

# Feasibility Study of Mother and Child Hospital in NCR

*By*

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*Dissertation submitted for the partial fulfillment of the  
MBA Hospital and Health Management*

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**TO WHOMSOEVER IT MAY CONCERN**

This is to certify that **Dr. Ramandeep Kaur** student of MBA Hospital and Health Management from The IIHMR University, Jaipur has undergone internship training at **PricewaterhouseCoopers, Gurgaon** from 7<sup>th</sup> March 2016 to 27th May 2016.

The candidate has successfully carried out the study designated to her during internship training and her approach to the study has been sincere, scientific and analytical.

The internship is in fulfillment of course requirements.

I wish her success in all her future endeavors.



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**To Whomsoever It May Concern**

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She has exhibited a keen interest in learning and has positive attitude. She is sincere and hard working. The efforts put in by her for the project and the analysis of the subject carried out during the training was outstanding.

We wish **Ramandeep Kaur**, the best in her future endeavors.

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**CERTIFICATE BY SCHOLAR**

This is to certify that the dissertation titled '**Feasibility study of mother and child hospital in NCR**' and submitted by Ms. Ramandeep Kaur under the supervision of Dr. Barun Kanjilal for award of Postgraduate Diploma in Hospital and Health Management of the University carried out during the period from 16<sup>th</sup> February 2016 to 27<sup>th</sup> May 2016 embodies my original work and has not formed the basis for the award of any degree, diploma associate ship, fellowship, titles in this or any other Institute or other similar institution of higher learning.



Signature

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Sincerely  
Dr. Ramandeep Kaur  
(MBA HM, 2014-2016)

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## **Abbreviations/ Acronyms:**

| <b>Term</b> | <b>Definition/Meaning</b>                                         |
|-------------|-------------------------------------------------------------------|
| AIIMS       | All India Institute of Medical Sciences                           |
| ALOS        | Average Length of Stay                                            |
| ARPOB       | Average Revenue per Occupied Bed                                  |
| ART         | Assisted Reproductive Technology                                  |
| ASD         | Artificial Septal Defect                                          |
| BMT         | Bone Marrow Transplant                                            |
| CAGR        | Compounded Annual Growth Rate                                     |
| CGHS        | Central Government Health Scheme                                  |
| CHC         | Community Health Centre                                           |
| CKD         | Chronic Kidney Disorder                                           |
| CSSD        | Central Sterile Services Department                               |
| EBITDA      | Earnings Before Interest, Taxes, Depreciation and Amortization    |
| ENT         | Ear-Nose-Throat                                                   |
| FY          | Financial Year                                                    |
| HIV/AIDS    | Human Immunodeficiency Virus /Acquired Immune Deficiency Syndrome |
| ICSI        | Intra-Cytoplasmic Sperm Injection                                 |
| IVF         | In Vitro Fertilization                                            |

|      |                                |
|------|--------------------------------|
| Mn   | Million                        |
| NCD  | Non-Communicable Diseases      |
| NCR  | National Capital Region        |
| NICU | Neonatal intensive care unit   |
| OPD  | Out Patient Department         |
| PDA  | Patent ductus arteriosus       |
| PICU | Paediatric intensive care unit |
| VSD  | Ventricular Septal Defect      |

# Internship Report

## 1.1 Objective of the internship

The primary objective of the internship is to get practical exposure and understanding of the hospital structure. This gives insight to the factors responsible for setting up a hospital. It gives a fair idea about the market assessment and looking for the gaps which can be further converted into opportunities. It helps in liaising with the team as well as members of the other teams.

## 1.2 Profile of the organization

PricewaterhouseCoopers is a multinational professional services network headquartered in London. It is one of the Big four auditing firms. It was founded in 1998. It is serving various areas worldwide. The offices are located in 756 locations, 157 countries of the world. The firm consists of three service lines that are assurance, advisory and tax. The largest share is constituted by the assurance that is 45%. It acts on the theory of global reach and use of resources to help governments, businesses and healthcare industry players accomplish their missions in today's dynamic and competitive environment. PwC provides health organizations with expert guidance regarding healthcare issues in their local markets as well as on operating in global markets.

This brand is developed with a broad mix of service lines that include foods, manufactured goods, communication devices, automobiles and information systems. PwC is known for maintaining working relationships with clients to improve operational performance in many functional areas. The global network of firms provides comprehensive advisory services such as management consulting, business assurance, tax, finance, advisory services, human resources solutions and business process outsourcing services. The distinguishing and value adding feature is experience in various industries and functional areas. The variable experience is highly valuable to clients as healthcare becomes increasingly interconnected with other industries. The healthcare is adopted by all the industries in one or the other form. The leadership initiatives of the firm benefits the client. The relevant best practices that emerge from engagements with other industries such as consumer products, telecommunications and manufacturing are tried to be incorporated into

the healthcare to get the best results. The client team consist of a broad range of experts, including medical practitioners, clinicians, nurses, biomedical and pharmaceutical specialists, and health policy experts. We have a team of dedicated professionals with practical experience and understanding of the industry.

PwC provides business insights to the new entrants, private investors and investors working on the model of the public private partnership. The firm explores mergers and acquisitions to expand the services and sustainability. It works in providing solutions and best practices to firms providing healthcare. It works with the governments, private investors, funding agencies or providers.

### **Mission statement of PwC**

PricewaterhouseCoopers mission is to provide an unrivaled level of service and to contribute to the sustained growth of the economy through the execution of vigorous, fair, and high-quality audits based on clear leadership and creative teamwork.

### **Code of Conduct**

PwC experience means:-

1. Invest in teams and relationships
2. Share and collaborate with clients and team members.
3. Put ourselves in each our client's shoes
4. Focus on enhancing the client value.

Given this solid foundation, it helps plan and execute high-quality audits that are based on a comprehensive understanding of our client's strategies, objectives, and plans, to ensure that clients will have an experience that is unrivaled.

## **1.3 Background of the project**

The objective of the project undertaken as part of my internship was to gain an understanding of the technical and financial factors which determine the successful design of a hospital. PricewaterhouseCoopers is a firm that is involved in performing feasibility reports for the hospitals. This projects are done for healthcare providers, payers and investors, both new and existing as well. For the existing providers, sometimes the projects are related to the expansion of the whole hospital or a unit (for e.g- cardiology unit) of the hospital. The time period of the internship was 3 months. The assigned project was performing feasibility

study of the mother and child hospital in NCR. Due to privacy and confidentiality policy of the PricewaterhouseCoopers, the identity of the client is not disclosed.

The client owned land in the NCR area with easy accessibility from both the airport and metro stations. The client wanted to open a mother and child hospital. The report is based on assessing the demand and supply for the hospital. Exploring the statistics and market assessment is the backbone of the project. It focuses on projections of the project after 4-5 years. This project gives an insight about the models for the healthcare. This project helped in building relationships with the team members as well as client.

I was involved in secondary research during the internship. I was assigned to prepare decks on healthcare opportunities and other projects along with team members. Besides that I was also part of few proposals for some other projects. It gives an insight to the healthcare industry.

# Dissertation

TOPIC- Feasibility study on mother and child hospital in NCR.

## Executive Summary

Hospital is the most visible face of Healthcare Industry. It is not just a building but a complex social institution that is composed of many subgroups which are further representing a variety of interests and diverse needs. In the modern hospitals, buildings are designed to minimize the effort of medical personnel as well reducing the possibility of contamination.

With renewed interest in facility construction, expansion or renovation, fundamentals of developing successful projects have not changed. Even before architectural designs are created, organizations need to assess their market opportunities, develop prudent business plans and monitor execution. The building blocks for this entire process are technical and financial feasibility study.

This study was focused on designing the feasibility study of the mother and child hospital with major focus on pediatrics super-specialty services. The major areas focused while preparing the report for mother and child hospital is related to market analysis, estimates of how the population in the particular region will change over time, analysis of the demographic changes or other market forces and how they will influence payment for services, understanding of the regulatory environment in which the new facility is constructed/formed.

The methodology adopted for this study is collecting data through secondary research from the journals, fact sheets and various publications related to health statistics and planning hospitals. The various health models are also reviewed and positioning strategies are also considered.

This hospital is designed to fulfil the need for a multi-super specialty children hospital in North India. It addresses to the demand for medical care for entire value chain from conception, prenatal, birth, neonatal, paediatric and adolescent under one roof. This hospital would be pioneer of academics and research in paediatric and paediatric sub specialities in India. The report also gives a projection of the

financial aspects of the hospital. The projection shows breakeven achievement in 4 years.

## **INTRODUCTION**

There is great need of mother and child hospital in India. The continuum of care is the need of the hour. The continuum covers the range from the IVF/ART till adolescent care covering pregnancy, fetal medicine, neonatal care, pediatric care. This project report is based on the feasibility study of the mother and child hospital in NCR region. This includes an overview of the healthcare in India based on various parameters. The next section gives insight to the healthcare of the NCR region along with demand of the mother and child health related facilities.

The feasibility study of this project is based on the 160 bedded mother and child hospital located in NCR region. The major focus of this hospital is providing specialized care to the mother and pediatric problems.

Indian healthcare industry is a booming industry with a growth rate of 12% CAGR. It is expected that the Indian healthcare industry is driven by sustainable growth factors due to which the growth of this industry is projected to approximately \$175 billion by 2020. The size of the healthcare market in year 2010 was approximately \$75, which has grown to \$99 by 2014 – 2015. The market revenue breakup constitutes of 51% by hospitals, 19% by pharmaceuticals and about 5% by the diagnostics. The growth factors responsible for this industry are favorable demographics and emerging middle class, increase incidence of the lifestyle diseases, increased awareness and penetration of the health insurance in the market. Other factors include rapidly organizing health delivery through expansion of traditional healthcare players and entry of non-health corporates into healthcare with new and innovative delivery models. On the other hand there are increased investments from PE funds and medical value travel advantage.

The NCR caters to healthcare need of approximately 5.3 crore residents and the patients from neighbouring states are about 33% of total intake at major hospitals. The projected growth of healthcare delivery market in NCR is at a rate of 12%. With favourable demand dynamics and a significant infrastructure gap, Delhi

offers significant opportunity to expand healthcare services. In India, the high percentage of 0 – 14 years age group population approximately 30% gives rise to opportunities across maternal and child care value chain. In 2011, age group 0-6 years constitutes about 11.6% of the total population.

The problems like largely unorganised Infertility treatment, makes the market a lucrative proposition. Nowadays, hospitals and health centres are providing specialized services to make pregnancy an experience. Globally, India accounts for the highest number of still births and most are avoidable through continuous monitoring and clinical intervention by qualified medical professionals. Around 779,000 neonates die in India every year and a large number of them cannot be saved because of shortage of NICU. Other problems include Neonatal Intensive Care infrastructure is in short supply in Delhi NCR. Paediatric issues like 1.5 lakh infants are born in India every year with congenital heart disease out of which approximately 78,000 die because of inadequate health care facilities in the country. Despite of these issues India has a handful of dedicated paediatric centres leading to a demand supply imbalance.

Delhi NCR does not have any private dedicated super specialty children's hospital dealing with this specialized care. In Delhi NCR, the facilities are available in different hospitals; there is need of all the facilities under one roof with infrastructural design emphasis on children. The Women & Child space is largely dominated by multi-specialty hospitals, but increasingly people are preferring single specialty centres. The boutique birthing centres are able to command much higher pricing than the large multi-specialty hospitals. So this project worked on the concept of providing exclusive care to mother, foetus, neonatal and children for their tertiary care needs.

## **LITERATURE REVIEW**

The healthcare market in India was approximately \$60 billion in year 2011 (WHO 2012) and projected to grow by \$175 billion by 2020 (PwC analysis). With a sustainable demand leading to emergence of various private healthcare businesses along the different value chain. There is continuous growth on the demand side as the population dynamics are changing rapidly. Increasing life expectancy and ageing of population are the major factors. According to Population Foundation of India, India's life expectancy has increased from 60.2 years in 2000 to 67.7 years in 2013 as a result of concerted efforts to tackle communicable diseases. As a result, the proportion of the elderly in India's population will rise and is expected to increase to nearly 8% by the year 2031.

There is increased dual burden of both chronic and acute diseases represent considerable healthcare burden (WHO 2012). Patients demanding better healthcare as awareness is rising which further leads to increase in treatments. Awareness of treatment options for major diseases is also contributing factor to the rise in hospitalisation cases across India. Other factor includes health insurance as stimulating factor for the growth of healthcare delivery. The health insurance premium collected in year 2015 is \$3 and is expected to grow by \$15 billion by 2020 (IRDA report)

Delhi NCR has emerged as a well-developed regional medical hub marked by presence of various quality healthcare facilities. Delhi has a network of various healthcare formats ranging from quaternary care centres (AIIMS, Medanta, FMRI, IP Apollo, Max-Saket), major tertiary care centres (Fortis, Gangaram, Artemis) as well as multiple single specialty formats for ophthalmology, dialysis, dental etc which are of a fairly recent origin. According to industry discussions, more than 50% of the patients catered by these hospitals are from outside Delhi NCR seeking super specialty care. The driving growth factors for Delhi emerging as a medical hub are population and economic growth, rise in health insurance, attraction by the medical tourist and availability of specialized medical staff.

According to Department of Health and Family welfare, NCR healthcare delivery market is estimated at INR 13,171 crore, projected to grow at CAGR of 12%. The number of govt. health facilities in Delhi NCR are 658 and private hospitals/nursing homes are about 1488. There is presence of maximum accredited modern hospitals in Delhi that makes it the biggest medical travel destination in India.

With favourable demand dynamics and a significant infrastructure gap, there are possibilities for expansion in the Delhi NCR region. The crude birth and death rate of Delhi are 17.2 and 4.1 respectively. The infant mortality rate in Delhi is 24.

As per WHO standards, 2.7 beds are required per 1000 persons and considering the growth in demand and future supply, the gap for the beds is expected to increase to 5,217 beds by 2020. There is a planned addition of 2000 beds in NCR in the next five years. The number of beds catering to the critical care are approximately 26% of the total beds (Industry discussions). The current facilities cater to 5.3 crore residents of Delhi region and the expected growth rate of the population is 1.9% by per year.

In India, 30% of the population lies between 0-14 years of age. It gives rise to opportunities across maternal and child care value chain. Out of which 0-6 years age group, constituted 11.76 % of Delhi's total population. (Health Nutrition and Population statistics 2015)

There is lucrative proposition in In Vitro Fertilization (IVF). The assisted reproductive technology increases with a CAGR of 18% to 23% from \$255 mn to \$2833 mn. Infertility affecting 10-15% of married couples in India and has around 22-33 million infertile couples (Ernst & Young report 2013). It also receives a lot of patients from neighbouring countries, Africa and middle-east for ART treatment. There are around 1200 registered ART centres across India, but according to estimates there would be more than 4000 centres in unorganised sector. Only few have been able to make a mark in India. Most centre in India are stand alone. Few like Nova have started a chain of IVF centres across India. It is to be noted that of the total 1 lakh cycles performed in 2015, Delhi NCR had the maximum number with 12,000 cycles. This indicates that there is an existing adequate requirement in Delhi NCR region. Also looking at the lifestyle, these problems are to increase in the future as well. There are efforts by the hospitals and investors to make pregnancy an experience for the women by providing specialized care.

India accounts for the highest number of still births and most are avoidable through continuous monitoring and clinical intervention by qualified medical professionals.

Number of still births in India are around 605000 in 2014(Medscape 2014).Early neonatal deaths and stillbirths usually have obstetric causes and largely preventable if good quality obstetric care is made available at the right time. Most common cause of intrauterine foetal death was found to be hypertensive disorder. Taking pregnant women through wellness regime and psychological support is known to reduce hypertension both in women and foetus.High degree of monitoring required specially in high risk pregnancy because of complications with mother or foetal anomalies.

Preterm birth (before 37 weeks gestation) remains the single biggest cause of neonatal death worldwide. It is now the second most common cause of death among under-five children, and is responsible for 1.1 million deaths every year. Of the 26 million birth annually in India, approximately 4 million are premature birth. All these premature new born need intensive care which is in short supply in India.Three causes accounted for 78% of all neonatal death are prematurity and low birth weight, neonatal infection & birth asphyxia and birth trauma(National Health Profile 2015).There are only handful of hospitals in India having treatment facility for congenital disorders.Some of the Public Hospitals like AIIMS, SGPGI, PGI have good facilities for congenital disorder treatments.On the contrary, there are very few private hospital which are equipped for the same.

According to Delhi government report for birth and death registration 2014, birth rate in Delhi is 20.88 birth per 1000 population.The average number of births per day in Delhi worked out to 1,024 in 2014 as compared to 1,014 in 2013.In 2014, there were 3.74 lakh births in Delhi state. Of this, 82.83% i.e. 3.1 lakhs births are institutional births. About 66 per cent of institutional births took place in government hospitals and 34 per cent in private hospitals. Strong growth expected in birthing market is mainly driven by emerging niche segments. The growth factors responsible are strong latent demand for organized birthing care, underserved market with few focused, national birthing chains, lack of super specialization to provide trauma and surgical care few chains focused on celebrating the birthing experience.

Around 779,000 neonates die in India every year, and a large number of them cannot be saved because of shortage of NICU. 1/3<sup>rd</sup> of all new born deaths within 24 hours of birth happen in India. The cause of deaths of under five children in 51.8% cases is due to neonatalservices. Further the neonatal services responsible for death are preterm delivery, severe infections, congenital diseases, asphyxia, diarrhoea and others.Delhi NCR has approximately 600 NICU beds but needs approximately 1787 NICU beds. Most of these available beds falls into lower levels of NICU (Level I and Level II). While majority of the premature births and

births with congenital defects need level III NICU. Public hospitals have about 250 NICU beds compared to approx. 350 NICU beds in the private sector.

Every year 1.5 lakh infants are born in India with congenital heart disease out of which about 78,000 die because of inadequate health care facilities in the country. More than 50% of children born with congenital heart defect require at least one invasive surgery in their lifetime (WHO health statistics 2015). The prevalence of neural tube defects such as Spina bifida is extremely high in north India (more than 4 per 1000 births), especially in the states of Punjab, Chandigarh, Haryana, New Delhi and Rajasthan.

Adolescents are young people aged between 9 to 19 years. It is a transitional stage of physical, physiological and psychological development from puberty to legal adulthood. They have poor knowledge and lack of awareness about physical and psychological changes that occurs during adolescence and the related health issues. In a conservative society like India reproductive and sexual health related issues are taboo for discussion, young people do not have much avenues to seek counsel for their needs. Also adolescents are prone to becoming victims to unwanted circumstances and incidents like sexual advances, drug and substance abuse, mental trauma and pressure, etc. Access and availability of health care services in India are severely limited for this age group's requirements. Around 14-20% girls show psychiatric morbidity during puberty and need medical support (Universal Journal of Psychology 2015).

The Women & Child space is largely dominated by multi-specialty hospitals, but increasingly people are preferring single specialty centres. Even though the boutique centres have lesser facilities and service lines than the multi super-specialty hospitals but as they are focussed only to women health, they have created niche service lines. The educated affluent class prefers the services of boutique centres to the multi super specialty centres.

Delhi NCR does not have any private dedicated super specialty children's hospital. It has few multispecialty hospital that deals with paediatric problems that requires specialized care. A dedicated Women & Child Super specialty Hospital with high end Neo Natal Intensive Care is required. Paediatrics sub specialties and adolescent care should be available under one roof with continuum of care.

## **OBJECTIVE**

- To assess the technical feasibility of mother & child hospital in NCR.

## **METHODOLOGY**

The study is based on quantitative technique. Secondary research involved review of literature, health statistics data from journals, sites like World Health Organization, fact sheets and various publications related to designing and planning hospitals. The data for this descriptive study is collected from the reliable sites like world health organization, health and family welfare, population foundation of India etc. The reports of the financial years has been studied and the trend between the financial years has been calculated along with CAGR.

The services available in the hospitals of NCR are studied through the websites of the hospitals. The positioning models for hospitals like Fortis, Max, Government hospitals, cloud nine, Private nursing homes are studied and a comparison has been drawn between them. The annual reports of the hospitals like Fortis, Apollo, Max, Mother and child hospital are reviewed for the bed occupancy, turnover rate, revenues etc.

The global health burden and the health estimates are reviewed from the website of WHO for the year 2013, 2014 and 2015. It gives fair idea about the health statistics and trends of the healthcare in India. The articles like ‘the future population of India’ has been reviewed from the website of Population Foundation of India 2012 to get estimate of the population of India and estimate of the growth pattern. The articles of the ‘Delhi Government of India’ and ‘National Family and Health Welfare’ for the current health status of the Delhi region and projections for the future healthcare.

## **RESULTS**

### **1. NEED ASSESSMENT**

This hospital is designed to fulfil the need for a multi-super specialty children hospital in North India. Address to the demand for medical care for entire value chain from conception, prenatal, birth, neonatal, paediatric and adolescent under one roof. This hospital would be pioneer of academics and research in paediatric and paediatric sub specialities in India. The hospital with an area of 180,000 sq.ft constitutes of 160 beds, out of which 68 beds for NICU & PICU beds.

### **SWOT Analysis for setting hospital in NCR:-**

SWOT analysis is a tool required for the scanning the microenvironment. The SWOT acronym stands for strengths, weaknesses, opportunities and threats. It is helpful in assessing the capabilities of the organization to the competitive environment. The strengths and weaknesses are internal parameters while threats and opportunities are external parameters. After doing the situation analysis of internal and external environment for the Mother and Child hospital in NCR, certain strengths and weakness come across. The major strength is the proposed location which is surrounded by the affluent population along with good connectivity to the airport as well as metro station. Weakness for this project is that it is an upcoming brand in the healthcare, attracting and retaining customers for a new brand is a challenge. The opportunities are easy availability of the specialists and super-specialists in NCR while threat to this model is the existence of already established brands in the nearby location.

**Table 1: SWOT analysis**

|                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strengths</b> <ul style="list-style-type: none"><li>• Proposed site is at premier location</li><li>• Affluent residential districts of Delhi nearby</li><li>• International &amp; Domestic airport being in the vicinity of the project site; potential to tap patients from within India and other neighbouring countries</li></ul>                                          | <b>Weakness</b> <ul style="list-style-type: none"><li>• Smaller land area limiting options in competitive market of South Delhi and Gurgaon</li><li>• No brand equity in healthcare space</li></ul>                                                                                                                                           |
| <b>Opportunities</b> <ul style="list-style-type: none"><li>• Easy flow of visiting specialists as some of the best hospitals are located nearby.</li><li>• Availability of eminent paediatric super specialist in Delhi NCR</li><li>• Absence of any dedicated children's hospital in North India, could become a destination for paediatric super specialty services.</li></ul> | <b>Threats</b> <ul style="list-style-type: none"><li>• Difficult to attract fulltime consultants at reasonable salaries because of hyper competitive market</li><li>• Presence of established hospital brands in close proximity</li><li>• From investment point of view gestation period is longer as compared to other industries</li></ul> |

## **2.PROPOSAL FOR A NEW HOSPITAL**

The services offered in the hospital would be:-

- IVF/ART
- Pregnancy
- Fetal medicine
- Neonatal care
- Pediatric care (1-5)
- Pediatric care (5-10)
- Adolescent care

The sub services offered by the hospital in each of the categories are as follows:-

Table 2.1: Sub services in the proposed hospital

| IVF/ART                                 | Maternity                                       | Birthing                       | Women Health                       |
|-----------------------------------------|-------------------------------------------------|--------------------------------|------------------------------------|
| IVF                                     | Regular check-ups                               | Normal Delivery                | Urological problems                |
| Intrauterine Insemination (IUI)         | Training and counselling related to child birth | Caesarean Delivery             | Family Planning                    |
| Intracytoplasmic Sperm Injection (ICSI) | High risk pregnancy monitoring and support      | Painless Delivery              | Menopause related Health Check ups |
|                                         | Foetal medicine                                 | Normal delivery post Caesarean | Gynaecology & Obstetrics           |

Table 2.2: Sub services in the proposed hospital

| Neonatology                                        | Paediatric Medicine                       | Paediatric orthopedics                                                                                         | Paediatric Surgery                                                                             |
|----------------------------------------------------|-------------------------------------------|----------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|
| Neonatal Critical Care<br>NICU level I, II and III | Preventive medicine/<br>Vaccinations etc. | Deformity corrections, Cerebral palsy, infections & TB spine are most common cases in paediatric orthopaedics. | Most common surgeries are hernia, appendix, undescended testes, hypospadias & imperforate anus |
| Pre mature neonates                                |                                           |                                                                                                                | Paediatric GI and Urological surgeries                                                         |

Table 2.3: Sub services in the proposed hospital

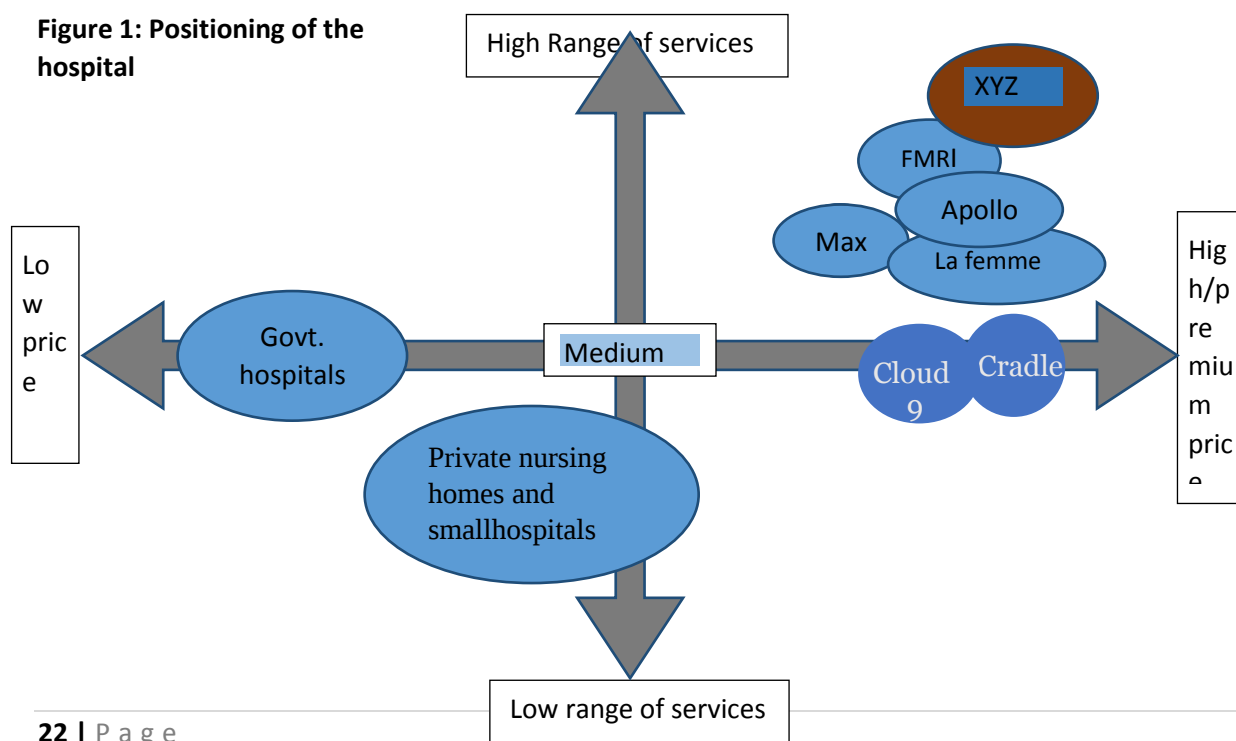
| Paediatric Neurosciences | Paediatric Cardiac Sciences                                                                                                        | Paediatric Oncology                    | Other Paediatric specialities         |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|---------------------------------------|
| Brain tumours            | Congenital Heart Diseases                                                                                                          | Paediatric Haemato-Oncology            | Pulmonology and endocrinology         |
| Epilepsy                 | Arterial Septal Defect (ASD), Ventricular Septal Defect (VSD), Patent Ductus Arteriosus (PDA) are most common surgeries/procedures | Paediatric Bone Marrow Transplantation | Dentistry, Ophthalmology, ENT         |
|                          |                                                                                                                                    | Paediatric medical oncology            | Psychology and rehabilitation centre. |

## Positioning of the hospital

Positioning is one of the marketing strategy through which comparison between different brands can be made. It is basically to differentiate from the existing brands in the market. In the figure below, the vertical line represents the range of services, in which upward arrow depicts high range of services whereas the downward arrow depicts low range of services. The horizontal line represents pricing strategy in which right head depicts high or premium pricing whereas left head indicates low pricing strategy. The Fortis, Apollo, La femme, Max lies in the quadrant of high range of services on premium price. The hospitals like cloud nine, cradle are working on a model of medium range of services on high price. The services in these facilities are restricted to the gynaecological services and early neonatal care.

The other model for positioning is providing low range of services at low price. The private nursing homes and small hospitals are part of this quadrant. The scope of services at this level is very limited whereas the government hospitals provide medium range of services at low price. The scope of services cover various gynaecological and paediatric surgeries along with the basic services. The motive of the proposed(XYZ) hospital is to provide all paediatric services under one roof. The positioning of the services in this hospital will be providing wide range of services at the premium pricing. The comparison of this hospital is clearly shown in the picture below :-

**Figure 1: Positioning of the hospital**



### **Bed Mix for the hospital**

The proposed model of hospital would consist of 160 beds with 76 beds dedicated for intensive care unit. There would be nine deluxe rooms that will be providing services like LCD TV, fridge, separate enclosure for the attendant, tea maker, 24 hour nurse on call services to the patients and price of these rooms will be on the higher end. There will be 33 private rooms for the patients not comfortable in sharing rooms with others. The type of services provided would include LCD TV, couch for attendant and 24 hour nurse on call service.

The type of services in twin sharing rooms will be similar to the private room but that will be shared by two patients. There will be demarcation in the bed areas of the patient by small partition wall. There will be 12 rooms for twin sharing with 24 beds. The general beds will be available in the wards that will be differentiated on pertaining to different departments like female ward, pediatric medicine ward, pediatric surgery ward etc.

**Table 3: Bed Mix**

| Room category  | No. of beds |
|----------------|-------------|
| Deluxe         | 9           |
| Private        | 33          |
| Twin sharing   | 24          |
| General        | 18          |
| Intensive care | 76          |
| Total beds     | 160         |

India has 3-tier system based on weight and gestational age of neonate

#### **Level I care**

Neonates weighing more than 1800 grams or having gestational maturity of 34 weeks or more are categorized under level I care. There would be 6 beds dedicated to this department.

#### **Level II care**

Neonates weighing 1200-1800 grams or having gestational maturity of 30–34 weeks are categorized under level II care. The number of beds for this would be 12.

### Level III care

Neonates weighing less than 1200 grams or having gestational maturity of less than 30 weeks are categorized under level III care.

Further the distribution of intensive care unit is represented in table 4.

| Intensive care beds  | No. of beds |
|----------------------|-------------|
| NICU level 1         | 6           |
| NICU level 2         | 12          |
| NICU level 3         | 30          |
| PICU                 | 20          |
| Medical/surgical ICU | 8           |
| Total ICU beds       | 76          |

**Table 4: Intensive Care beds**

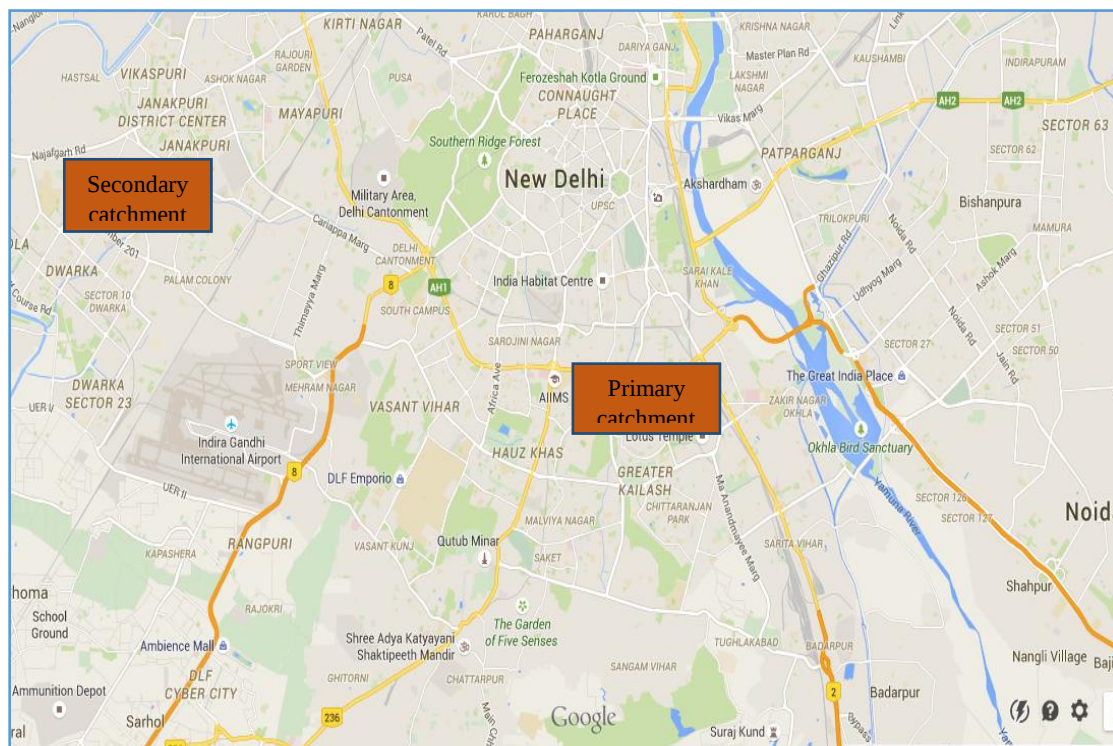
## **Catchment analysis for Mother and Child format**

The **primary catchment** is the area from where the majority of patients would come and avail the services. For the primary catchment area, the demographics of the area like population of that area, various indicators. It would include the district of South Delhi & parts of Central & South-West Delhi and has an addressable market of:

- Approximately 20 lakh women
- 60,000 infants or deliveries per year
- Paediatric population of approximately 8 lakhs

The **secondary catchment** is the other expected or probability areas from where patients can come and avail the services. It would include entire Delhi NCR for cases related to gynaecology and fertility, Haryana, Chandigarh, Punjab and few areas of Rajasthan.

**Figure 2: Catchment area for the hospital**



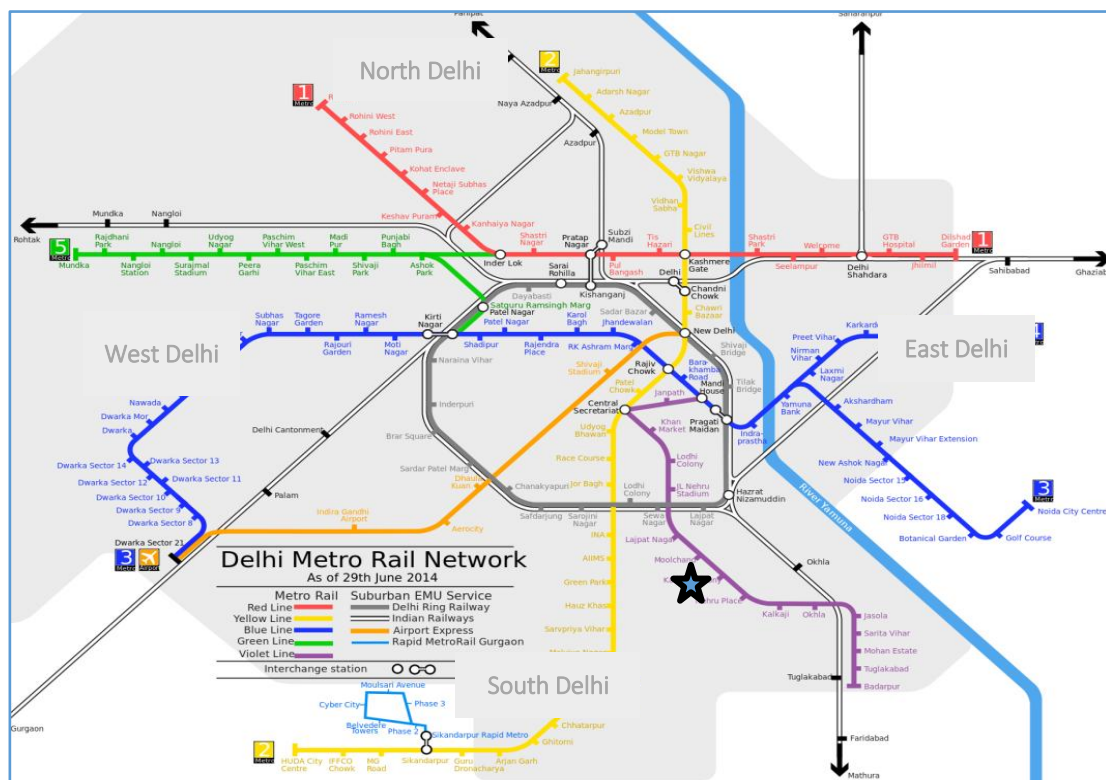
## Site Analysis

With 4,870 Square metres and a FAR of 3.75 the proposed hospital can have:

- Built-up area: 180, 000 Sq. Ft.
- Total number of beds: 150-180

The site is directly connected with Central Delhi, Noida, East Delhi, North Delhi and South-west Delhi through Delhi metro yellow line. The project site is well connected with all regions of Delhi via the Delhi Metro. The project site is at a distance of 2-6 km's from 5 metro stations in its vicinity. The good metro connectivity is one of the strength for the proposed hospital.

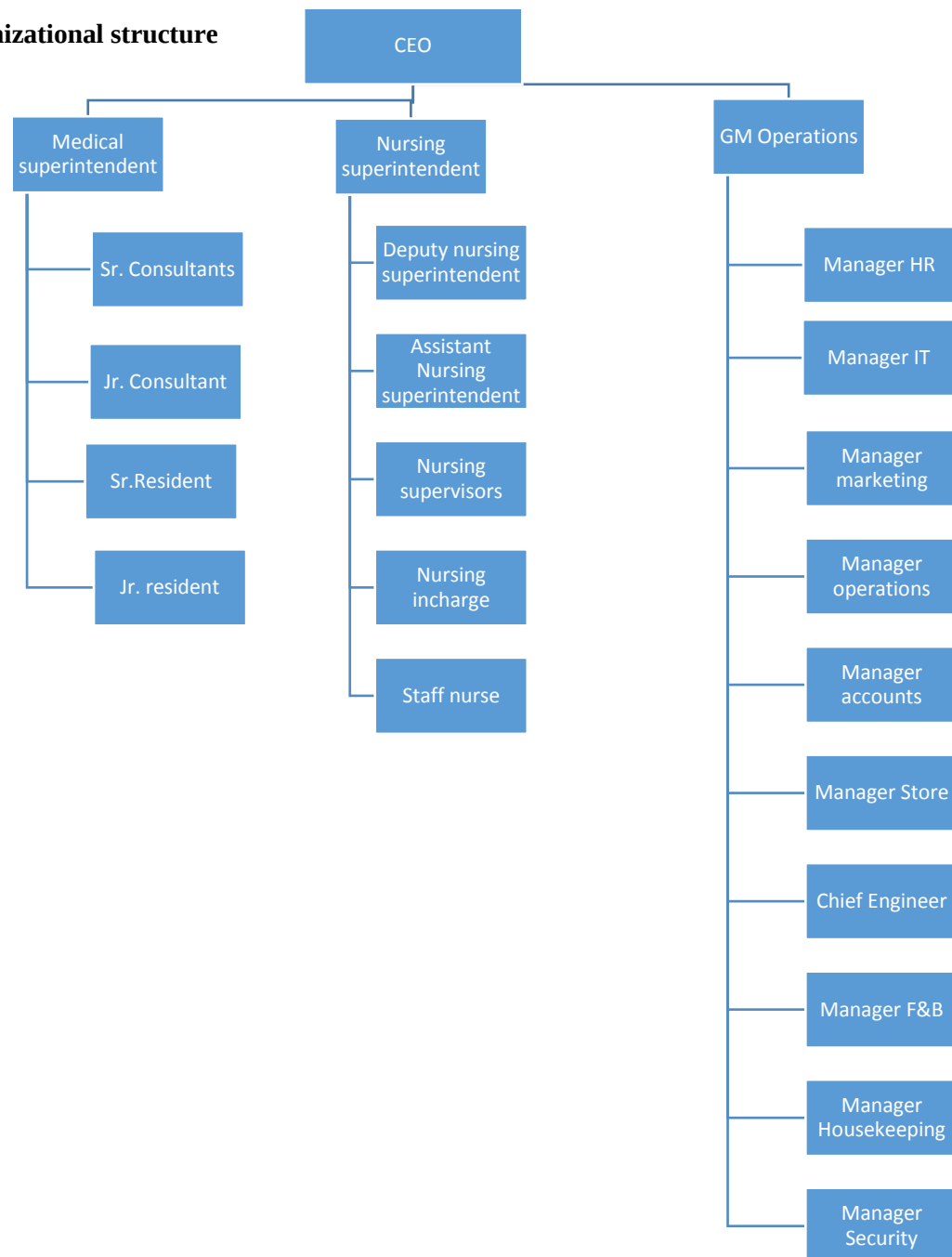
Figure 3: Site analysis



## **Proposed organizational structure for the hospital**

The hospital hierarchy is shown in the figure below. The hospital will be headed by the CEO of the hospital that can be someone with medical background along with management degree having minimum 10 years of experience of hospital industry. The organizational structure is proposed on the basis of the industry reviews after reviewing organizational structure of established hospitals.

**Figure 4: organizational structure**



## **Manpower planning**

The manpower for the hospital is proposed on the basis of the norms of the NABH, WHO. It is also planned on the basis of the projected patient load and after reviewing the standard practices of the industry. The manpower planning about the doctors, nurses, paramedical staff, non-clinical staff is shown in the annexure 2.

## **Project Timelines**

The project requires 4-5 months for appointment of architectural firm and designs/plans completion. The turnkey design solutions include approvals from municipality, initiation and finalization of designs. The next 18-20 months would be required for civil construction. At this point, there will be involvement of the project management consultancy. The tenders for the civil and electrical work will be selected and work would begin in this phase only. At the end of this phase, the interior work begins.

The installation of medical equipment's takes 7-8 months. The some phase of installation of medical equipments is overlapping with the construction of the building as the few equipments are fitted during the construction itself. The process for medical equipment would start from the quotations, negotiation and installation of the equipments. The next 8-9 months are required till the commissioning of the hospital in which ground level market assessment, manpower planning, hospital tariff structure, marketing and SOP's are drafted. The hospital information system is developed during this stage. The pre commissioning is carried out before the commissioning of the hospitals and corrective actions are taken if any discrepancies are observed in the pre commissioning phase. The breakdown of the activities starting from the appointment of architectural firm till the commissioning as follows:-

Figure 5: project timelines

| Sr       | Activity                                                       | Timeline in Months |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|----------|----------------------------------------------------------------|--------------------|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
|          |                                                                | 1                  | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| <b>A</b> | <b>Turnkey Design Solutions</b>                                |                    |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 1        | Appointment of Architectural Team                              |                    |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 2        | Approvals from municipality (if any)                           |                    |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 3        | Design Initiation                                              |                    |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 4        | Design and plans finalized                                     |                    |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| <b>B</b> | <b>Civil Construction</b>                                      |                    |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 1        | Construction Activity Schedule to be confirmed                 |                    |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 2        | Appointment of Project Management Consultancy Firm             |                    |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 3        | Project Management Consultancy throughout the project duration |                    |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 4        | <b>Civil Works – Tenders</b>                                   |                    |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 5        | Awarding of tender and construction kick off                   |                    |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |

|          |                                                                                        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|----------|----------------------------------------------------------------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| <b>6</b> | <b><u>Electrical Works – Tenders</u></b>                                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| <b>7</b> | <b><u>Negotiation and Awarding work</u></b>                                            |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| <b>8</b> | <b><u>Electrical Works timeline</u></b>                                                |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| -        | <b><u>(includes mechanical, plumbing, fire, electricals, HVAC, elevators, etc)</u></b> |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |



|    |                                                         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|----|---------------------------------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| 9  | Salary structure for Core team                          |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 10 | Preparation of Organogram, JD, JS, Competency Framework |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 11 | Recruitment and deployment of Core Team                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 12 | Advertisement for employment                            |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 13 | HR planning and recruitment for hospital staff          |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

|    |                                                                                                                                         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|----|-----------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| 14 | <b>Preparing Hospital tariff structure</b>                                                                                              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 15 | <b>Marketing</b>                                                                                                                        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 16 | <b>Drafting SOP's / Manuals</b>                                                                                                         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 17 | <b>Hospital Information Systems</b>                                                                                                     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|    | Identification of Broad Level specifications                                                                                            |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|    | Vendor finalization                                                                                                                     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|    | Identification of requirements specific to hospital                                                                                     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|    | Customization of software modules                                                                                                       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 18 | <b>Outsourcing of Support Services</b>                                                                                                  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 19 | <b>Pre Commissioning</b>                                                                                                                |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|    | <i>(Ensuring closure of tariff structuring, equipment installation, recruitment, empanelment's, license approvals, SOP's, HIS, etc)</i> |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 20 | Dry run                                                                                                                                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 21 | Corrective actions if any                                                                                                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 22 | Wet run                                                                                                                                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 23 | <b>Post commissioning</b>                                                                                                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

|                                                                  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------------------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Ensure the hospital systems & operational processes are in place |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------------------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|

## **Conclusion**

The mother and child hospital located in NCR region consists of 160 beds with largest NICU & PICU beds (76). The positioning of the hospital is providing high range of services under one roof. The hospital will be having good connectivity to the airport as well as metro stations. The services of the hospital are designed in order to provide continuum of care. The services are designed on the basis of demand value. The primary catchment areas for the project are Delhi. The secondary catchment areas are NCR, some parts of Haryana, Punjab. The financial projection of this project shows that the breakeven point would be achieved by 2023 that is 4 years after commissioning.

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## **Annexure 1: Licenses required for the hospital**

| #                                      | License type                                                                         | To be issued by                      |
|----------------------------------------|--------------------------------------------------------------------------------------|--------------------------------------|
| <b>Pollution Control Board</b>         |                                                                                      |                                      |
| 1                                      | Pollution Control Board NOC to construct the Hospital                                | State Pollution Control Board, Delhi |
| 2                                      | Authorization from State Pollution Control Board to start the operation              | State Pollution Control Board, Delhi |
| 3                                      | NOC DG Set from PCB                                                                  | State Pollution Control Board, Delhi |
| 4                                      | Consent for Air (establishing for 250 DG set)                                        | State Pollution Control Board, Delhi |
| 5                                      | Bio-medical waste authorization by pollution control board to generate waste         | State Pollution Control Board, Delhi |
| 6                                      | license to operate-sewage treatment plant                                            | State Pollution Control Board, Delhi |
| <b>Delhi Development Authority</b>     |                                                                                      |                                      |
| 7                                      | All approved drawings (by DDA) - building plans, electrical drawings, plumbing, hvac | Planning Member, DDA                 |
| 8                                      | Occupancy Certificates                                                               | Planning Member, DDA                 |
| 9                                      | Final Drawing Approval letter from Delhi Development Authority (DDA)(Revised)        | Planning Member, DDA                 |
| <b>Director Estate, Govt. of Delhi</b> |                                                                                      |                                      |
| 10                                     | Grant of permission for Mortgage of leased plots                                     | Director Estate, Govt. of Delhi      |
| <b>District Labour Office</b>          |                                                                                      |                                      |
| 11                                     | Certificate of Registration (Principal Labour License under contract labour act)     | District Labour Officer              |
| 12                                     | Registration under Building & Other Construction Workers(RE&CS) Act, 1996            | District Labour Officer              |
| 13                                     | Delhi Shops & Commercial Establishment certificate of registration                   | District Labour Officer              |
| <b>HR Compliance</b>                   |                                                                                      |                                      |
| 14                                     | Indian Medical Council Act-(all doctors to be registered with MCI)                   | Medical Council of India, Delhi      |
| 15                                     | Indian Nursing Council Act (All nurses to be registered with NCI)                    | Delhi Nursing Council                |
| 16                                     | Prof. Indemnity                                                                      | Insurance companies/                 |

|    |                                                                   |                                             |
|----|-------------------------------------------------------------------|---------------------------------------------|
|    |                                                                   | Indian Medical Association                  |
| 17 | NOC for water supply                                              | Executive Engineer, Public Health, Division |
| 18 | NOC for fire safety                                               | Fire Prevention Officer                     |
| 19 | NOC for Sewerage and Drainage                                     | Municipal Corporation of Delhi              |
| 20 | Trade License and Money Receipt towards payment                   | Municipal Corporation of Delhi              |
| 21 | Holding tax, Latrine tax and Lighting tax yearly                  | Municipal Corporation of Delhi              |
| 22 | Food License                                                      | Municipal Corporation of Delhi              |
| 23 | Municipal Corporation Licence for hospital business               | Municipal Corporation of Delhi              |
| 24 | Allopathic Registration of hospital                               | Clinical Establishment Act                  |
| 25 | Permanent Account Number (PAN)                                    | Income Tax Department                       |
| 26 | Tax Deduction Account Number (TAN)                                | Income Tax Department                       |
| 27 | Income Tax Exemption certificate, Section 17 of IT act 1961       | Chief Commissioner of Income Tax            |
| 28 | NOC from CDMO to DMET for issuing Registration                    | CDMO and Collector & Dist. Magistrate       |
| 29 | PNDT License for each Equipment                                   | CDMO and Collector & Dist. Magistrate       |
| 30 | Human Organ Transplantation                                       | DMET                                        |
| 31 | Sprit / Alcohol License.                                          |                                             |
| 32 | Blood Bank License                                                | Drugs Controller of Delhi                   |
| 33 | Separate license for Single donor platelets required additionally | Drugs Controller of Delhi                   |
| 34 | Drug License as per Form 20, 20B                                  | Drugs Controller of Delhi                   |
| 35 | Drug License as per Form 20-F                                     | Drugs Controller of Delhi                   |
| 36 | Drug License as per Form 21, 21B                                  | Drugs Controller of Delhi                   |
| 37 | Narcotic Drug License(NDPS)                                       | Drugs Controller of Delhi                   |

## Annexure 2: Manpower details

|                                     |    |
|-------------------------------------|----|
| <b>Doctors</b>                      |    |
| Pediatric Orthopedics               | 1  |
| Obstetrics and Gynecologist         | 3  |
| SJunior Obstetrics and Gynecologist | 4  |
| Pediatric cardiac surgeon           | 1  |
| Junior Surgeon (general surgery)    | 1  |
| pediatric neurology                 | 1  |
| Pediatric Urology                   | 1  |
| Pediatric surgery                   | 1  |
| Pediatric Gastroenterology          | 1  |
| IVF                                 | 1  |
| Jr. IVF                             | 1  |
| Pediatric Internal Medicine         | 2  |
| Pediatric General Surgery           | 3  |
| Pediatric Cardiology                | 1  |
| Pediatric (Pulmonary, Skin)         | 2  |
| Radiologist                         | 1  |
| Jr. Radiologist                     | 2  |
| Pathologist                         | 1  |
| Intensivist (ICU Specialist)        | 1  |
| Jr. Intensivist                     | 2  |
| Psychiatrist                        | 1  |
| Dietician                           | 2  |
| Anesthetists                        | 2  |
| RMOs                                | 14 |

Other manpower details:

|                                               |    |
|-----------------------------------------------|----|
| <b>Designation</b>                            |    |
| <b>TOP MANAGEMENT</b>                         |    |
| COO                                           | 1  |
| CEO                                           | 1  |
| Unit Head                                     | 0  |
| Medical Superintendent<br>(Including AMS/DMS) | 2  |
| CFO                                           | 1  |
|                                               |    |
| <b>NURSING</b>                                |    |
| Infection Controller                          | 1  |
| Nursing Supervisors (incl.<br>quality)        | 2  |
| Nurse Education Services                      | 1  |
| OT Nurses & Speciality                        | 9  |
| Staff Nurses                                  | 34 |
| Staff Nurses NICU - 1                         | 1  |
| Staff Nurses NICU - 2                         | 4  |
| Staff Nurses NICU - 3                         | 16 |
| Staff Nurses PICU                             | 7  |
| Total nursing staff                           | 75 |
|                                               |    |
|                                               |    |
| <b>PARAMEDICAL &amp;<br/>ASSISTANCE</b>       |    |
| ECG/TMT/ECHO Technicians                      | 2  |
| Physiotherapist                               | 5  |
| MRI Technician                                | 0  |
| CT Technicians                                | 1  |
| X-ray technicians                             | 3  |

|                                   |    |
|-----------------------------------|----|
| PET CT Technicians                | 0  |
| LINEAC Technicians                | 0  |
| Anesthesia Technicians            | 2  |
| Central Sterile Supply Dep. Tech. | 5  |
| Lab technicians                   | 3  |
| Microbiology Tech(M Sc.)          | 1  |
| Phlebotomist                      | 2  |
| Ward Boys/ Assistants             | 8  |
| Cath Lab Technicians              | 2  |
| Lab. Asst.                        | 2  |
| Medical Records supervisor        | 1  |
| Ward clerks                       | 16 |
| Pharmacist                        | 4  |
| Pharmacy Support Staff            | 4  |
| Yoga and Fitness experts          | 4  |
| Naturopath                        | 2  |
| Baby care counsellors             | 2  |
| Masseuse                          | 4  |
| <b>ADMINISTRATION</b>             |    |
| Chief of Nursing                  | 1  |
| Head - HR                         | 1  |
| Head - Finance                    | 1  |
| Head - Marketing                  | 1  |
| Manager Operations                | 1  |
| Manager Pharmacy                  | 1  |
| Manager Purchase                  | 1  |
| Manager IT                        | 1  |
| Manager - Engineering Services    | 1  |
| Asst. Manager HR                  | 2  |

|                                        |    |
|----------------------------------------|----|
| Asst. Manager F&B                      | 2  |
| Asst. Manager Housekeeping             | 1  |
| Asst. Manager Pharmacy                 | 2  |
| Asst. Manager Biomedical (Engineer)    | 2  |
| Asst. Manager Administration/liasoning | 5  |
| Asst. Manager Customer care            | 2  |
| Asst. Manager Maintenance              | 2  |
| Asst. Material Purchase                | 2  |
| Chief Accountant                       | 1  |
| Accountants                            | 2  |
| Cashiers                               | 4  |
| CSSD Incharge                          | 1  |
| Purchase Asst.                         | 4  |
| Store In Charge                        | 2  |
| Stores Clerk                           | 2  |
| Asst Admin                             | 2  |
| Patient Relations Officer              | 6  |
| Executive Pool                         | 10 |
| Front Office Executive                 | 8  |
| Front Office Supervisor                | 3  |
| Telephone Operators                    | 6  |
| Dietician                              | 1  |
| Bio-medical Technician                 | 2  |
| Equipment Electrician                  | 2  |
| Asst. Manager IT                       | 1  |
| IT Executive                           | 4  |
| Maintenance Supervisor                 | 3  |
| Electricians                           | 4  |

|                                  |    |
|----------------------------------|----|
| Civil Maintenance Staff          | 2  |
| HVAC Technician                  | 6  |
| Water Treatment Plant & Plumbers | 5  |
| Ambulance / Drivers              | 13 |