in some facilities. These practices may increase the risk of cross-infection and compromise other services. The amenities are also overstretched. These hospitals will not be able to accommodate additional childbirths unless immediate measures are taken by the HDB and the MoHP.

One option for enhancing the capacity of maternity units would be to add new birthing units to existing maternity ward so that they could be freed to handle complicated deliveries. Alternatively, there is evidence to show that after appropriate screening, intrapartum care for low-risk deliveries could effectively be provided by midwives at BCs [27]. Similarly, experiences in India suggest that trained-nurse-midwife-led BCs with 24-hour services could be successful in reducing maternal deaths and serving the community at their door [28].

Insufficient HR

The sanctioned positions that were created to address the requirements of the National Health Policy of 1991 are seriously outdated; even those positions are not filled, adding to the workload of the limited number of health personnel working in these hospitals. The shortage of health workers has seriously compromised the quality of maternity services and may be contributing to high MMR and stillbirth rates in at least one hospital. To assure QoC as per the WHO benchmark, it is essential that the existing gap of 313 nurses and 28 doctors are filled.

Client Preference for Hospitals

The design of services has not generally taken into consideration the preferences of women. Referral hospitals are clearly preferred by women, and this strong preference is contributing to extremely high self-referral rates (98%). Conversely, at lower-level birthing facilities, conditions and incentives within the health system, and demands from the community, are leading health professionals to over-refer. Consequently, the BCs are significantly under-utilised, with inefficient use of available resources.

This study has tried to look at the preferences of families to help guide the future planning for maternity service provision. It is quite clear that better awareness regarding the possibility of complications [2], which has influenced the care-seeking behaviour in favour of institutional childbirth, could also be influencing the preference towards bigger public hospitals. The preference of those who had decided in favour of institutional delivery was clearly in favour of bigger public hospitals, as they were perceived to provide better quality services. The availability of skilled personnel, facilities for investigations, and surgical interventions if/when needed clearly stands out as a driving force for referral hospitals being preferred as the first choice by women and their families. The earlier notion that births were not given importance does not seem tenable.

The literacy rate of women increased from 42.8% in 2001 to 51.4% in 2011, which may also have influenced their choices [30, 31].

Improved Access to Hospitals

Despite the availability of Aama travel incentives, transport costs and other indirect costs remain a barrier to seeking institutional delivery [17]. However, the communication network has been expanding in rural areas in recent years, with a 37% increment in the overall road network. Similarly, access to telephones has increased threefold [29, 30], and NDHS 2011 found that over 70% of households had access to mobile phones [2]. These contextual factors are influencing utilisation and bypassing of lower-level facilities. The proportion of people below the poverty line has been reduced to 25% from 42% in the last 15 years. Poverty remains a particularly rural problem, with about double the proportion of rural households living in poverty compared to urban households (15.46% in urban and 27.43% in rural). When Aama started in 2008/09, the per capita GDP was 425 United States Dollars (USD); by 2010/11 it had increased to USD 642 [29, 30]. It is evident from the service utilisation pattern of the studied districts that better roads and access to rural roads has helped women to go directly to referral hospitals. The BCs in Morang and Chitwan Districts conducted only 5% and 2.5% of the total deliveries respectively, while in Kailali District this figure stood at 45%. It seems that in low-HDI districts, growth in institutional deliveries is largely driven by increase in the use of BCs, while the growth in institutional deliveries is largely driven by increased use of public hospitals in high-HDI districts.

4.4 Cost and Quality

Cost of Care for Childbirth

The unit cost has been calculated based on the cost of five major categories: buildings, equipment/instruments/furniture, personnel, drugs/medical supplies, and utilities, referencing previous work [34]. This costing has not considered the mothers' transportation costs. The largest share of expenditure is for personnel and drugs. The cost of personnel will further increase if the current vacant HR positions are filled and the minimum standard of deliveries per SBA is followed [12].

The average unit cost at BCs is higher than at referral hospitals as a result of the unused capacity of their ANMs and facilities. The average unit cost of a normal childbirth is estimated at NPR 3,625; this figure is derived on the assumption that the used capacity of the BCs is about one third. The unit cost is therefore likely to fall with the increased use of BC capacity. As indicated by the findings, the capacities of the BCs are currently not optimally utilised, and this offers the opportunity to reduce the burden on referral hospitals by improving the access to BCs. This would entail improving the

availability of services round the clock, assuring QoC, and having proper referral channels and the means in place to facilitate referrals for complications. As the BCs are relatively new, it may be too early to perform their cost analysis as it is best to do such analysis in a situation where 80% of the capacity for producing health care is utilised [25].

On the other hand, out-of-pocket expenditure is high for delivery at a hospital, while it is lower at a BC. The transportation costs, living costs of a number of visitors, and other indirect costs at referral hospitals might increase the cost there [5, 17].

The findings from the fieldwork suggest that even within the Terai (and one hill area), utilisation patterns vary considerably, and the responses of facilities are varied. Preferred options will be different across regions: there needs to be some local flexibility, while adhering to technical and economic principles.

Quality and Cost

Quality is often ignored while doing cost analyses [24]. The unit cost of a normal childbirth in BH (NPR 1,983) is considerably higher than in JZH (NPR 1659). The QoC between these two hospitals varies quite considerably, and this must be taken into consideration. For example, BH uses more SBAs, bed sheets and curtains are in place, partition screens are used between the beds to protect the privacy of the clients, nurses are found to offer prompt nursing care, the hospital appears cleaner as it is cleaned three times a day, measures for infection prevention are strictly followed, routine laundry services are offered, food is provided to the patients, and power backup is available 24/7. On the other hand, JZH uses far fewer SBAs (who are low paid), there are no bed sheets, curtains or partition screens in place, there are limited laundry services, limited dietary provisions, and hospital cleaning takes place only three times a week. This lowers the cost but compromises quality. It is important to bear in mind that the unit cost at the JZH would increase considerably if those factors were added to ensure quality. Thus, the real efficiency of the hospital would be reflected in quality-adjusted unit cost.

Key Issues and Emerging Options

6.1 Key Issues

A rapid increase in demand for hospital delivery projected:

- Births will continue to increase over the next decade or more, particularly in urban areas.
- Rapidly changing demographics and demand-side factors are changing patterns of utilisation, while service provision lags behind these trends.
- A greater proportion of deliveries will be in health institutions.
- Current users of institutional childbirths prefer hospital to BCs in most of the Terai and easy-access hill areas.

The hospitals visited are at crisis point:

- Key managerial positions (MSs, matrons, nursing supervisors) lay vacant at all the hospitals.
- Confirmation that hospitals are overcrowded and under-resourced, affecting QoC. (Worryingly evident at JZH which has very high bed occupancy, and low utilisation of Aama funds for improving the QoC).
- Better hospital management could mitigate some of the consequences of overcrowding, but hospitals are at near crisis point from overload and need major investment.
- The referral hospitals are serving the basic maternity service needs of the people in the municipal areas and adjoining VDCs along with providing specialised referral services.

Shortage of skilled human resources at hospitals:

- Outdated sanctioned and unfilled key HR positions (senior gynaecologist/obstetrician, anaesthetist) at hospitals remain a major constraint for ensuring quality services.
- There are concerns regarding guideline for hiring of required HR at local level.
- Contracted SBAs (nursing staff, doctors and other) have a heavier workload with less remuneration than regular staff.

Hospital management issues:

- Disconnect between the management, service providers and mothers.
- Lack of dedicated management capacity.
- Frequent changes of the Hospital Development Board leadership.

The scope for re-distribution of births to lower level facilities may be limited:

- Women who have decided to use institutional care, will continue to seek higher level facilities.
- Strengthening district hospitals, where they exist, to provide CEONC, we believe remains an essential component of health systems strengthening, though this has not been explored in this study. However, strengthening district hospitals is unlikely to have a major impact on reducing the overcrowding at the referral hospitals.
- The study finds BCs are largely underutilised – but regional variation exists with more use in Far Western compared with the Eastern Terai districts.
- Limited ownership by SBAs at BCs due to isolation and limited skills.

Referral has not been addressed:

- There is no evidence of a functional referral system in place (98% self-referral to hospital).

Costs are similar across hospitals and BCs:

- Costs of normal delivery at BCs and hospitals are more similar than expected (once costs are normalised for under-resourcing at hospitals and underutilisation at BCs).
- The resource gap for providing better QoC can be identified.

Policy and planning needs to be re-visited:

- This study challenges this assumption that “Greater investment and an improvement in quality of primary health care will in the long-run increase demand for services at that level” from the prior Aama evaluation [17].
- Appears to be an emerging tension between local planning, technical efficiency and allocative efficiency. For retention of skills and QoC a SBA should conduct about 175 births/year. Therefore, a facility with 2 SBAs should have a minimum of 300 deliveries/year.
- There has been exponential growth in BC in the last few years (2007/8 to 2011/12). HMIS reports that the number of BCs at HP and SHPs has increased four-fold from 254 to 1046 (573 in HP and 473 in SHP.)
- Decisions on future investment will have to balance VFM and equity of access objectives.
- Planning should be based on agreed criteria, and not entirely target-based.
- Aama funds not used to improve quality of maternity care.

Engagement of private sectors in maternity services:

- The capacity of private sector for quality maternity care has not been fully exploited.
- No mechanism of coordination and collaboration between private and public hospitals.
- Lack of trust of mothers and communities towards private hospitals.

6.2 Emerging Options

The proposed options that have emerged from this study are not mutually exclusive. As health care provisions are evolving, service utilisation patterns and other local realities must be given due consideration and preferred options fully appraised during planning.

6.2.1 Enhance Capacity of Referral Hospitals

- The evidence in favour of the enhancing capacity of the hospitals as the preference of women (who have chosen institutional care) to go directly to a hospital with CEONC services.
- This policy option would allow women to come directly to CEONC hospitals.
- The maternity services at the district hub would need to be strengthened and enhanced by one of the following measures:
 - Expanding current maternity wards
 - Creating birthing unit at the hospital for normal delivery
 - Building maternity hospitals in the district (this option is preferred by the hospital stakeholders).

6.2.2 Strengthen Strategic BC Package

- The referral hospitals are accessed mainly by women in nearby VDCs, access for other women limited by distance /affordability; many BCs near roads/hospital are underutilised.
- Policy decision – focus resources on strategic BCs (where access to alternatives is poor); in areas where BC are used.

- Service provision option – create a package of services for strategically located BCs including:
 - Information and promotion about BC in local communities
 - Free referral (ambulance/voucher/cash)
 - Availability of services 24/7
 - FCHV incentive
 - HFOMC involvement in BC management
 - Rotation of SBAs to hospitals (referral and confidence improvement).

6.2.3 Continue to Strengthen District Hospitals to Become CEOCN Providers

- Continue as per plan for one CEOCN facility per district
- Consider the existing higher-level facility (Zonal, Med. College) while planning CEONC services.

6.2.4 Utilise Excess Private Sector Capacity for Normal Childbirth and Complications

Explore other options for engaging private sector. A potential opportunity if risks are managed:

- Risk of over-medicalisation (CS higher)
- Increased costs for the system and for users
- Widening of the equity gap.

Recommendations

The key informants group developed the preliminary recommendations.

Policy Review and Reformulation

- Develop referral guideline, and appropriate referral mechanism between BCs and referral hospitals.
- Review the expansion plan (NHSP II) of BCs in Terai.
- Guideline on use of Aama funds for improvement of maternity services at the facility level
- Guideline for short-term deputation of SBAs for strengthening the linkage between the referral hospital and the BCs, onsite coaching and mentoring

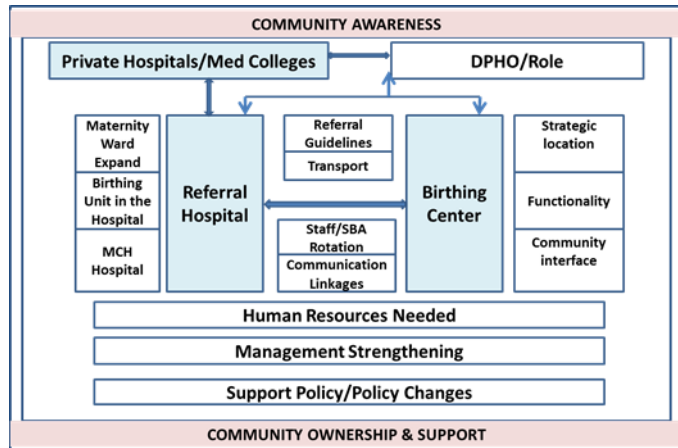


Figure 19: Conceptual frameworks for recommendations

Availability of Skilled Human Resources

- Ensure the availability of appropriately skilled HR as per sanctioned positions at the hospitals
- Revise the HR strategy (sanctioned positions) as per the current population structures and service utilisation pattern for ensuring quality services
- Develop appropriate guideline regarding hiring of required human resource including fair salary and benefits at local level

Strengthening the HDB

Enhance the capacity of HDB in

- Training in hospital management including their role and responsibility for ensuring quality services at the hospital
- Experience sharing visits to learn from better performing hospitals

Expanding Capacity of the Referral Hospitals

Increase the capacity of hospital for providing maternity services to cope with the increasing demands by:

- Reorganising the hospital departments to find the additional space for maternity ward as immediate response.
- Increasing the number of beds in current maternity ward either by adding beds at the available space or by constructing new building,
- Adding a birthing unit to the existing maternity wards of hospitals, which would free the existing maternity beds for management of complications,
- Constructing a separate maternal and child health (MCH) hospital

- Consider the cost implications, coordination mechanisms as well as the management infrastructure for the different options.

Strengthening the BCs

- Enhancement of skills and establishment of linkage between the SBAs at BC and the referral hospitals through short-term deputation for onsite coaching and mentoring
- Strategic location, availability of 24/7 services and service utilisation as per WHO standard (175 births/SBA/year) for establishment of new BC

Greater engagement of private sector for maternity service provision

- Explore and establish mechanisms for coordination and collaboration between the public and private hospitals and DPHO
- Explore other cost effective possible models for increasing institutional childbirths at private sector under public private partnership.
- Explore modalities for strengthening monitoring and enhancing public trust when rolling out Aama in private sector and consider bridging equity gaps.

JAR EHCS Group Recommendations:

During the Joint Annual Review meeting on 28-30th December 2012, the Director General (DG), DoHS, made a presentation on the progress of EHCS programme along with the issues and challenges. The key findings of this study pertaining to the overcrowding of the referral hospitals and under-utilisation of birthing centers for childbirth were shared. This was followed by a luncheon meeting with EHCS group (GoN stakeholders and partners) chaired by DG to discuss on the issues mentioned in EHCS presentations and Mid Term Review Report. The group came up with the following recommendations to be included in the next Annual Work Plan and Budget (AWPB) 2013-14 as follows:

- A Comprehensive, need based plan for improving QoC at referral hospitals including
 - Infrastructure and equipment
 - Human resource
 - Management improvement plan
- Develop and strengthen district referral system-implement in at least 3 districts (3 ecological zone)
 - Strengthen service sites at strategic locations including BC (with appropriate HR management) to be piloted in ten sites at different geographic locations
 - Early recognition of complications, timely referral and free transport support

A workshop with senior central level programme managers as well as the district stakeholders expanded these for each district, especially focusing on actions, which could be taken quickly to improve the situation at the hospitals. These are included in Annex 2. For individual referral hospitals, the actions are presented in Annex 3.

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Annexes

Annex 1: Human resources for health for maternity services at referral hospitals

Hospital	Positions	Government			HDB			Total filled	Total Vacant	HR working at maternity
		Sanctioned	Filled	Vacant	Sanctioned	Filled	Vacant			
SZH	Gyne/Obs.	1	1	0	0	0	0	1	0	1
	Anesthetist	1	0	1	0	0	0	0	1	0
	MO/Sr. MO	8	6	2	5	4	1	10	3	2
	Nursing supervisors	2	0	2	0	0	0	0	2	0
	Staff nurse	19	19	0	6	3	3	22	3	6
	ANM	5	5	0	16	15	1	20	1	2
	Support Staff	34	34	0	18	10	8	44	8	4
	Anesthetic assistant		3					3	0	0
BZH	Gyne/Obs.	2	1	1	0	0	0	1	1	1
	Anesthetist	1	0	1	0	0	0	0	1	0
	MO/Sr. MO	9	7	2				7	2	1
	Nursing supervisors	3	0	3	0	0	0	0	3	0
	Staff nurse	24	23	1	7	7	0	30	1	11
	ANM	3	7	0	7	7	0	14	0	2
	Support Staff	36	36	0	39	39	0	75	0	6
	Anaesthetic assistant		2					2	0	
WRH	Gyne/Obs.	2	1	1	0	0	0	1	1	1
	Anesthetist	2	1	1	1	1	0	2	1	0
	MO/Sr. MO	23	19	4	13	13	0	32	4	5
	Nursing supervisors	6	2	4	0	0	0	2	4	0
	Staff nurse	67	67	0	34	34	0	101	0	24
	ANM	1	1	0	7	7	0	8	0	10
	Support staff	43	23	20	77	77	0	100	20	9
	Anaesthetic assistant		2			4		6	0	0
BH	Gynae/Obs.	2	1	1	0	0	0	1	1	1
	Anaesthetist	1	1	0	0	0	0	1	0	0
	MO/Sr. MO	20	13	7	15	15	0	28	7	4
	Nursing supervisors	3	0	3	0	0	0	0	3	0
	Staff nurse	40	31	9	58	58	0	89	9	21
	ANM	5	16	0	15	13	2	29	2	6
	Support staff	37	37	0	43	46	0	83	0	10
	Anaesthesia assistant		3			2		5	0	0
JZH	Gynae/Obs.	2	0	2	0	0	0	0	2	0
	Anaesthetist	1	0	1	0	0	0	0	1	
	MO/Sr. MO	10	8	2	12	12	0	20	2	7
	Nursing supervisors	3	0	3	0	0	0	0	3	0
	Staff nurse	24	13	11	19	13	6	26	17	6
	ANM	4	4	0	12	13	0	17	0	7
	Support staff	36	28	8	50	50	0	78	8	8
	Anaesthesia assistant		4			2		6		0
KZH	Gynae/Obs.	2	1	1	0	0	0	1	1	1
	Anaesthetist	2	1	1	0	0	0	1	1	0
	MO/Sr. MO	24	15	9	25	25	0	40	9	7
	Nursing supervisors	4	0	4	0	0	0	0	4	0
	Staff nurse	61	61	0	17	10	7	71	7	13
	ANM	10	10	0	48	42	6	52	6	11
	Support staff	53	31	22	108	108	0	139	22	13
	Anaesthesia assistant		4			2		6		0

Annex 2: Recommendation by Health System Area

Facility Level	Issue	Recommendation by Health System Area				Aim of recommendation
		Infrastructure	HRH	Management/ Governance	HMIS & Analysis	
ZONAL HOSPITALS (10)	1. Normal births at study ZHs have risen 43% in last 4 years.	Approve plans for expansion of beds in 4/6 hospitals in 2013/14 budget	Extend eligibility for CEONC Funds (to fund additional staff) to <u>referral</u> hospitals	Undertake external management review of 6 ZHs (inc. financial management & PPPs)		Increase maternity beds in 6 ZHs by 2015
	2. No new hospital construction in last 15 years; all study ZHs over 30 years old.					
	3. No functioning referral system	Add costs for ancillary facilities for hospital expansion plans in 2013/14 budget.	Review hospitals' use of Aama funds	Get better understanding of additional resources potentially available to improve QoC at hospitals		
	4. Not all Aama funds going to maternal health					
5. One hospital (JZH) responsible for half of maternal deaths in study hospitals in last 3 years.		Do urgent troubleshooting study of JZH	Tackle evident QoC problems at JZH			
DISTRICT HOSPITALS (65)	1. No district hospital in 5/6 districts surveyed; confirms lack of hospital infrastructure.	n/a	n/a	n/a	Undertake full survey	To ascertain potential of district hospitals to meet future maternal bed demand
BIRTHING CENTRES (940, of which PHCC =81, HP=533, SHP=326)	1. Only 12.5% of all births in study districts were in BCs in 2011/12.	Halt new BC construction plans in areas where capacity utilization projected to remain below	Pilot accreditation & circulation of BC-Hospital staff			To better utilise existing BC capacity where feasible and increase their contribution to mat bed demand in less accessible areas.
	2. Average utilization in study BCs was 33%. Needs to be raised					

	<p>to 50-80% to be cost-effective.</p> <p>3. Almost 800 new BCs built since 2007/8</p> <p>4. Unit cost of normal delivery in BC = NR 3,600 V wide range of unit costs NR 1,500–18,000 (12x).</p> <p>5. Population density, spatial accessibility & income appear to be determinants of use.</p>				<p>Learn lessons from well performing birth centres</p>	<p>To cut expenditure on high cost/low utilization BC maternal beds (saving NPR).</p>
<p>Implement criteria for all health infrastructure planning as set out in Building Guidelines</p>						

Immediate (within F/Y 2012/13)

Short term. No policy change needed

Longer term. More planning or possible policy changes needed.

Annex 3: Recommendations for the districts from group work at the FHD Workshop in November 2012

1. Dhangadhi

Seti Zonal Hospital

Stakeholders:

- Zonal hospital, DoHS, MoHP, DPHO

Policy review needed:

- To ensure that the resources (budget and personnel) as based on the patient load and services rendered.
- To make standard operating procedures available.

Activities

- Expand maternity ward to accommodate the increased demand.
- Manage the need for additional human resources
- Ensure the availability of one gynaecologist, 10 SBAs and two helpers.
- To improve QoC, availability of equipment, USG/Lab investigation, other infrastructure including waiting rooms
- Develop NIC unit
- Trained human resource (paediatrician, trained nurse)
- Provision for infection control- through training and follow-up
- Death audit
- Aama income needs to be utilised for maternity wards and purpose
- HMIS training and additional HR for recording and reporting
- Public counselling

Urban health

Stakeholders:

- Municipality/DPHO/Zonal Hospital/ DoHS/NGO/INGO

Policy review:

- Having municipal clinics and district hospitals or for delivery care in urban areas
- Having a mechanism for coordination with MoLD

Activities:

- Strengthen existing urban health clinic as birthing center
- Ensure availability of SBA training for at least two nurses from urban health clinic

District Hospital

Stakeholders:

- DHMC/DPHO/DHO/DoHS/MoHP

Policy review:

- Gap in the policies – lack of district hospital, adequacy of sanctioned posts, budget, supplies

Activities:

- Develop infrastructure, ensure availability of all required resources including human resource to enable CEONC services

Birthing Centre

Stakeholders:

- Management committees at BC/BEOC, DPHO/DHO, DoHS, MoHP, NGO/INGO, HDC at ZH

Activities

- Strengthen, equip existing birthing centres, with ensuring the availability of appropriate (and additional if needed) human resources, to ensure quality of services

- System for monitoring and supervision in place
- Create awareness among public on service provided by birthing centres.
- Review location of birthing centres
- Modality for rotation of staff/SBA between the referral hospital and the birthing centres
- Mobilise ambulance service providers with telephone numbers and ensure compliance.
- Provide telephone number of ambulance service
- Two-way communication for immediate feedback and response between the hospital and BCs

Private Sector

Stakeholders:

- DPHO/DHO, HDC at Zonal hospital, private stakeholders

Activities:

- Discussion meetings, coordination meetings with private sector
- Promote SBA training to the private sector staff
- Revise exemption criteria for poor
- Monitoring and supervision systems

2. Banke

Bheri Zonal Hospital

Stakeholders:

- HDC, FHD/ MoHP, DPHO, MS

Policy review:

- To enable the HDC to hire specialists locally, the salary of the vacant posts need to be transferred to the local management.
- Clear guidelines for HDC on their responsibility and authority for financial management.
- Policy to facilitate rotation of staff between referral hospital and BCs
- Policy for free transport between BC and referral hospital

Activities:

- Add one storey over the current maternity ward building (immediately). Financial support would be needed from MoHP, while the HDC would be responsible to coordinate the activities.
- Open a birthing unit in the space available at the hospital with 40-50 beds, ensure availability of the staff.
- Local recruitment through HDC of the 9th and 11th grade position of gynaecologists and anaesthetist as these positions are currently vacant. Additional financial support would be needed, as Aama income is inadequate.
- Local recruitment of SBAs
- Rotation of SBAs between the BC and the hospitals (2 person at a time/one month). MS and the DPHO would have to collaborate.
- Construct toilets (1 for staff & 2 for patients) in current building. Funding needs to be provided by the centre (FHD to provide fund based on Aama fund analysis), with HDC responsibility
- 1050 degree Celsius incinerator with support from centre, as the one in use gets wet during monsoon season.
- HDC to invite nurse in-charge of maternity and matron in all its meetings

Birthing Centre:

Stakeholders:

- DPHO/MS, Maternity in-charge, HFOMC

Activities:

- Add staff in BC based on utilisation (at least 175 per year) FHD to make funds available.
- ANM rotation from BCs to hospital (2 person at one time, one month) to improve communication and support, and skill transfer. Phone numbers of hospital staff could be given to those working at the BC to enhance communication.

- Free transport between BCs and hospital for referral cases (Implement HMIS 8)

Private sector:

Stakeholders:

- DPHO, management at private hospital, public hospital, DPHN
- To form a committee to facilitate communication.

3. Kaski

Western Regional Hospital

Stakeholders:

- Local mgmt. Committee, Central/local govt

Policy review:

- Increment of unit cost of services of Aama Programme and transportation allowance
- Availability of resources for infrastructure, equipment and supplies, HR and other resources should be based on the reality of service provision to address the increased demand for services.
- Monitoring system both for private as well as public sectors

Activities:

- Build infrastructure, add HR, ensure availability of QA fund
- Rotation of nursing staff at hospital
- HMIS orientation to staff

4. Chitwan

Bharatpur Zonal Hospital

Stakeholders:

Hospital administration, Hospital Development Committee, Regional Health Directorate, DPHO, Private sector, and other stakeholders would be responsible for the following:

- Upgrade the maternity facility at the hospital by establishing a 50 bedded birthing unit within the hospital to accommodate 60% of births.
- Enhance teaching learning and skill transfer; facilitate rotational duty for peripheral staff and those working at the referral hospital. Policy review needed, as currently there is no such modality in place.
- Upgrade the hospital with intensive care services for the mother and the newborn.
- Advocate for filling of the vacant sanctioned positions.
- Advocate for increasing the numbers of sanctioned positions to address the current demand.
- Explore possibility of working with private colleges (medical and nursing) for optimal availability of HR
- Chalk out a modality that allows the health workers in maternity to have more roles regarding the utilisation of Aama funds for quality improvement.

At the district level

- Advocate for strengthening of the CEONC services at the neighbouring districts.

Birthing Centres

Stakeholders:

- HFMOCC at the BC and the DPHO

Policy review and formulation was needed since currently, there was no clear guideline for establishing BC

Activities:

- Develop criteria for establishing BCs – location, rural area, population density, availability of 24/7 services, ownership and interest of the community
- Early detection of complications and referral with transport for referral
- Availability of ambulance
- SBA training to ensure availability of competent SBAs at the peripheral BCs

- Activities to create awareness and motivation in the community

Private sector

Stakeholders:

- DPHO, HDB, management of private hospitals

Activities:

- Form working group comprising of DPHO, hospitals of public and private sector
- Scale up Aama programme in private facilities with monitoring system in place
- Utilise HR from private hospitals and nursing colleges in public hospitals

5. Dhanusha

Janakpur Zonal Hospital

Stakeholders:

- MOHP, FHD, Management Division and local stakeholders like HDC, INGOs, Indian Embassy

Activities

- Expand maternity wards –centre for mother and babies with 200-250 beds at least
 - Hire two gynaecologists, four advanced SBAs, and 20 SBAs
 - Establish channels of communication between maternity centre and the peripheral birthing centres, PHCC and district hospital.
 - Ensure availability of free ambulance services
- Policy review: To ensure that the availability of grant as well as staff (sanctioned posts) from the government are based on the performance of the hospital in terms of the number and quality of services provided.

At the district level

Stakeholders:

- MOHP, FHD, management division and local stakeholders like hospital development committee, INGOs, Indian Embassy

Activities

- Availability of CEONC services at Yadukaha and Dhalkewar

Birthing Centres

Stakeholders:

MOHP, FHD, Management Division and local stakeholders like Hospital HFOMC, INGOs, Indian Embassy

Activities:

- According to population and local need, there should be one birthing centre to cover 20 thousand populations
- Expansion of birthing centres, good counselling and ANC services, availability of ambulance services, increase number of SBAs (permanent/ full timer)

Referral: There should be programme of ambulance procurement according to demand of community

6. Morang

Koshi Zonal Hospital

Stakeholders:

1. HDB, FHD, DoHS, MoHP, National Planning Commission, EDPs,
2. HDB, FHD, MoHP – Purchase of basic equipment, construct placenta pit

Policy review

- Revise the policy of MoHP to ensure availability of resources according to the present day realities
- Increase sanctioned post (Darbandi),

Activities

- Expand the current maternity wards – with 30 additional beds along with the needed - equipment, human resources (Gyne/Obs), Paediatrician, SN/ANM, Peon, and Sweepers.
- Improve the QOC increase the number of HR, IP training and in service training to staff, supply of equipment and instrument (with modern technology), proposal collection, disposal of medical waste (incinerator, placenta pit), cleaning of the ward
- Establishment of NICU in current paediatric ward (Equipment, HR)
- Priority for mothers referred from the BC
- Utilization of Aama funds for the quality maternity services.
- Improve recording and reporting (strengthen the recording and reporting system, data quality assurance)
- Strengthen the monitoring evaluation system
- Quarterly release of the Aama fund
- Ambulance

District Hospital

Stakeholders:

- FHD, MoHP

Activity

- Strengthen CEONC at district hospitals by making MDGP/DGO available at Rangeli, Inaruwa and other district hospitals

Birthing Centres

Stakeholders:

- DPHO, HDB, FHD, MoHP

Activities:

- Increase the number of nursing staff at BCs to 4
- Quarter facility for staff providing 24/7 services
- Establish BCs as per the need of community.
- Ensure standard infrastructure of birthing centre
- DPHO ensure capacity enhancement of SBAs at birthing centre
- Availability of ambulance at birthing centre
- Two-way communication between BC and KZH in case of referral and feedback.

Private sector

- System for monitoring of private sector by the Govt. authorities

Annex 4: Recommendations by Joint Annual Review (JAR) Meeting for EHCS

Based on the recommendations from the MTR, EHCS group decided to include the followings in the next AWPB:

1. Unreached population: To have disaggregated targets for un-reached population (eg. Remote areas) for NHSP 2 and develop a remote areas guideline or strategy for MNCH services to be piloted in a few districts. Example - District specific planning to reach un-reached population including deployment of Community ANM at each ward level to provide Immunization, Family Planning, Antenatal Care, Health Education and Recording & Reporting services at community level. This could be complemented with remote area focused approaches such as misoprostol.
2. Integrated family health camps in selected remote districts.
3. New Born Health:
 - a. To strengthen health facility level new born care at all levels including implementation of SARC Development Fund supported activities
 - b. Scaling up of CBNCP after revision of the package
 - c. Joint consultative meeting between FHD and CHD to clarify roles and responsibilities of FHD and CHD in new born and maternal nutrition
4. Increased production of skilled HR for MNCH:
 - a. Acceleration of SBA, AA and DGO training by
 - b. Initiation of Diploma in Child Health and Diploma in Anesthesia training
 - c. Initiate professional midwifery education
 - d. Improved pre-service training quality including medical internship
 - e. Focused Obstetric Ultrasound training for SBAs
5. Comprehensive, need based planning for improving quality of care at referral hospitals including
 - a. Infrastructure and equipment
 - b. HR and
 - c. Management improvement plan
6. Develop and strengthen district referral system – implement in at least 3 districts (3 ecological zones)
 - a. Strengthen service sites at strategic locations including Birthing Centre (well-managed HR) to be piloted in at least ten sites at different geographic locations.
 - b. Early recognition of abnormal conditions and timely referral to centre including transportation support
7. Contracting out, below district supply management to CBO/NGO to improve health commodities stock-out situation in remote districts.
8. Looking forward for NHSP 3:
 - a. Situational analysis of NCD, RH morbidities and mortalities

Annex 5: Indicative Costings for Immediate and Long-term Responses To Increased Demand For Maternity Services

Overview

In August 2012, Family Health Division (FHD) commissioned a study to respond to increased demand for institutional childbirth in referral hospitals in Nepal. The study sampled 6 of the country's 12 referral hospitals⁹, plus two birthing centres in each of the six districts.¹⁰ According to the findings from these settings, mothers are demonstrating a clear preference to deliver at a hospital with comprehensive maternity services: utilization of hospitals for normal childbirth and CS has increased by 43% in the last four years¹¹. However, the supply side has not kept pace with demand; there has been little increase in infrastructure, sanctioned beds, or human resources over the same period. All 6 hospitals are exceeding recommended safe bed-capacity levels. There is an estimated gap of 426 beds, 277 nurses (SBAs) and 28 doctors for maternity services. The study also found virtually no linkage between the birthing centres and the referral hospitals.

The study findings informed an FHD workshop of MoH officials, health workers and hospital managers in November 2012. The workshop explored possible solutions that included immediate responses by hospital management, a longer-term development of district hubs for expanded maternity services, and a complementary strategy of strengthening selected birthing centre in areas where physical access to hospital was especially difficult.

Purpose of this Note

This note sets out indicative costings for each of the three options *for initial budget planning purposes only*. Critical knowledge gaps are identified and additional work needed to test assumptions, establish the feasibility of implementation plans and firm up costs is recommended.¹²

Method

The costings are based on the six sampled hospitals and a number of each district's best utilised birthing centres (between nine and 15 per district). Immediate responses are defined as those which can be implemented before any additional infrastructure would come on-stream, i.e. the next three years. A longer-term response with additional infrastructure would need to be implemented over five years. A summary description of the short and long term responses are set out in Table A below.

Table A: Immediate and Long-term Actions to Respond to Increased Demand For Maternity Services

⁹ Five in the Terai and one in the Pokhara valley: Seti, Bheri, Western regional, Bharatpur, Janakpur and Koshizonal hospitals.

¹⁰ Maternity and operating theatre registers for the four-year period 2008/9-2011/12 were analysed; financial records for 2011/12 were analysed in detail and over 80 in-depth interviews were conducted with hospital managers, health workers and mothers.

¹¹ with the highest increment (more than 80%) at Seti Zonal Hospital and Bheri Zonal Hospital.

¹² For example, new infrastructure is typically assumed to have a life of at least twenty years, so long term assumptions about growth in population and hospital utilisation become important.

At Six Referral Hospitals

Action	Immediate response	Long term response
A. Hospital Infrastructure	- Reorganise maternity departments; find additional short-term space.	-Develop maternity expansion plan linked to hospital master plans and MoH infrastructure development plan Construct additional infrastructure.
B. Hospital human resources	- Offer additional short-term service contracts to SBAs and Obstetricians through HDB.	Create additional SBAs and Obstetricians positions filled by public service commission
C. Hospital management & maternity systems improvements	- Process related QOC & HDB fund management improvements - Management exchange visits HFOMC membership of BC management committee.	Total quality management (TQM) improvements
D. Birthing Centres (Selection of BCs based on criteria to be established)	- Establish referral linkages between hospital and birthing centres - BCC for promotion of birthing centres - Incentives for FHCVs and 24/7 SBA attendance - Free transport for mothers to referral hospital.	Formally extend Aama payments to mothers for referral from BCs to Hospitals.

Assumptions for Immediate and Long-term Responses

A. Increasing hospital maternity bed numbers

Hospital departments will be reorganised to find the additional space for the expansion of maternity services. The space will be renovated and equipped. In the longer run, the temporary unit would be transferred to a new building, once construction is completed after two to three years. For example, initial estimates indicate an additional 25-30 beds required in Seti zonal hospital (SZH), 40-50 beds in Janakpur zonal hospital (JZH), and 30-40 beds in Koshi zonal hospital (BZH) would need to be added to accommodate current levels of demands for hospital deliveries up to 2015. These are large increases, averaging in these examples a 20% rise in total hospital beds and a doubling in current maternity bed levels. The expanded maternity wards would be equipped with beds and other necessary equipment and furniture.

B. Increasing human resources

There is a large gap between the required number of SBAs as indicated by the WHO benchmark and the numbers currently available; the budgetary provision allows for only a limited number of SBAs in the referral hospitals. For example, it is projected that two obstetricians and 12 SBAs in BZH, one obstetrician and 12 SBAs in SZH and two obstetricians and 20 SBAs in JZH must be added in the maternity units to cope with the estimated increased demand up to just 2015. It is assumed that, in addition, each referral hospital will recruit a nursing supervisor to provide the technical back-stopping and manage the referral linkage between the birthing centres and the hospitals.

C. Hospital Management and Process Improvements

Individual hospital improvements need further specification. It is assumed that additional efficiencies can indeed be found. These may include the maternity ward being led by the senior nurse (SBA) and backed up by the obstetricians of the hospital. This would make explicit the lead role of SBAs for the majority of hospital births which do not require medical intervention and it would free-up the time of the medical specialists to manage complicated deliveries. Moreover, it should be easier to meet the demand-side aspects of QoC such as privacy, presence of a family/friend and cleanliness. An exchange visit programme between the hospitals could be conducted to learn from good practice observed at the better performing hospitals.

D. Strengthening selected birthing centres

The study found that mothers were reluctant to attend birthing centres because they lacked emergency facilities and 24/7 services; they perceived the SBAs to be inexperienced and unsupervised; and, in the eventuality of a referral, the increased costs, time and risks incurred were all deemed too high. For costing purposes, it is assumed that the following activities are involved in strengthening birthing centres:

1. At least two SBAs at each birthing centre, with additional support to achieve 24/7 services.
2. Free referral services provided to women from birthing centres to referral hospital, e.g. by issuing a voucher.
3. Incentives to FCHV of NRs 150.00 for bringing women at birthing centres for childbirth.
4. Rotation of SBAs between the birthing centre and the hospital for confidence improvement and building the referral linkage. Allowance will be provided to the SBAs for a month as per the government of Nepal rules and regulation.
5. An information and Behaviour Change Communication (BCC) programme to promote the use of the improved birthing centres and new referral system.

Project Support and Implementation

As an indicative costing exercise only, this note does not set out a detailed implementation plan. This should be drawn up following more a detailed feasibility and design study. However, implementation is likely to include:

1. Context specific planning: Local stakeholders will be engaged in the planning process. A context specific plan will be developed to ensure the cooperation of all stakeholders.
2. Participatory management: a meeting will be held in the maternity ward to plan, implement, and monitor the expansion activities and outputs.
3. Onsite support and facilitative supervision: the hospital will provide onsite support during the facilitative supervision visits (CR A4.building linkage).
4. Review of progress of the piloting: the DHRCC will review the progress of piloting twice a year, provide feedback and take corrective action.

Indicative Cost for Immediate (3 Year) Response in 6 Referral Hospitals and Selected Birthing Centres, 2013-2015

The estimated total *additional* cost for a three year programme of immediate responses in the six referral hospitals and strategically selected birthing centres is US \$1.5 million (approximately \$250,000 per district), or £875,000.

Activities are costed individually (see Table B below and A2 in Annex 5.1) by extrapolating from actual 2011/12 costs¹³ found in hospital accounts by the 2012 referral study. At almost 75% of the total cost for the hospitals, human resources are the largest cost component. Staff needs are as advised by the Medical Superintendent and Matron of each hospital based on their assessment of what would be adequate for short-term expansion. Resulting staffing levels are not assumed to reach any international standard.

Renting of additional space in external buildings is costed for Bheri and Janakpur where the options for expansion within the hospital appear particularly limited. It is assumed that this will be possible. Referral of mothers to private hospitals is assumed to occur at the same rate as before, with the costs continuing to falling on the Aama programme.

Birthing centres included for upgrading are the most highly utilised in each district in 2011/12.¹⁴ This amounts to between nine and 15 selected birthing centres per district. Human resource costs for the birthing centre upgrading component are 40% of the total. These estimates are based on increasing the number of SBAs per birthing centre to achieve 24/7 attendance and providing an incentive payment to community health workers as in the successful example of Kailali. BCC communication costs are based on the cost of a community nurse visiting womens' groups. The estimated cost of improved referral linkages is based largely on the allowances payable to SBAs when rotated between hospital and BC.

Table B: Indicative Costs for Immediate response in 6 Referral Hospitals and Selected BCs

1. Hospitals (annual cost)							
	Seti	Bheri	Pokhara	Bharatpur	Janakpur	Koshi	TOTAL
Sub-total of Hospitals	4,716,300	4,716,300	4,326,300	4,176,300	6,874,300	4,716,300	29,525,800
B. Strengthening Birthing Centres (annual cost)							
	Kailali District	Banke District	Kaski District	Chitwan District	Dhanusa District	Morang District	TOTAL
Sub- total of Birthing Centres	2,619,900	2,237,400	1,584,900	1,363,900	2,263,900	1,603,900	11,673,900
Total Hospitals & BCs year 1	7,336,200	6,953,700	5,911,200	5,540,200	9,138,200	6,320,200	41,199,700
Total Hospitals & BCs year 2 (minus equipment & furnishing)	6,780,700	6,233,200	5,355,700	5,149,700	8,417,700	5,764,700	37,701,700
Total Hospitals & BCs year 3	7,458,770	6,856,520	5,891,270	5,664,670	9,259,470	6,341,170	41,471,870

¹³ No inflation for future years is included. It is assumed domestic inflation will be offset by a Nepalese Rupee devaluation, leaving the foreign exchange cost unchanged.

¹⁴ Taken from HMIS 2011. The original intention was to select only those BCs achieving a utilization of 80 deliveries per year or more. Only Kailali and Banke districts achieved a sufficient number on this criterion. For the other 4 districts, simply the currently most highly utilized BCs were selected.

TOTAL for Three years (NRs)	21,575,670	20,043,420	17,158,170	16,354,570	26,815,370	18,426,070	120,373,270
TOTAL in USDollars	253,831	235,805	201,861	192,407	315,475	216,777	<u>1,416,156</u>
GRAND TOTAL in £ Sterling	<u>£875,000</u>						

Indicative Costs for a Long-term response in 6 referral hospitals

The estimated total *additional* cost for a long term response to reduce overcrowding in 6 referral hospitals for the next twenty years is estimated to be £12.5 million. With almost half of this attributed to salary costs borne by GoN, the capital costs that could be picked up by donors is estimated to amount to approximately £6.5 million.

The long-term response is differentiated from the short-term by the construction of additional physical infrastructure. NHSSP advise that this would take a minimum of 2 years to plan and implement and would therefore not come on stream until 2015 at the earliest. Buildings are assumed to have a life of at least 20 years and therefore must be scaled to accommodate growth in demand.

Projecting demand for maternity beds and related hospital space over this period involves forecasting demographic (fertility and urbanisation rates) and market (public and private suppliers) changes. Over the longer term, we can expect fertility to decline and urbanisation to rise, although we cannot safely predict the rates at which these will happen. We have therefore estimated increases in births in the six districts on current trends until 2017/18, thenceforth making a straight-line projection for a further 13 years to 2030. Throughout, we assume 12% of total births occur in birthing centres and 23% occur in the private sector.

We apply the same method used in the Referral Study of finding the difference between the actual and normalised unit costs of deliveries to arrive at a broad-brush estimate of the *additional* cost of improving standards of maternity care in the six referral hospitals. These are summarised in Table C below and in more detail in Table A3 in the Annex 5.1. The normalised unit costs include estimates for annualised infrastructure costs and for increasing staffing levels to WHO standards (although not the salary increases to achieve this). Using current salaries, human resources account for just over half (54%) of total projected costs.

Table 3: Long term response: Projection of deliveries and additional costs in 6 referral hospitals 2012/13- 2030/31

Projection	2012/13 Base year	2013/14	2014/15	2015/16	2016/17	2017/18	2017/18 - 2030/31
Total births in 6 Districts	48,813	54,671	61,231	68,579	76,808	84,489	1,098,357
Additional cost in NRs (Normalised unit cost – Actual unit cost)							
Annual additional cost	55,068,194	61,676,377	69,077,543	77,366,848	86,650,869	95,315,956	1,239,107,432

NRs							
Annual additional cost US Dollars	647,861	725,604	812,677	910,198	1,019,422	1,121,364	14,577,735
GRAND TOTAL in US Dollars	\$19,814,861						
GRAND TOTAL in £ Sterling	£12.5 million						

*Figures and based on the unit costs of 2012 price

Next Steps to finalise Design

These indicative costings are a first step in an iterative process of estimating the scale of additional resources that may be needed from development partners for a short-term response and a long-term response to the overcrowding identified in the 6 referral hospitals. They also highlight further design and implementation issues that need to be explored before a complete implementation plan can be finalized. The main outstanding actions are:

1. The 'strategic' birthing centres have been selected for the purpose of this costing exercise on the basis of highest current utilization as indicated by HMIS. The selection needs to be revised on the basis of more rigorous criteria. These may include travel distances, type of health centre or other special issues such as socio-economic factors and mothers' preferences. Criteria could be developed through a census of BCs and focus group discussions in a sub-sample of the districts;
2. Cross-check infrastructure assumptions and costs with NHSSP infrastructure adviser;
3. Test the feasibility of the major assumptions that significant staff vacancies can be quickly filled and is affordable and that temporary additional space can be found on the scale necessary;
4. Better definition of the potential of 'total quality management' improvements.

Devi Presai
Rachel Phillipson
1st February, 2013.

ANNEX 5.1
Detailed Costing Tables

Table A2: Indicative Costs for Immediate response in 6 Referral Hospitals and Selected Birthing Centres

1. Hospitals							
Action	Seti	Bheri	Pokhara	Bharatpur	Janakpur	Koshi	Total
1. Temporary maternity space							
1.1 Renovation (painting, repairing)	100,000	100,000	100,000	100,000	100,000	100,000	600,000
1.2 Renting facility	0	240,000	0	0	240,000	0	480,000
1.3 Equipment/beds	450,000	600,000	450,000	300,000	600,000	450,000	2,850,000
1.4 Furnishing/clothing	55,000	55,000	55,000	55,000	55,000	55,000	330,000
2. Human resource	3,432,000	3,042,000	3,042,000	3,042,000	5,200,000	3,432,000	21,190,000
3. Exchange visit	60,000	60,000	60,000	60,000	60,000	60,000	360,000
4. Referral & management linkage between Hospital and birthing centres	430,300	430,300	430,300	430,300	430,300	430,300	2,581,800
5. Supervision & improving QOC	180,000	180,000	180,000	180,000	180,000	180,000	1,080,000
6. Monitoring performance	9,000	9,000	9,000	9,000	9,000	9,000	54,000
Sub total of hospitals	4,716,300	4,716,300	4,326,300	4,176,300	6,874,300	4,716,300	29,525,800
B. Strengthening birthing centres							
Action	Kailali District	Banke District	Kaski District	Chitwan District	Dhanusa District	Morang District	Total
7. Behaviour Change Communication	87,900	87,900	87,900	87,900	87,900	87,900	527,400
8. Ensuring SBA 24/7 (pool for backup)districts	663,000	663,000	663,000	442,000	442,000	442,000	3,315,000
9. Free transport from BC to referral hospital	1,500,000	1,200,000	600,000	600,000	1,500,000	900,000	6,300,000
10. Rotation of SBA to hospitals	75,000	75,000	75,000	75,000	75,000	75,000	450,000
11. Incentive to FCHVs for bringing women to BCs	270,000	187,500	135,000	135,000	135,000	75,000	937,500
11. Monitoring	24,000	24,000	24,000	24,000	24,000	24,000	144,000
Sub- total of birthing centres	2,619,900	2,237,400	1,584,900	1,363,900	2,263,900	1,603,900	11,673,900
Total of year 1	7,336,200	6,953,700	5,911,200	5,540,200	9,138,200	6,320,200	41,199,700
Total of year 2 (minus equipment & furnishing)	6,780,700	6,233,200	5,355,700	5,149,700	8,417,700	5,764,700	37,701,700

Total of year 3	7,458,770	6,856,520	5,891,270	5,664,670	9,259,470	6,341,170	41,471,870
Total for three years	21,575,670	20,043,420	17,158,170	16,354,570	26,815,370	18,426,070	120,373,270
Total for three years in US Dollars	253,831	235,805	201,861	192,407	315,475	216,777	1,416,156

Table A3: Long term response: Projection of deliveries, actual, normalised and additional costs for five years in six referral hospitals

Projection	2012/13 Base year	2013/14	2014/15	2015/16	2016/17	2017/18	Total of 2013/14- 2017/18
Normal deliveries	37,454	41,948	46,982	52,620	58,935	64,828	265,314
Complication managed	2,574	2,883	3,229	3,616	4,050	4,455	18,233
Caesarean section	8,785	9,839	11,020	12,342	13,823	15,206	62,230
Total	48,813	54,671	61,231	68,579	76,808	84,489	345,778
Actual cost in NRS*							
Normal	69,177,538	77,478,843	86,776,304	97,189,460	108,852,195	119,737,415	490,034,217
Complication managed	8306298	9303053.76	10419420.21	11669750.64	13070120.71	14377132.8	58,839,478
Caesarean section	97970320	109726758	122893969.4	137641245.7	154158195.2	169574015	693,994,184
Total	175,454,156	196,508,655	220,089,693	246,500,456	276,080,511	303,688,562	1,242,867,878
Normalised cost in NRs							
Normal	92061932	103109364	115482487.5	129340386	144861232.3	159347356	652,140,825
Complication managed	10146708	11364313	12728030.52	14255394.18	15966041.48	17562645.6	71,876,425
Caesarean section	128313710	143711355	160956717.8	180271524	201904106.8	222094518	908,938,221
Total	230522350	258185032	289167235.8	323867304.1	362731380.6	399004519	1,632,955,471
Additional cost in NRs (Normalised- Actual)							
Normal	22,884,394	25,630,521	28,706,184	32,150,926	36,009,037	39,609,941	162,106,609
Complication managed	1,840,410	2,061,259	2,308,610	2,585,644	2,895,921	3,185,513	13,036,947
Caesarean section	30,343,390	33,984,597	38,062,748	42,630,278	47,745,912	52,520,503	214,944,038
Total additional cost (NR)	55,068,194	61,676,377	69,077,543	77,366,848	86,650,869	95,315,956	390,087,593

*Figures and based on the unit costs of 2012 price