ODISHA TECHNICAL & MANAGEMENT SUPPORT TEAM
MARCH – 2012

DEPARTMENT OF HEALTH & FAMILY WELFARE
GOVERNMENT OF ODISHA

Enhancing Quality of Care in provision of Maternity Services in Hospitals across Odisha

A Scoring And Ranking Excercise leading to State And Facility level Quality Improvment Action Plan

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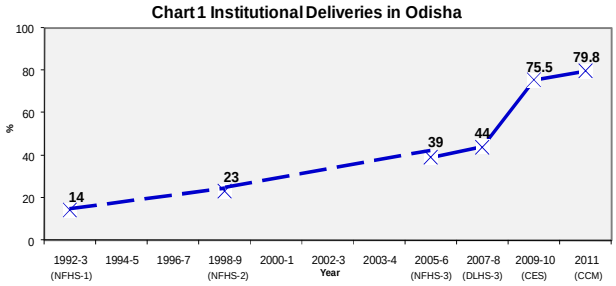
ACRONYMS

ADMO	Additional District Medical Officer
ANM	Auxiliary Nurse & Midwife
ARHQ	Agency for Healthcare Research and Quality
ASHA	Accredited Social Health Activists
BWM	Biomedical Waste Management
CCM	Concurrent Monitoring
CDMO	Chief District Medical Officer
CEmONC	Comprehensive Emergency Obstetric and Newborn Care
CES	Current Employment Statistics
CMO	Chief Medical Officer
DHH	District Headquarter Hospital
DLHS	District Level Household And Facility Survey
DOHF&W	Department of Health & Family Welfare
DPM	District Program Manager
EVA	Electric Vacuum Aspiration
HIV	Human immunodeficiency virus
HMIS	Hospital Management Information System
ICPD	International Conference on Population & Development
IRCCS	
IUD	Intrauterine device
JD.Tech	Joint Director Technical
JE	Janani Express
JHPIEGO	Johns Hopkins Program for International Education in Gynaecology &Obstetrics
JSSK	JananiShishuSurakshaKaryakram
JSY	JananiSurakshaYojana
LSAS	Life Saving Anesthetic Skills
MD	Mission Director
MDG	Millennium Development Goal
MDR	Maternal Death Review
MoHF&W	Ministry of Health & Family Welfare
MTP	Medical Termination Of Pregnancy
MVA	Manual Vaccum Aspiration
NFHS	National Family Health Survey
NRHM	National Rural Health Mission
O/G	Obstetricians and Gynaecologists
OHSP	Orissa Health Sector Plan
OT	Operation Theatre
PNMCH	Partnership for Maternal Newborn& Child Health
PPP	Public Private Partnership
PRB	Population Reference Bureau
QoC	Quality of care
RCH	Reproductive Child Health
RMNCH	Reproductive Maternal & Neonatal Child Health
SBA	Skill Birth Attendant
SPSS	Statistical Package for the Social Sciences
TMST	Technical Management Support Team
UNFPA	United Nations Fund For Population Activities
WHO	World Health Organisation

EXECUTIVE SUMMARY

BACKGROUND

India accounts for nearly 25% of global maternal mortality (387,200) and over 30% of neonatal mortality (3.4 million). To address this high as well as avoidable death toll, the Government of India successfully launched Janani Suraksha Yojana (JSY), a conditional cash transfer scheme to improve access to and utilisation of Maternal and Child Health (MCH) services by poor families. Since inception of the programme in 2005, India has seen a substantial rise in the rate of institutional delivery and utilisation of MCH services across all states. In the state of Odisha, institutional delivery has increased from 14% in 1993 to 80% in 2011 (Chart 1).



The vast majority of deliveries in Odisha take place in the public sector (estimated 93% of rural deliveries in public facilities, Concurrent Monitoring, CCM, 2011), which is consistent with National Sample Survey (NSS) 2004 findings that the public sector is the dominant provider in the state.

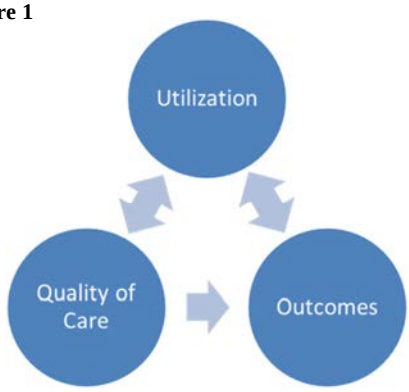
With a high load of institutional deliveries, provided overwhelmingly through government hospitals, the quality of care in these facilities will largely determine the safety of childbirth in Odisha.

RATIONALE

So far little is known about the effect heightened demand has had on the quality of services provided in the state. The assessment was conducted by a DFID funded, long-term technical support team (TMST), with full agreement of the Department of Health and Family Welfare (DoH&FW). Assumptions underlying the assessment are that increased utilisation of services affect quality of care and maternal/new born outcomes, and equally that the quality of care provided and outcomes could also affect people's utilisation of services in the future (Figure 1)

*This summary presents evidence gathered through a QoC Assessment conducted at 30 publicly funded **district Headquarter hospitals (DHH)** across Odisha*

Figure 1



Using a three dimensional approach, the QoC review attempted to conduct a systematic assessment of quality of performance indicators categorised by *a) Input b) Process, and c) Output.* By assigning a QoC score to each indicator in these categories, it aimed to achieve an inter and intra-hospital comparison and help quantify the resources and strategies required in order to improve quality. The hope is that raising the bar of quality in these district hospitals could provide a cascading effect on the other hospitals around them.

Underpinning this assessment is the need to assess Quality of Care in Maternal Services, not to find fault, but to add value by identifying gaps and areas that need strengthening and arriving at practical suggestions on how to address these.

KEY FINDINGS

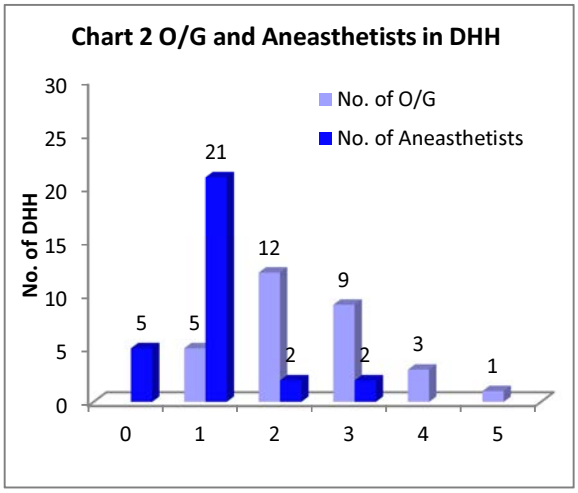
The QoC study (2011-2012) identified a range of quality indicators within the framework.

INPUTS

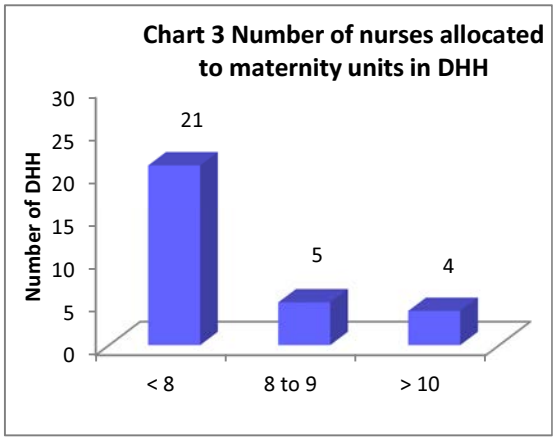
Human resources

The single biggest challenge, as is well acknowledged, appears to be in the area of Human Resources – the sanctioned numbers, actual numbers in place, attitude and morale. This will never be an easy problem to solve, and we will need to be pragmatic and practical.

The assessment found a substantial gap between the number of sanctioned posts and the number of posts required for quality service provision. For example even though all the 73 sanctioned OG specialists positions were filled, there was a 19% to 39% shortfall in the numbers of specialists required for quality improvement. For anaesthetists, out of the 56 sanctioned posts across the DHH, only 31 were filled. This means only four DHH have at least two anaesthetists, severely limiting availability of 24/7 emergency obstetric care (Chart 2)



Most of the Maternal Care in hospitals is actually provided by Nurse-Midwives (GNMs). Presently, most DHH Maternity Units with about 40 patients in the ward and 15-20 deliveries a day, have only 5 or 6 maternity nurses in total to be shared across 3 shifts, for the Labour Room and the Wards. In practice, this means there are only 1 or 2 nurses at any given time, to conduct deliveries and provide medications, monitoring and care to the ward patients, including post-operative mothers. For staffing a Labour Room and the Maternal Ward in 3 shifts, a DHH would need a minimum of 10 nurses. In practice just four hospitals had 10 or more nurses (Chart 3).



Further, availability of skilled HR does not necessarily match case load, which has a wide inter-district variation (ranging from 3 to 27 deliveries per day). On a positive note, some significant improvement in daily management of hospital resources was observed, largely due to the introduction by NRHM of hospital managers.

Infrastructure

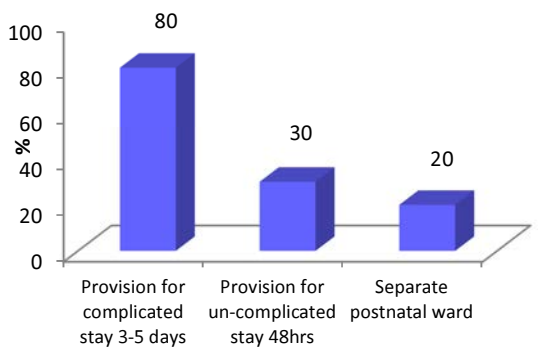
As noted, there is wide variation in utilization of services between hospitals. Therefore adequacy of infrastructure also varies based on availability and **case load**. In most hospitals, the Maternity wards and Labour Rooms were overcrowded.

Issues identified were largely around the design, appropriateness and maintenance of infrastructure. In most cases design and layout of maternity care wards are not ideal and do not take into account the way MCH care should be delivered i.e. continuum of care approach. Many hospitals are old and pre-date modern concepts of care, but even new or upgraded maternity units often have sub-optimal layout.

*The Labour Room in almost all facilities visited, is conceptualised and functioning **only as a Delivery Room**. There are only 3 – 5 delivery tables in most labour rooms, with average no. of deliveries per day of around 15-20. Mothers coming in early labour are usually kept in the wards until they reach second stage, and are then moved to the Labour Room. Again, soon after delivery they are moved back to the wards to make space for the next mother. However, the wards are not staffed or equipped to be able to monitor the mother and the foetus in the critical periods before and after delivery. This means foetal distress and other obstetric emergencies can be missed with potential for avoidable prenatal morbidity and mortality.*

Further, only 20% of all facilities had a separate post natal ward (Chart 4), a huge limitation in provision of safe neonatal care.

Chart 4 Provision for maternity clients



Equipment

Shortfalls observed for providing quality of care included hand washing, where only half the operation theatres where caesarean sections are conducted had functional facilities; and sterilisation, where only one-third of the labour rooms had adequate sterilisation equipment. Further, instruments used for delivery are too few to meet the increased case load resulting in short-cuts in the sterilisation process. Instruments and equipment for new born care also fall short of requirement.

The performance scores for equipment showed the greatest variation between facilities (range 4 to 88 out of 100), suggesting this is an area that can be readily addressed at the facility level by local procurement to match case-loads.

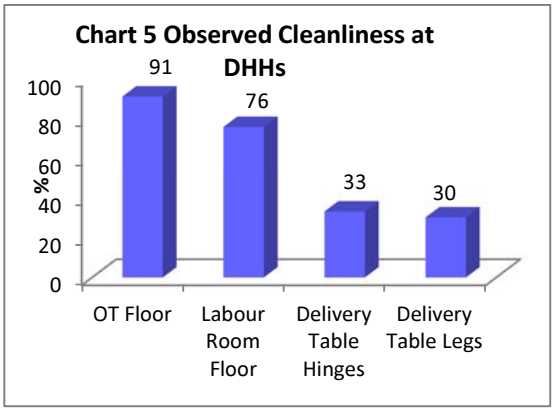
Drugs and consumables

Availability of essential drugs was generally better than equipment. Two DHHs scored less than half of

the best performing DHHs and therefore require urgent attention. However there were shortfalls in assured stock of all essential drugs and regular consumables and staff reported families were often asked to purchase. Supplies of common consumables were also poor in many labour rooms with half reporting availability of gloves as an issue.

Non-clinical services

Despite most facilities having biomedical waste management systems (BMS) and trained staff to conduct this work, it was often found that staff did not adhere to all necessary protocols. While guidelines and protocols were widely available, only 60% of the hospitals put them into practice. Out-sourced housekeeping services such as laundry, cleaning and security performed relatively well. However, standards of cleanliness are still fall short of infection prevention requirements. For example, floors in the operating theatre (OT) and labour rooms were generally clean, but hinges and legs of delivery tables were largely over looked (Chart 5), suggesting check-lists and supervision of cleaning have to be detailed.



Registers

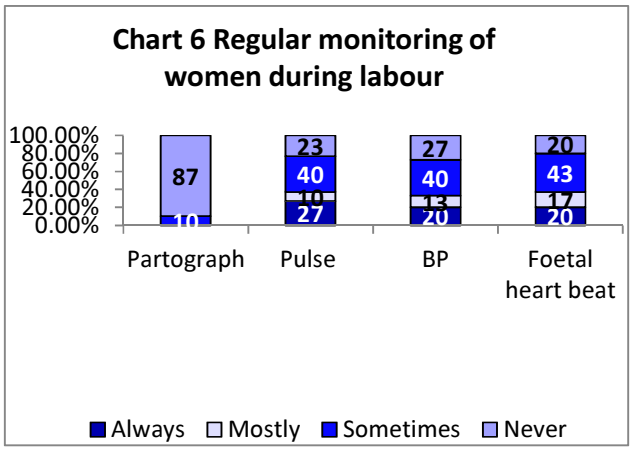
A wide variation was noted in the availability of effective information management tools and even when available, there remained a lack of uniformity in the templates of these registers. A well-designed and comprehensive register has been recently introduced by the DoH&FW, but at the time of assessment was not available in all districts. Consistent recording of mother and baby records is constrained by the high work load of nurses, who are responsible for maintaining the registers. This limits data use in state-wide audits and facility level quality assurance processes.

PROCESSES

One of the major findings of this assessment is that foetal distress may often be missed.

Good Practice

The Hospitals were scored on their use of 20 internationally accepted good practices in maternal care. Scores are based on what, usually labour room staff nurses, reported as their normal practice and limited direct observation. Staff overall showed a good awareness of infection control though some said that '*they do not have time for that*' reflecting an overstretched workforce. Similarly, most hospitals said partographs were not used widely outside the training workshop situation, for lack of time. Only about a quarter of the staff reported they always monitor pulse, BP and foetal heart beat hourly (Chart 6).



Some good practices, such as the use of Magnesium Sulphate in eclampsia or Nevirapine for HIV+ve mothers were reported as almost universal. Willingness to

allow mothers to choose alternative birthing positions or companions for social support was relatively less common. Privacy in labour wards, while largely recognised in nearly 87% of the facilities, is still sub-optimal with a lack of dividers in labour rooms in over half of the DHHs visited. Staff also reported having to examine mothers without adequate space and screens to ensure privacy.

Scarce laboratory facilities also meant that routine tests during delivery were only available in just over half of the DHHs surveyed with patients often paying for tests privately when delivery was conducted outside normal working hours.

Reported newborn care practices were consistently good across all facilities with only 3%-10% reporting departures from accepted norms and protocols. Similarly a greater consistency and good coverage was noted in services aimed at promoting exclusive breastfeeding and family planning.

Another area in need of attention is the clinical guidelines for medical termination of pregnancy and post abortion care. Ninety per cent of obstetricians reported use of dilation and curettage rather than the internationally recommended vacuum aspiration.

Referral

Twenty hospitals said they sometimes had to refer patients out for caesarean sections either due to major maternal complications, or absence of key staff such as the anaesthetist or OG specialist. Given that these are district referral hospitals serving 1-2 million population, regular referral to the medical colleges (of which there are only 3 in the State), is a cause of concern. None of the hospitals visited had a system in place for receiving advance information on in-referrals or sending advance information for out-referrals. However, almost all of them reported giving Referral Certificates to those they referred out.

OUTPUTS

Availability of clinical services is essentially influenced by the input factors already outlined above.

Little over half of the district headquarter hospitals (63%) perform less than 10% of all births by caesarean section. This appears low given they are referral hospitals. The reasons include the shortage of anaesthetists, the inability to monitor for foetal distress due to the caseload, and the tendency to refer out mothers needing surgical intervention especially where bigger hospitals are relatively nearby.

Provision of services depends on availability of trained staff, infrastructure and equipment. It is therefore hardly surprising that only 53% of all district hospitals are able to provide the 9 emergency obstetric care signal functions 24 hours, 7 days a week.

Only 17% of the facilities had laboratory available on a 24x7 basis. Only about two-thirds of the facilities had provision for ultrasounds, which can be crucial in cases like antepartum hemorrhage, and for quality antenatal care.

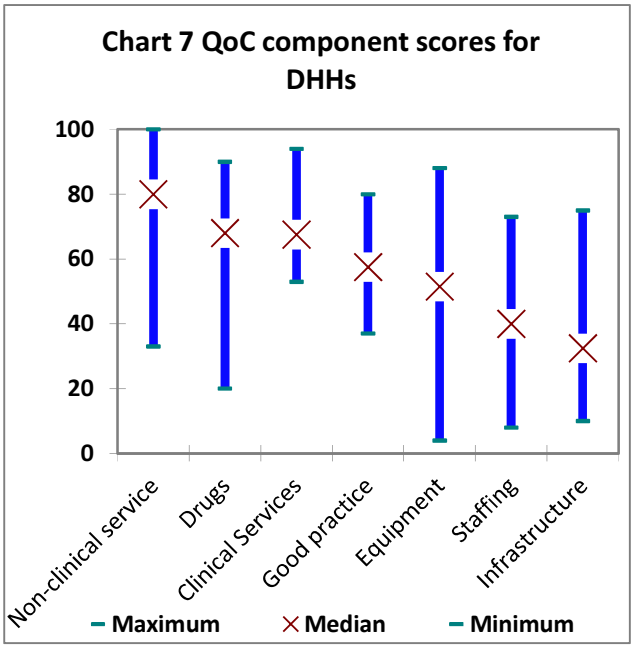
Finally while 67% and 60% of the hospitals provide post-partum and post-abortion family planning support respectively, staff at these hospitals often reported a low uptake of such services by clients. Most facilities fared well in providing post abortion care and abortion during the first trimester, but

only two thirds of the facilities provided abortion related care in slightly advanced stages of pregnancy.

CONCLUSION

The chart below (Chart 7) summarises the QoC component scores across all district headquarter hospitals. Median scores are highest for non-clinical services, which reflect the recent efforts by the state to improve these areas of quality which can readily be addressed.

Overall, the QoC exercise has been a very intensive learning experience that brings us face to face with both the massive achievements made and the major challenges that need to be addressed. The price of success is evident. Where systems have improved, demand has increased, thereby putting pressure on quality. Much needs to be done. We hope this assessment will help to light the path that needs to be chosen.



Staffing and infrastructure have the lowest median scores, but the range is wide indicating the need to plan for each hospital individually, especially given wide variations in case-load.

SUGGESTIONS FOR CHANGE

These findings were discussed at a formal meeting of the DoH&FW, chaired by the Commissioner-Cum-Secretary, during January 2012. The suggestions below have emerged from this meeting and some have already been proposed within the forthcoming National Rural Health Mission (NRHM) Odisha Plan of Implementation (PIP) and other DoH&FW plans including the DFID supported Odisha Health Sector Plan (OHSP). Full implementation of Janani Shishu Surakshya Karyakram (JSSK) – free maternal and neonatal hospital care – is expected to both increase demand and reduce some of the drugs and consumables supply constraints highlighted.

GENERIC

Suggestion 1: Produce Quality Improvement Plans for both the system level (for generic issues), and the individual facility level.

Suggestion 2: Appreciate, document and disseminate innovations and best practices to other facilities to inspire change.

INPUTS

Suggestion 3: Optimise the utilization of specialists. Consider ways to relocate Gynaecologists and Anaesthetists within the district to L 3 hospitals.

Suggestion 4: Increase the availability of specialists**.** Consider re-starting the Post Graduate Diploma programmes in the critical disciplines of Anaesthesia, O&G and Paediatrics.

Suggestion 5: Enhance the role of Nurses. Increase the sanctioned number of nurses to required levels based on the delivery load and the bed strength in the wards. Where Staff Nurses are unavailable, ANMs could be taken and trained for the role, so that there are enough trained hands to ensure quality of care. Empower the nurse-midwives to officially do what they are trained to do i.e. normal deliveries. This would release a lot more potential for care. Re-locate SBA-trained Nurses for optimum utilization in the Maternity Units of DHHs. Create systems for fixing the posting of nurses to Maternity Care Units within the DHH to enable skill development and utilisation.

Suggestion 6: Introduce Hospital Managers into all hospitals that provide comprehensive and basic emergency obstetric care.

Suggestion 7: Allocate technical personnel to institutions based on Case Load.

Suggestion 8: Professionalise the designing of Labour Rooms and Maternity Wards to enable quality care, including space for monitoring mothers in early labour through larger Labour Rooms or First Stage Wards, and separate wards for Antenatal and Post-Natal mothers.

Suggestion 9: Design model infrastructure plans for Maternity units.

Suggestion 10: Include a specific focus in the NRHM Program Implementation Plan (PIP) 2012-13 on Infrastructure and Equipment for Maternal Care, especially in districts with below-median scores.

Suggestion 11: Consider using Government-financed or PPP models to create a few dedicated, professionally designed, Maternity Hospitals - especially in former sub-divisions and where there is little private sector care available.

Suggestion 12: Consider setting up Pre- and Post-Natal Hostels near/in DHHs in PPP **mode** : this would allow the health services to focus on the provision of good quality care and not in housing mothers, their babies and companions.

Suggestion 13: Accredit more private health care providers at Level 2 and Level 3 to share the case load.

Suggestion 14: Purchase additional, high-quality, sets of frequently used instruments (delivery kits, specula etc) in proportion to the increased case load.

Suggestion 15: Lay down and operationalise clear systems with the necessary equipment to ensure sterility of instruments before use for patient care.

Suggestion 16: Place Biomedical Engineers at district level to provide preventive and corrective maintenance for equipment. Include provision for AMC at time of purchase of equipment, where relevant.

Suggestion 17: Ensure availability of adequate consumables used regularly for deliveries such as Gloves and Syringes either through sustained supplies or through enhanced local purchasing capacity.

Suggestion 18: Strengthen Drugs Inventory Management; include more effective pre-dispatch Quality Assurance for drugs.

Suggestion 19: Appreciate the quality improvement that has occurred through sustained inputs. Document and disseminate the best practices and outcomes in these areas, for cross learning and modelling.

Suggestion 20: Improve Bio-Waste Management systems in all the DHH facilities through a campaign mode.

PROCESS

Suggestion 21: Continue to use in-service education programmes to update staff on changes in recommended practices. There is a need to ensure that all the members of the team are up-to-date, if change is to come. The crucial people in this appear to be the senior nurse in charge and the OG specialist.

Suggestion 22: Introduce the WHO Safe Childbirth Checklist, which is a simple tool to ensure the basic steps for good practice are followed.

Suggestion 23: Revisit the concept of maternal care we provide, so as to have a continuum of quality of care from admission till discharge, with adequate monitoring in labour. Design the structures and the staffing pattern to achieve this

Suggestion 24: Operationalise the universal use of the new labour room registers: print and distribute the new registers to all facilities.

Suggestion 25: Identify a person to be responsible for recording the required birth related information whether from existing data-entry persons or recruit new staff (like a “Ward / Labour Room Clerk”).

Suggestion 26: Scale up the automation of records (already piloted at DHH Puri)

Suggestion 27: Create a mechanism for peripheral units to inform the hospital in advance of patients being referred, to ensure prior to transfer that they can treat the patient and enhance the speed of response and quality.

OUTPUTS

Suggestion 28: Each facility needs their own Quality Improvement Plan to ensure availability of all 9 signal CEmONC functions 24 x 7 by addressing the current gaps.

Suggestion 29: Take steps to operationalise ultrasound services and 24x7 laboratory services

1. INTRODUCTION

1.1 Background

Of the 140 million births that take place each year worldwide (PRB 2010), an estimated 358,000 result in the mother's death (PMNCH 2011), 1.02 million in an intra-partum related stillbirth (Lawn et al. 2009) and 3.1 million in a neonatal death (Rajaratnam 2010). Furthermore, the burden of such mortality largely falls on developing countries, where these deaths could be avoided if existing knowledge and evidence-based maternal and neonatal practices were implemented effectively.

In order to address the high incidence of maternal and neonatal mortality, and meet the targets for MDGs 4 and 5, women in low-income countries are increasingly being encouraged to deliver in health facilities, or be attended by a skilled birth attendant at home births, so that potential complications can be avoided or optimally managed if they do occur. In practice, however, too frequently the Quality of Care (QoC) at health facilities, or from skilled birth attendants, is reported to be inadequate, thereby undermining the impact of formal MCH care on reducing the incidence of high mortality. Integrated service packages that build upon existing clinical system frameworks to improve the continuum of reproductive, maternal, newborn and child health (RCMNCH) care provides a promising solution to address QoC issues. Such approaches are urgently needed in low income settings to maximise access to and utilisation of total RMNCH care and the resultant health outcome.

The major causes of maternal and neonatal mortality are widely known: haemorrhage, infection, hypertensive-related disorders, prolonged/obstructed labour, infection, birth asphyxia, and complications of prematurity (UNFPA 2004). "A child's risk of dying is highest during the first 28 days of life when about 40% of under-five deaths take place, translating into three million deaths. Up to one half of all newborn deaths occur within the first 24 hours of life and 75% occur in the first week" (PMNCH 2011: 6).

The challenges are surmountable but there is a need to consider the wider structural issues within the health system and apply a more holistic model to the delivery of care that could contribute towards the betterment of the aforementioned indicators. A recent WHO report on RCMNCH strategies (2011) claims that survival and better outcomes are strongly correlated to interventions that target the wider health issues of mothers. It advocates the need to review ways in which care is delivered by incorporating a continuum of care approach. The report also argues that an integrated care delivery approach will help lower the cost of the intervention, promote greater efficiency by reducing duplication and enhance consistency in the resources used. However, limited action has been taken to put such theory into practice and there remains a lack of consensus on how best to implement such approaches in order to accelerate progress towards the MDGs.

1.2 Objectives

The study had the following objectives:

- To compute QoC scores for District Headquarter Hospitals (DHHs) across Odisha, by assigning weightages to various contributing components, and enable comparison between the Hospitals .
- To prepare an action plan with the Government of Odisha outlining priority areas that need immediate attention and suggests doable solutions, factoring in existing constraints to improve QoC in these DHHs.
- To create a QoC assessment tool to enable facilities to perform periodic self-assessment at regular intervals.

1.3 Quality of Care

QoC was recognized as an integral and key component of people's reproductive rights at the International Conference on Population & Development (ICPD) at Cairo in 1994 (UN 1995).The conference was a paradigm shift from a demographic approach to one which responds to the reproductive health needs of clients. Over the past two decades technical experts in the field have offered a variety of definitions for quality in health care, with some examples set out below:

- Attributes of a service programme that reflect adherence to professional standards, in a congenial service environment and satisfaction on the part of the user (MOHF&W 2008; UNFPA technical report 1999).
- The degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge (Lohr 1990).
- The way clients are treated by the system and the actual process of care-giving, focusing on the client's or user's perspectives of services (Hull, 1994).
- The degree of match between the client's view of the quality of care received and the service provider's view (Ishikawa, 1985).
- Doing the right things (getting the health care services you need), at the right time (when you need them), in the right way (using the appropriate test or procedures), to achieve the best possible results (ARHQ 2005).

Other key attributes of quality health services include safety, appropriateness, effectiveness, equity, efficiency, sustainability, being humane (IoM 2001) and especially in a community health care setting may also include factors related to access, training, and infrastructure. Most of the definitions and frameworks described above emphasise that providers' attitude towards the client, technical appropriateness and the desired health outcomes are important components of quality.

1.4 Quality Assurance Cycle

Quality improvement is a systematic approach to achieving agreed standards of care. However, once the agreed standards are established, a quality assurance process enables a systematic and planned approach to assess, monitor, protect, promote and improve the quality of health services in an iterative manner (Donebedian 2003).

Hence the quality assurance cycle helps to forge greater confidence by improving communication channels and thereby facilitating a clearer understanding of community needs and expectations. The evaluation process utilises the data on key health indicators and encourages a multi- disciplinary team approach to problem solving and quality improvement

1.5 QoC Assessment

The aim of this QoC Assessment is to undertake a critical analysis of the quality of maternity services being provided at District Headquarter Hospitals across Odisha, not with the intention of finding fault, but to add value by identifying areas that need strengthening, and prepare an action plan with the Government of Odisha.

The Technical and Management Support Team (TMST), undertook a Quality of Care assessment in 2011, covering 32 hospitals in the state. This included all 30 District Headquarter Hospitals (DHH) and two higher level referral hospitals (viz Capital Hospital Bhubneshwar and Rourkela General Hospital). The 30 DHHs together are responsible for approximately 23% of all institutional deliveries in the state, and it is hoped that improving QoC standards at these institutions would have a cascading effect on other healthcare institutions around them.

The assessment was conducted using a pre-tested tool designed primarily around 10 QoC components. These were adapted to be consistent with National guidelines and the local context through brain storming sessions with local stakeholders such as TMST members, representatives of Department of Health and Family Welfare (DOHF&W) and also GoO doctors who had decades of hands on experience. The assessment tool itself may also be useful for introducing and instilling the concepts and the contents of internationally recommended guidelines and standards for Quality of Care.

The key principle underlying the QoC assessment used in this study is that a health system approach should be adopted when assessing, reviewing and developing health policies. The roots of most of the underlying the problems are usually systemic. Therefore, it is important to avoid fragmentation in assessing the situation and its underlying causes and identifying appropriate action. The tool used for this assessment will enable the DOHF&W, the Government of Odisha, policy makers, health managers and leading professionals to assess the performance of the health system with respect to maternity care and help to identify key policy areas that require improvement and prioritisation.

As illustrated in Figure 1, we hypothesise that:

- increased utilisation of services (without the necessary increased investment in the system) could potentially have an adverse impact on quality of care and outcomes
- the quality of care provided could subsequently affect people's utilisation of services

- the quality of care provided could also affect maternal and new born outcomes, as could utilisation

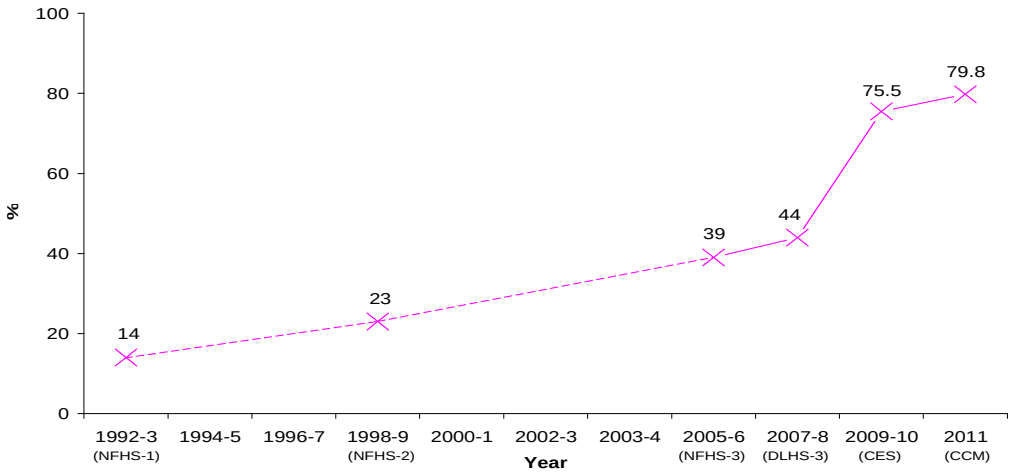
Figure 1: Relationships between utilisation, quality of care and outcomes

1.6 Maternity Care in Odisha

Increase in the percentage of institutional deliveries

While health is primarily a State responsibility, National efforts in recent years to improve maternal and new born health in India have influenced the utilisation of maternity services in Odisha considerably. As part of the National Rural Health Mission's (NRHM) Reproductive and Child Health Programme (RCH-II), the Government of India launched the Janani Suraksha Yojana (JSY), a conditional cash transfer scheme in 2005 with an aim of improving access and utilisation of maternal and child health services by poorer families and reducing the incidence of maternal and infant mortality in the state. The JSY scheme links cash incentives for mothers and ASHA workers (i.e. Accredited Social Health Activists) with delivery and post-delivery care, as well as providing cost reimbursement for transport to and from health facilities. **The number of institutional deliveries have increased dramatically in Odisha in a relatively short period of time** from an estimated 14% in 1993 ***to an estimated 80% in 2011*** (Figure 2).There was a steady increase in the percentage of institutional deliveries between 1992 and 2005. However, following the introduction of JSY, a dramatic increase was seen between 2007-08 and 2009-10, with **institutional deliveries increasing from 44% to 76% in just one year.** The impact of this heightened demand on both Quality of care to the patient and Maternal and new born outcomes is yet to be determined.

Figure 2: Percentage of institutional deliveries in the state of Odisha

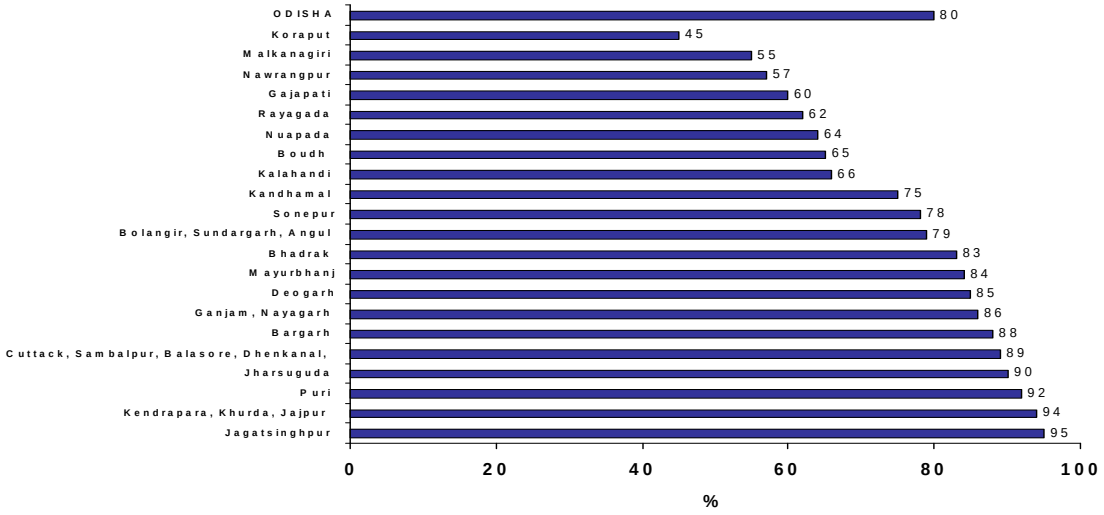


NOTE: Other data reported for the same time periods have been excluded from Figure … for simplicity. HMIS data is considered to be less reliable than that included in the chart, and reported the percentage of institutional delivery to be 30 in 2005-2006, 52 in 2007-2008, 54 in 2009-2010, and 57 in 2010-2011 = 57 (i.e. lower than that reported in the chart for 2005-6, 2009-10 and 2010-11, but higher in 2007-8). CES data for 2005-06 (46%) was also excluded and was higher than NFHS3 data (39%)

Eighty per cent of deliveries in Odisha are at present conducted in institutions which include both public and private institutions (Figure 3).However, the percentage of institutional delivery **varies greatly from district to district ranging from 45% in Koraput to 95% in Jagatsinghpur**. However , in districts such as Koraput, Malkangiri and Nawarangpur, home deliveries remain as high as 55%, 46% and 43% respectively.

Figure 3: **Percentage of institutional deliveries by district (public and private)**

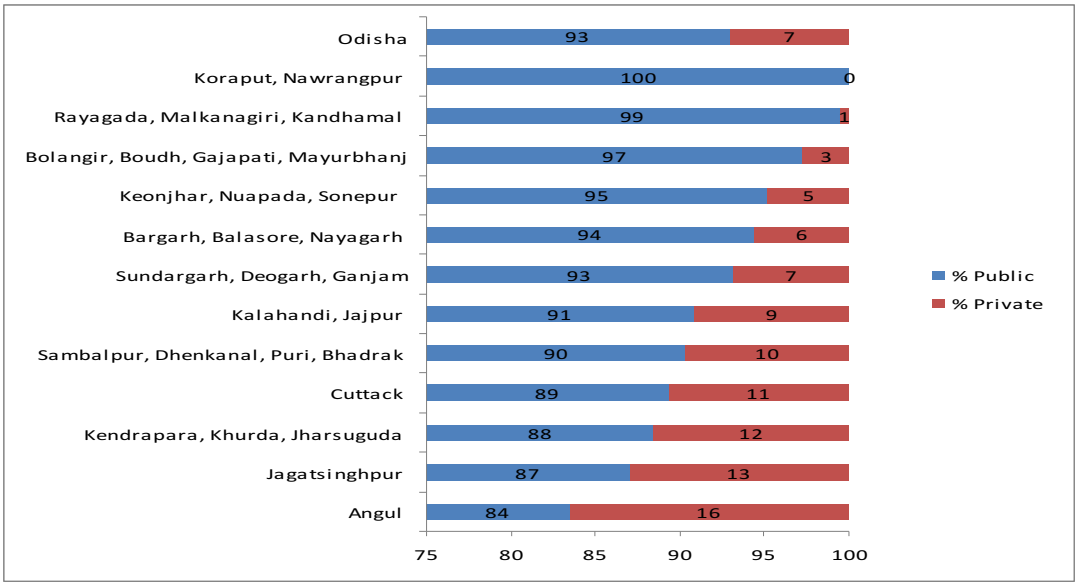
Source: Concurrent Monitoring – 2011



Split up of deliveries conducted in the Public / Private institutions

Figure 4 below shows the percentage contribution of public and private institutions to institutional deliveries. The findings show high utilisation of the public sector, with ***93% of deliveries in Odisha occurring in the public sector***. The extent to which the private sector plays a role in institutional deliveries varies by district.

Figure 4: Percentage of institutional deliveries by public & private split, by district (rural sample)

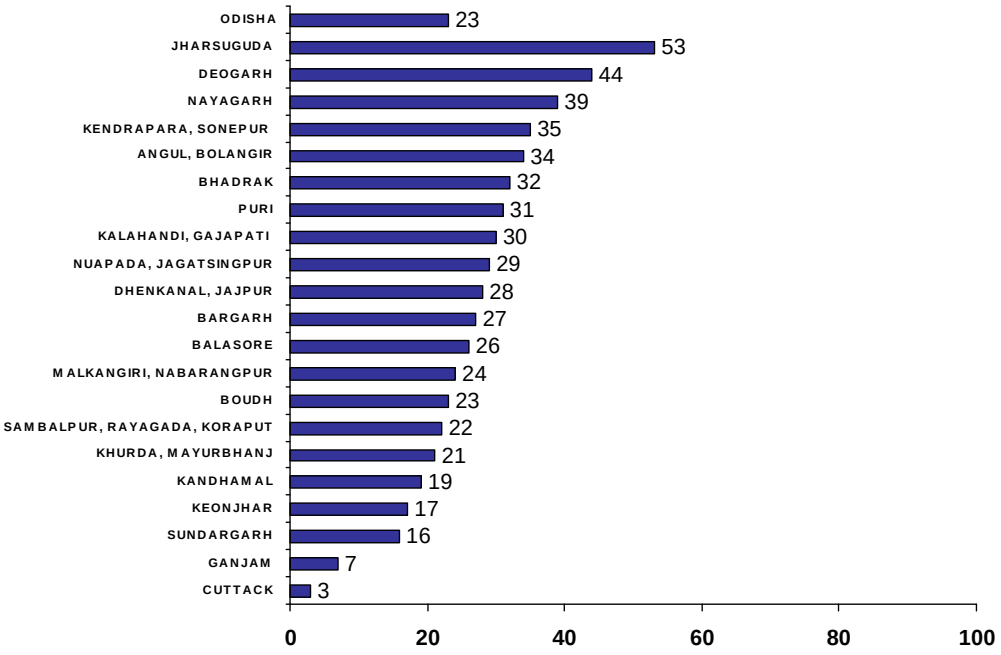


Source: Concurrent Monitoring - 2011

Deliveries in District Headquarter Hospitals

Nearly a quarter (23%) of all institutional deliveries within the state are now carried out in the 30 District headquarter hospitals (DHH) included in this assessment (Figure 6). However, there is considerable variation between districts in regards to the percentage of institutional deliveries within the district that are conducted in the DHH, ranging from just 3% in Cuttack to 53% in Jharsuguda.

Figure 6: % of institutional delivery in district conducted in district hospitals



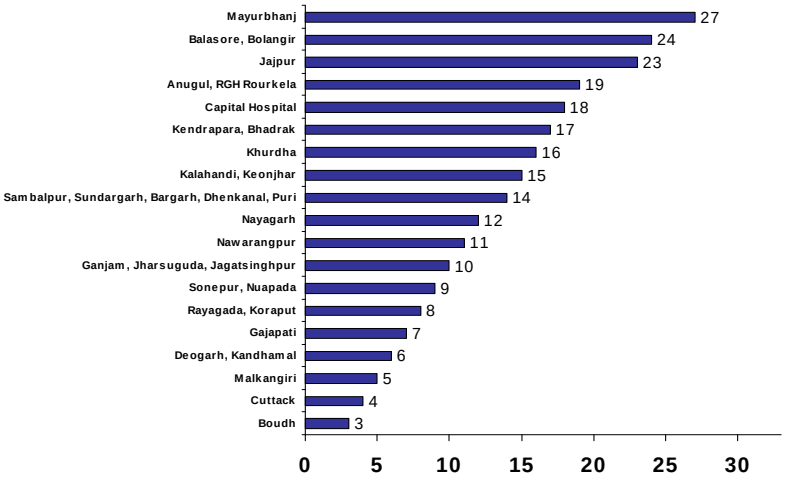
SourceHMIS April-November– 2011

There is also a **substantial variation in the average number of deliveries per day between the district hospitals** (Figure 7), with Mayurbhanj having nine times as many deliveries on average per day (27) as Boudh (3). Further , Mayurbhanj, Balasore, Bolangir and Jajpur and Anugul also had an even higher number of deliveries per day than Capital Hospital , Bhubneshwar and Rourkela General Hospitals.

Figure 7: **Average number of deliveries per day**

Source: Facility records, June 2011

Most District Hospitals across Odisha have shown a sharp increase in numbers of deliveries conducted over the last 5 – 6 years, especially with the addition of the JSY, JSSK programmes and the role of the ASHAs. Further, the DHH has moved from a predominantly Out-Patient Service Role as in the past to an increasingly In-Patient Role at



present due to the increased number of deliveries being conducted in the DHHs. The staffing pattern and facilities have not kept up with this change and have not been able to cope in most DHHs with the increased load of inpatients .This sharp increase in numbers of patients without corresponding increase in staff and Infrastructure has presumably had an adverse affect and has resulted in Quality of Care provided to the individual patients often being compromised. ; the immediate focus at present seems to be necessarily to cope with the Quantity of Care demanded, with inadequate time to look at Quality issues.

Another consequence of this phenomenal increase in the number of deliveries has resulted in the other services of the hospital, such as General Medicine, General Surgery etc and also other Gynecological cases not related to pregnancy such as Fibroids , DUB etc to get eased off the priority radar, as attention, resources and pressure are centered on Mother and Child Care.

The 13 old District Headquarters generally seem to be better off in terms of hospital facilities and quality than the daughter-districts that were carved out from them. This could be in terms of Staffing, Infrastructure, Access, Utilization etc. In fact, some of the hospitals at the new District HQ's, while playing the role of DHH's, are still classified as SDH's or otherwise(Listing of Mother and Daughter DHHs)

While certain generic patterns emerge, it is clear that **each Hospital is really unique** – with different external and internal environments that cannot be generalized. Quality Improvement Plans will therefore have to be individualized to the hospital level, while taking on board the generic or systemic recommendations.

1.7 Report Structure

QoC is an integral part of health service delivery and a likely determinant of the utilisation of health services and health outcomes, however, there is little consensus among policy-makers as to how to integrate Quality Assurance (QA) processes into current health systems. This report aims to fill this gap by undertaking a detailed QoC assessment and proposing quality improvements in a range of indicators across 30 District Headquarter Hospitals across Odisha, focusing primarily on maternity services.

The first section of this report presented the background with regards to assessing quality of care and provided a brief synopsis of institutional delivery in Odisha. In the next section , the methods that were developed and employed to collect and analyse the data for this assessment will be described, as well as mentioning some of the limitations of our approach. In Sections 3, 4 and 5, we present a detailed account of the findings across all QoC components categorised as Inputs, Processes and Outcomes. In Chapter 6, we present the QoC composite scores and the overall ranking of the DHHs according to these scores to enable intra-hospital comparison. Chapter 7 presents a detailed action plan based on the findings from this assessment.

2. METHODOLOGY

2.1 Identification of QoC components

The first stage was to identify key QoC components. All aspects of the service delivery system, directly and indirectly associated with maternal health care, were considered for inclusion. Ten key components were identified and classified as Inputs, Processes or Outputs (See Table 1).

Table 1: QoC components by Inputs, Processes and Outputs

INPUTS	PROCESSES	OUTPUTS
1. Availability of human resources	7. Good practice	10. Availability of clinical services
2. Infrastructure	8. Record keeping	
3. Equipment	9. Referral	
4. Drugs & consumables		
5. Non-clinical services		
6. Registers		

2.2 Identification of QoC indicators

Following the identification of the ten key components, the next stage was to identify indicators that adequately reflect the range of quality of care attributes within these components. In selecting indicators guidelines from the Government of India were reviewed, as well as international studies including a site assessment tool by JHPIEGO, Institute of Child health and IRCCS. The indicators were developed and adapted by members of TMSTto be consistent with local systems. Inputs were also gathered through sharing ideas with the State Maternal and Child Health (MCH) team, TMST internal team and UNFPA. A detailed list of all such indicators are enumerated below (Table 2).

Table 2: QoC indicators by component

Component	Indicator
INPUTS	
Availability of human resources	Number of Staff Nurses : Number of deliveries
	Number of Obstetricians / Gynaecologists (O/G) : Number of deliveries
	At least one Anaesthetist / LSAS available 24X7
Infrastructure	Functional building and external works
	Operating theatre in good repair & functional
	Maternity ward in good repair & functional

Component	Indicator
	Labour room in good repair & functional
Non-clinical services	Functional biomedical waste management systems in place
	Adequate general hospital services (Diet, laundry, Security etc.)
Equipment	Essential equipment available and functional in labour room / newborn corner
	Essential instruments available and functional for pelvic examination
	Essential equipment available and functional in Maternity ward (including beds)
	Essential equipment required for MVA available and functional
	Maternity ward has a nurses station
Drugs & consumables	Facility has essential drugs available
	Facility has essential consumables available
	Good infection prevention and control
Registers and records	Key information included in registers
PROCESSES	
Record keeping	Key information completed in the registers
	Have a process to review maternal deaths
Referrals	Ever refer c/s cases out
Good practice	Infection prevention
	Cleanliness
	Respect for client's privacy
	Mother monitored during first stage of labour
	Appropriate use of oxytocic drugs
	Prophylactic antibiotics given to women with premature rupture of membranes
	Magnesium sulphate given to women with Eclampsia
	Nevirapine available for HIV+ mothers in labour
	Breastfeeding and skin-to-skin encouraged
	Infants labelled soon after birth
	Episiotomy not performed routinely
	Vacuum aspiration / medical abortion used for abortion care
	Appropriate wiping, wrapping and bathing of newborns
	Position for labour (Upright encouraged over supine)
	Hb and urine albumin testing performed for admissions to labour room
	JSY payments made before discharge

Component	Indicator
	Mothers encouraged to be mobile during labour
	Enema and perineal shaving not performed
	Companions allowed during delivery
	Mothers given social support, health education and advice after delivery
OUTPUTS	
Availability of services	Provide all 9 CEmONC signal functions 24hours a day 7 days a week
	% of deliveries that are c/s
	Laboratory services available 24 hours
	Provide comprehensive abortion services
	Provide comprehensive family planning services
	Have an ultrasound service
	Number of beds in maternity ward: Number of deliveries
	Number of beds in labour room: Number of deliveries

2.3 Weightage of QoC components

Technical consultants within TMST agreed on the overall weighting for each of the ten key components, based on the perceived relative importance of that component to QoC, with the sum of the scores for all ten components being 100 (Table 3). The scoring process was a weighted summation of the total score under each major indicator (TS-1……..TS-10). The overall QoC score for the facility was equal to (W1 x TS-1) + (W2 x TS-2) + (W3 x TS-3) + …… (W10 x TS-10). Whereas, W1 = Weighted score for availability of HR (0.10), TS1 = Total score (out of 100) for HR, W2= Weighted score for availability of infrastructure (0.30), TS2 = Total score (out of 100) for availability of infrastructure, W3= Weighted score for essential equipment (0.10), TS3 = Total score (out of 100) for essential equipment etc

Table 3: Weighted score of QoC components

INPUTS	Points (TS)	Weightage(W)
Availability of Human Resources	30 (TS_1)	0.30 (W_1)
Infrastructure	10 (TS_2)	0.10 (W_2)
Equipment	10 (TS_3)	0.10 (W_3)
Drugs & Consumables	10 (TS_4)	0.10 (W_4)
Non-clinical Services	5 (TS_5)	0.05 (W_5)
Registers	1 (TS_6)	0.01 (W_6)
PROCESS		
Good Practice	15 (TS_7)	0.15 (W_7)
Record Keeping	3 (TS_8)	0.03 (W_8)
Referral	1 (TS_9)	0.01 (W_9)
OUTPUT		
Availability of Clinical Services	15 (TS_10)	0.15 (W_10)
TOTAL	100	1.00

2.4 Weightage of QoC indicators

Similarly, within each of the ten components, the indicators were each assigned a score based on their relative importance, with the sum of the scores of each component being 100. The total score out of 100 was then converted to a weighted score according to the value of the respective weightings in Table 4. See Annex 1fora further breakdown of scoring for the QoC indicators, where applicable.

Table 4: Breakdown of scores by indicator

INDICATOR	INDICATOR	
INPUTS		
Availability of human resources*	Number of Staff Nurses : Number of deliveries	34
	Number of Obstetricians / Gynaecologists (O/G) : Number of deliveries	33
	Number of anaesthetist / LSAS available	33
	Total points	100
Infrastructure	Functional building and external works	25
	Operating theatre in good repair & functional	25
	Maternity ward in good repair & functional	25
	Labour room in good repair & functional	25
	Total points	100
Non-clinical services	Functional biomedical waste management systems in place	70
	Adequate general hospital services (Diet, laundry, Security etc.)	30
	Total points	100
Equipment	Essential equipment available and functional in labour room / newborn corner	60
	Essential instruments available and functional for pelvic examination	15
	Essential equipment available and functional in Maternity ward (including beds)	10
	Essential equipment required for MVA available and functional	10
	Maternity ward has a nurses station	5
	Total points	100
Drugs & consumables	Facility has essential drugs available	50
	Facility has essential consumables available	25
	Good infection prevention and control	25
	Total points	100
Registers and records	Key information included in registers	100
	Total points	100
PROCESS		
Record keeping	Key information completed in the registers	80
	Have a process to review maternal deaths	20

INDICATOR	INDICATOR	
	Total points	100
Referrals	Ever refer c/s cases out	100
	Total points	100
Good practice	Infection prevention	6
	Cleanliness	6
	Respect for client's privacy	6
	Mother monitored during first stage of labour	6
	Appropriate use of oxytocic drugs	6
	Prophylactic antibiotics given to women with premature rupture of membranes	6
	Magnesium sulphate given to women with eclampsia/pre-eclampsia	6
	Nevirapine available for HIV+ mothers in labour	6
	Breastfeeding and skin-to-skin encouraged	6
	Infants labelled soon after birth	6
	Episiotomy not performed routinely	5
	Vacuum aspiration / medical abortion used for abortion care	5
	Appropriate wiping, wrapping and bathing of newborns	5
	Position for labour (Priority given to comfort)	4
	Hb and urine albumin testing performed for admissions to labour room	4
	JSY payments made before discharge	4
	Mothers encouraged to be mobile during labour	4
	Enema and perineal shaving not performed	3
	Companions allowed during delivery	3
	Mothers given social support, health education and advice after delivery	3
	Total points	100
OUTPUTS		
Availability of services	Provide all 9 CEmONC signal functions 24hours a day 7 days a week	45
	% of deliveries that are c/s	15
	Laboratory services available 24 hours	10
	Provide comprehensive abortion services	10
	Provide comprehensive family planning services	5
	Have an ultrasound service	5
	Number of beds in maternity ward: Number of deliveries	5
	Number of beds in labour room: Number of deliveries	5
	Total points	100

* **Scoring for human resources:** The scoring the human resource indicators took into consideration the total number of staff (considering the minimum requirement for a Level 3 hospital according to guidelines by the State) as well as the ratio of the number of deliveries to the number of staff.

2.5 Tool Design

The tool was designed to ensure that it could be used to assess the current situation and to monitor subsequent improvements. It will also provide key information for incentive and accreditation schemes. The QoC indicators were used as the basis to decide what questions to include within the quality assessment tool. The indicators chosen were computed from quantitative questions, as this was necessary for scoring and ranking purposes. However,the tool also provided the study team with the opportunity to look at specific areas in more detail and facilitate comparison between health facilities, hence some qualitative questions were included in the assessment tool and the research team were encouraged to note all relevant observations, case studies and to collect photographic evidence.

2.6 Piloting the tool

Following consensus from the initial stage of tool selection and development it was piloted in four DHHs: Angul, Nayagarh, Dhenkanal and Khurda. The piloting process enabled the team to modify the tools based on the experiences from the research team and suggestions from local hospital staff. This ensured that the indicators and tool were compatible to the local health context before they were finalized for the main study.

2.7 Study Location

The study was conducted in all 30 District Headquarter Hospitals (DHHs) across Odisha, as well as Capital Hospital Bhubaneswar and Rourkela General Hospital.

2.8 Data Collection

Prior to embarking on data collection, a government approved letter was circulated from Mission Director NRHM & Joint Director, Technical (FW) to all the Chief District Medical Officers (CDMOs) ,and other concerned district officers requesting their support in facilitating the assessment process.

The data collection process was started by the core teams in May 2011 and completed in December 2011. Data-gathering at each site lasted for 2-3 days.There were three technical teams in total from the TMST. Each core team consisted of three individuals including one medical doctor, one data specialist and a public health trained graduate/ trained nurse. **I**nformation was collected through:

- Observations
- Interviewing staff
- Reviewing facility registers

2.9 Database design, data entry, cleaning and analysis

The database is designed and developed in MS-Access. Variable constraints were implemented to minimise data entry error. The data was transferred from MS-Access to SPSS for cleaning and analysis purposes.

2.10 Limitations of methodology:

I. The study only gathered information at one point in time and it is feasible that the time visited is not the best reflection of the facility generally. However, the team feel that the results provide an accurate picture of the current situation and can be used as a marker for measuring future improvements against.

II. The study did not collect information from clients about their experiences of or perspective on the service received.

III. Some indicators are solely reliant on self-reporting by staff, for example, findings on good practice indicators. Hence, findings may be subject to some bias and they may or may not accurately reflect day to day practice.

IV. The study did not include any provision for assessing staff competency. Time constraints meant it was not possible to verify if what was said was actually beingdone in practice. However, even when observationsare feasible, staff may change their behaviour due to being observed. Similarly, prior knowledge of a facility assessment can influence behaviour, for example, cleanliness of premises.

V. The study did not cover postpartum centre which would have enabled a more in-depth evaluation of family planning services.

VI. The study did not cover all public hospitals in Odisha, lower level facilities or the private sector.

FINDINGS

3. INPUTS

3.1 Human Resources

Services provided by frontline staff are one of the key determinants of Quality of Care provided at the facility. However their unequal spread across the DHHs in the state may affect the provision of services and affect how well services are executed especially at peripheral and remote hospitals . Further, staff are likely to be overburdened where there are shortages again adversely affecting the services being provided.

Sanctioned and Filled Posts

The number of **sanctioned staff posts tends to reflect historical factors and haven't commensurately changed to reflect the huge increase in institutional deliveries.** Hospitals that have been more recently classified as DHHs have not seen the number of sanctioned staff increase to reflect this change in status. All DHHs in old districts had two sanctioned O&G specialist posts, whereas all DHHs in new districts had three sanctioned O&G specialist, highlighting the difference between old and new. Furthermore, sanctioned posts in new districts were less likely to be filled. There is a **huge gap between need and sanctioned and between sanctioned and posted.**

Obstetricians and Gynaecologists (O&G)

There are an **inadequate number and uneven distribution of O&G specialists .**A DHH should ideally have three to four O&G specialists. Hence the total number of O&G specialists required for improving the quality of care should be around 90 to 120 across the 30 district hospitals, however, there is a shortfall in the number of O&G specialists sanctioned (73) and in post (73) at the time of the assessment.

In addition , those in post are not evenly distributed across the DHHs. Five DHHs had only one O&G specialist (Boudh, Rayagada, Jharsuguda, Nawarangpur, Angul) and over half (57%) of the DHHs had less than the recommended three O&G specialists (see Figure 8 below). Balasore had the highest number, with five O&G specialists. O&G Specialists are hard to recruit and it is often challenging to recruit ones to fill sanctioned posts in remote or difficult areas, hence distributing them evenly is not always easy.

Figure 8: Number of Obstetricians and Anaesthetists at DHHs

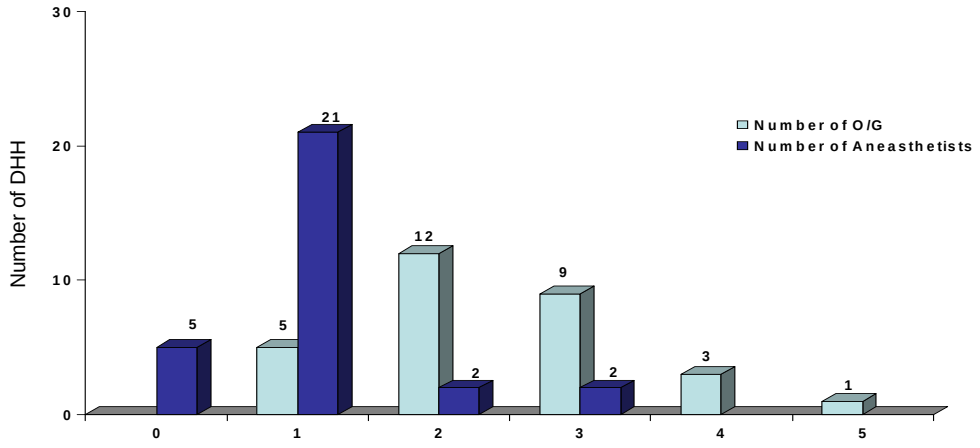
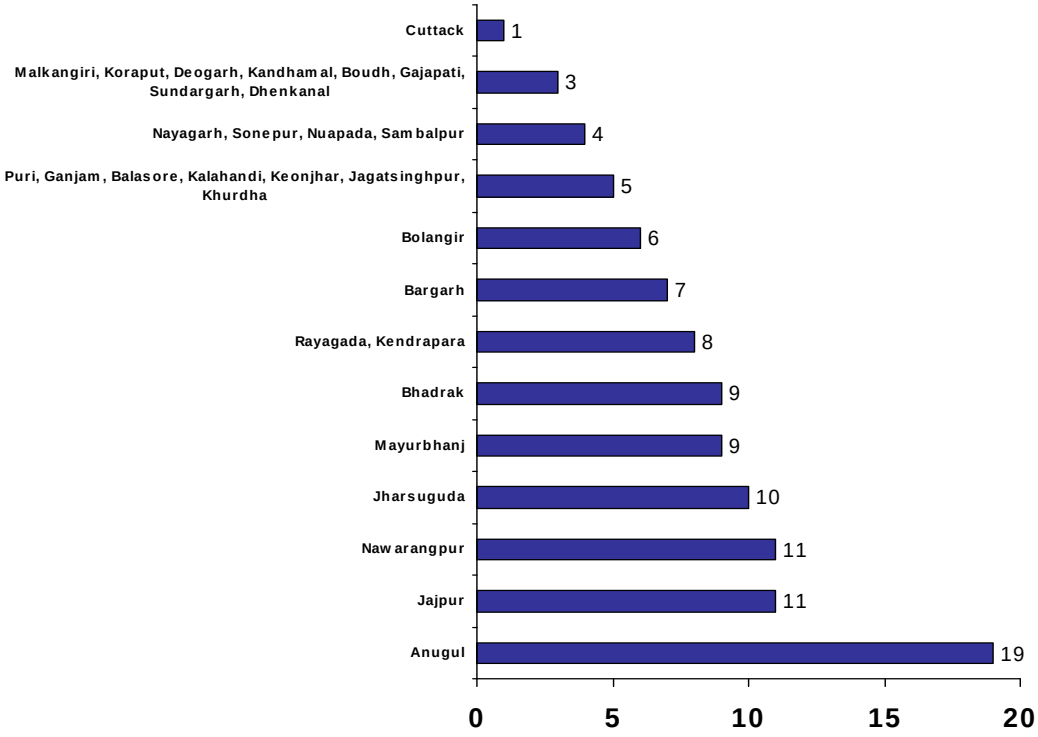


Figure 7 in the introduction highlighted the difference in the number of deliveries per day in individual DHHs. Figure 9 illustrates the substantial variation in the number of deliveries per day per O&G specialist, highlighting that the distribution of O&G specialists between the DHHs in Odisha does not reflect the current caseload. Cuttack had the lowest ratio of deliveries to O&Gs, with just one delivery per day per O&G, compared to 19 deliveries per day per O&G in Angul. Cuttack is close to the capital and hence on the one hand it is an easy place to recruit O&G staff, but equally clients are more likely to travel to other facilities due to the close proximity.

Figure 9: Average number of deliveries per day per O/G at DHHs

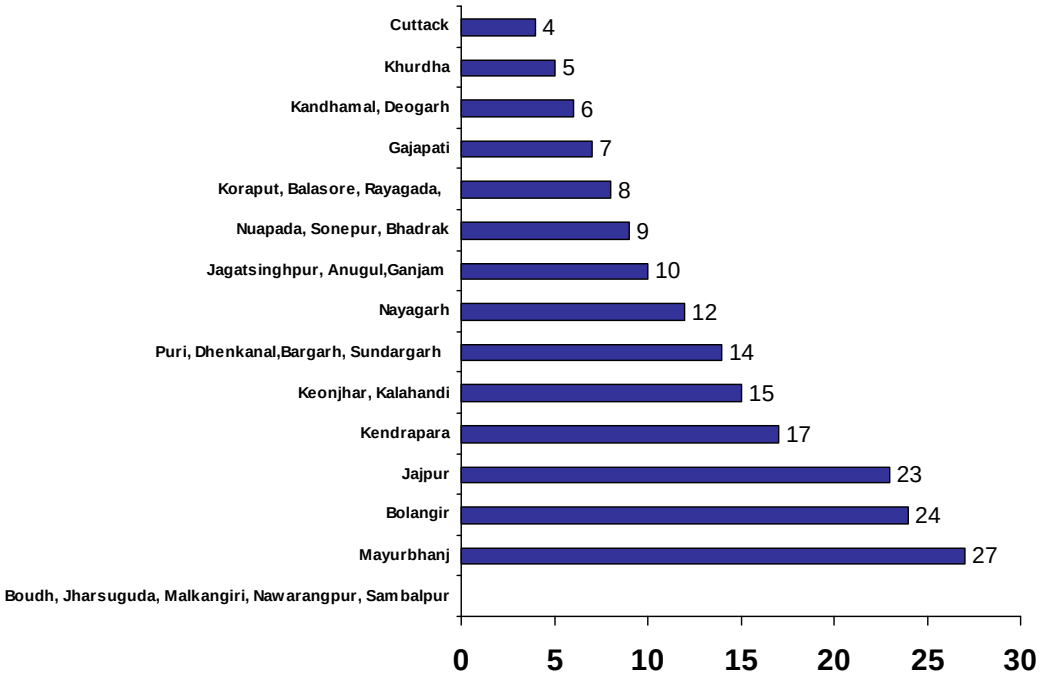


Anaesthetists

There are an acute shortage of **anaesthetists** including number of medical officers trained in Life Saving Anaesthetic Skills (LSAS) who have been trained to administer anaesthesia for caesarean cases.. Ideally, a DHH would have at least two anaesthetists who are able to support CEmONC services, ensuring that there is at least one available 24 hours a day , seven days a week, but in total there were just 31 anaesthetists. These were also unevenly distributed: five DHHs had no anaesthetist or doctor trained in LSAS, and just 13% had at least two anaesthetists (see Figure 8). The shortage of anaesthetists is a big problem, especially in regards to caesarean sections.

As with O&G there is a substantial variation between DHHs that have anaesthetists in regards to the number of deliveries per day per anaesthetist, ranging from just four deliveries per day in Cuttack to 27 in Mayurbhanj (see Figure 10 below).

Figure 10: Average number of deliveries per day per anaesthetist at DHHs



Nurses

A critical factor in the provision of Quality of care in the maternity units the number of nurses physically on duty on any one shift. The total number of nurses assigned to the maternity units of DHHs to provide round the clock cover ranged from 3 in Boudh, Bargarh and Kurdha to 13 in Jajpur. In practice, this means that in many DHHs, there were only one or two nurses on duty at any one given time, and they were expected to monitor women in the labour room and the maternity ward (which includes post-operative mothers), conduct deliveries, provide medications etc. To staff both the labour room and the maternity ward overall three shifts, a DHH would need an absolute minimum of ten nurses. Once again like O&G specialists and anaesthetists , the distribution of Nurses across DHHs is very uneven. Just 13% of the DHHs had at least ten nurses, and 70% had less than eight. Bargarh, Boudh, and Kurdha had just three nurses allocated to the maternity care unit , highlighting the **acute shortage of nurses to attend to the labour room and maternity ward and cover all shifts**.

Figure 11: Number of nurses in maternity section of the district hospital

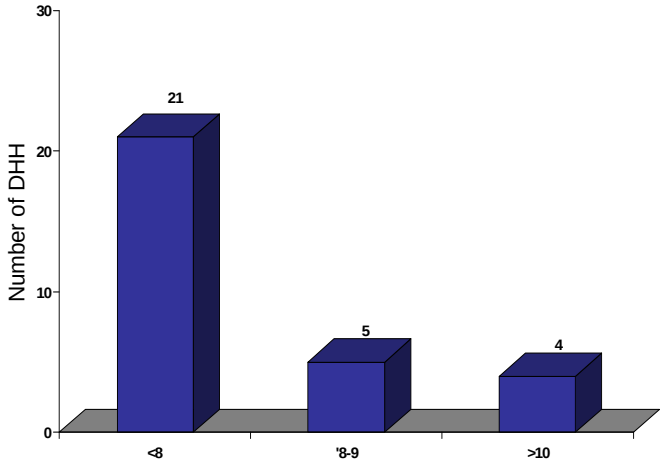
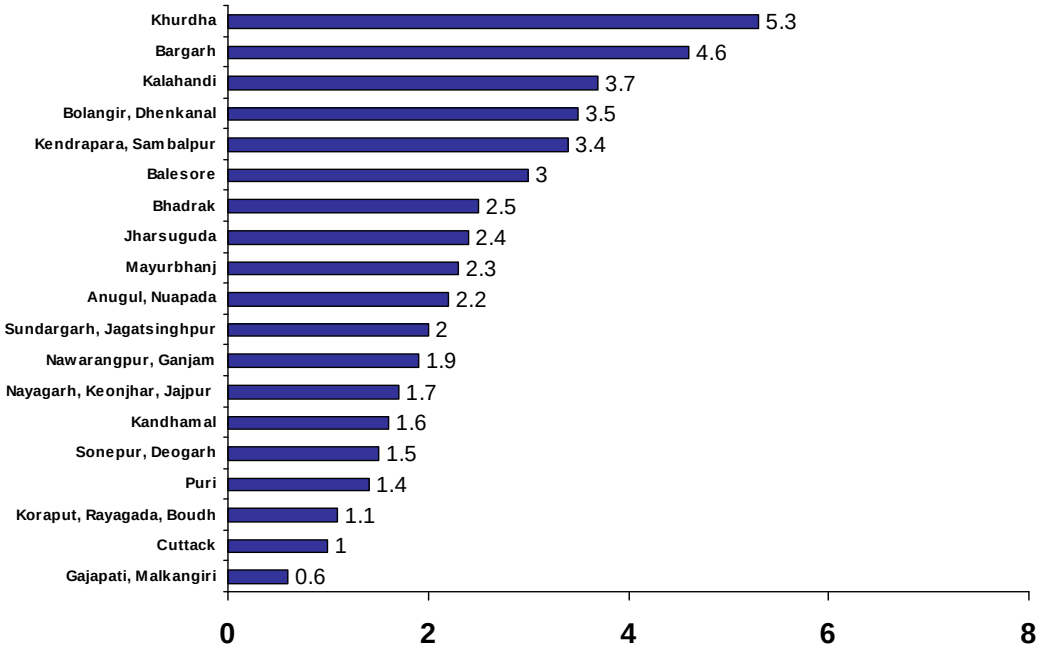


Figure 11: Number of deliveries per nurse varies widely between DHHs, ranging from five deliveries per day per nurse in Kurdha to less than one in Gajapati and Malkangiri.

Figure 12: Average number of deliveries per day per nurse in maternity section of the district hospitals

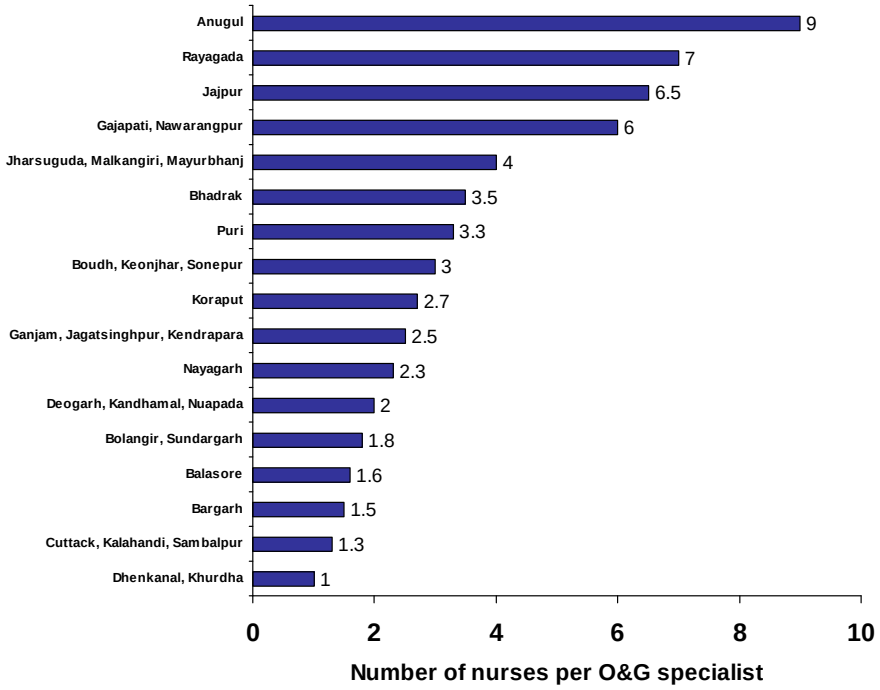


Ratio of Nurses : O&G specialists

The sanctioned staffing pattern in some DHHs, in regards to the ratio of doctors to nurses , is often a reflection of the old outpatient-centric services. However, such ratios are likely to be inappropriate for hospitals with busy in-patient services. In regards to the ratio of

doctors to nurses in post, Figure 13 illustrates the number of nurses in post in the maternity section per O&G Specialist in DHHs. The results show huge variation between the DHHs with Dhenkanal and Kurdha having one nurse for every one O&G specialist, compared to Anugul having nine times as many nurses as O&G specialists. With this acute shortage of nurses, even doctor-led services such as caesarean section suffer, as it is not uncommon for just one nurse to be available to assist.

Figure 13: Number of nurses in post in the maternity section per O&G Specialist in DHHs



Role of nurses in DHH

Officially only O&G specialists can conduct deliveries in DHHs and officially it is reported that only they conduct deliveries. However, in reality it is widely known that most of the maternal care in hospitals, including deliveries ,are actually provided by nurse-midwives.

Improvement of Quality of Care provided in the maternity unit of any healthcare facility especially in the context of DHHs may be achieved to a great extent by enhancing the role of Nurses in Maternal Care by increasing the sanctioned number of nurses to required levels based on the delivery load and the bed strength in the wards. In addition , where Staff Nurses are unavailable, ANMs could be taken and trained for the role, so that there are enough trained hands to ensure quality of care. Further, Nurse-midwives maybe empowered to officially do what they are trained to do i.e. normal deliveries.

Hospital Managers

There has been improved management through the introduction of hospital managers.

Their introduction has been one of many positive policies of recent years. The team observed that effective hospital managers have added a professionalism and energy that was lacking and this has enabled better utilisation of available resources and opportunities.

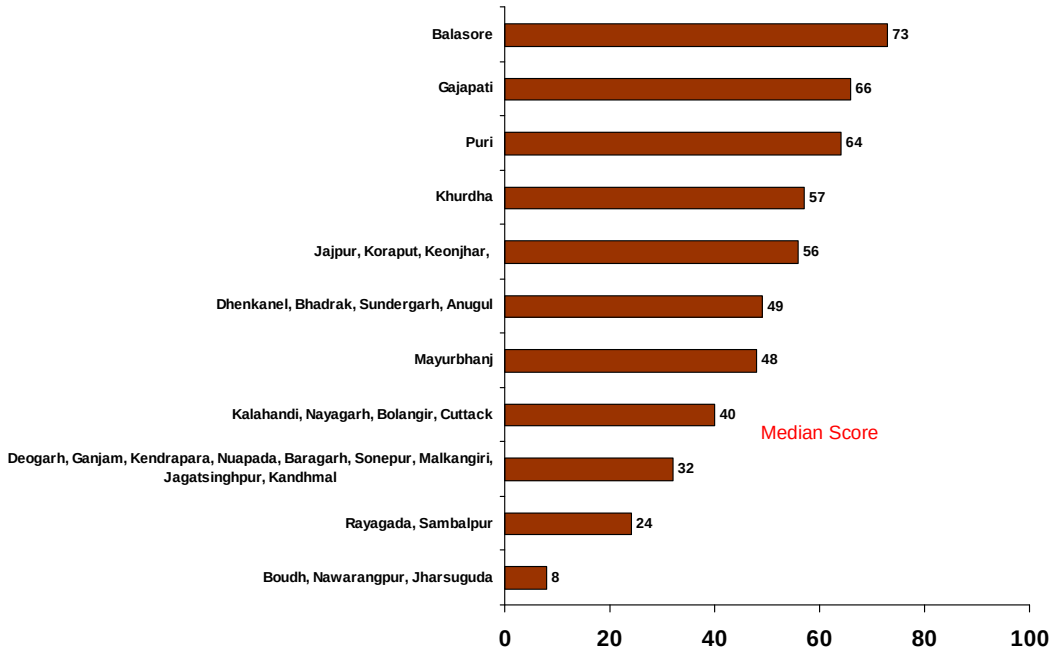
Staff Availability

The team also observed that **staff availability on campus still reflects the past**, when the DHHs were largely outpatient focused, and has not changed to reflect the huge increase in in-patients in recent years.

- ***Scoring and Ranking***

Staffing had a **low median score of 40, highlighting the acute shortage of nurses and anaesthetists** and shortage and uneven distribution of O&G specialists within the state (Figure 14). There was also a very wide variation between facilities in the scores for the availability of staff, with scores ranging from 8 to 73, highlighting the uneven distribution of the staff in post.

Figure 14: Facility scores for the availability of human resources



3.2 Infrastructure

There is considerable variation in infrastructure between district hospitals. The infrastructure available for overall hospital care, and more specifically for maternal and newborn care services, varied in terms of appropriateness of design, maintenance of buildings, space etc. The study team felt that there was scope for improvement in all of these areas. As seen in the introduction, the caseload varies a lot between facilities and the adequacy of the infrastructure also varied in regards to being able to cope with the current

case-load. The study also highlighted a big variation in the infrastructure between the 'mother and daughter' districts.

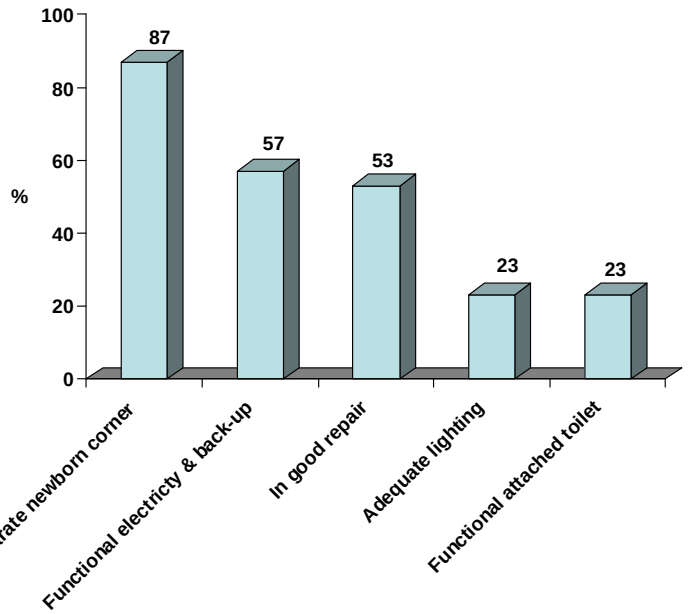
The maternity care infrastructure was often poorly designed, even where buildings had been built or modified in recent years. The inadequacy of the new construction due to poor planning and design has wasted valuable resources. It is clear that those employed in the design and planning have an inadequate understanding of health facility architecture. Designing hospital buildings is different from civil construction, and a better understanding of the needs of a hospital environment and more creativity should be applied so as to optimise the use of the resources available for quality patient care. Some districts were attracting private and corporate funding for building infrastructure and this opportunity could be utilised more widely.

The **Labour Room** in almost all facilities visited, is conceptualized and functioning **only as a Delivery Suite**. There are only 3 – 5 delivery tables in most Labour Rooms, with average no. of deliveries per day of around 15-20. Mothers coming in early labour are usually kept in the wards until they reach second stage, and are then shifted to the Labour Room. Again, soon after delivery they are shifted to the wards to make space for the next mother. However, the wards are not staffed or equipped to be able to monitor the mother and the fetus in the critical periods before and after delivery. This means fetal distress and other obstetric emergencies can be missed with potential for avoidable prenatal morbidity and mortality.

Section 5.1 shows the results for the number of deliveries per delivery table.

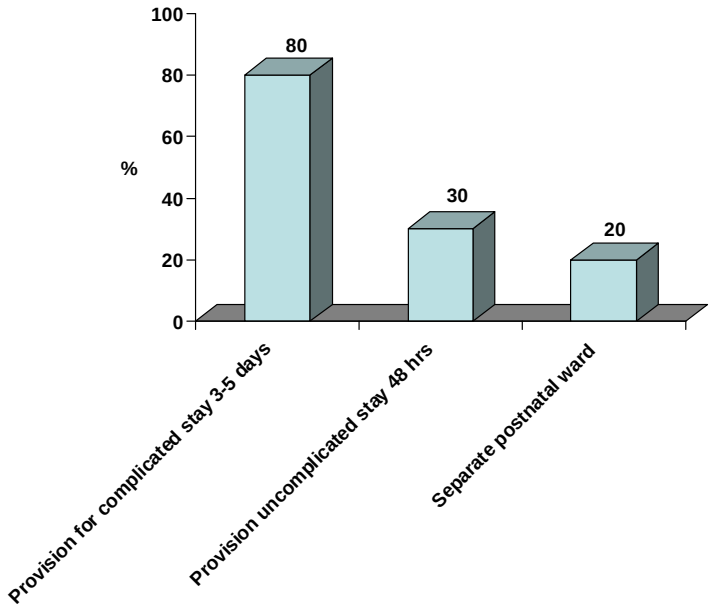
The infrastructure in the labour rooms was inadequate in many of the DHHs (Figure 15). Less than a quarter (23%) had adequate lighting or an attached functional toilet. Just over half were in good repair (53%) or had functional electricity with adequate back-up. Thirteen per cent of DHH had no separate newborn corner within the labour room.

Figure 15 Percentage of district hospitals with adequate labour room infrastructure



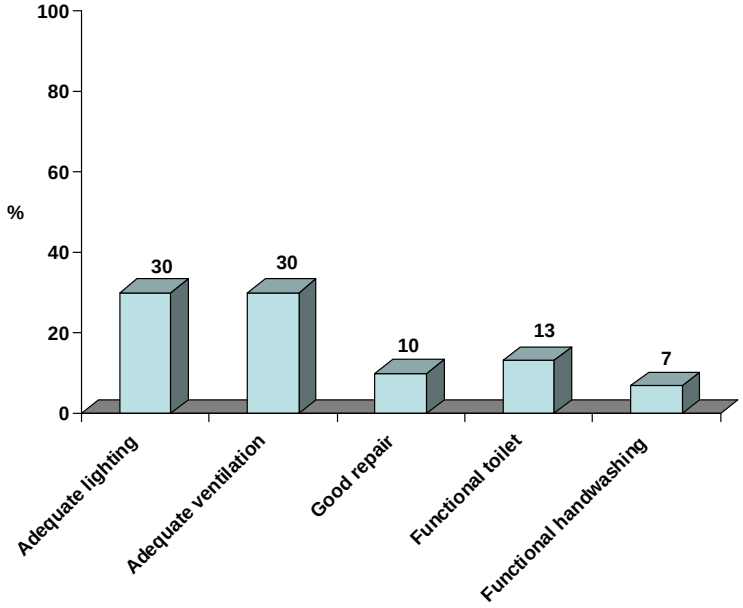
The study team found that **in most district hospitals, the maternity wards were over crowded.** Data on the number of deliveries per bed in the maternity ward are included in Section 5.1.If there are no known complications, **mothers and infants are usually discharged within 24 hours**, let alone waiting until 48 hours. Some facilities reported that they usually just kept mothers for one to two hours after delivery. **This is largely due to overcrowding with an acute shortage of beds and space, and many patients on the floor or in corridors even with this rapid turnaround***:* less than one third (30%) had provision for patients to stay 48 hours after delivery (Figure 16). Although in some instances the decision to discharge is down to the patients and / or their relatives. It is often only those who have had a caesarean section who stay in hospital, but even then one-fifth of the DHHs did not have provision for complicated patients to stay the recommended three to five days. In Section 4.1 (Good Practice) the findings showed that providers largely report that they routinely give magnesium sulphate for patients with pre-eclampsia / eclampsia. However, if a patient is given magnesium sulphate they need to be monitored carefully but with the current set-up most district hospitals had no space to monitor them. The maternity wards are further stretched as 80% of DHHs have no separate postnatal ward, and there are a lack of waiting homes for those who have far to travel.

Figure 16: Provision for complicated and uncomplicated delivery clients to remain in DHHs, and whether a postnatal ward is available



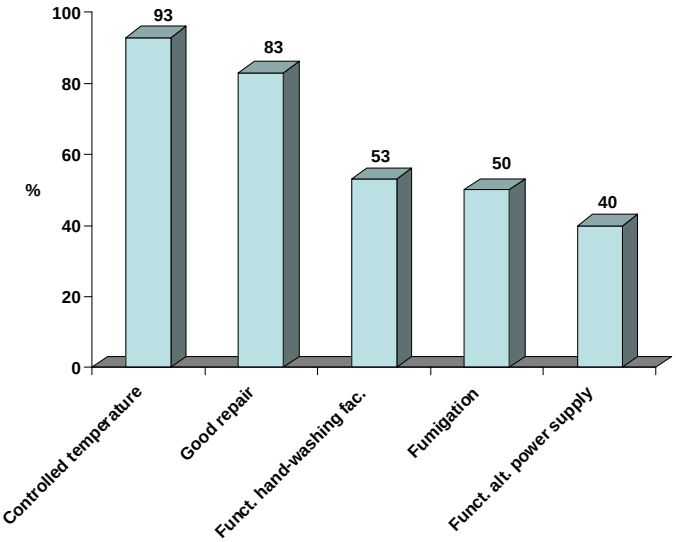
Within maternity wards the infrastructure was often very basic: only 30% had adequate lighting, 30% had adequate ventilation, just 10% were in good repair, 13% had a functional toilet and 7%had a functional hand washing facility.

Figure 17: Percentage of DHHs with adequate maternity ward infrastructure



Most operating theatres in DHHs had controlled temperature (93%) and were in good repair (83%). However, only half had a functional hand-washing facility (53%) or fumigation (50%). Just 40% had a functional alternate power supply, and the study team noticed that even when electricity supplies were backed-up with generators, there were problems in regards to the delay between the electricity going and the back-up kicking-in. Furthermore, when the inverter was on the staff were limited in regards to what could be powered, leaving many essential machines not functioning. The study team also observed major problems with the maintenance, such as rain water flooding into the operating theatre etc.

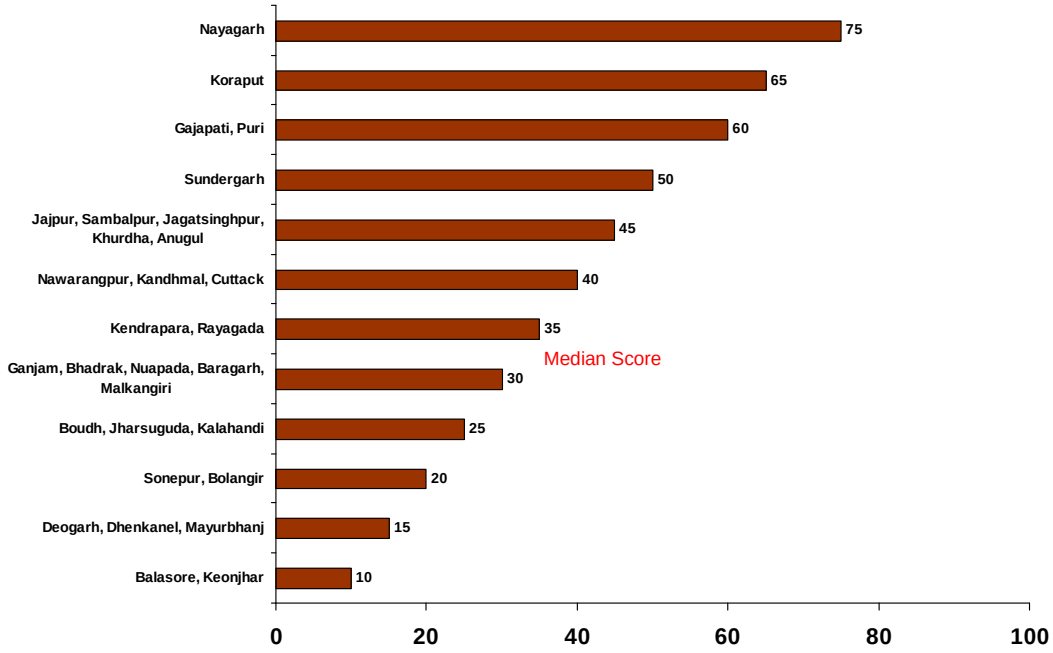
Figure 18: Percentage of DHHs with adequate operating theatre infrastructure



- Scoring and Ranking

Infrastructure had the lowest median score at 32.5, highlighting the need for improvement in most DHHs. There was **a lot of variability** in the infrastructure score between the DHHs, with Keonjhar and Balasore having the lowest score, and Nayagarh scoring highest. The factors that pulled down the infrastructure included the poor infrastructure in the maternity wards (e.g. hand-washing facilities and accessible functional toilets, adequate lighting and ventilation), the lack of provision for uncomplicated patients to stay 48 hours and lack of a postnatal ward. Furthermore, in the labour room the lack of functional hand-washing facilities and accessible functional toilets, and lack of temperature control in the newborn area also brought scores down. Most DHHs had temperature controlled operating theatres that were also in good repair bringing the scores up.

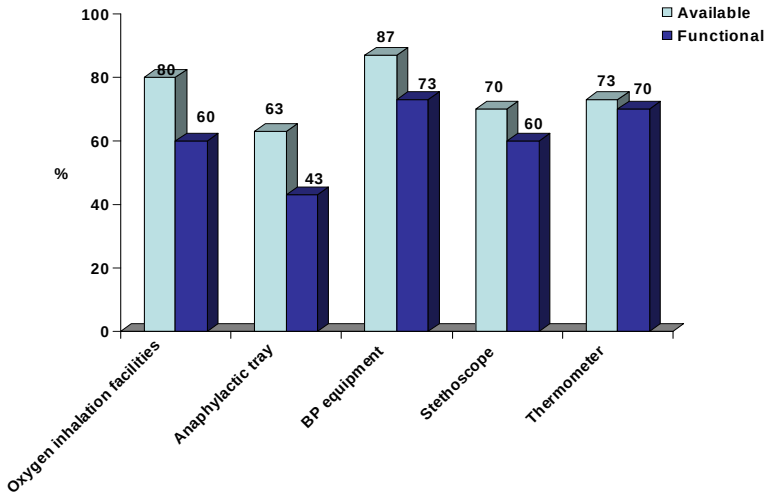
Figure 19 Facility scores for infrastructure



3.3 Equipment

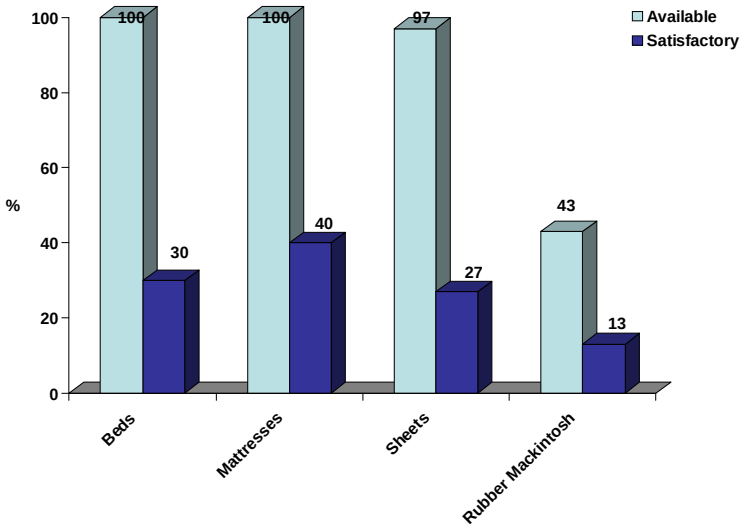
Equipment was grossly insufficient. The most positive findings for equipment were in the maternity ward with most facilities having the essential equipment for monitoring women: 73% had functional BP equipment, 70% had a thermometer and 60% had a stethoscope (Figure 20). However, as seen in the best practice section, despite the availability of equipment, staff rarely had time to utilise it in monitoring the women. This lack of utilisation may be the reason it is present and functional. However, less than half of the DHHs had a functional anaphylactic tray.

Figure 20: Percentage of DHHs with available and functional equipment in maternity ward



There was an **acute problem with beds**. Less than one third of DHHs had satisfactory number and condition of beds, just 40% had satisfactory mattresses, and 27% had satisfactory sheets on the beds (Figure 21). The key shortage was seen for rubber mackintoshes with just 13% of DHH having satisfactory mackintoshes.

Figure 21: Percentage of DHHs with satisfactory beds, mattresses, sheets and rubber mackintoshes

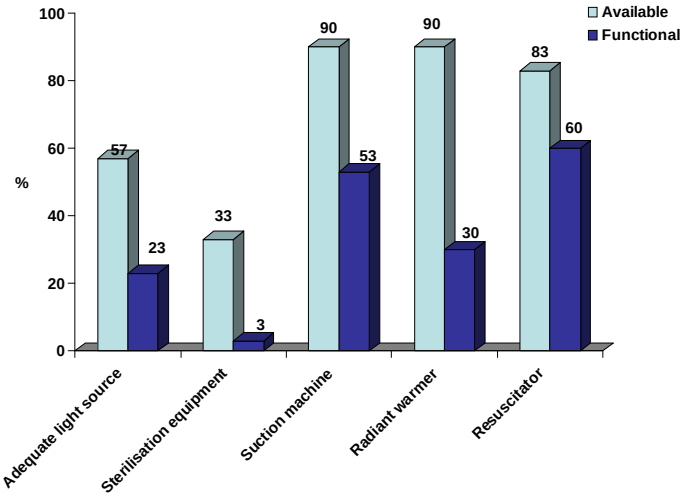


Essential instruments for conducting deliveries were frequently unavailable. *T*he most widely-used instruments in the labour rooms were often insufficient in number and quality considering the current workload. Furthermore, the lack of a focused light frequently hampered staff efforts, with just 23% of DHH having functional adequate lighting in the labour room.

There were acute shortages of equipment for newborn care, such as suction apparatus, masks for babies, functioning radiant warmers, cord clamps. **When equipment was available it was frequently not operational** (Figure 22), as one provider stated, "the scissors don't cut, the forceps don't hold, the cord clamps don't clamp".

When equipment was available and functional there was the **additional problem of equipment being unsterile and not ready to be used**, as one provider stated "we need to ensure the equipment we have is adequately sterilised, and we need more equipment to use while it is being sterilised". Just one third of DHH had sterilisation equipment in the labour room, and this was only satisfactory in one DHH. Infection prevention in Section 4.1 looks at sterilisation in more detail.

Figure 22: Percentage of DHHs with available and functional equipment in labour room

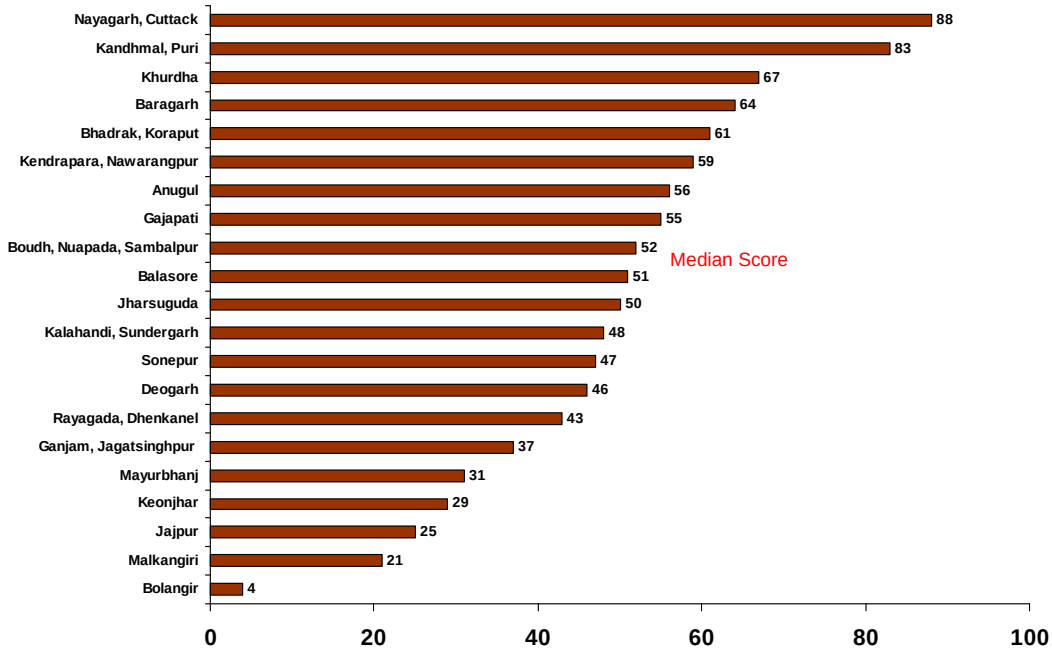


It is the staff whose reputation is at risk as a result of the lack of functional equipment and therefore the study team observed that in many instances they had had to resort to bringing in their own equipment, such as their own personal suction machine. One provider stated that **"the current procurement system doesn't enable hospitals to procure the right things at the right time."**

There is an urgent need to improve the procurement system, for example an informed person at a facility who understands the current need may request twenty cord clamps from the administrator. The administrator in turn doesn't understand what the importance of the equipment requested and may just arbitrarily decide to provide 5 instead of 20. Often innovations such as the one seen alongside are resorted too when there are no other options .

Scoring and Ranking

Equipment had the greatest variation in the scores between the different DHHs. Four DHHs stand out as having very good equipment scores (Nayagarh and Cuttack with 88, and Kandhamal and Puri with (83), while Bolangir (4), Malkangiri (21) and Jajpur (25) scored low. This highlights the urgent need for more functional equipment at Bolangir. Equipment that brought the scores down included inadequate sterilisation equipment, suction machines, labour tables, maternity ward beds and mackintosh, anaphylactic trays and kidney trays. More positive findings were seen for IV stands, facility for oxygen administration, and blood pressure equipment.



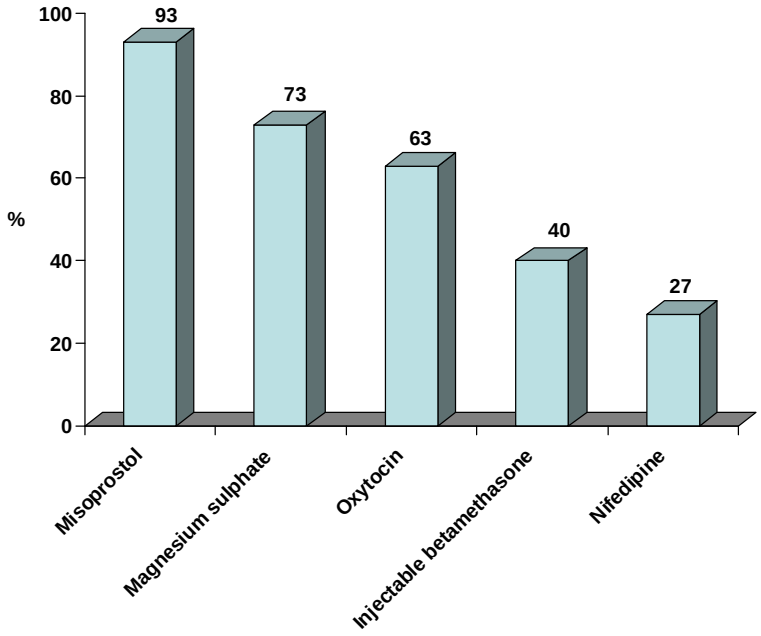
3.4 Drugs and Consumables

The assessment team found in almost all DHHs that the availability of essential drugs like Oxytocin, Antibiotics, Magnesium Sulphate was extremely sporadic with one or more drugs having to be purchased by the patient from the local chemist. There were also questions raised by clinicians on quality of some drugs.

Acute shortage of frequently used consumables like gloves, syringes, baby mucous suckers, cord clamps and IV fluids was reported in some facilities.

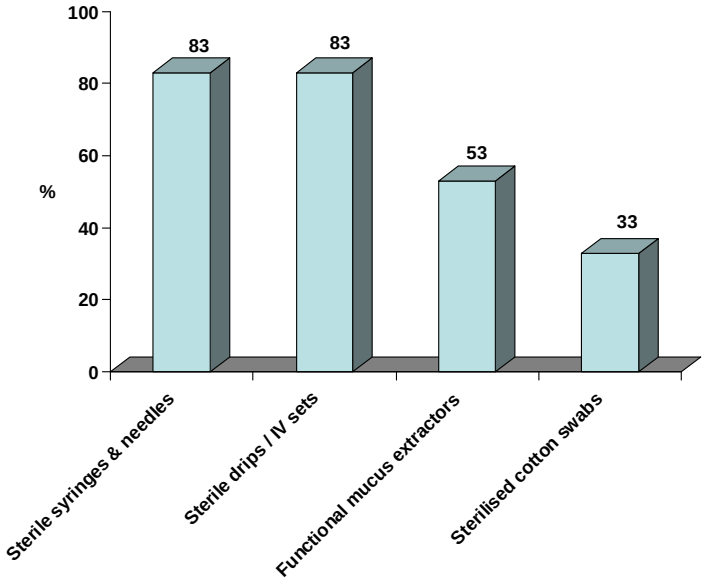
Patients families are seen routinely seen buying supplies for their deliveries against prescriptions. Some of this has been partly addressed recently at the time of writing this report with the operationalization of the JSSK programme and cashless care.

Figure 23: Availability of essential drugs at time of visit



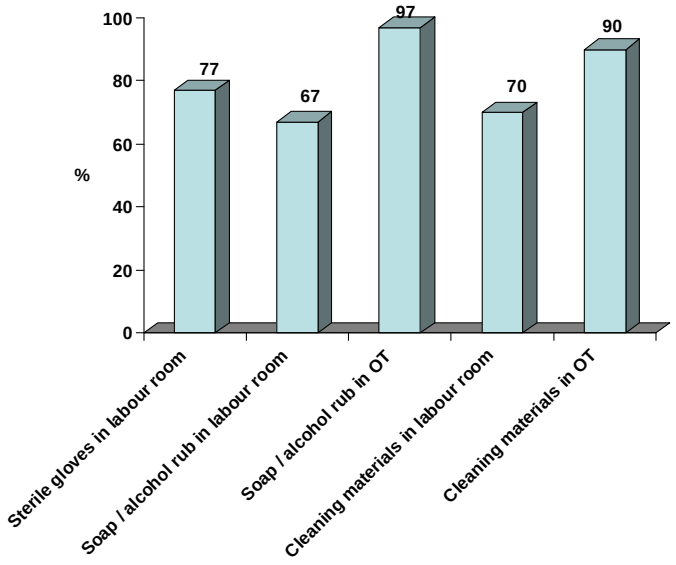
Facilities reported acute shortages of sterilised cotton swabs, in stock in one third of DHH (33%) and mucus extractors were available and functional in just 53% (Figure 24). Sterile syringes, needles and drips / IV sets were in stock in 83% of DHHs.

Figure 24: Availability of essential consumables



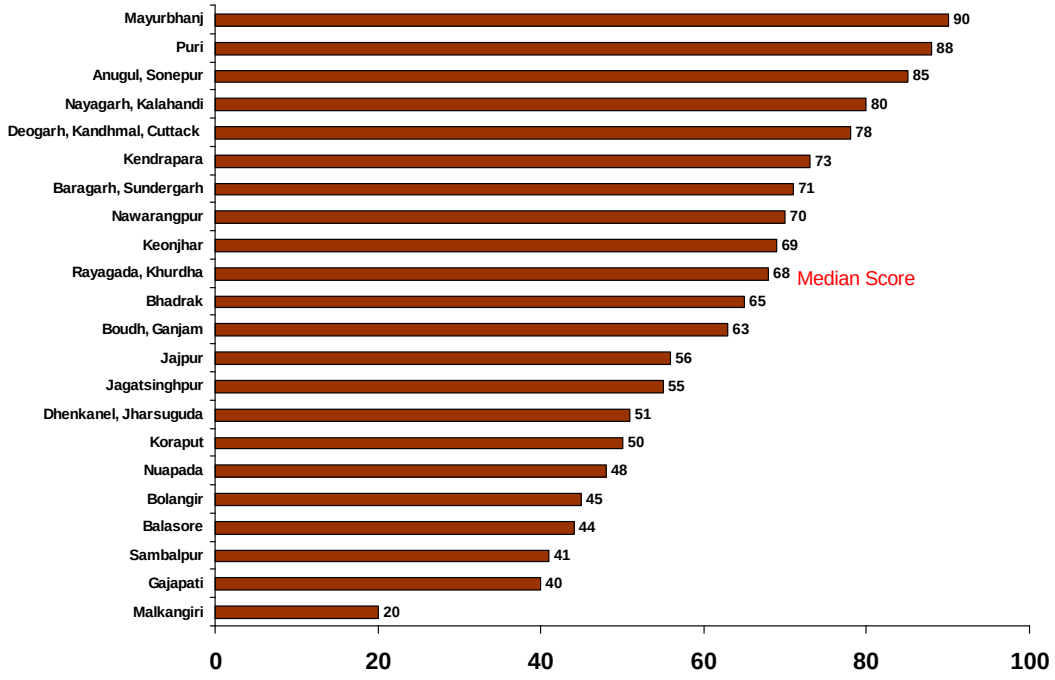
There was adequate infection prevention in most operating theatres, with 97% having soap / alcohol rub at the hand washing facilities and 90% having cleaning materials easily to hand. Standards were noticeably poorer in the labour room with 70% having cleaning materials to hand and 67% alcohol rub. Nearly one quarter of labour rooms (23%) lacked gloves.

Figure 25: Availability of consumables for infection prevention



- **Scoring and Ranking**

The drugs and consumables component had a relatively **high median score of 68, however some DHH scored very low**. Malkangiri scored lowest with 20, a score that was half that of the second lowest, Gajapati (40). This highlights the urgent need for better availability of drugs and consumables at Malkangiri DHH. Mayurbanj and Puri scored highest, with 90 and 88 respectively. The essential drugs selected for the scoring were injectable oxytocin, nifedipine tablets, injectable magnesium sulphate, injectable lignocaine hydrochloride, injectable gentamicin (or similar), misoprostol tablets, IV fluids, injectable methylergometrine, injectable betamethasone, and injectable adrenaline. The drugs that were most commonly out of stock and hence brought the scores down, included nifedipine tablets, injectable betamethasone, and consumables included the lack of sterilised cotton swabs and mucus extractors. There was also a lack of soap and alcohol rub in the hand washing facilities in nearly one third of labour rooms. There was good supply of misoprostol and relatively good supply of sterile needles and sterile drip / IV sets.



3.5 Non-clinical Services

- **Biomedical Waste Management (BWM)**

Most facilities have the necessary biomedical waste management (BWM) provisions in place, however, despite 90% of facilities having staff trained in BWM they are still not always adhering to protocols. Most facilities have a cordoned off area for BWM (93%), however, even then the cordoned off area is not always sufficient or poorly planned, and may be difficult to access. Most facilities have accessible guidelines (83%),but even then they're not necessarily followed / adhered to, for example colour-coded bin are available in all facilities, but only functional in 60% and even then segregation is not always practiced. There is an urgent need for more functional protective gear, as only 43% of facilities had functional protective gear at the time of visit, and even when it is available it is not always functional.

Figure 23: Percentage of district hospitals with biomedical waste management provisions in place

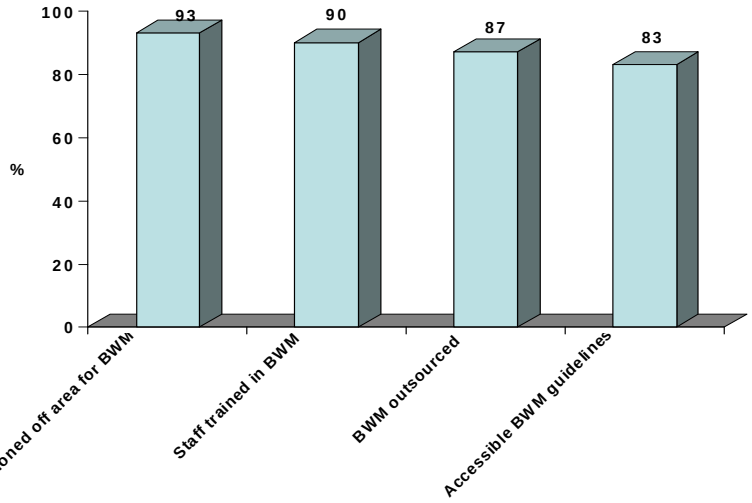
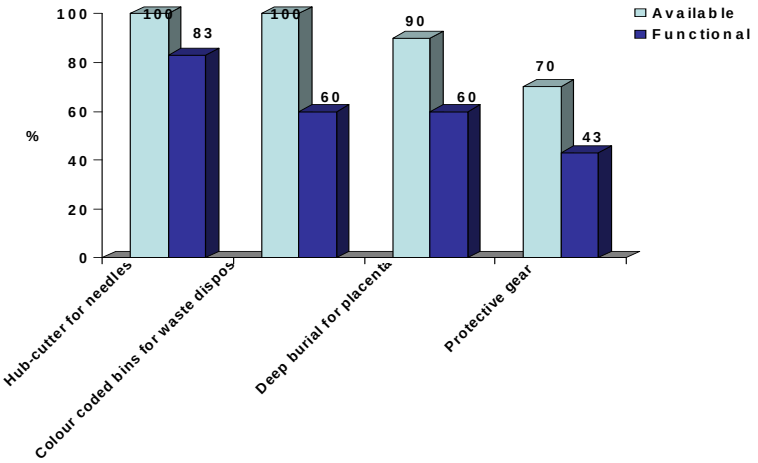


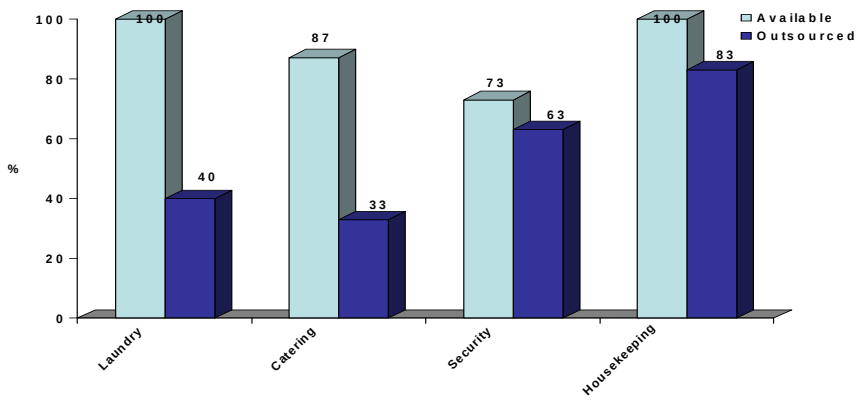
Figure 24: Percentage of district hospitals with biomedical waste management structures available and functional



- ***General Services***

Most facilities had housekeeping (100%), laundry (100%), catering (87%) and security services (73%) in place. However, **many of the services were reported as being inadequate for many of the facilities** While some facilities had developed an in-house capacity other in-house laundry services were reported as being highly inadequate and unable to cope with the load. Some of these were partly, but not fully, outsourced. The catering provision was inadequate, with reports of no cooked food being provided, very primitive cooking areas, and facilities only providing patients with egg and bread. Likewise, the security was often inadequate. However, the study team felt that **the provision of these services had improved considerably in recent years and this change was often contributed to the hospital managers.**

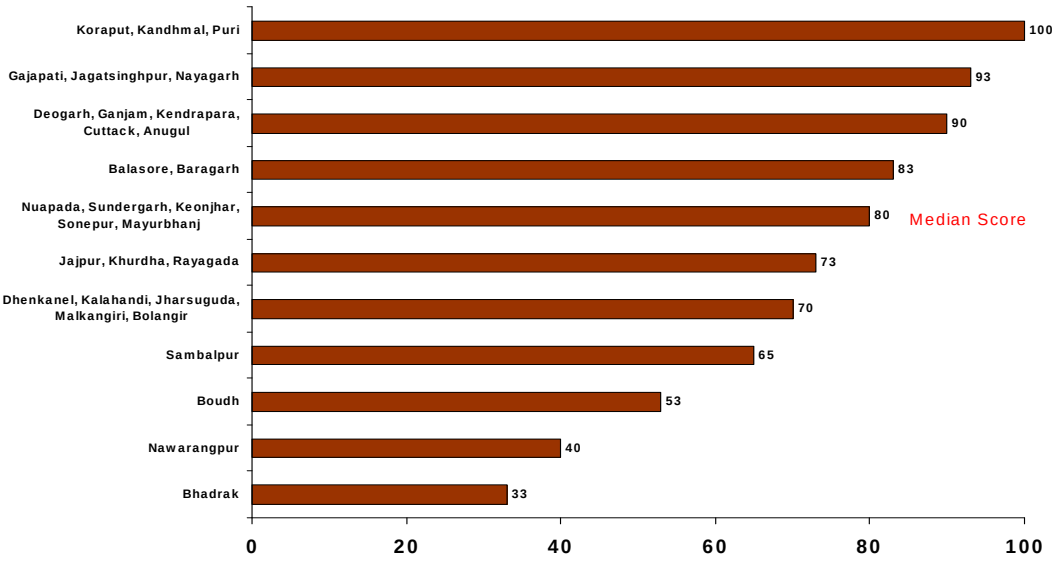
Figure 25: Percentage of district hospitals with general services, and whether they are outsourced



- **Scoring and Ranking**

The non-clinical services component had a high median score of 80, which reflected how many of the facilities had good provisions in place for biomedical waste management. Facilities scored highly for having a cordoned off area for BWM, accessible BWM guidelines, staff receiving training in BWM and provision of housekeeping and laundry services. However, the study team also observed that despite BWM provisions being in place (although not always functional) and staff being trained the BWM protocols were not always being adhered to. Likewise, the housekeeping and laundry services, although in place, were not always adequate. The scores were brought down by the lack of functional protective gear for staff, and lack of functional colour coded bins and functional deep burial bit for placenta, as well as the lack of adequate security for the facility.

Figure 26 Facility scores for the provision of non-clinical services

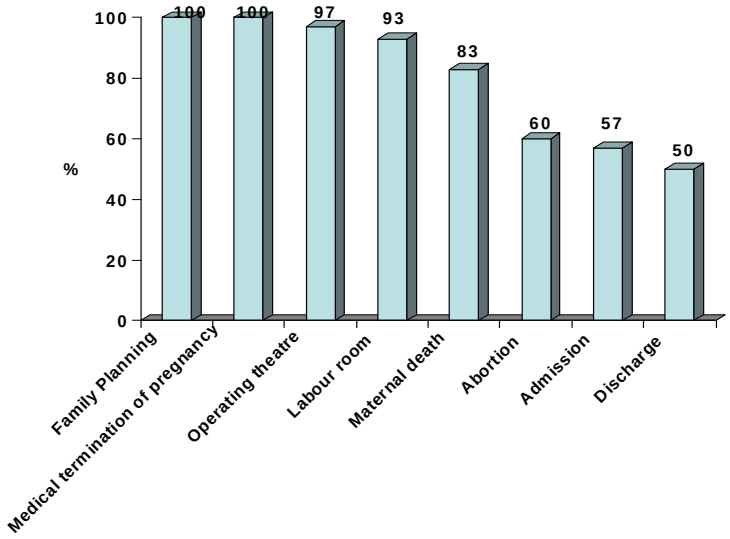


3.6 Registers

There was **wide variation in the availability of effective information management tools**. The availability of registers varied between district hospitals and when they were available there was a lack of uniformity in the registers. The recent registers devised by the Government of Odisha (with support from UNFPA) were very comprehensive and well-designed. However, they were not operational in some of the district hospitals, either due to non-receipt or non-utilisation, and the lack of prescribed standardised format in these facilities resulted in them producing their own templates.

All facilities had a register of some kind, most often with hand-drawn columns in a note-book, which did not cover all the information needed for quality improvement. All district hospitals had a register for family planning and medical termination of pregnancy (MTP), and most also had one for the operating theatre (97%) and labour room (93%). The registers that were most likely to be missing were discharge, admission and abortion. In some instances the admission and discharge details were collected on the same register. Sometimes maternal deaths were recorded on a register with all hospital deaths, rather than on a separate register.

Figure27: Percentage of district hospitals with available registers, by type



- **Scoring and ranking**

The scoring and ranking for the registers component was simply based on the availability of the registers. As seen above, **scores were brought up by the availability of family planning and MTP registers at all facilities, but brought down by the absence of discharge and admission registers**.

4. PROCESSES

4.1. Good Practice

The hospitals were scored on their use of 20 internationally-accepted good practices in maternal care. It must be noted that most of the scoring was based on self-reporting by care-givers describing their normal practice, and not on direct observation.

- **Infection Prevention**

In regards to infection prevention, the scoring was based on a mixture of interviewer observations, such as availability of protective gear, and the responses of interviewees, such as whether providers washed their hands before and after seeing patients. On the whole the interviewee responses often pulled the scoring up more than the actual observations. For example, ***most respondents gave positive responses in regards to routinely washing their hands*** before (83%) and after (80%) seeing patients, although one respondent did state "they don't have time for that". The ***availability of protective gear was inadequate*** in many district hospitals, for example only 53% had gloves, and staffs were using the gloves in just 43%.

Providers at most district hospitals reported using an autoclave / boiling their instruments (97%), however, ***there were no systems to monitor effective sterilisation***, and hence ensure an instrument was adequately sterilized before it was re-used.

Sterility of the instruments used was circumspect because of

i) excessive re-use as instruments
ii) instruments not organised into delivery kits
iii) poor sterilisation equipment and techniques and finally
iv) no system / protocol in place for sterilisation before re-use.

The study team witnessed a lot of inappropriate practice such as the water not being boiled and instruments being put in a shared pot without any knowledge of how long each instrument has been in there.

The most-used instruments for delivery available in Labour rooms are far too insufficient in numbers and quality, for the current load.

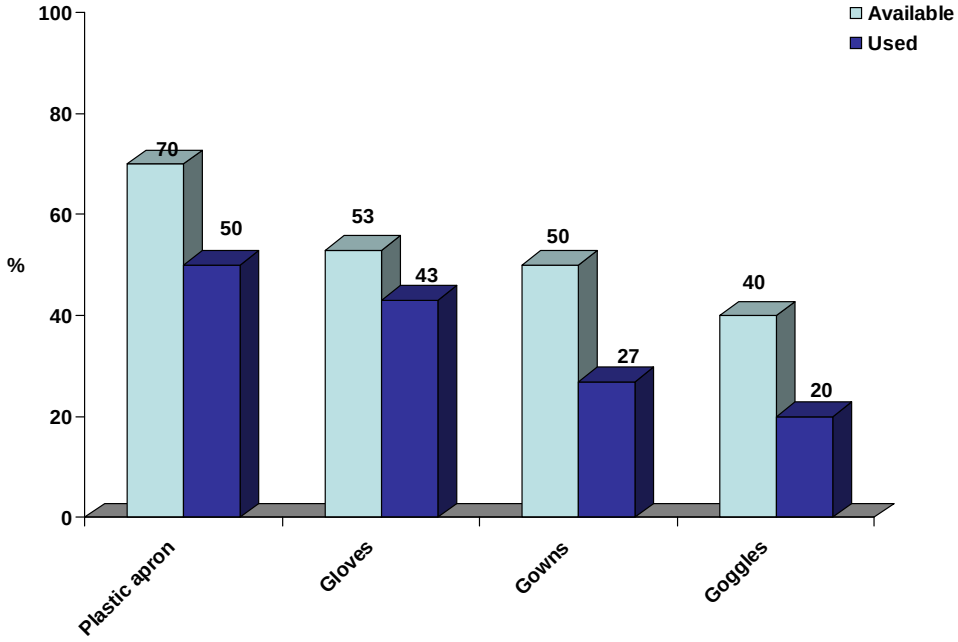
There is also no system to ensure an instrument is adequately sterilized before re-use. Sterility of the instruments used is circumspect because of

- Frequent Re-use as the instruments are too few for the case-load.
- Poor Sterilization Equipment and Techniques
- No system / protocol in place for sterilization before re-use.

Insufficient and non-operational equipment were also found in many Labour Rooms, such as radiant warmers, suction apparatus etc. Adhoc arrangements such as boiling

instruments in a cooking utensil, metal sterilizer placed over a heater etc were also seen.

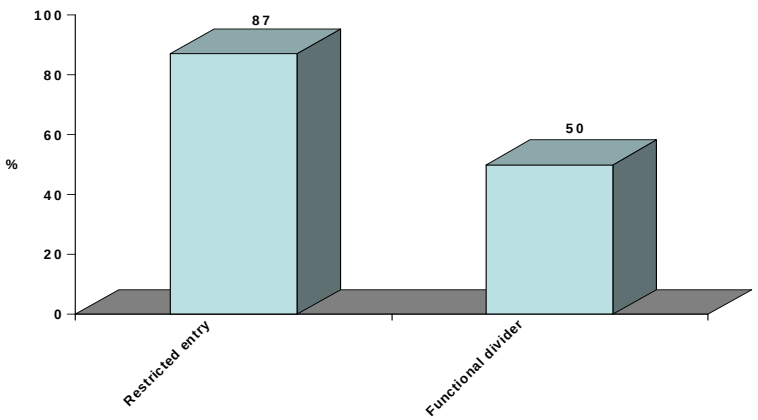
Figure 28: Percentage of district hospitals with protective gear available and used



- **Cleanliness**

In regards to cleanliness the hospitals had **largely cleaned the more obvious parts of the room** such as the floor of the operating theatre (91%) and the labour room floor (76%),**however, many crucial places were not clean, such as the delivery table hinges**(33%) and the delivery table legs (30%).Furthermore, the study team also observed that cleaning materials, including disinfectant were readily available, in the labour room in 72%, and operating theatres in 91%, of district hospitals.

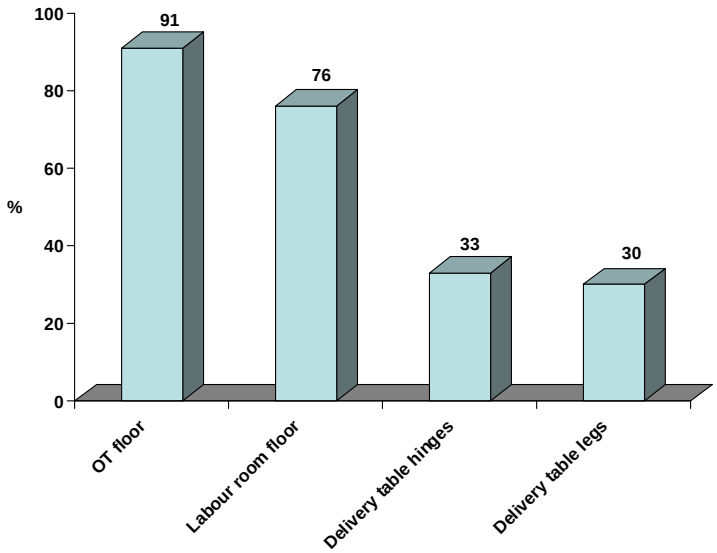
Figure29: Percentage of district hospitals meeting cleanliness standards



- **Privacy**

In regards to privacy the study team observed that **although 87% of district hospitals had restricted entry into the labour room it was rarely enforced,** as there were no security staffs to enforce it. **Only half of district hospitals (50%) had functional dividers in place,** however, in some instances the room was already too small and having **fixed dividers hampered the staff** in their efforts to treat the patients. Better planning is needed in the appropriate installation of dividers, with mobile dividers or curtains often being preferred. It was also noted that there was generally a lack of privacy in regards to examining patients in the overcrowded maternity wards to enable decisions to be made about when to transfer patients to the labour room.

Figure 30: Percentage of district hospitals with restricted entry into labour room and functional dividers in place

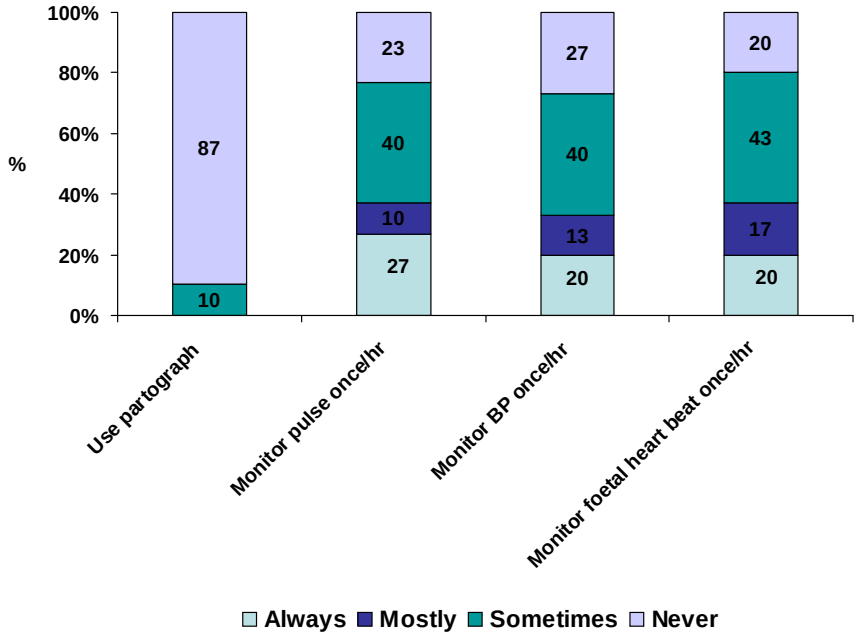


- **During labour**

There were many good practice questions related to labour. **At 87% of facilities the providers admitted to never using the partograph, and this was largely reported to be due to lack of time**, although one facility said they had no supply. However, they did report that they used it during SBA training. Likewise very few reported that they routinely monitored the women's pulse (27%), blood pressure (20%) or foetal heart beat (20%).

Lack of time was the main reason given for not routinely monitoring all women during labour, and hence some said they had to prioritise women in the advanced stages of labour, or those they perceived to be at greater risk. In some instances they reported the Yeshoda or ASHA undertook these tasks. In many cases there is no monitoring of the women in regards to pulse, blood pressure or foetal heart beat, dilated and then transfer them to the labour room when the second stage of labour is reached and the head is visible

Figure31: Percentage of district hospitals monitoring women during labour



In regards to administering drugs(based on provider response rather than observation): 63% sometimes give mothers oxytocic drugs prior to delivery and 83% routinely give these after delivery; prophylactic drugs are routinely given to mothers during caesarean section in 80% of district hospitals and to those with premature rupture of membranes in 83% of cases;**93% reported routinely administering magnesium sulphate to women with pre-eclampsia / eclampsia, although in many cases the patient is told to purchase the drugs and some of those observed in the ward were noted as being out of date**.

With regards to testing admission to the labour room: **Hb testing is routinely performed in 57% of district hospitals and urine albumin testing in half of the district hospitals (50%). Although many hospitals reported that these were only available during working hours**, and outside of working hours patients were told to go elsewhere to get the tests done. In 70% of district hospitals nivirapine is available to HIV mothers during labour.

Two thirds of the district hospitals (67%) routinely allowed a companion to be with mothers during labour and likewise during delivery (67%). In some instances only the ASHA was allowed.

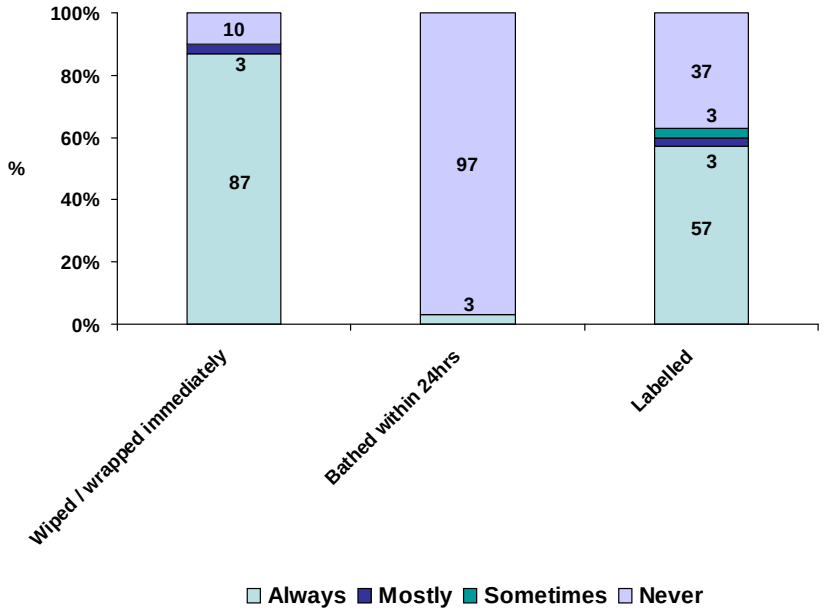
More than three quarters (77%) routinely encouraged women to be mobile during labour, however, most also routinely encouraged women to deliver in the supine / lithotomy position (97%) and **never encourage women to deliver in a squatting / lateral tilt position (93%)**.

Episiotomies are routinely being performed at 13% of district hospitals, enemas at 50% of them, and perineal shaving at 30%, with the later sometime reported as only being done for caesarean section patients.

- **New born**

Ten per cent of district hospitals reported that they never wiped and wrapped the infant immediately following delivery, and 3% reported that they routinely bathed infants within the first 24 hours. The findings regarding labelling infants were more mixed with just over half (57%) reporting that they always labelled infants Angul labelled both mother and baby with matching coloured bands.

Figure 32: Percentage of district hospitals practicing essential newborn care



In over half of district hospitals (57%) mothers are routinely encouraged to do skin to skin contact immediately, and most routinely encourage mothers to exclusively breastfeed (93%) and to initiate breastfeeding within the first hour (93%). Seventy per cent reported routinely giving mothers social support, health education advice for the mother and infant, and 77% routinely provide advice on family planning post-partum.

- **Abortion Method**

The results for the method of abortion used for incomplete / missed abortion and first trimester abortion highlight the common use of dilation and curettage, with 90% using this method. The World Health Organisation (WHO) do not recommend the use of this method, and instead advocate for the use of vacuum aspiration methods, which were used by 63% and 76% of DHHs for incomplete / missed abortion and first trimester abortion respectively, or medical abortion, although no DHH is using the recommended combination of mifepristone and misoprostol, some are using misoprostol alone.

Table 5 Percentage of DHH

	Incomplete / missed abortion		First trimester abortion	
	n	%	N	%
D&C	27	90	19	63
MVA	9	30	7	23
EVA	10	33	16	53
Misoprostol (alone)	1	3	2	7
Mifepristone & Misoprostol	0	0	0	0
Oxytocin	0	0	0	0
	30		30	

- **JSY payments**

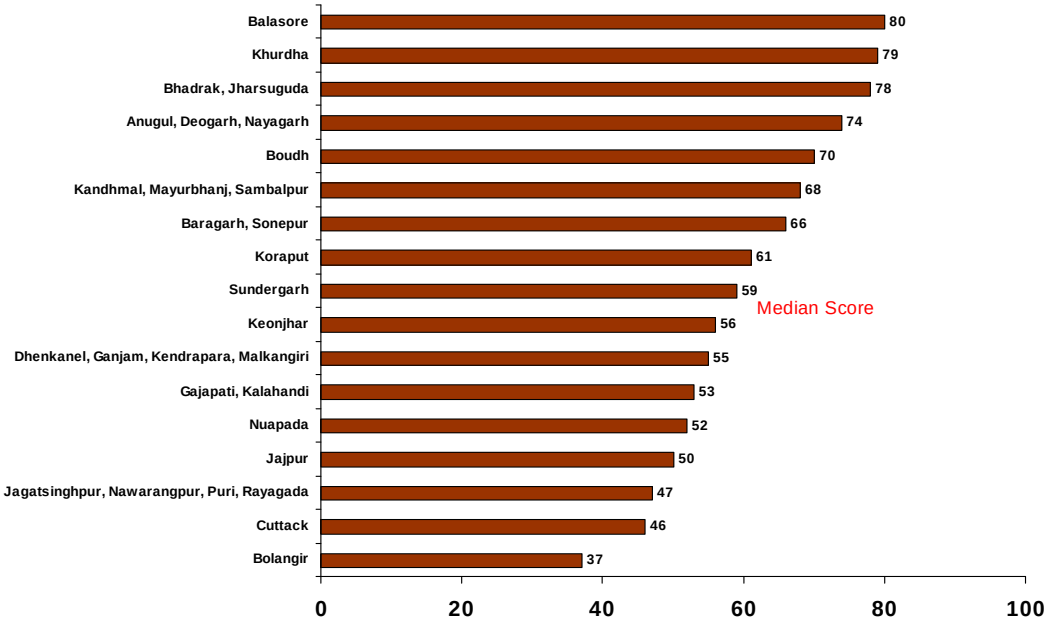
All hospitals reported that they paid JSY payments on time. Although during one visit the team observed a local patient returning later for her payment. And at a different facility they reported that payments were not always made on Sundays.

- **Scoring and ranking**

The good practice component had less variation than most of the other components, with scores ranging from 37 to 80.Bolangir stood out at the bottom of the scoring, with a score much lower than the second lowest. Overall scores for this component were boosted by the high scores for good practice for administering drugs, i.e. magnesium sulphate for eclampsia / pre-eclampsia, Nevirapine for HIV positive mothers, prophylactic drugs to women with premature rupture of membranes and appropriate use of oxytocics (even though patients are often told to procure). Likewise good advice was reportedly given in regards to breastfeeding, and JSY payments were reportedly paid before discharge. The scores were brought down by facilities failing to monitor women and their foetuses during labour (with partographs barely used outside of training),lack of use of MVA for abortion, routinely conducting practices such as

episiotomies, enema and perineal shaving on a routine basis, and routine use of the lithotomy position during labour.

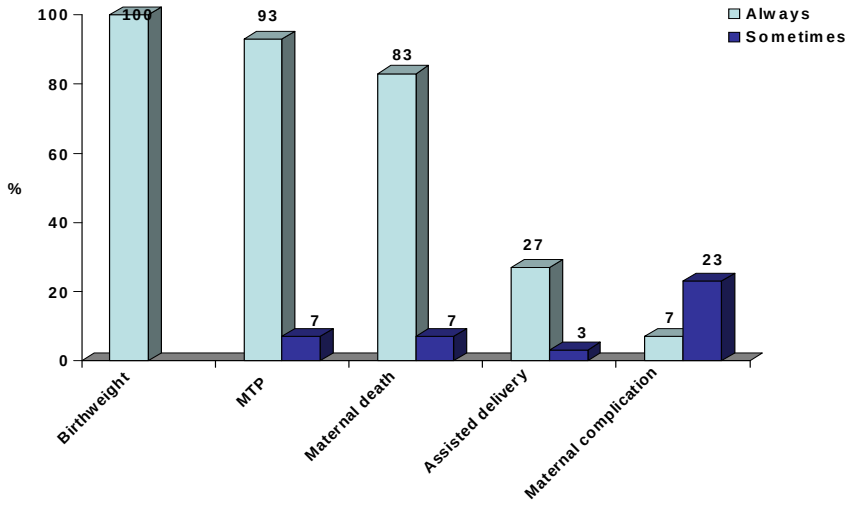
Figure 33: Facility scores for good practice



4.2. Record Keeping

The clinical **registers were often incomplete or inaccurate**, for example sometimes the cause of maternal deaths or details surrounding maternal death were absent. In many instances the **staff simply didn't have enough time**. Many have around 12 registers to complete but are already overstretched with their clinical responsibilities. **Information on birth weight and medical termination of pregnancy (MTP) were completed well** in 100% and 93% of district hospitals respectively. In contrast, completing information in regards to whether it was an assisted delivery (27%) or whether the women experienced any maternal complications (7%) were less well recorded.

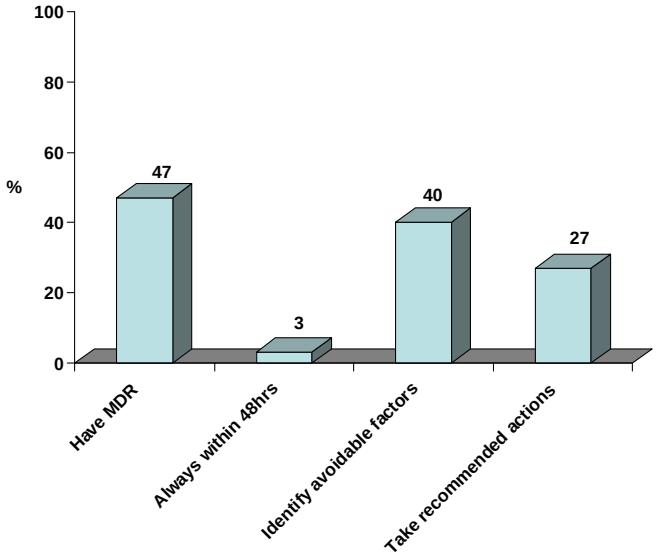
Figure34: Percentage of district hospitals with key information completed in the registers



- **Maternal death review**

Less than half of all district hospitals (47%) have a maternal death review process, and just 3% ensure they conduct a maternal death review within 48 hours of a maternal death. Those that do the process reported doing it on a monthly or even three monthly basis and others it was just irregular or hadn't been conducted for the last few months. Forty per cent of hospitals revealed that they identified avoidable actions, i.e. most of those undertaking the process, but only 27% of hospitals were taking any recommended actions.

Figure35: Percentage of district hospitals performing maternal death reviews



- **Scoring and ranking**

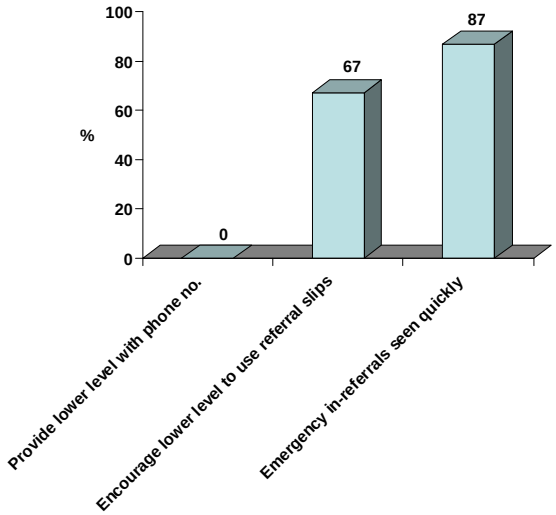
The scoring of the record keeping component took into account whether there was a process to review maternal deaths and whether key information was correctly recorded in the facility registers. The key information selected for monitoring record keeping were type of delivery (including assisted), maternal complications, maternal deaths, birth-weight and medical termination of pregnancy (MTP). On the whole facilities scored very well in regards to recording birth weight, MTP, and maternal deaths. Most facilities did not record whether a delivery was assisted or not and recording of maternal complications was very rare. Scores were brought down by the lack of maternal death reviews: just under half of the facilities had a process to record a maternal death and just one stated that it conducted the process within 48 hours.

4.3. Referral

- **In-referrals**

Most district hospitals reported that emergency referrals were seen quickly by clinical staff (87%), although it is concerning that 13% of district hospitals did not report that. Two-thirds of district hospitals (67%) reported that they actively encourage the lower level facilities to use referral slips when referring patients to them. However, there is ***no advance referral system in place*** .No district hospitals reported that they provided lower level facilities with a phone number to check whether the district hospital has the capacity to treat them prior to referring them or to enable them to inform them of emergency in-referrals on their way. It's not uncommon for patients to be referred multiple times due to inappropriate referral to a facility unable to treat them, and these multiple referrals can increase the cost to patients and cause fatal delays. It was clear to those conducting the assessment that there is also a clear need to invest in transport to hospitals from the community as well as lower level facilities.

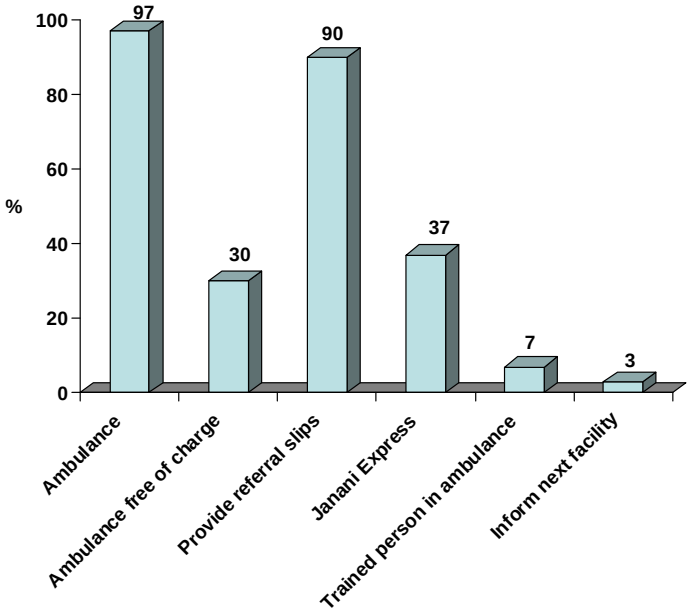
Figure 36: Percentage of district hospitals adhering to good referral practice for in-referrals



➢ **Out-referral**

Nearly all district hospitals (90%) reported that they provided referral slips for patients being referred out, but only 3% phoned the next facility to inform them and check they had the capacity to treat prior to referring patients. Most district hospitals (97%)had an ambulance for referring patients out, however, less than one third of hospitals (30%) had an ambulance available free of charge (although some reported the charge was just nominal), and just 7% had a trained person in the ambulance. Over a third had access to the Janani Express (JE) (37%), although some district hospitals reported that the JE was only available for in-referrals, not out-referrals.

Figure 37: Percentage of district hospitals adhering to good referral practice for out referrals



➢ **Referral for caesarean section**

Only 37% of the district hospitals reported that they never refer patients for caesarean sections. Of those that do refer patients, **the main reason was due to the unavailability of an anaesthetist**, although some also reported the lack of an OG specialist or referring patients experiencing complications, such as pre-eclampsia / eclampsia, HIV and heart disorders. Patients are usually referred to one of the medical colleges, with **many patients having to travel for up to six hrs to get there**.

➢ **Scoring and ranking**

The only factor taken into account in the scoring for referral was whether a facility reported referring patients out for caesarean or not. Hence those who reported they didn't scored highly and those who reported they did scored lowly. As mentioned above the availability of an anaesthetist was a crucial underlying factor in regards to whether they had to refer caesarean section patients out or not.

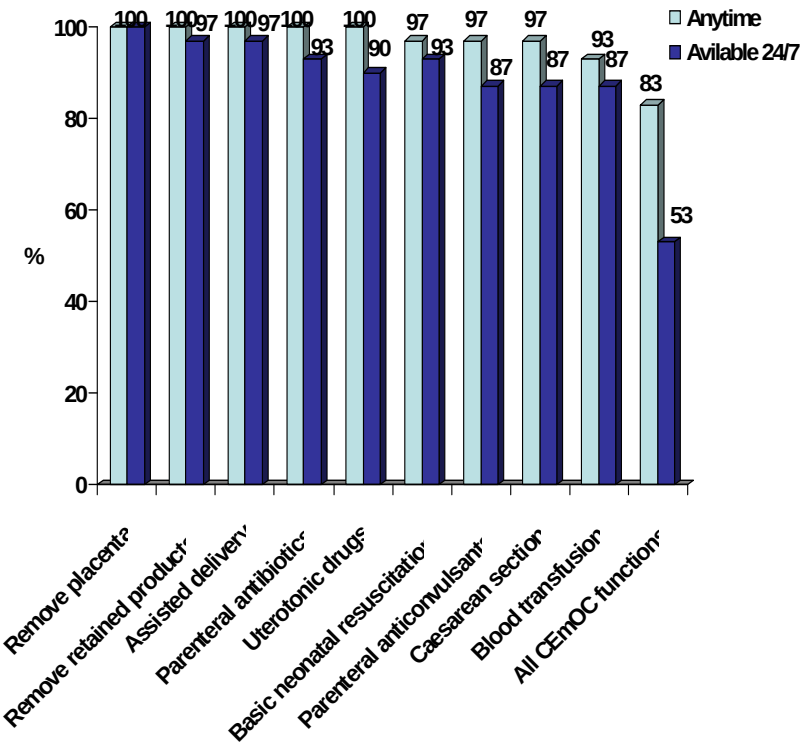
5. OUTPUT

5.1. Availability of Clinical Services

- **Comprehensive Emergency Obstetric and Newborn Care (CEmONC) services**

Most hospitals provided most CEmONC functions. However, despite the provision of each of the individual CEmONC functions being fairly high **only half of all district hospitals (53%) have all nine CEmONC signal functions available twenty four hours a day seven days a week.** Only one signal function, manual removal of placenta, was available at all times from all district hospitals, and even then there were reports of the manual vacuum aspiration (MVA) equipment being inadequate. The services least likely to be available at all times were blood transfusion, caesarean section, and administration of parenteral anticonvulsants. In regards to neonatal resuscitation, even when the service was available there were still problems reported due to acute shortages of bag and masks, the lack of the correct 'O' size mask or no separate newborn corner in the labour room in which to perform the resuscitation. Where assisted delivery was performed, it was largely vacuum delivery, with forceps delivery being reported as very rarely practiced.Facilities reported that blood exchange transfusion service was generally available.

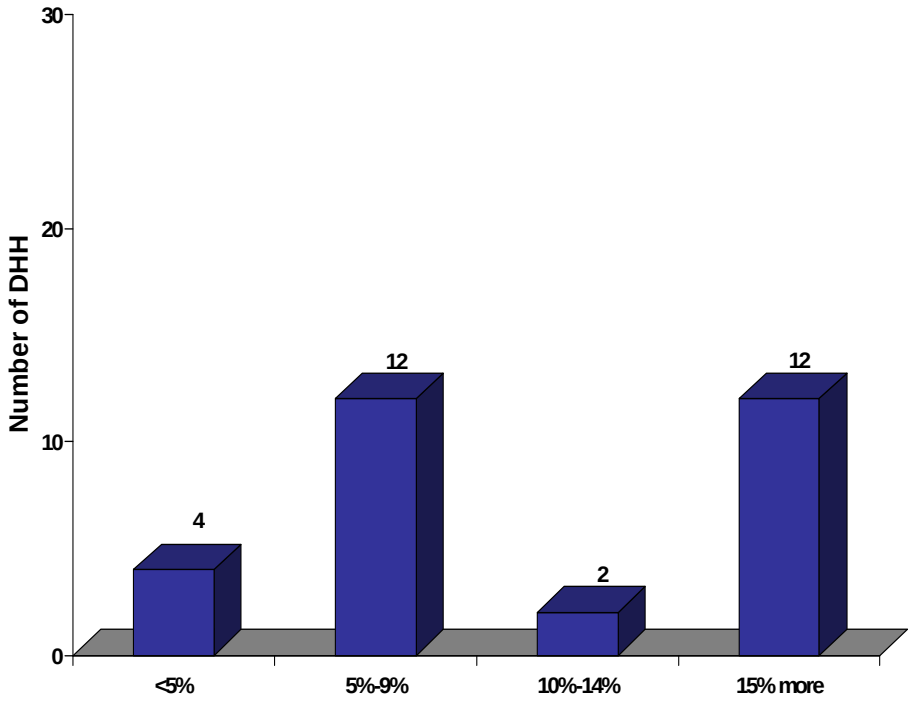
Figure 38: Percentage of district hospitals with CEmONC services available



- **Percentage of deliveries by caesarean section**

Caesarean rates in some of the district hospitals were a lot lower than what would be expected in a level three referral hospital where rates should be a lot higher than at the population level. The percentage of caesarean section deliveries ranged from 0% in Jagatsinghpur to 40% in Gajapati. Just 40% of DHH had 15% or more of deliveries by caesarean section, and 53% had under 10%.The **provision of caesarean sections is affected by the shortage of anaesthetists**, as one facility reported: *"the sole anaesthetist became the CDMO, so then there was no anaesthetist, and as a result the hospital hasn't been able to conduct any caesarean sections in the last four months".* Due to the lack of anaesthetists it was **not uncommon for facilities to perform caesarean sections under local anaesthetic**, and afterwards give the women a huge dose of painkillers. Even when an anaesthetist is available there are reported difficulties in facilities that have to share the operating theatre for general surgery as well as caesarean sections. The **majority of caesarean sections performed are due to maternal distress as foetal distress frequently goes undetected**. As mentioned in the Good Practice Section there are too few staff to enable them to regularly monitor the foetus throughout labour and hence foetal distress frequently goes undetected and this could contribute to high stillbirth rates.

Figure 39: Percentage of deliveries by caesarean section in DHH



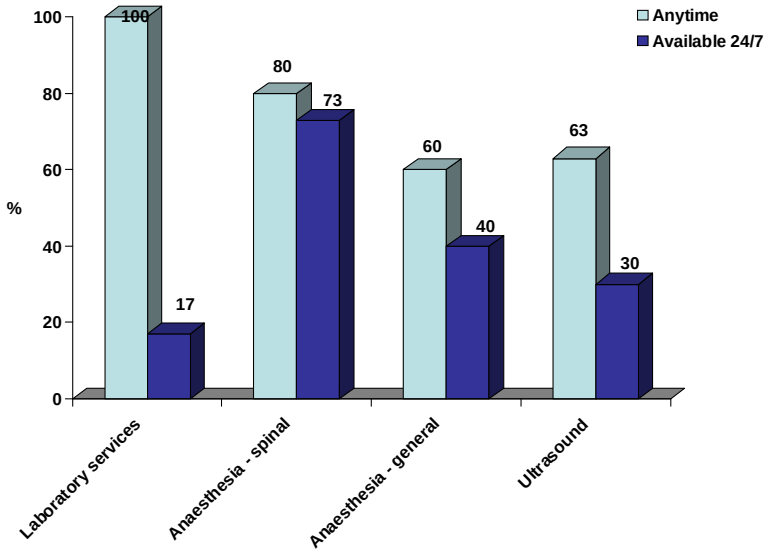
- **Essential Level 3 services: laboratory services anaesthesia and ultrasound**

Despite all district hospitals having laboratory facilities, only 17% have laboratory services available twenty four hours a day, seven days a week. Many essential tests, such as for malaria, are rarely available outside of normal working hours, and hence often in an emergency during no working hours patients are sent outside for tests.

General anaesthesia was available at all times in 40% of facilities but was reportedly rarely used. Instead spinal anaesthesia services are more readily available and utilised, however, even then, over a quarter of district hospitals do not provide spinal anaesthesia at all times (27%).

More than one third of hospitals (37%) have no ultrasound service, which can be crucial in some cases like antepartum haemorrhage and for quality antenatal care. Facilities commonly reported that although the ultrasound equipment was present there was no trained radiologist to use the equipment and thus the equipment was redundant. In some instances the equipment was used by a visiting trained doctor

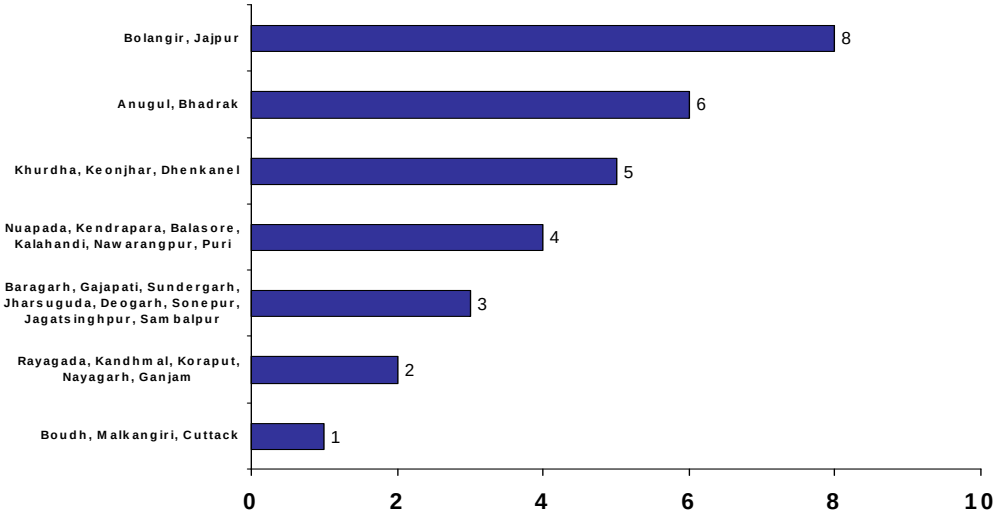
Figure 40: Percentage of district hospitals with laboratory services, anaesthesia and ultrasound available



- **Beds**

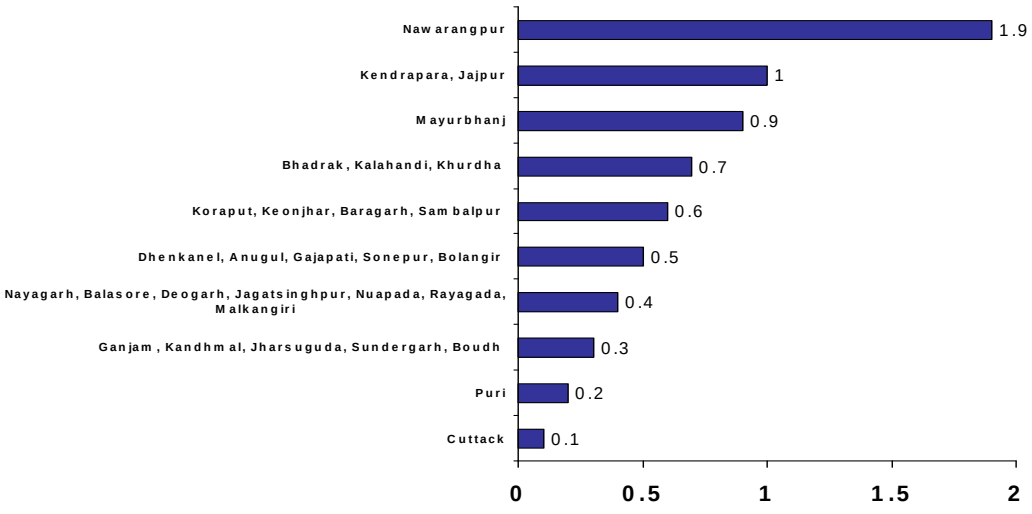
There was an insufficient number of delivery tables in most DHH labour rooms. The number of delivery tables ranged from 2 to 7 with an average of 4. On average the DHHs had 4 deliveries per day per delivery tables, but this ranged from 8 deliveries per delivery table in Bolangir and Jajpur to 1 in Boudh, Cuttack and Malkangiri (Figure 40). Often the number of beds in the labour room was inadequate to provide adequate monitoring during labour.

Figure 40: Average number of deliveries per day per delivery table in district hospitals



In most of the DHHs the number of beds available in the maternity wards was inadequate to keep all uncomplicated postnatal mothers for at least 48 hours, **with considerably more patients than the numbers of beds available**. The number of beds in the maternity ward ranged from 6 to 60, with an average of 26. It was not uncommon to find 50 patients at one time with just 30 beds. The number of deliveries per day per maternity ward bed ranged from 0.1 deliveries per bed in Cuttack to 1.9 in Nawarangpur (Figure 41). As mentioned in the infrastructure section, the maternity wards usually need to accommodate women pre labour (as there are no waiting homes), those in labour up until delivery (as the labour rooms are short of space and beds they are just delivery rooms in practice) and complicated and uncomplicated post-natal mothers along with their newborns (as there are few postnatal wards)

Figure 41: Average number of deliveries per day per maternity ward bed in district hospitals



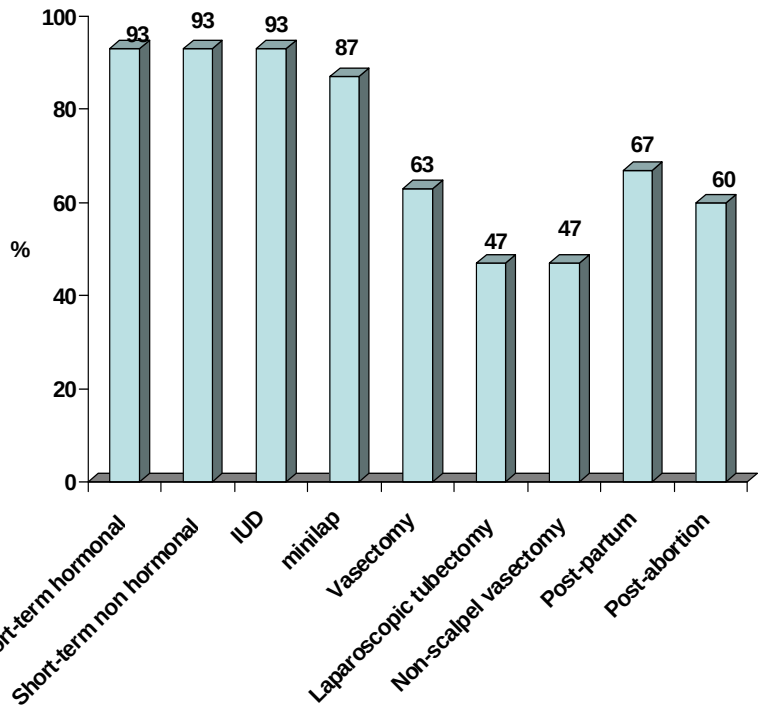
- **Family Planning and Abortion**

As Figure 42 shows **most district hospitals provided short term hormonal (93%) and non hormonal (93%), IUD (93%) and minilap (87%)**methods of family planning. In regards to short term hormonal it was largely oral contraceptive pill that was available – not injectables. However, facilities were less likely to provide vasectomies (63%), with even fewer providing laparoscopic tubectomy (47%) and non-scalpel vasectomy (47%).

Only two thirds of facilities reported that they provide post-partum family planning (67%) and post-abortion family planning (60%). Furthermore, **facilities reported that even when they offered post-partum and post-abortion family planning services these were rarelyused by patients.**

All district hospitals provide incomplete or missed abortion care and first trimester induced abortions, however, only two thirds (67%) provide second trimester abortion care.

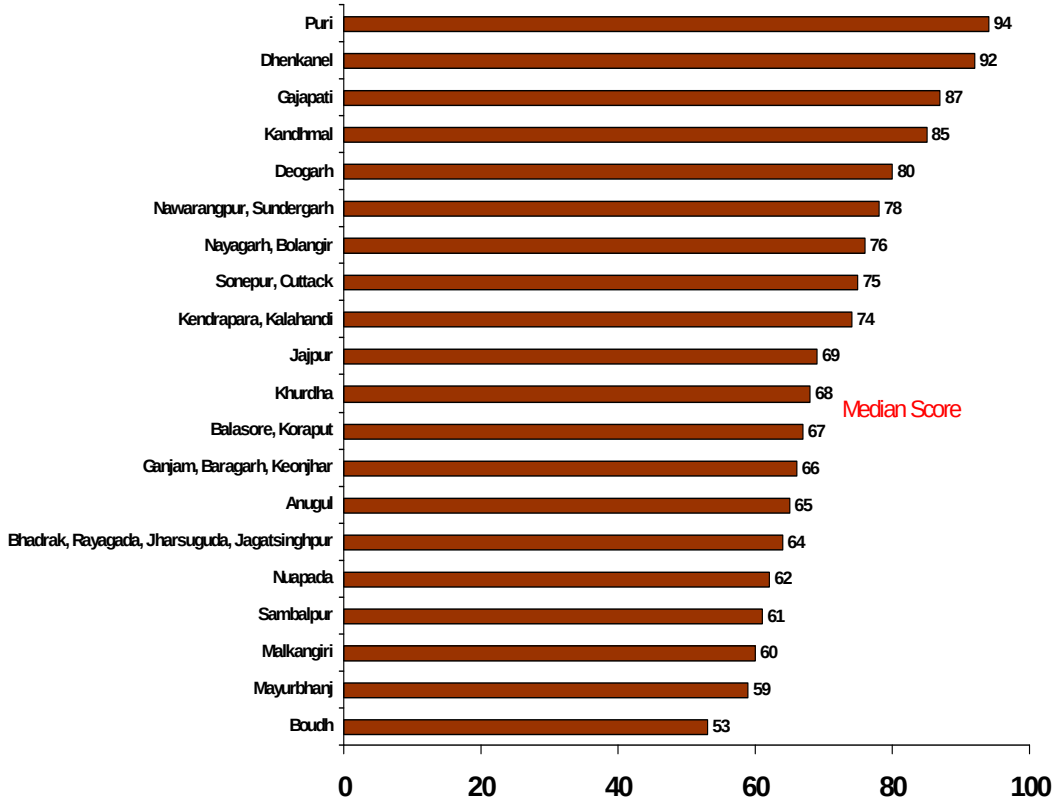
Figure 42: Percentage of district hospitals with family planning services always available



- **Scoring and Ranking**

There was **less variation between facilities in the scores for the availability of clinical services than for other components of Quality of care**, ranging from 53 to 94.The median score for this component was relatively high at 67.5. As seen from the analysis above, factors having a positive impact on the scores included manual removal of the placenta 24/7, provision of non-permanent family planning methods, missed /incomplete abortion care and first trimester induced abortions. **Factors that brought the scores down included the low % of caesarean deliveries, the lack of laboratory services and ultrasound 24/7**,the lack of second trimester abortion services, and the lack of post-partum and post-abortion family planning. Puri, Dhenkanal and Gajapati scored highest in regards to the services provided while Boudh, Mayurbhanj and Malkangiriscored lowest.

Figure 43: Facility scores for the provision of clinical services



6. Composite QoC scores and ranking of all DHHs

Figure 44 presents the maximum, minimum and median scores for seven of the ten QoC components.[1] In the chart they are ordered according to the median score, with non-clinical services having the highest median score (80) and infrastructure the lowest (32.5). The non-clinical services and drugs and consumables components have the highest medians. This suggests that overall the DHHs are doing best in these components, however the large gap between the maximum and minimum values highlights that there are still some facilities scoring low and require individual attention. For clinical services and good practice there is the least variation between DHHs and they have relatively good scores, although there is still a lot of scope for improvement, especially in good practice. The equipment component has the widest variation, with scores ranging from10 to 75, indicating that some facilities are in desperate need of new equipment. Staffing and infrastructure have the lowest scores indicting the urgent need for strategies to improve these components to be discussed at the state level.

Figure 44: Maximum, minimum and median scores for QoC components

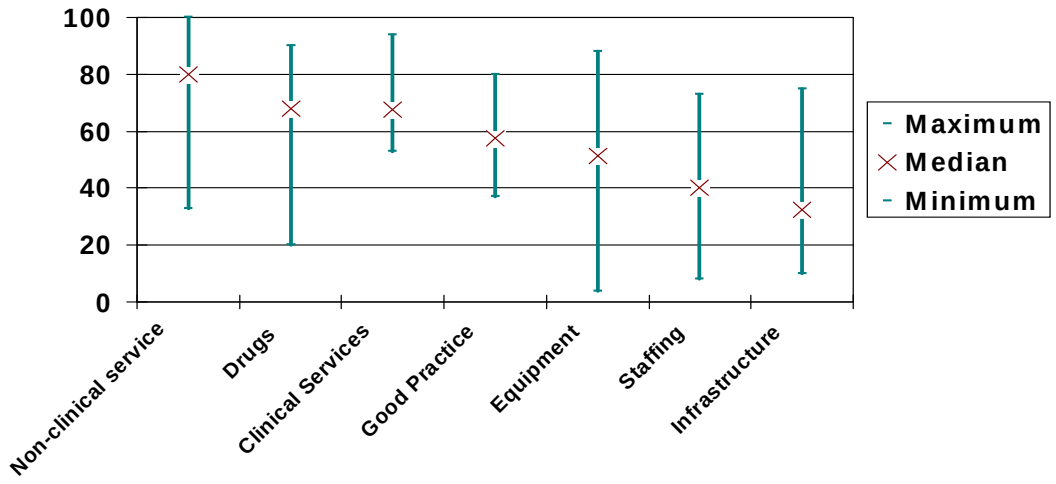
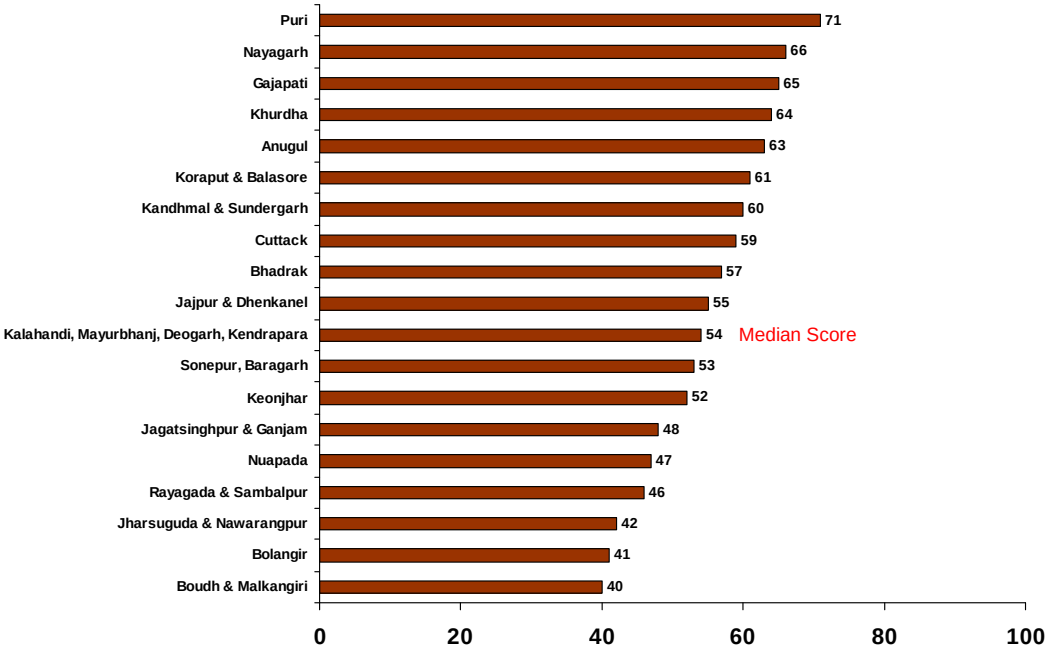


Figure 45 presents the final weighted composite score for each DHH. The scores ranged from Puri, with the highest score of 71, to Boudh and Malkangiri with the lowest score of 40. Within this range the scores are fairly evenly distributed, with a median of 54. When interpreting the scores one should not view it as those at the top are the better performing facilities and hence should be rewarded, as the score could be seen as a reflection of the uneven distribution of resources between DHHs, such as what staff have been allocated, what investment has been made in the infrastructure, what equipment they have available. Hence, it is more appropriate to view it as a reflection of the quality of care that is likely to be received by clients. As noted in the limitation this assessment has not included the client perspective to enable this comparison to be looked at. Therefore, those DHH at the bottom

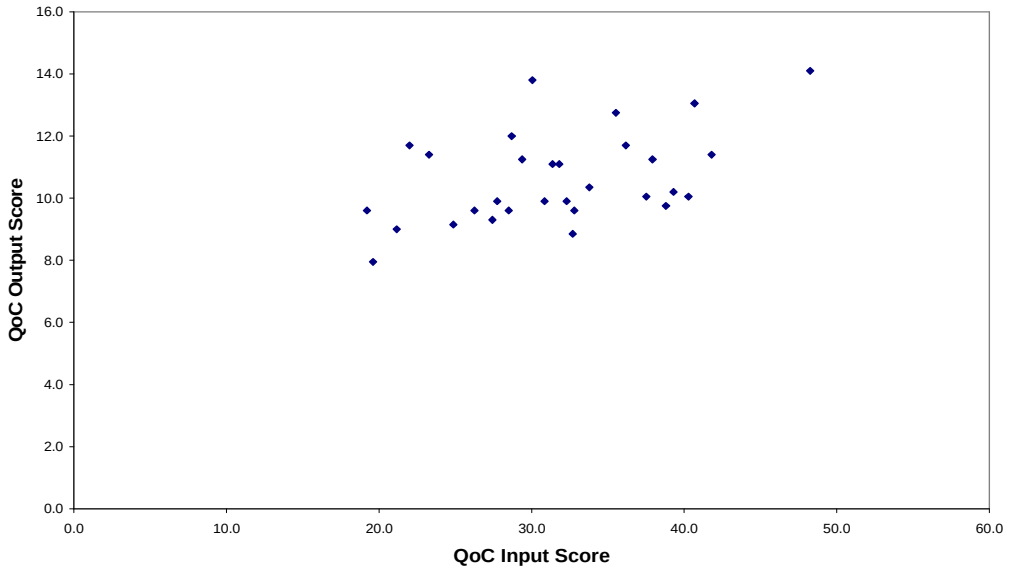
[1] The remaining three (registers, records and referral) are excluded from the diagram as they contain few indicators.

of the ranking are in most need of additional resources and support, although the individual components should be looked at to take a more informed approach.

Figure 45: QoC Composite score for each DHH



There is a positive correlation (0.322), significant at the 99% level of significance, between the quality of care input and output scores, i.e. the more inputs that are put in place (human resources, infrastructure, equipment, drugs and consumables, non-clinical services and registers) the better the output (the availability of clinical services)Figure 46: Relationship between QoC input and QoC output scores (r^2 =0.322, p=0.001)



7. Quality Improvement Action Plan

Introduction :

The last five years have seen an exponential rise in Institutional Deliveries in Odisha, especially subsequent to the launching of the NRHM, with JSY and ASHA programmes. The District Headquarter Hospitals and other Referral Hospitals have risen to the occasion, providing care to larger numbers and facing the rising expectations of the mothers and newborn babies that now utilize the services. There is a need to assess Quality of Care in Maternal Services ; not to find fault, but to add value ; by identifying gaps and areas that need strengthening, and arriving at suggestions on how to address the same.

The Technical & Management Support Team of the OHSP, Govt of Odisha, has undertaken such a Quality of Care Assessment process. The Assessment Tool and processes were designed through brain-storming sessions and reference to Government of India Guidelines, besides other international experiences on Quality of Care Assessment. The tool was pre-tested, modified further and finalized in discussion with members of TMST and the Dept of Health & Family Welfare. Technical Consultants were oriented to undertake the Assessment process in 32 Hospitals (30 DHH, Capital Hospital, Bhubaneswar and Rourkela General Hospital). These Hospitals are Level 3 Referral Hospitals for their respective areas, and together undertake a significant percentage of the over-all Institutional Deliveries in the state. The hope is that raising the bar of quality in these hospitals could provide a cascading effect on the other hospitals around them.

By December 2011, the Assessment visits had been completed in all 32 hospitals, and the data entry undertaken. While there is a great amount of detailed information available for 10 composite indicators facility-wise, this document seeks to capture and share the “big messages” – or the larger picture emerging from the assessment, and suggested plans for Quality Improvement. The detailed analysis and information is available in the body of the Study Report. The Suggestions in this document for Quality Improvement have come from multiple sources – some directly from the practitioners in the facilities, some from the TMST Teams that undertook the visits, some from the group that analysed and studied the findings, and some from the Health Department of the Government of Odisha, during the QoC Workshop held on 11th January 2012 to review the findings and discern the way forward. This Quality Improvement Plan could be used as a base document to help individual hospitals create and roll out their own specific QoC Improvement strategies. The following pages provide a look at the Composite Indicators, the Messages and Suggestions for Quality improvement.

The Overall Picture : Generic Issues Emerging – and some suggestions

1. All the Hospitals have seen **a sharp increase in numbers** of deliveries conducted over the last 5 – 6 years, especially with the addition of the JSY programme and the ASHA.
2. The DHH has moved from a predominantly **Out-Patient Service Role to an increasingly In-Patient Role**. The staffing pattern and facilities have not kept up with this change.
3. This sharp increase in numbers puts **pressure on Quality** ; the immediate focus is necessarily to cope with the Quantity of Care demanded, with inadequate time to look at Quality issues.
4. The **other services of the hospital**, such as General Medicine, General Surgery etc tend to **get less focus**, as attention, resources and pressure are centred on Mother and Child Care.
5. Over the last few years, there also seems to have been an **Overall Upgradation of District HQ Hospitals** in terms of **Infrastructure** (through construction and equipment), **Overall Cleanliness** (through out-sourcing, better Waste Management etc), **Management** (through the addition of the Hospital Manager, RKS etc), **Image** (from all of the above) and **Utilisation** (especially of Maternal and Child Care services)
6. The **13 old District Headquarters** generally seem to be **better off** in terms of hospital facilities and quality than the daughter-districts that were carved out from them. This could be in terms of Staffing, Infrastructure, Access, Utilization etc. In fact, some of the hospitals at the new District HQ's, while playing the role of DHH's, are still classified as SDH's or otherwise
7. While certain generic patterns emerge, it is clear that **each Hospital is really unique** – with different external and internal environments that cannot be generalised. Quality Improvement Plans will therefore have to be individualised to the hospital level, while taking on board the generic or systemic recommendations.

Suggestion 1 : Quality Improvement Plans will have to be made separately at the System level for generic issues, and at the Individual Facility level. Under-performing Districts such as Bolangir may need special plans and hand-holding to improve quality of care. Undertake an exercise at selected Facilities based on the Assessment Report to develop Quality of Care Improvement Plans. TMST can support this process in selected hospitals, on a phase-wise basis.

8. Individual Hospitals and "champions" in the system have come up with Interesting **Innovations & Best Practices** that can inspire change :

For example, the Kondhamal DHH has come up with a number of patient-friendly innovations such as :

- A Help Desk at the registration counter – run on PPP mode with an NGO

partner

- A Mass Referral System with a vehicle taking patients needing higher care to MKCG Medical College, Berhampur, 3 days a week, and accompanied by a Volunteer
- A PA system in the hospital that plays music and conveys announcements or calls for help in emergencies.
- A free Contraceptive Supply stand near the Water Cooler
- Security Gates that close at 10:00 pm
- A Caesarean Section Kit – a kit of all consumables needed for a single patient going for Caesarean Section, prepared and supplied by the Pharmacy

Suggestion 2 : Appreciate, Document and Disseminate these Innovations and Best Practices for other facilities to inspire change.

INPUT COMPONENTS

Component : Human Resources for Quality Care

Emerging Issues Identified	Suggestions for Quality Improvement	Level of Response (State/District/Facility)
The single biggest challenge, as is well acknowledged, appears to be in the area of Human Resources – the sanctioned numbers, actual numbers in place, attitude and morale etc. This will never be an easy problem to solve, and we will need to be pragmatic and practical. The critical cadre for Maternal Care are the following :	***Suggestion 3 : Optimising Utilization of Specialists*** *Consider ways to* ***relocate*** *Gynaecologists and Anesthetists within the district to L 3 hospitals.*	***State & District Level*** ***State Level***
O & G Specialists : A DHH would ideally need 3-4 OG Specialists. In reality, they are hard to get and to retain in difficult areas. Distribution is also not easy. At the time of the assessment, Cuttack with 114 deliveries in June had 3 OG specialists, while	***Suggestion 4 : Increase availability of Specialists:*** *Consider* ***re-starting the Post Graduate Diploma programmes*** *in the*	***State, District & Facility Level***

Angul with 583 deliveries had 1. There were a total of 73 OG Specialists in the 30 hospitals, with a minimum of 1 in 5 hospitals, and a maximum of 5 in Balasore. **Anesthetists** : There were 5 hospitals who did not have an anesthetist or a doctor trained in LSAS. Ideally, a District Hospital would need at least 2, to be able to provide CEmONC services 24x7. There were a total of 31 Anesthetists in the 30 hospitals. **Nurses** : Most of the Maternal Care in hospitals is actually provided by Nurse-Midwives. Presently, most DHH Maternity Units with about 40 patients in the ward and 15-20 deliveries a day, have only 5 or 6 maternity nurses in total to be shared across 3 shifts, for the Labour Room and the Wards. In practice, this means there are only 1 or 2 nurses at any given time, to conduct the deliveries and provide medications, monitoring and care to the ward patients, including post-operative mothers. The number of Nurses available in a Maternity Unit ranged from a low of 3 in Boudh to the highest of 13 in Jajpur. For staffing a Labour Room and the Maternal Ward in 3 shifts, a DHH would need a minimum of 10 nurses. This would then increase with the case-load. A critical factor in quality of care would be the number of nurses actually available for care. The sanctioned Staffing Pattern in some DHHs have a doctor-nurse ratio of 3:2. This is probably due to the old OP-centric services, but is inappropriate for hospitals with busy In-Patient services. Furthermore, the Nurses allotted are for the whole district / hospital, and	*critical disciplines of Anaesthesia, O&G and Pediatrics.* *Capital Hospital, Bhubaneswar can be made a **PG Training Institute** to run these programmes.* ***Suggestion 5: Enhance the role of Nurses :*** ***Increase the sanctioned number** of nurses to required levels based on the delivery load and the bed strength in the wards* *Where Staff Nurses are unavailable, **ANMs could be taken** and trained for the role, so that there are enough trained hands to ensure quality of care.* ***Empower the nurse-midwives** to officially do what they are trained to do ie. normal deliveries. This would release a lot more potential for care.* ***Re-locate SBA-trained Nurses** for optimum utilization in the Maternity Units of DHHs. Create systems for **fixing the posting** of nurses to Maternity Care Units within the DHH to enable skill development and utilisation.*	***State & District Level*** ***State Level***

those specifically in the Maternity Care Unit of the DHH are not usually fixed. Even SBA-trained nurses are often posted in other clinical areas, rather than the Labour Room. **Hospital Managers** : Their introduction appear to be one of many positives of recent years. Where effective, they have added a professionalism and energy that was lacking, and this has enabled better utilization of resources and opportunities.	***Suggestion 6*** *: Consider introducing* ***Hospital Mangers for All FRU's.*** ***Suggestion7:Allocation*** *of technical personnel to institutions should be* ***based on Case Load****.*	
Component : Infrastructure for Quality Care		
Emerging Issues Identified	**Suggestions for Quality Improvement**	**Level of Response (State/District/Facility)**
Infrastructure available (both for overall hospital and for specifically the Maternal and Newborn Care Services) **varies considerably** from hospital to hospital, in terms of age of buildings, appropriateness of design, campus size etc. There is scope for improvement in all of these. There is wide variation in utilization of services from 3.4 deliveries per day in Boudh to 27.5 deliveries a day in DHH, Baripada (figures for June 2010). Therefore adequacy of infrastructure also varies based on availability and case load. In most hospitals, the Maternity wards and Labour Rooms were **overcrowded** ; the numbers of patients were far greater than the beds and space available. The **design of the Maternity Care Infrastructure is often less than appropriate**, even where new buildings are being made or old ones are being modified. Designing of hospital buildings is different from normal civil	***Suggestion 8 : Professionalise the designing of Labour Rooms and Maternity Wards to enable quality care****, including space for monitoring mothers in early labour through larger Labour Rooms or First Stage Wards, and separate wards for Antenatal and Post-Natal mothers.* ***Suggestion 9*** *:* ***Consider making some model infrastructure plans for Maternity units.****.* ***Suggestion 10*** *: Make a specific* ***focus in the NRHM Program Implementation Plan (PIP) 2012-13*** *on* ***Infrastructure and Equipment for Maternal***	***State level*** ***State Level*** ***State& District Level*** ***State, District and Facility Level*** ***State Level*** ***State & District Level***

construction, and more professionalism, thinking and creativity needs to go into the designing to optimize the use of the resources available for quality patient care. Some Districts are attracting Private and Corporate funding for building infrastructure. This is an opportunity that could be used better. The newly set up Sick Newborn Care Units newly are an example of how quality of **infrastructure can be standardized and professionalized**. The **Labour Room** in almost all facilities visited, is conceptualized and functioning **only as a Delivery Room**. There are only 3 – 5 delivery tables in most Labour Rooms, with average no. of deliveries per day of around 15-20. Mothers coming in early labour are usually kept in the wards until they reach second stage, and are then shifted to the Labour Room. Again, soon after delivery they are shifted to the wards to make space for the next mother. However, the wards are not staffed or equipped to be able to monitor the mother and the foetus in the critical periods before and after delivery. This means foetal distress and other obstetric emergencies can be missed with potential for avoidable prenatal morbidity and mortality. This is addressed under Good Practices.	***Care,especially in districts with below-median scores.*** ***Suggestion 11:*** ***Consider using Government-financed or PPP models to create a few dedicated, professionally designed, Maternity Hospitals -*** *especially in former sub-divisions and where there is little private sector care available.* ***Suggestion 12:*** ***Consider setting up Pre- and Post-Natal Hostels near/in DHHs in PPP mode :****This would allow the health services to focus on the provision of good quality care and not in housing mothers, their babies and companions.* ***Suggestion : 13*** ***Accredit more private health care providers at Level 2 and Level 3*** *to share the case load*	

Component : Essential Equipment for Quality Care		
Emerging Issues Identified	**Suggestions for Quality Improvement**	**Level of Response (State/District/Facility)**
The most-used **instruments for delivery available in Labour Rooms are far too insufficient in numbers and quality,** for the current load. There is also **no system to ensure an instrument is adequately sterilized before re-use.** Sterility of the instruments used is circumspect because of - Frequent Re-use as the instruments are too few for the case-load. - Instruments not organized into Delivery Kits - Poor Sterilisation Equipment and Techniques - No system / protocol in place for sterilization before re-use. **Insufficient and non-operational equipment** were also found in many Labour Rooms, such as radiant warmers, suction apparatus etc	***Suggestion 14: Purchase additional, high-quality, sets of frequently used instruments(delivery kits, specula etc) in proportion to the increased case load.*** ***Suggestion 15 : Lay down and operationalise clear systems with the necessary equipment to ensure sterility of instruments before use for patient care.*** ***Suggestion16: Place Biomedical Engineers at district level to provide preventive and corrective maintenance for equipment. Include provision for AMC at time of purchase of equipment, where relevant.***	***Facility Level*** ***State and Facility Level*** ***State & District Level***

Component : Drugs & Consumables for Quality Care		
Emerging Issues Identified	**Suggestions for Quality Improvement**	**Level of Response (State/District/Facility)**
The **availability of essential drugs** like Oxytocin, Antibiotics, Magnesium Sulphate is **not adequately maintained**. There were also questions raised by clinicians on quality of some drugs. Acute **shortage of frequently used consumables** like gloves, syringes, baby mucous suckers, cord clamps and IV fluids was reported in some facilities. Patients families are seen routinely seen buying supplies for their deliveries against prescriptions. Some of this will have been addressed with the operationalisation of the JSSK programme and cashless care.	***Suggestion 17 : Ensure availability of adequate consumables*** *used regularly for deliveries such as Gloves and Syringes either* ***through sustained supplies or through enhanced local purchasing capacity****.* ***Suggestion18****:* ***Strengthen Drugs Inventory Management*** *; Include more* ***effective pre-dispatch Quality Assurance for drugs.***	***State & Facility Level*** ***State Level***
Component : Non-Clinical Services for Quality Care		
Emerging Issues Identified	**Suggestions for Quality Improvement**	**Level of Response (State/District/Facility)**
The areas assessed included **Bio-Waste Management, Laundry, Catering, Security and House Keeping services.** By and large, these critical areas appear to have **improved considerably in recent years**. The Hospital Managers have often contributed to this change. While some hospitals have out-sourced these services, others have built the in-house capacity to do the same.	***Suggestion 19: Appreciate the quality improvement*** *that has occurred through sustained inputs.* ***Document and disseminate the best practices*** *and outcomes in these areas, for cross learning and modeling.* ***Suggestion 20 :****Improvement of* ***Bio-Waste Management systems*** *in all the DHH facilities should be pursued on a campaign mode.*	**State & Facility Level** **State, District & Facility Level**

PROCESS COMPONENTS		
Component : Good Practices for Quality Care		
Emerging Issues Identified	**Suggestions for Quality Improvement**	**Level of Response (State/District/Facility)**
The Hospitals were scored on their use of 20 internationally accepted good practices in maternal care. It must be noted that the scores are based on what the care -givers reported as their normal practice and not direct observation. Some good practices, such as the use of **Magnesium Sulphate in Eclampsia or Nevirapine for HIV+ve mothers was reported as almost universal**. On the other hand, most hospitals said **Partographs were not used** widely outside the training workshop situation, for lack of time. Willingness to allow mothers to choose alternative birthing positions or companions for social support was relatively less common. However, the major issue identified was that, as described under the Infrastructure Section, the Labour Rooms are designed and functioning only as "Delivery Rooms". The mother is in the Labour Room under the care of the nurses there only for second and third stage of labour, and the actual delivery, given the large case load and the inadequate space and staffing available. From admission to delivery, she is the ward where monitoring is physically not possible. Similarly, during the post-natal period. Quality care for minimizing risk of perinatal morbidity and mortality is not possible without changing this approach.	***Suggestion 21 : Continue to use in-service education programmes*** *to update staff on changes in recommended practices. There is a need to ensure that* ***all the members of the team*** *are up-to-date, if change is to come. The crucial people in this appear to be the senior nurse in charge and the OG specialist.* ***Suggestion 22 : Introduce the WHO Safe Childbirth Checklist,*** *which is a simple tool to ensure the basic steps for good practice are followed*. ***Suggestion 23*** *:* ***Revisit the concept of maternal care*** *we provide, so as to have a* ***continuum of quality of care from admission till discharge****, with adequate monitoring in labour.* ***Design the structures and the staffing pattern t****o achieve this*	***State & District Level*** ***State and Facility Level*** ***State, District and Facility Level***
Component : Information Management for Quality Care : Registers & Record Keeping		

Emerging Issues Identified	Suggestions for Quality Improvement	Level of Response (State/District/Facility)
Information Management needs optimization for better Quality Improvement The Labour Room Registers of Govt of Odisha (designed with support from UNFPA) are **very comprehensive and well-designed**. However, they are being used **only in some districts**, either due to non-receipt or non-utilisation. (This point may have already been addressed since). The present overburdened Staff Nurse seems unable to fill in all the information. There may be a role for a non-technical person like **a Ward Clerk** who could handle this and other house-keeping roles in the ward. All the Labour Rooms visited however had some register, most often with hand-drawn columns in a note-book, which did not cover all the information needed for Quality Improvement.	***Suggestion 24:*** ***Operationalise the universal use of the new Labour Room Registers;*** *Print and distribute the new delivery registers to all facilities.* ***Suggestion 25 :*** ***Identify a person to be responsible*** *for recording the required birth related information whether from existing data-entry persons or through recruiting of new staff (like a "Ward / Labour Room Clerk") or recruit new staff.* ***Suggestion 26*** *:* ***Scale up Automation*** *of records (already piloted at DHH Puri)*	***State Level*** ***State & District Level*** ***State Level***
Component : Referral Services for Quality Care		
Emerging Issues Identified	**Suggestions for Quality Improvement**	**Level of Response (State/District/Facility)**
None of the hospitals visited had a system in place for receiving **advance information on in-referrals** or sending advance information for out-referrals. However, almost all of them reported	***Suggestion 27 :*** ***Create a mechanism for peripheral units to inform the Hospital in advance of patients***	**District & Facility Level**

giving Referral Certificates to those they referred out. 20 of the 30 hospitals said they sometimes had to **refer patients out for Caesarean Sections** either due to major maternal complications, or absence of key staff such as the anesthetist or OG specialist.	***being referred**, so as to enhance the speed of response and quality of care on arrival.*	

OUTPUT COMPONENTS		
Component : Availability of Clinical Services for Quality Care		
Emerging Issues Identified	**Suggestions for Quality Improvement**	**Level of Response (State/District/Facility)**
The hospitals provide most of the CEmONC functions, but only 13 out of 30 provide all the 9 Signal CEmONC functions 24 x 7. Some functions that need to be strengthened include 24x7 availability of Caesarean Sections, Blood Transfusions, Eclampsia Management and use of utero-tonic drugs. Caesarean Rates in some hospitals were less than would be expected of a referral hospital. Availability of Lab Services 24x7 was only in 5 hospitals out of 30. Family Planning and Abortion services were reported to be almost universally available in all the hospitals. 11 hospitals did not have functioning Ultrasound services, which can be crucial in some cases like antepartum hemorrhage, and for quality antenatal care. In most hospitals, the number of beds available in the Wards were inadequate to keep all postnatal mothers for at least 48 hours. Similarly, the number of	***Suggestion 28 : Each Facility needs in their Quality Improvement Plan to ensure availability of all 9 signal CEmONC functions 24 x 7 by addressing the current gaps.*** ***Suggestion 29 :** Take steps to operationalise**Ultrasound Services and 24x7 Laboratory Services** based on local issues*	**State, District & Facility level** **District & Facility level**

beds in the Labour Room were inadequate to provide adequate intranatal monitoring		

Conclusion:

The way forward could take the following steps :

- Study the diagnosis made at the Facility Level and at the Generic / System level
- Work from the Suggestions given and Additional Ideas generated in discussion to arrive at a Menu of Options for Quality improvement.
- Build Quality Improvement Action Plans for System Level Actions at the State level.
- Enable individual facilities to undertake Facility-level Quality Improvement Plans in the districts.
- Quality Assurance Cells can monitor and carry the process forward.
- Use a modified QoC Self-Assessment Tool to re-measure the Quality Status after an appropriate period, using the Study data as a Baseline.
- Use a participatory process to cultivate an attitude of Quality Care in our health institutions

Overall, the QoC exercise has been a very intensive learning experience that brings us face to face with both the massive achievements made and the major challenges that need to be addressed. The price of success is evident. Where systems have improved, demand has increased, thereby putting pressure on quality. Much needs to be done. We hope this study and document will help to light the path that needs to be chosen.

* * * * *

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ANNEX 1: Breakdown of scoring for QoC indicators

	INDICATOR			
INPUTS				
AVAILABILITY OF STAFF	Number of General Nurse Midwives (GNM) in post: Number of deliveries	34		
	Number of Obstetricians / Gynaecologists (O/G) in post: Number of deliveries	33		
	At least one anaesthetist / LSAS available in post	33		
		100		
INFRASTRUCTURE	Functional building and external works	25	- Buildings - Boundary wall& signage - Wiring, 24/7 electricity link& generator back-up - Piped 24 hour water supply, sanitary fittings & plumbing - Drug shop within premises Total	5 5 5 5 5 25
	Operating theatre in good repair & functional	25	- Good repair - Alternate power supply - Fumigation - Controlled temperature - Hand-washing facilities Total	5 5 5 5 5 25
	Maternity ward in good repair & functional	25	- Good repair - Adequate lighting & ventilation - Hand-washing facilities & accessible toilets - Provision for patients without complications to stay 48 hours & patients with complications 3-5 days - Separate postnatal ward Total	5 5 5 5 5 25

	Labour room / newborn corner in good repair & functional	25	- Good repair - Adequate lighting - Electricity supply with back-up facility, alternate power supply and air conditioning - Attached toilet & hand-washing facilities & 24 hour running water - Separate area fornewborn corner, which is temperature controlled Total	5 5 5 5 5 25
		100		
NON-CLINICAL SERVICES	Good biomedical waste management (BWM) systems in place and followed	70	- Cordoned off area for BWM disposal - BWM guidelines / protocols easily accessible - Staff given formal training on BWM - Hub-cutter for needles - Appropriate colour coded bins for BWM - Deep burial for placenta/ body parts - Protective gear for handlers	10 10 10 10 10 10 10
	Adequate general hospital services	30	- Laundry service - Catering service - Security service - House-keeping service	7.5 7.5 7.5 7.5
		100		
EQUIPMENT	Essential equipment available and functional in labour room / newborn corner	60	- IV stand - Suction machine - Facility for oxygen administration - Sterilisation equipment - Instruments required for normal delivery / vacuum / forceps delivery - Labour table & Mackintosh	10 10 10 10 10 10

	Essential instruments available and functional for pelvic examination	15	- Sim's/Cusco's vaginal speculum - Anterior vaginal wall retractor - Sterile gloves - Sterilized cotton swabs and swab sticks in a jar with lid - Kidney tray for keeping used instruments - Bowl for antiseptic solution - Steel tray with lid to keep sterile/HLD instruments - Antiseptic solution: Chlorhexidine 1% or Cetrimide 2% / Povidone iodine solution - Cheatle forceps with a dry bottle to hold it - Proper light source	1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5
	Essential equipment available and functional in maternity ward	10	- Oxygen inhalation - Anaphylactic tray - BP equipment - Stethoscope - Thermometer - Beds, mattress, rubber makintosh and sheets	1 1 1 1 1 5
	Essential drugs and equipment for MVA available and functional	10	- MVA syringe and cannulae, sizes 4-8 - Vulsellum / allis long forceps - Syringe for local anaesthesia and sterile needle - Local anaesthetic agent	2.5 2.5 2.5 2.5
	Maternity ward has a nurses station	5	- Maternity ward has a nurses station	5
		100		
Drugs & consumables	Essential drugs available	50	- Inj. Oxytocin - Inj. Magnesium sulphate - Inj. Lignocaine hydrochloride - Inj. Gentamicin / Inj. Ampicilin /Cephoperazone/Cephotaxime with sulbactum - Tab. Misoprostol - IV fluids - Inj. Methylergometrine - Inj. Betamethasone - Inj. Adrenaline -	5 5 5 5 5 5 5 5 5 5
	Essential consumables available	25	- Antiseptic solution - Sterile syringes and needles - - Sterile drip/IV sets	5 5 5 5

			- Sterilised cotton swabs - Mucus extractor	5
	Essential consumables for infection prevention available	25	- Gloves - Soap / alcohol rub - Cleaning materials	10 7.5 7.5
		100		
REGISTER	Key information included in registers	100	- Admission - Labour room (including infant death) - Family Planning - Medical Termination of Pregnancy - Abortion - Operating Theatre - Maternal Death - Discharge	12.5 12.5 12.5 12.5 12.5 12.5 12.5 12.5
		100		
PROCESS				
RECORD KEEPING	Key information completed in the registers	80	- Type of delivery (including assisted) - Maternal complications - Maternal deaths - Birth weight - Medical Termination of Pregnancy (MTP)	16 16 16 16 16
	Have a process to review maternal deaths	20	- Process at facility to review maternal deaths - All deaths reviewed within 48hrs	15 5
		100		
REFERRAL	Ever refer c/s cases out	100	- Ever refer c/s cases out	100
		100		
GOOD PRACTICE	Infection prevention	6	Wear sterile dispoSBAle gloves when perform PV examination routinely; Providers routinely wash hands before and after seeing patients; Providers use a sterile scissors for cord cutting and sterilised cord ties; Providers use an autoclave boil instruments	6
	Cleanliness	6	OT - Cleaning equip & disinfectant readily available, floor clean; Labour room - clean flr, clean flr around bed, clean surface of delivery table, hinges of delivery table, legs of delivery table,	6

			Cleaning equip & disinfectant readily available	
	Respect for client's privacy	6	Restricted entry to labour room Divider / curtains for privacy in labour room	6
	Mother monitored during first stage of labour	6	Mother monitored during first stage of labour	6
	Appropriate use of oxytocic drugs	6	Appropriate use of oxytocic drugs	6
	Prophylactic drugs given to women with premature rupture of membranes	6	Prophylactic drugs given to women with premature rupture of membranes	6
	Magnesium sulphate given to women with eclampsia	6	Magnesium sulphate given to women with eclampsia	6
	Nevirapine available for HIV+ mothers in labour	6	Nevirapine available for HIV+ mothers in labour	6
	Breastfeeding and skin-to-skin encouraged	6	Breastfeeding and skin-to-skin encouraged	6
	Infants labelled soon after birth	6	Infants labelled soon after birth	6
	Episiotomy not performed routinely	5	Episiotomy not performed routinely	5
	Vacuum aspiration / medical abortion used for abortion care	5	Vacuum aspiration / medical abortion used for abortion care	5
	Appropriate wiping, wrapping and bathing of newborns	5	Appropriate wiping, wrapping and bathing of newborns	5
	Position for labour (Upright encouraged over supine)	4	Position for labour (Upright encouraged over supine)	4
	Hb and urine albumin testing performed for admissions to labour room	4	Hb and urine albumin testing performed for admissions to labour room	4
	JSY payments made before discharge	4	JSY payments made before discharge	4
	Mothers encouraged to be mobile during labour	4	Mothers encouraged to be mobile during labour	4
	Enema and perineal shaving not performed	3	Enema and perineal shaving not performed	3
	Companions allowed during delivery	3	Companions allowed during delivery	3
	Mothers given social support, health education and advice after delivery	3	Mothers given social support, health education and advice after delivery	3
		100		
OUTPUTS				
AVAILABILITY OF SERVICES	Provide all 9 CEmOC signal functions 24hours a day 7 days a week	45	- Administer parenteral antibiotics (injection or intravenous infusion) 24/7 - Administer uterotonic drugs (i.e. parenteral oxytocin[a]) 24/7 - Administer parenteral anticonvulsants for preeclampsia and eclampsia (i.e. magnesium sulphate) 24/7 - Manually remove the placenta 24/7 -Manually removed retained products of conception 24/7 - Perform assisted vaginal delivery (vacuum extraction, forceps delivery) 24/7 - Facilities for basic Neonatal resuscitation (with bag and mask) 24/7 - Facilities to perform caesarean section 24/7 - Facilities for blood transfusion 24/7	5 5 5 5 5 5 5 5 5

	% of deliveries that are c/s	15	- 15% or more - 10-14% - 5-10%	15 10 5
	Laboratory services available 24 hours	10	- Laboratory Service available 24hrs - Laboratory Service available, but not 24hrs	10 3
	Provide comprehensive abortion services	10	- Provide missed / incomplete abortion care - Provide first trimester induced abortion care - Provide second trimester abortion care	5 4 2
	Provide comprehensive family planning services	5	- Post-partum & - Post abortion - Short term hormonal - Short term non-hormonal - IUD - Minilap / vasectomy	1 1 1 1 1
	Have an ultrasound service	5	- Have an ultrasound service	5
	Number of beds in maternity ward: Number of deliveries	5		
	Number of beds in labour room: Number of deliveries	5		
		100		

ANNEX 2: Quality of care unweighted component Scores by district headquarter hospital

District Headquarter Hospital (DHH)	Staff	Infra-structure	Equipment	Drugs	Non-clinical Service	Register	Good Practice	Referral	Record Keeping	Clinical Services
Puri	64	60	83	87.5	100	100	47	0	63	94
Nayagarh	40	75	88	80	92.5	87.5	74	0	48	76
Gajapati	66	60	55	40	92.5	75	53	100	63	87
Khurdha	57	45	67	67.5	72.5	62.5	79	100	47	68
Anugul	49	45	56	85	90	100	74	100	63	65
Koraput	56	65	61	50	100	87.5	61	0	63	67
Balasore	73	10	51	44	82.5	100	80	0	48	67
Kandhmal	32	40	83	77.5	100	87.5	68	0	63	85
Sundergarh	49	50	47.5	71	80	62.5	59	100	64	78
Cuttack	40	40	88	77.5	90	87.5	46	100	68	75
Bhadrak	49	30	61	65	32.5	87.5	78	100	63	64
Jajpur	56	45	25	56	72.5	75	50	100	64	69
Dhenkanel	49	15	42.5	51	70	100	55	100	48	92
Mayurbhanj	48	15	30.5	90	80	75	68	100	48	59
Kalahandi	40	25	48	80	70	100	53	100	79	74
Deogarh	32	15	46	77.5	90	75	74	0	64	80
Kendrapara	32	35	59	72.5	90	62.5	55	100	64	74
Sonepur	32	20	46.5	85	80	62.5	66	100	64	75
Baragarh	32	30	64	71	82.5	62.5	66	100	48	66
Keonjhar	56	10	29	68.5	80	75	56	0	63	66
Jagatsinghpur	32	45	36.5	55	92.5	62.5	47	100	63	64
Ganjam	32	30	36.5	62.5	90	75	55	100	32	66
Nuapada	32	30	52	47.5	80	87.5	52	100	48	62
Rayagada	24	35	43	67.5	72.5	87.5	47	100	63	64

Sambalpur	24	45	52	41	65	62.5	68	0	48	61
Jharsuguda	8	25	49.5	51	70	75	78	0	63	64
Nawarangpur	8	40	58.5	70	40	75	47	0	48	78
Bolangir	40	20	4	45	70	87.5	37	0	32	76
Boudh	8	25	52	62.5	52.5	62.5	70	100	48	53
Malkangiri	32	30	20.5	20	70	100	55	0	63	60
Median	40	32.5	51.5	67.5	80	75	57.5	100	63	67.5
(Min, max)	8-73	10-75	4-88	20-90	32.5-100	62.5-100	37-80	0-100	32-79	53-94
*CapitalHospitalBhubaneswar	100	35	66	85	100	0	78	100	0	94
*RourkelaGeneralHospital	32	40	64	72.5	90	100	59	0	48	83
Total	/100	/100	/100	/100	/100	/100	/100	/100	/100	/100

ANNEX 3 :Quality of care weighted component Scores by district headquarter hospital

District Headquarter Hospital (DHH)	Staff	Infrastructure	Equipment	Drugs	Non-clinical Service	Register	Good Practice	Record Keeping	Referral	Clinical Services	TOTAL
Puri	19.2	6	8.3	8.8	5	1	7.1	1.9	0	14	71.3
Nayagarh	12	7.5	8.8	8	4.6	0.9	11.1	1.4	0	11	65.7
Gajapati	19.8	6	5.5	4	4.6	0.8	8	1.9	1	13	64.6
Khurdha	17.1	4.5	6.7	6.8	3.6	0.6	11.9	1.4	1	10	63.8
Anugul	14.7	4.5	5.6	8.5	4.5	1	11.1	1.9	1	10	62.5
Koraput	16.8	6.5	6.1	5	5	0.9	9.2	1.9	0	10	61.4
Balasore	21.9	1	5.1	4.4	4.1	1	12	1.4	0	10	61
Kandhmal	9.6	4	8.3	7.8	5	0.9	10.2	1.9	0	13	60.4
Sundergarh	14.7	5	4.8	7.1	4	0.6	8.9	1.9	1	12	59.6
Cuttack	12	4	8.8	7.8	4.5	0.9	6.9	2	1	11	59.1
Bhadrak	14.7	3	6.1	6.5	1.6	0.9	11.7	1.9	1	10	57
Jajpur	16.8	4.5	2.5	5.6	3.6	0.8	7.5	1.9	1	10	54.5
Dhenkanel	14.7	1.5	4.3	5.1	3.5	1	8.3	1.4	1	14	54.5
Mayurbhanj	14.4	1.5	3.1	9	4	0.8	10.2	1.4	1	9	54.2
Kalahandi	12	2.5	4.8	8	3.5	1	8	2.4	1	11	54.2
Deogarh	9.6	1.5	4.6	7.8	4.5	0.8	11.1	1.9	0	12	53.7
Kendrapara	9.6	3.5	5.9	7.3	4.5	0.6	8.3	1.9	1	11	53.6
Sonepur	9.6	2	4.7	8.5	4	0.6	9.9	1.9	1	11	53.4
Baragarh	9.6	3	6.4	7.1	4.1	0.6	9.9	1.4	1	10	53.1
Keonjhar	16.8	1	2.9	6.9	4	0.8	8.4	1.9	0	10	52.5
Jagatsinghpur	9.6	4.5	3.7	5.5	4.6	0.6	7.1	1.9	1	10	48

Ganjam	9.6	3	3.7	6.3	4.5	0.8	8.3	1	1	10	47.9
Nuapada	9.6	3	5.2	4.8	4	0.9	7.8	1.4	1	9	47
Rayagada	7.2	3.5	4.3	6.8	3.6	0.9	7.1	1.9	1	10	45.8
Sambalpur	7.2	4.5	5.2	4.1	3.3	0.6	10.2	1.4	0	9	45.7
Jharsuguda	2.4	2.5	5	5.1	3.5	0.8	11.7	1.9	0	10	42.4
Nawarangpur	2.4	4	5.9	7	2	0.8	7.1	1.4	0	12	42.2
Bolangir	12	2	0.4	4.5	3.5	0.9	5.6	1	0	11	41.2
Boudh	2.4	2.5	5.2	6.3	2.6	0.6	10.5	1.4	1	8	40.5
Malkangiri	9.6	3	2.1	2	3.5	1	8.3	1.9	0	9	40.3
*CapitalHospital, Bhubaneswar	30	3.5	6.6	8.5	5	0	11.7	0	1	14	80.4
*RourkelaGeneralHospital	9.6	4	6.4	7.3	4.5	1	8.9	1.4	0	12	55.5
Total	/30	/10	/10	/10	/5	/1	/15	/3	/1	/15	/100

*Non-DHH facilities

ANNEX 4: Ranking of district headquarter hospitals by quality of care components

District Headquarter Hospital (DHH)	INPUTS						PROCESSES			OUTPUTS	
	Staff	Infrastructure	Equipment	Drugs	Non-clinical Service	Register	Good Practice	Referral	Recording	Clinical Services	Composite score Ranking
Puri	3	3=	3=	2=	1=	1=	25=	19=	3=	1=	1
Nayagarh	13=	1	1=	5=	4=	7=	5=	19=	19=	8=	2
Gajapati	2	3=	12	29	4=	15=	21=	1=	3=	3=	3
Khurdha	4	6=	5	15=	19=	23=	2	1=	19=	14=	4
Anugul	8=	6=	11	3=	7=	1=	5=	1=	3=	14=	5
Koraput	5=	2	7=	24	1=	7=	14	19=	3=	14=	6
Balasore	1=	29=	16=	27	12=	1=	1	19=	19=	14=	7
Kandhmal	17=	11=	3=	7=	1=	7=	9=	19=	3=	3=	8
Sundergarh	8=	5	18=	11=	14=	23=	15	1=	3=	5=	9
Cuttack	13=	11=	1=	7=	7=	7=	29	1=	2=	8=	10
Bhadrak	8=	16=	7=	17	30	7=	3=	1=	3=	14=	11
Jajpur	5=	6=	28=	20	19=	15=	24	1=	3=	14=	12=
Dhenkanel	8=	26=	22=	22=	22=	1=	17=	1=	19=	1=	12=
Mayurbhanj	12	26=	26	1	14=	15=	9=	1=	19=	26=	14=
Kalahandi	13=	21=	18=	5=	22=	1=	21=	1=	1=	8=	14=
Deogarh	17=	26=	21	7=	7=	15=	5=	19=	3=	5=	16
Kendrapara	17=	14=	9=	10	7=	23=	17=	1=	3=	8=	17
Sonepur	17=	24=	20	3=	14=	23=	12=	1=	3=	8=	18
Baragarh	17=	16=	6	11=	12=	23=	12=	1=	19=	14=	19
Keonjhar	5=	29=	27	14	14=	15=	16	19=	3=	14=	20
Jagatsinghpur	17=	6=	24=	21=	4=	23=	25=	1=	3=	14=	21
Ganjam	17=	16=	24=	18=	7=	15=	17=	1=	29=	14=	22
Nuapada	17=	16=	13=	25	14=	7=	23	1=	19=	26=	23

Rayagada	26=	14=	22=	15=	19=	7=	25=	1=	3=	14=	24
Sambalpur	26=	6=	13=	28	27	23=	9=	19=	19=	26=	25
Jharsuguda	28=	21=	17	22=	22=	15=	3=	19=	3=	14=	26
Nawarangpur	28=	11=	9=	13	29	15=	25=	19=	19=	5=	27
Bolangir	13=	24=	30	26	22=	7=	30	19=	29=	8=	28
Boudh	28=	21=	13=	18=	28=	23=	8	1=	19=	30	29
Malkangiri	17=	16=	29=	30=	22=	1=	17=	19=	3=	26=	30

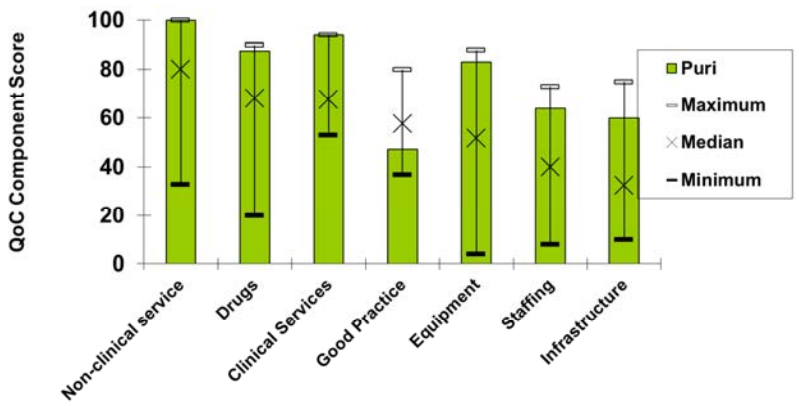
ANNEX 3: Scores and Ranking of district headquarter hospitals by quality of care inputs, processes and outputs

District Headquarter Hospital (DHH)	INPUT		PROCESS		OUTPUTS	
	Scores	Ranking	Score	Ranking	Score	Ranking
Puri	48.3	1	8.9	28=	14.1	1=
Nayagarh	41.8	2	12.5	5=	11.4	8=
Gajapati	40.7	3	10.8	15=	13.1	3=
Khurdha	39.3	5=	14.3	2=	10.2	14=
Anugul	38.8	5=	14	2=	9.8	14=
Koraput	40.3	4	11	15=	10.1	14=
Balasore	37.5	7=	13.4	5=	10.1	14=
Kandhmal	35.5	9=	12.1	11=	12.8	3=
Sundergarh	36.2	9=	11.8	11=	11.7	5=
Cuttack	37.9	7=	9.9	20=	11.3	8=
Bhadrak	32.8	12=	14.6	1	9.6	14=
Mayurbhanj	32.7	12=	12.6	5=	8.9	26=
Jajpur	33.8	11	10.4	20=	10.4	14=
Dhenkanel	30.1	18	10.7	15=	13.8	1=
Kalahandi	31.8	14=	11.3	15=	11.1	8=
Deogarh	28.7	19=	13	5=	12	5=
Kendrapara	31.4	16=	11.2	15=	11.1	8=
Sonepur	29.4	19=	12.8	5=	11.3	8=
Baragarh	30.9	16=	12.3	11=	9.9	14=
Keonjhar	32.3	14=	10.3	20=	9.9	14=
Jagatsinghpur	28.5	19=	9.9	20=	9.6	14=
Ganjam	27.8	22=	10.2	20=	9.9	14=
Nuapada	27.4	23	10.2	20=	9.3	26=
Rayagada	26.3	24	9.9	20=	9.6	14=
Sambalpur	24.9	25	11.6	11=	9.2	26=
Jharsuguda	19.2	30	13.6	2=	9.6	14=
Nawarangpur	22	27	8.5	28=	11.7	5=
Bolangir	23.3	26	6.5	30	11.4	8=
Boudh	19.6	29	12.9	5=	8	30
Malkangiri	21.2	28	10.1	20=	9	26=
RourkelaGeneralHospital*	32.8		10.3		12.5	
CapitalHospital, Bhubaneswar*	53.6		12.7		14.1	
Total	/66	/30	/19	/30	/15	/30

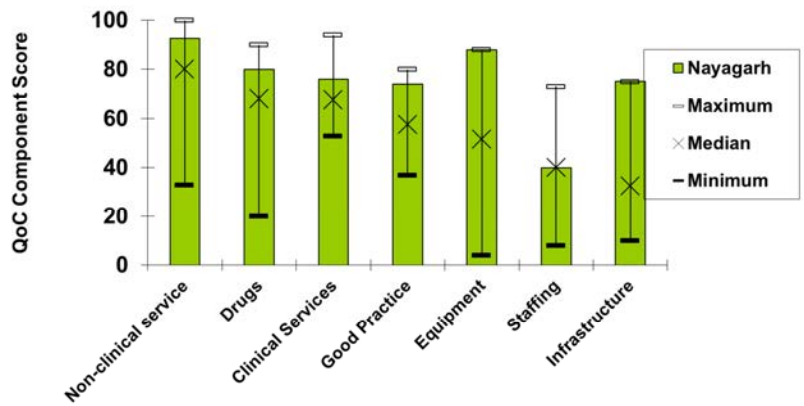
*Non-DHH facilities

Annex 4: District Wise Composite Score Ranking

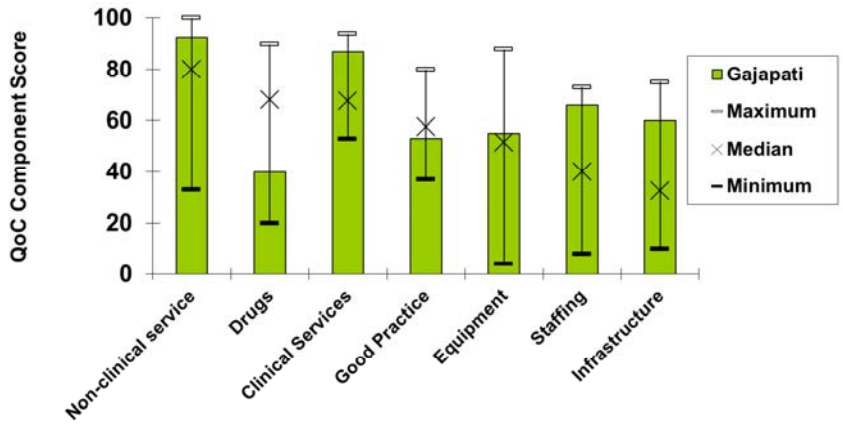
Puri



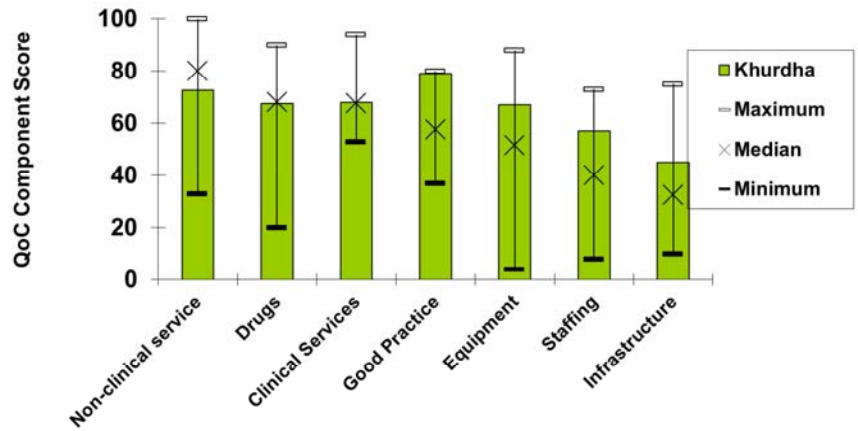
Nayagarh



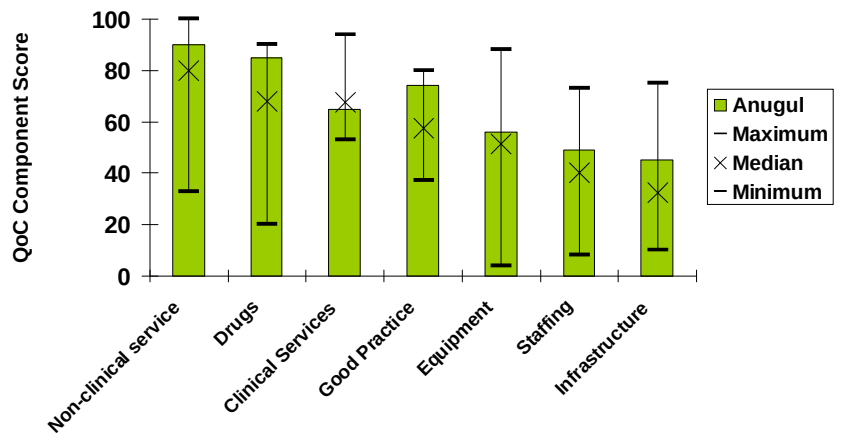
Gajapati



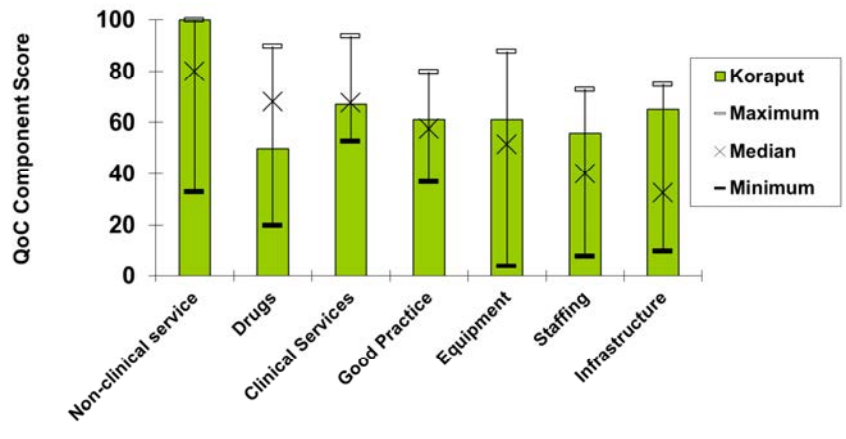
Khurdha



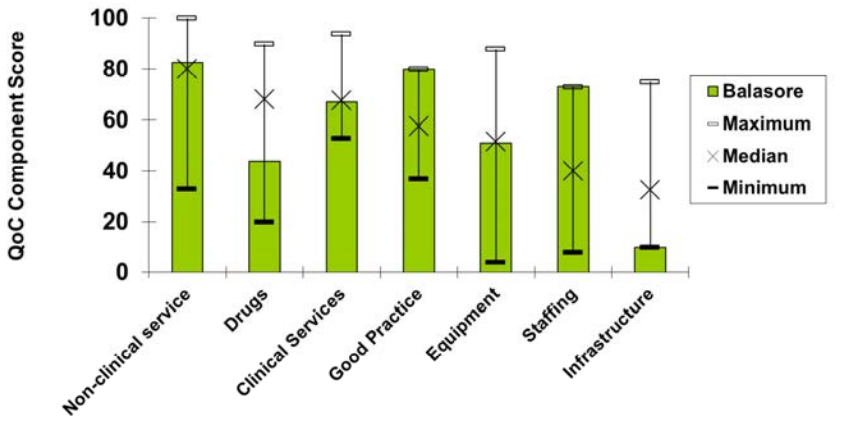
Anugul



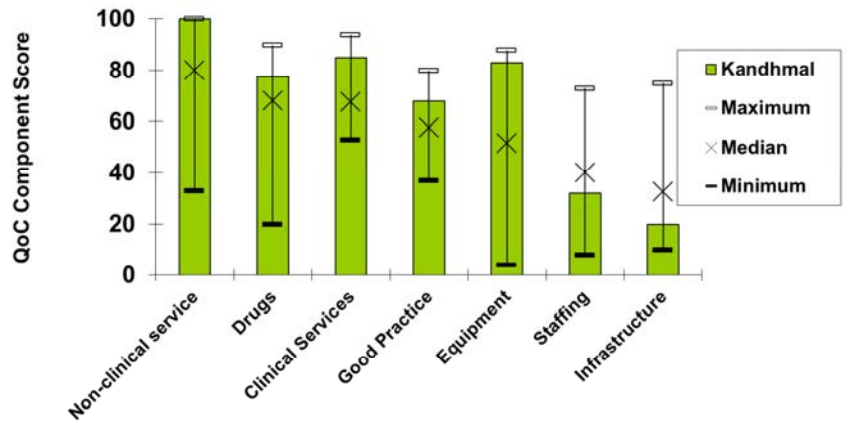
Koraput



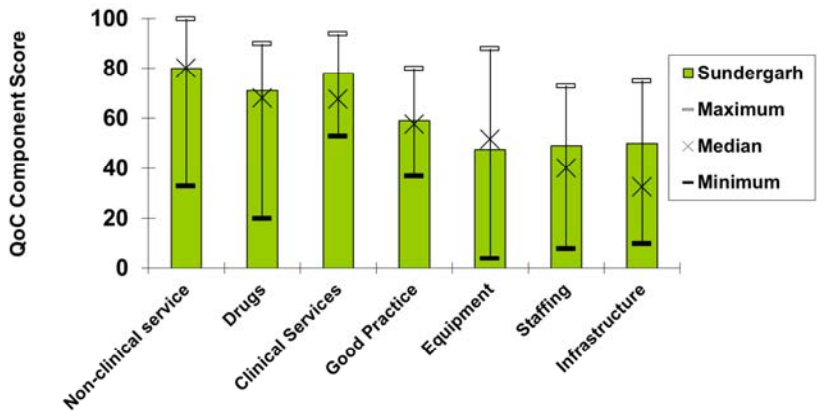
Balasore



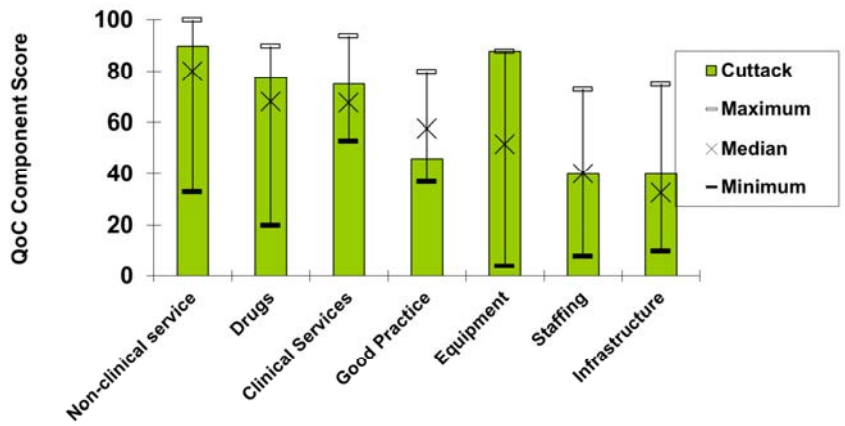
Kandhmal



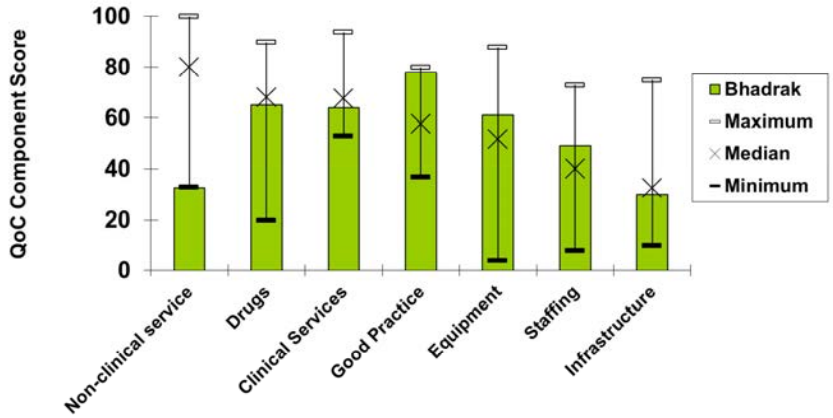
Sundergarh



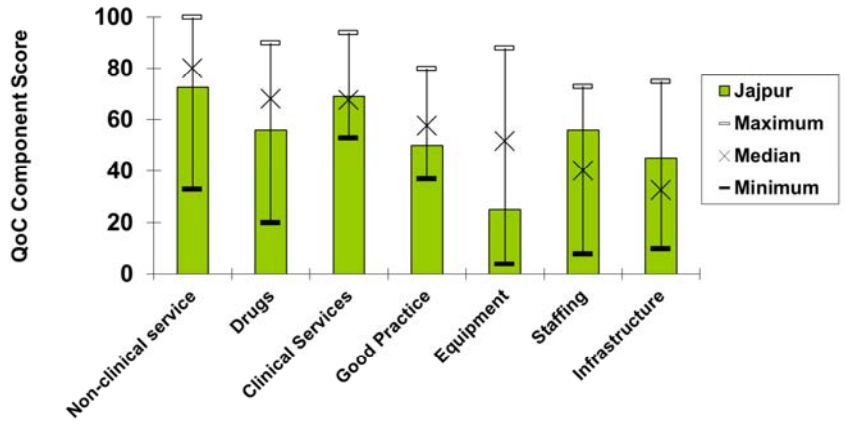
Cuttack



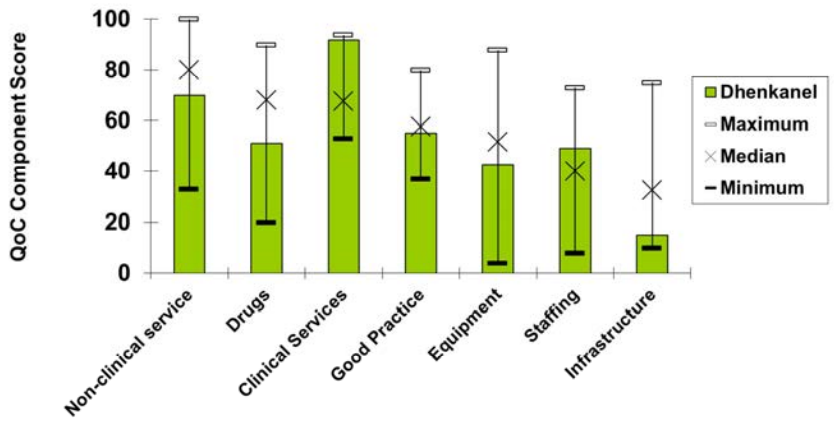
Bhadrak



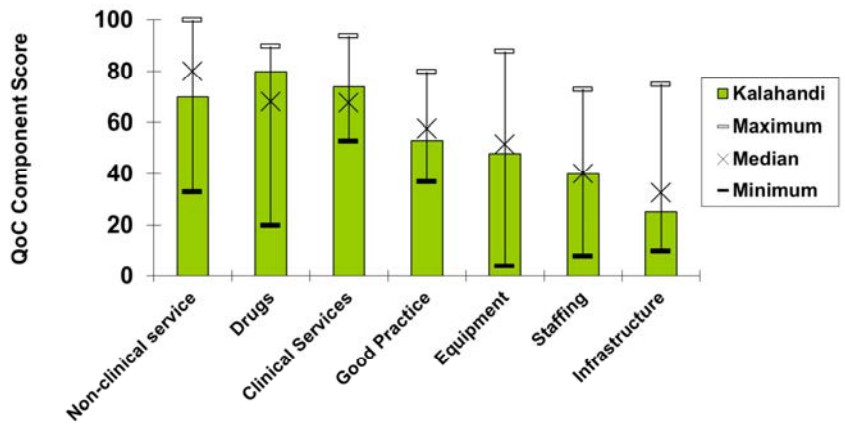
Jajpur



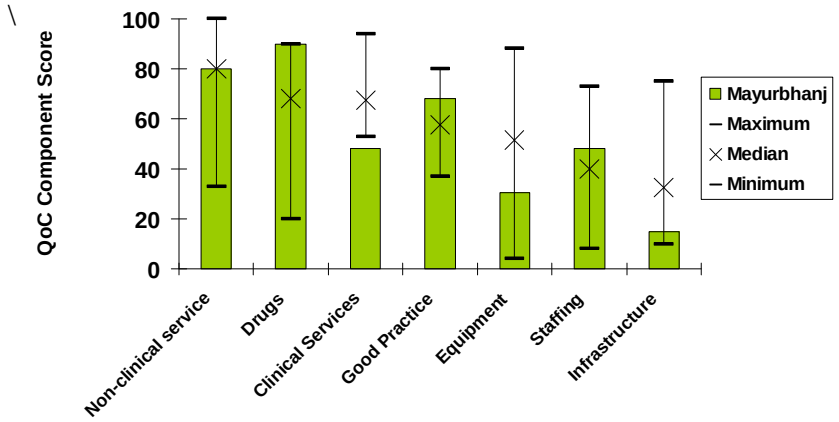
Dhenkanel



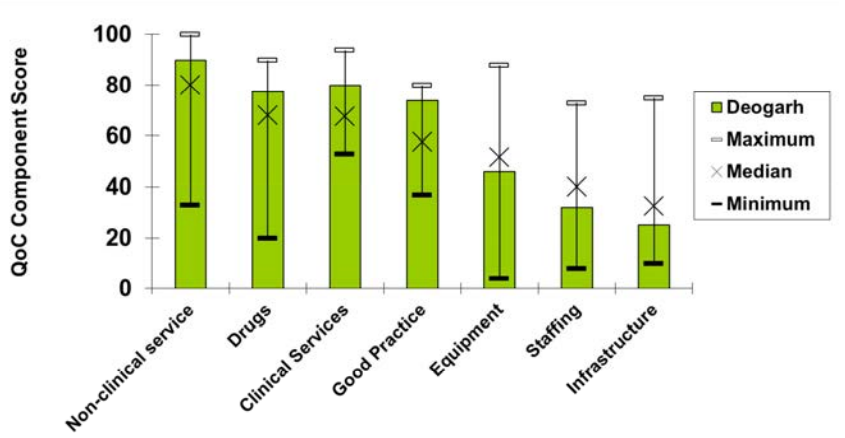
Kalahandi



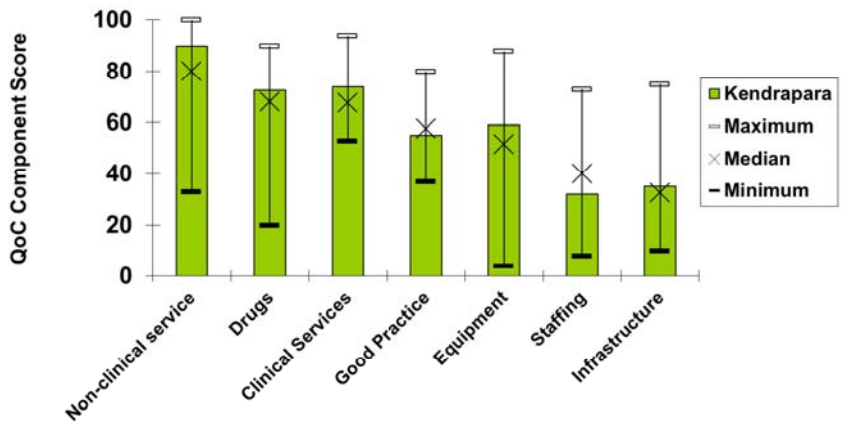
Mayurbhanj



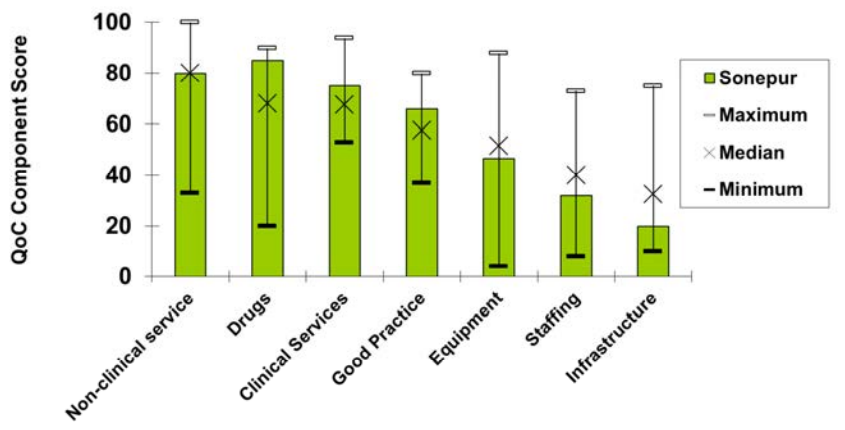
Deogarh



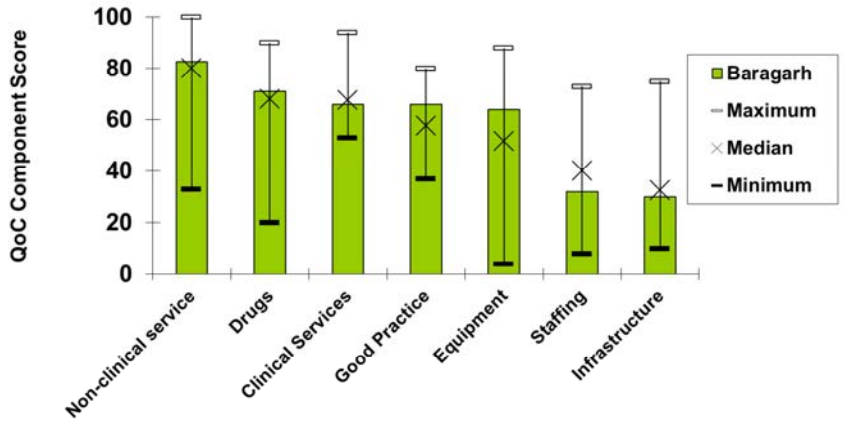
Kendrapara



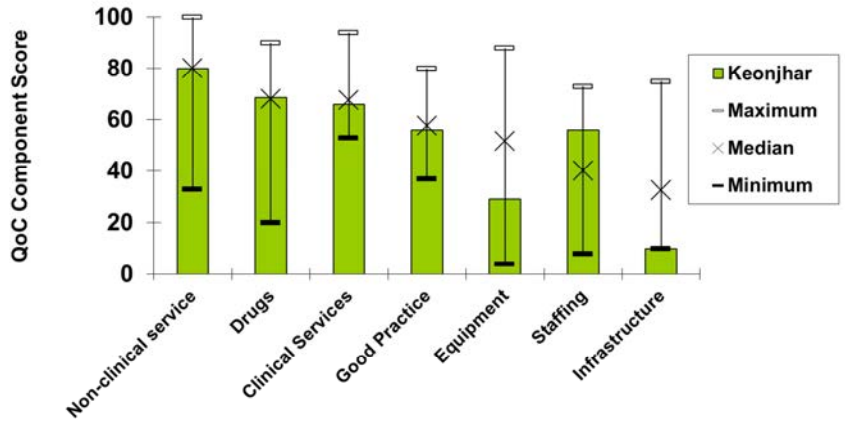
Sonepur

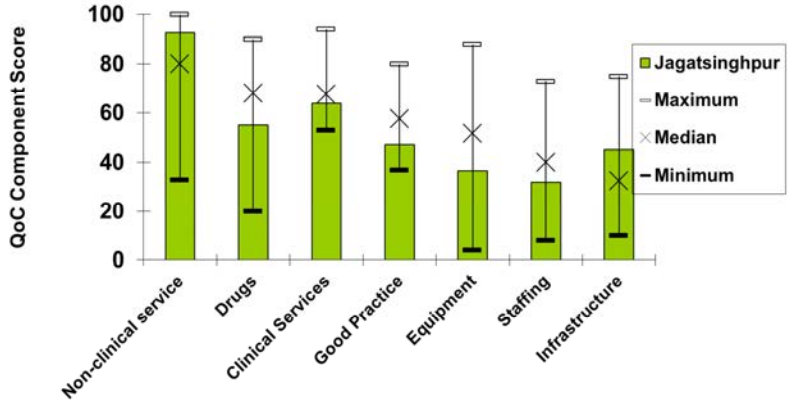
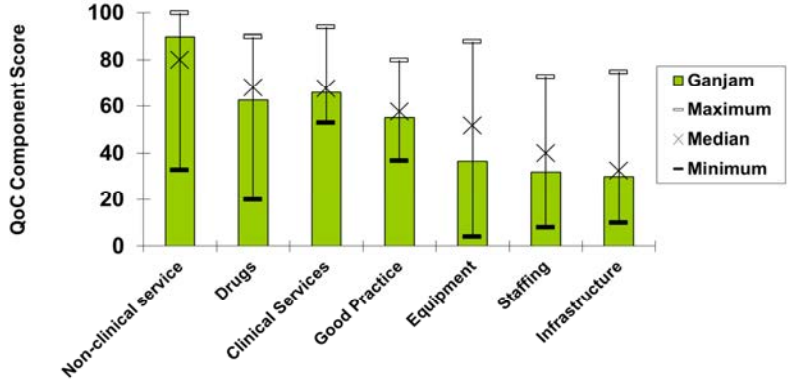
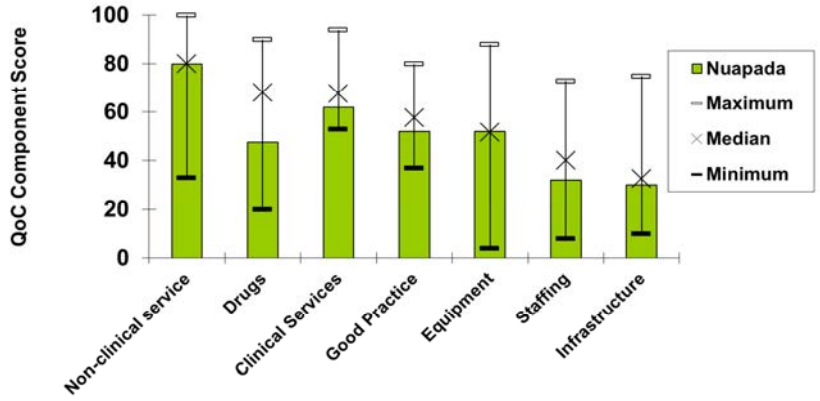
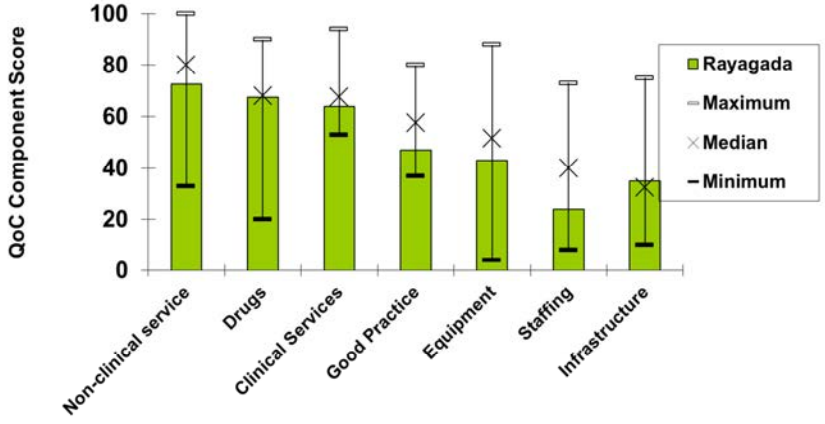


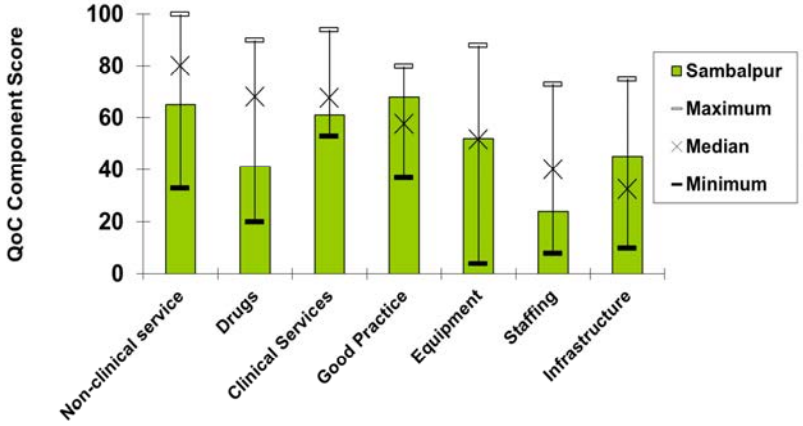
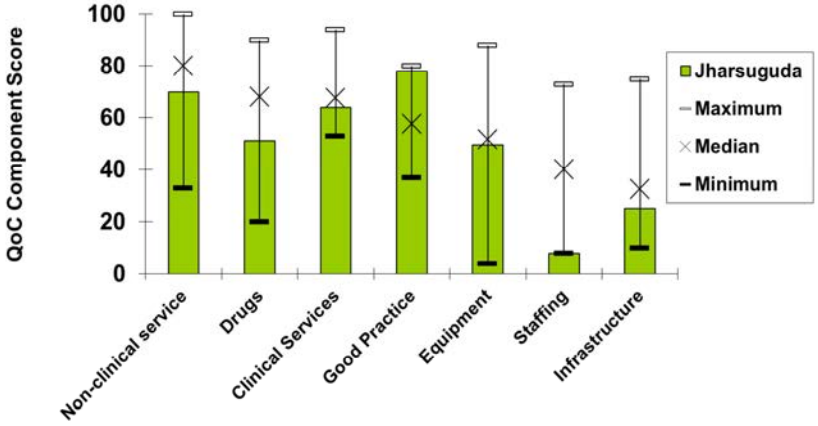
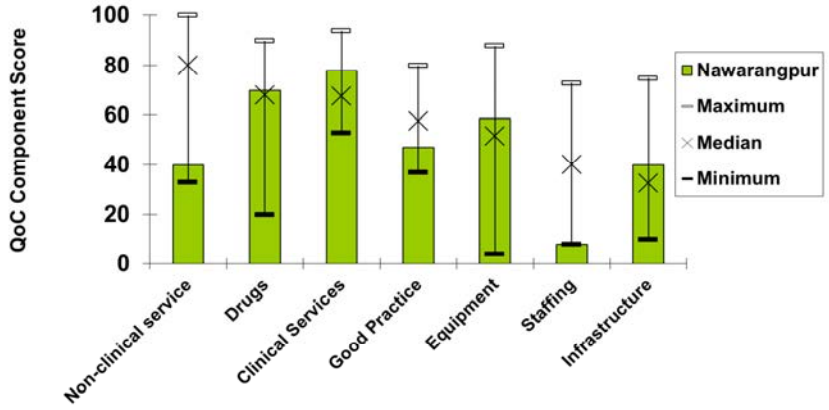
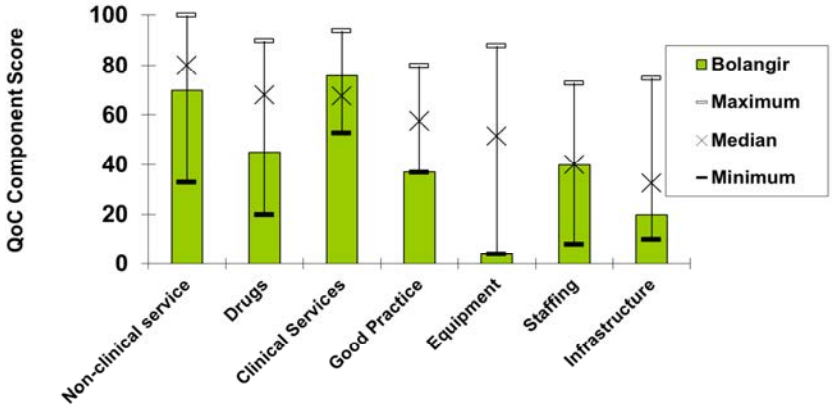
Baragarh

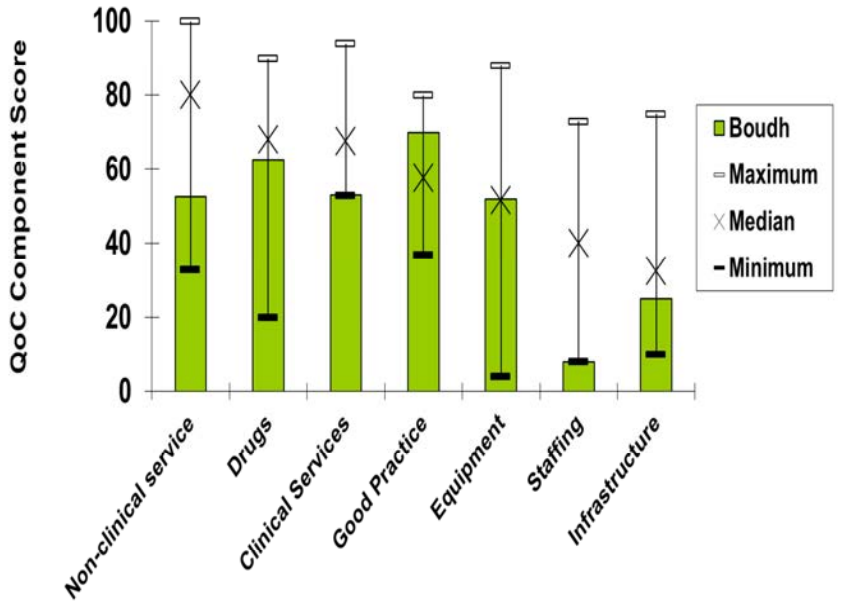
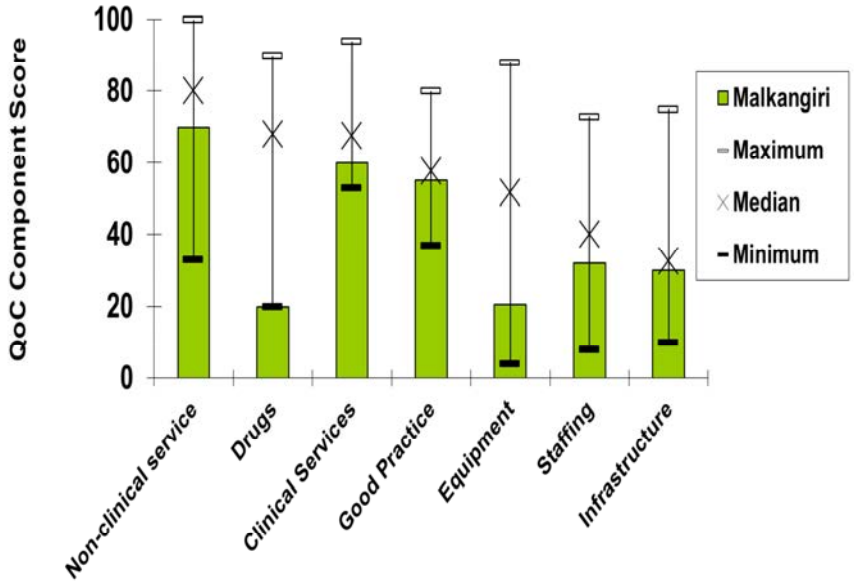


Keonjhar



Jagatsinghpur	Ganjam
	
Nuapada	**Rayagada**
	

Sambalpur	Jharsuguda
	
Nawarangpur	**Bolangir**
	

Boudh	Malkangiri
	

Overall, the QoC exercise has been a very intensive learning experience that brings us face to face with both the massive achievements made and the major challenges that need to be addressed. The price of success is evident. Where systems have improved, demand has increased, thereby putting pressure on quality. Much needs to be done. We hope this assessment will help to light the path that needs to be chosen.