Report on Mapping of Healthcare Sector in India

SWECARE AND SWEDISH TRADE COUNCIL, INDIA

2012
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Preface

India has the potential to be the fastest growing economy in the World by 2050. This explosive growth is fuelled by an impressive average GDP growth of 8%. The country is also undergoing a phase of rapid urbanization which will add nearly 900 million people to Indian cities by 2050 which would mean that the cities need to grow nearly 400% in less than 40 years to accommodate this increase.

However, all of these growth factors would also pose challenges to India’s healthcare, which is undergoing what is known as an epidemiological, health and demographic transition, reflecting a change in the disease pattern prevalent earlier. The growth in India’s healthcare sector is likely to be driven by various government programs that are focusing on provision of affordable healthcare services to the country’s billion plus population in addition to the demand of high quality healthcare services by the rising middle class of the county which is leading to growth in investments from the private sector.

This report, a product of joint collaboration between Embassy of Sweden in India, Swecare, and the Swedish Trade Council (STC) in India, aims to understand the current situation of healthcare and map out the various segments that form a part of it, to identify potential opportunities that exist for Swedish stakeholders within the Indian healthcare segment. More specifically, it aims to explore the opportunities available in the selected areas of public health, lifestyle diseases, infectious diseases, elderly and geriatric care, medical education, and frugal engineering. In addition, the report will help in effectively achieving the objectives defined under the MoU signed for cooperation in the field of health care and public health between the Government of the Republic of India and the Government of the Kingdom of Sweden.

This study project was led by a team from STC comprising of Manik Karn, Pawan Tahlani, Vibhushree Hamirwasia, Pooja Khanna, and Anjali Bhola. The team worked in close cooperation with Maria Helling and Patrik Barje from Swecare. Yasmin Zaveri-Roy from the Embassy of Sweden in India and Anders Malmström, Trade Commissioner, India also contributed with their inputs to the report.

The team would like to express their gratitude to the Ministry of Health and Family Welfare (MoHFW), Government of India, officials from the National Rural Health Mission (NRHM), and, State governments of Andhra Pradesh, Chandigarh, Karnataka, Madhya Pradesh, Maharashtra, New Delhi, and Uttar Pradesh for the invaluable input received from them about the current status of healthcare in India, government initiatives and future outlook.

The team would also like to thank the various private and public healthcare institutions that shared perspective on the subject of this study. This report is a step towards understanding healthcare in India today, along with opportunities that this sector presents to Swedish stakeholders, creating a coordinated effort towards successful partnerships between India and Sweden in the area of healthcare.
EXECUTIVE SUMMARY
1. Executive Summary

1.1. Overview - Health Situation in India

The Healthcare sector is rapidly emerging as one of the mainstays of the Indian economic growth. In the coming years, the industry is likely to witness a compounded annual growth rate of around 17%-18% and is expected to be worth around SEK 1700 billion by 2016.

The growth is likely to be driven by various government programs that are focusing on provision of affordable healthcare services to the country’s billion plus population. In addition, demand of high quality healthcare services by the rising middle class of the county is leading to growth in investments from the private sector. Other factors such as increase in penetration of medical insurance and medical tourism are likely to add to this.

Among various segments in the healthcare sector, service delivery is expected to account for around 71% of the total revenue generated and is likely to be followed by pharmaceuticals, and medical equipment & supplies segments with respective share of 13% and 9%.

During recent times, the healthcare delivery in India has improved considerably, which is mainly evident from improvement in key health indicators such as decline of mortality rates for infant and mother and rise of average life expectancy at birth. Figure below depicts improvement in health indicators in India:

![Figure 1-1: Major Healthcare Indicators](image)

1.1.1. Health Infrastructure in India

A mismatch between the growing population, increased ailment reports and beds added in the last decade has contributed to a significant dearth of health infrastructure and services providers in
India. As a result, India’s situation on major infrastructural parameters as compared to other countries needs considerable improvement. This is despite the fact that the country has one of the largest number of beds in the world i.e. around 841000 and it adds around 41000 doctors per annum. Figure below depicts situation of India as compared to other countries:

![Figure 1-2: Healthcare Infrastructure Situation](image)

Source: STC Analysis, WHO Health Statistics 2011

1.1.2. Key Stakeholders and Programs

The Ministry of Health and Family Welfare (MoHFW) is the apex body responsible for implementation of national health and family welfare programs in India. It also facilitates technical support; provides guidance to state bodies and works towards promoting the traditional and indigenous systems of medicine. There are some programs running under the jurisdiction of the Ministry of Science and Technology and Ministry of Social Justice and Empowerment. Figure below depicts the administrative structure of MoHFW:
At the state level, the state health department is the nodal agency for healthcare services; the department is governed by the Principal Secretary, health and family welfare of the state.

National Rural Health Mission is the umbrella program focused on improvement of healthcare infrastructure across rural areas in the country and is launched for the period 2005-2012. Major achievements under this program include addition of around 2300 Specialist Doctors, 8300 M.B.B.S. Doctors, as well as around 90000 other doctors and staff. With a total budget of SEK 180 billion, the program has also led to the construction of 11856 Sub Centres, 4165 Primary Health Centres (PHCs), 2921 Community Health Centres (CHCs) and 433 District Hospitals.

The Government of India plans to launch a new program with inclusion of urban areas called National Urban Health Mission (NUHM). The program focuses on improving the urban healthcare delivery system to handle the growth of both urban areas and of urban poor. Hence, moving
forward the NUHM and NRHM would be considered under the aegis of National Health Mission (NHM) although it still awaits final comments and approval from the planning commission.

Besides, there are a number of disease-specific national programs running across India. These include National Vector Borne Disease Control Program, Revised National Tuberculosis Control Program, Reproductive and Child Healthcare Program and National AIDS Control Program. The Medical Council of India is the regulatory body for medical education in the country, while Central Drugs Standard Control Organization (Drug Controller General of India also known as DCGI) is the nodal authority controlling medical devices in India.

1.2. Shortlisted Sectors and Major Business Opportunities

The study is focused on in-depth coverage of four disease areas, education, medical devices and other select sectors. The major goals and objectives of the study are depicted in the figure below:

Attributed to the factors discussed in the first section, there are number of business opportunities available across all the sectors covered under this study. However, there are certain sectors that look more promising and have higher potential.

A number of factors were considered for short listing of these sectors which include current size, future potential in terms of magnitude of the problem. Government programs, dependency in imports etc. Following figure depicts shortlisted disease treatment areas as are as follows:
From Sweden's point of view, significant potential lies in all disease covered under lifestyle diseases section. In infectious disease, HIV AIDS, tuberculosis, respiratory disease and malaria exhibit considerable opportunities for Swedish companies and institutions. There are also available opportunities related to stroke, Alzheimer and Dementia and home based care under elderly care. All the seven cities covered during the study showed considerable potential and openness for Swedish technologies and solutions; as a starting point, Swedish institutions can start focussing on one city each across the three categories for example Hyderabad (Tier I), Chandigarh (Tier II) and Bhopal (Tier III).

Key findings and major business opportunities available across these areas are as follows:

1.2.1. Public Health - Maternal and Child Care

Maternal and Child health are amongst the biggest health concerns for the Indian Government today. Despite improving situation, the infant mortality rate (IMR) and maternal mortality rate (MMR) rates in India are significantly high at 47 per thousand live birth and 250 per 10000 live births respectively. Table below provides a brief overview and treatment scenario in this sector:
Maternal Care
- Significantly high maternal mortality rates (MMR) – ranges between 230 to 250 per 100,000 live births as compared to other countries such as Brazil (58), China (38), and Sri Lanka (38)
- Close to 75% of these deaths are preventable with adequate care
- Haemorrhage (32%), Anaemia (17%) and Sepsis (15%) among leading causes of maternal deaths in the country
- Majority of infant and maternal deaths take place across rural areas in India due to lack of awareness and absence of healthcare facilities
- Private hospitals offer advanced treatment options within maternal and child care, with large hospitals chains such as Columbia Asia, Fortis Healthcare, Max Hospitals, etc providing end-to-end services
- Public hospitals largely concentrate on births and neonatal care, apart from the family planning initiatives.

Child Care
- India has one of the highest infant mortality rates in the world at 47 deaths per 1000 live births
- Usage of advance techniques such as mother and child tracking system and health management information system facilitating decline in IMR and MMR
- However, situation still poorer as compared to other countries – Sweden (2), Brazil (17), China (17), and Sri Lanka (13)
- Public hospitals largely concentrate on births and neonatal care, apart from the family planning initiatives.

### 1.2.1.1. Major Opportunities

- A “multi-sectoral programme to address maternal and child malnutrition in selected 200 high burden districts is being rolled out during 2012-13. It will harness synergies across nutrition, sanitation, drinking water, primary health care, women education, food security and consumer protection schemes.
- Midwifery and Nursing care training is limited and scattered, but this could be a tool to improve maternal care and child care, especially in the rural areas. There is great demand for skilled support staff within maternal and child care at all institutions.
- Mammographic screening, as a tool to detect Breast cancer is a Swedish methodology that could be implemented in India on a large scale.

### 1.2.2. Public Health – Substance Abuse

Substance abuse in India has reached at an alarming level in recent times. Smoking (cigarettes, ‘beedis’), chewing tobacco (‘gutkha’, ‘pan masala’), alcohol, cannabis (marijuana, ganja, bhang, charas), opioids (cough syrups, opium and heroin), Sedative-Hypnotics (sleeping pills, Alprazolam, Diazepam) and Inhalants (correction fluid) are some of the most common forms of abused substance being used in India today. Table below provides a brief overview and treatment scenario in this sector:

<table>
<thead>
<tr>
<th>Disease</th>
<th>Overview</th>
<th>Treatment Scenario</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohol Abuse</td>
<td>Alcohol consumption in India has grown by 171% in the past 15 years</td>
<td>Tobacco, alcohol and drugs are still considered taboo and hidden</td>
</tr>
</tbody>
</table>
Around 63 million alcohol users in India, with almost 14 million users needing assistance for de-addiction. Lack of awareness and treatment affordability are major hindrances in widespread usage of de-addiction centres. There are around 134 de-addiction centres run by MoHFW around India. About 450 rehabilitation / counselling centres run by voluntary organisations with support from the Ministry of Social Justice and Empowerment.

Screening process is fairly traditional and inaccurate, especially in smaller clinics.

1.2.2.1. Major Opportunities

- Considerable demand for better equipped de-addiction centres in the country. This includes upgradation of the existing ones, and establishing more especially in rural areas.
- Deployment of mobile screening and detection equipment
- Trained support staff for de-addiction centres is greatly lacking. Institutions are interested to understand more about courses within treatment of addiction and recovery with regards to substance abuse.

1.2.3. Lifestyle Disease

Around 53% of total deaths in India were due to lifestyle disease in 2010. CVDs (22%) remain the largest, singular cause of deaths in the country, followed by hypertension, cancers, etc. The primary reasons for the prevalence of lifestyle diseases are known to be high usage of tobacco, unhealthy diets, high levels of stress, alcohol consumption, insufficient treatment, physical inactivity, and general lack of awareness. Table below provides a brief overview and treatment scenario in this sector:

<table>
<thead>
<tr>
<th>Disease</th>
<th>Overview</th>
<th>Treatment Scenario</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiovascular Disease</td>
<td>CVD kill around 3 million people per annum in India</td>
<td>Despite presence of almost 50% patients for CVDs and 32% for diabetes, treatment as well as diagnostic scenario across rural</td>
</tr>
<tr>
<td>(CVD)</td>
<td>Almost 25% of deaths in the age group of 25-69 are due to CVDs</td>
<td></td>
</tr>
</tbody>
</table>
### Disease Overview

<table>
<thead>
<tr>
<th>Disease</th>
<th>Overview</th>
<th>Treatment Scenario</th>
</tr>
</thead>
</table>
| Cancers | - Around 2.5 million cancer cases registered per annum in India, of which 500,000 lead to deaths.  
- Around 70% of disease burden is related to prevailing lifestyles such as eating habits, personal habits, infections, consumption of tobacco, etc.  
- Prevalent cancers in India include that of the lung, cervix, breast, oral, oesophagus, and stomach.  
- Tobacco related cancers are the largest cause for mortality in males (39%), where as breast cancer leads to around 25% of mortalities in women. | - Improving availability of treatment of lifestyle diseases across urban areas in India  
- Private hospitals are very active including Fortis Escorts Heart Hospital, Tata Memorial Cancer Hospital and Narayana Hrudayalaya  
- Low awareness about symptoms is a major challenge with diabetes, which leads to delay/absence of treatment  
- Diagnostic facilities only present across Tier-I towns leading to delay in cancer identification/misdiagnosis across majority of regions |
| Diabetes | - Around 20% of the world’s diabetics are Indians.  
- It is forecasted that close to 70 million Indians would contract diabetes by 2025 as opposed to 39 million diabetics in India currently.  
- More than half of these cases remain undiagnosed and untreated  
- Largest age groups affected by diabetes is that of falling in 40 years – 59 years age group. | - Developing expertise within affordable diagnostics, non-invasive treatment and training for all lifestyle related diseases, given that almost 80% of all medical technology and equipment for use in lifestyle diseases is imported from other countries.  
- Technology related partnerships are most interesting for large specialty hospitals like Narayana Hrudayalaya, due to the increasing need of introducing better equipment for the management and control of CVDs.  
- Expertise exchange on developing better specialty hospitals  
- Research and Development investments particularly to aid development in diagnostics and monitoring to improve the treatment and management of blood pump technology, cardiac surgery, interventional cardiology, etc.  
- Diabetes monitoring is also an opportunity that could be looked at from an Indian hospital perspective, to virtually be able to maintain records of the patient’s diabetic history |

### 1.2.3.1. Major Opportunities

- Developing expertise within affordable diagnostics, non-invasive treatment and training for all lifestyle related diseases, given that almost 80% of all medical technology and equipment for use in lifestyle diseases is imported from other countries.
- Technology related partnerships are most interesting for large specialty hospitals like Narayana Hrudayalaya, due to the increasing need of introducing better equipment for the management and control of CVDs.
- Expertise exchange on developing better specialty hospitals
- Research and Development investments particularly to aid development in diagnostics and monitoring to improve the treatment and management of blood pump technology, cardiac surgery, interventional cardiology, etc.
- Diabetes monitoring is also an opportunity that could be looked at from an Indian hospital perspective, to virtually be able to maintain records of the patient’s diabetic history
1.2.4. Infectious Diseases

Approximately 25% of disease burden in India is due to infectious diseases, which is also responsible for around 34% of all deaths. Some of the major reasons for the spread of infectious diseases include unhygienic surroundings, lack of personal hygiene, hospital acquired infections (especially high in Government hospitals), lack of awareness about infections and infectious diseases, etc. Table below provides a brief overview and treatment scenario in this sector:

<table>
<thead>
<tr>
<th>Disease</th>
<th>Overview</th>
<th>Treatment Scenario</th>
</tr>
</thead>
</table>
| HIV / AIDS   | • Around 2.3 million HIV positive patients were present in India in 2010, of which 39% were female  
• Around 1.7 million deaths in 2010 due to HIV AIDS, and about 1.15 million new patients reported  
• Further, 3.5% of all AIDS patients were children below 15 years and around 60 000 children in India are born HIV positive annually  
• Leading reasons for contracting HIV/ AIDS in India is heterosexual contact, this is followed by transmission from parent to child at birth | • Higher number of disease incidences across rural areas as compared to urban areas  
• With the shift in focus from infectious diseases to lifestyle diseases, it is primarily the public sector that looks into treatment, and control of communicable diseases  
• The MoHFW has established a number of healthcare institutions to tackle the diseases, and has instated specialized diagnostic and treatment centres  
• Primarily the public sector looks into treatment, & control of communicable diseases in India and has instated specialized diagnostic and treatment centres  
• Select hospitals at and above the district level have been christened as DOTS and ART centres, etc which also take referral cases from private hospitals  
• Limited involvement of private sector with a number of hospitals not offering treatment within infectious diseases yet |
| Malaria      | • Close to 95% of the Indian population resides in malaria endemic areas  
• Around 1.3 million malaria cases were reported in 2011; there has been a steady decline in number of malaria cases per annum, which is indicative of the efforts employed by the MoHFW through the National vector borne diseases control program  
• Around 80% of the cases reported are confined to areas which consist of 20% of the population, residing in tribal, hilly, inaccessible regions. |                                                                                  |
| Tuberculosis | • India has 1/5th of the global TB cases, making it the highest TB burden country in the world.  
• An estimated 1.98 million cases of the 9.4 million cases globally are from India  
• Multi-drug resistant TB (MDR-TB) is another growing concern for India with almost 63 000 cases reported in 2010, the highest in the South-East Asian region.  
• Union Health Ministry launched Revised National Tuberculosis Control Programme |                                                                                  |
<table>
<thead>
<tr>
<th>Disease</th>
<th>Overview</th>
<th>Treatment Scenario</th>
</tr>
</thead>
</table>
| Infection Control  | • Around 190 000 neo-natal deaths in India occurred due to sepsis in 2011, out of which over 30% are attributable to anti-biotic resistance in a year  
• Private hospitals in India have a high focus on infection control and have developed specific departments/teams taking care of infections in the hospital  
• In comparison, public hospitals have limited focus on infection control, which is mainly attributed to the higher number of patients visiting these. |                                                                                                         |
| Diarrhoeal Diseases| • Diarrhoeal diseases such as cholera and dysentery are known to have the highest prevalence in India  
• Viral pathogens like Rotavirus account for nearly 70-80% of all diarrhoeal infections.  
• Over 10 million cases of diarrhoea are detected in India annually and the disease is the cause of over 20% of all paediatric deaths (children under the age of 5) |                                                                                                         |
| Respiratory Diseases| • Asthma, chronic obstructive pulmonary disease (COPD), occupational, environmental and interstitial lung diseases are major type of respiratory diseases in India  
• Currently, there are around 25 million Indians affected by respiratory diseases in India, with a growing incidence of asthma in school children.  
• Approximately 1.3 million deaths in 2010 were due to chronic respiratory ailments in India. |                                                                                                         |

1.2.4.1. Major Opportunities

• Developing expertise within effective diagnosis, treatment devices, non-invasive treatment and training for infectious disease specialists
• For HIV AIDS, the NRHM is looking to scale up HIV testing and counselling to a large extent by setting up new clinics. Knowledge sharing about service delivery, and related to technological and equipment expertise is also an interesting prospect from an Indian company’s point of view.
• TB testing and diagnostics equipment is also another area where there could be opportunities, especially for portable testing equipment which could be integrated into the RNTCP as well. Expertise within Multi drug-resistant TB is required as well.

• Certain specific opportunities within respiratory diseases includes requirement for better preventive medicine technology and equipment, including screening and testing equipment (peak flow meters). Portable treatment equipment such as nebulizers is mainly imported for home use and during travel, which could be supplied by Swedish companies as well.

• Equipment and technology within infection control is another interesting. Major private hospitals in Tier-I towns such as Fortis Hospitals, Apollo Hospitals and Medanta Medicity have high focus on control of infections in the hospitals and are very much open for advanced technologies and solutions to further reduce the number of HAIs.

1.2.5. Elderly Care

The share of elderly population with age 60 and above is likely to grow from 7%-8% at present to around 11% by 2021, which will result in around 140 million elder people in the country. Following are the major problems for elderly in India:

<table>
<thead>
<tr>
<th>Disease / Area</th>
<th>Overview</th>
<th>Treatment Scenario</th>
</tr>
</thead>
</table>
| Alzheimer and Dementia          | • In 2010, an estimated 3.7 million Indian people aged over 60 were suffering from dementia, with women accounting for 58% of total dementia patients.  
  • Around 20% of the elderly people over 80 years of age suffer from Alzheimer in India, while the corresponding ratio for the 65 age group is 1 in 20. | • Alzheimer and Dementia in India are still hidden problems with only 10% of 3.7 million patients getting diagnosed.  
  • Home based care of elderly people in India has been mainly influenced by Indian culture, where family members take care of the elder people in the family  
  • Most of the elderly patients receive treatment across general hospitals, which might have special programs/clinics for this category of patients.  
  • The concept of special nursing homes for elderly people is at a very nascent stage in India with only a few establishments. |
| Home based care and assisted devices | • Percentage of elderly people suffering from physical immobility increase with growing age.  
  • Around 19% of elderly people in the age range 60-64 are physically immobile. Corresponding figures for elderly in the age group 65-69 and 70+ above are 22.3% and 59.2% respectively  
  • Usage of trained external personal care givers for home based care is high across urban areas |                                                                                                                                                                                                                                                                                           |
| Geriatric care and assisted devices | • Significant demand for geriatric care services with about 64 per thousand elderly persons in rural areas and 55 per thousand elderly persons in urban areas suffering from one or more disabilities.  
  • Elderly persons need assistive care devices most importantly in segments like blindness, low vision, hearing aids and loco-motors |                                                                                                                                                                                                                                                                                           |
1.2.5.1. Major Opportunities

- Swedish knowledge for setting up of advanced Day-care facilities in India, considering the fact that there is a huge demand for well equipped and constructed old-age homes.
- Also, with growing deployment of personal caregivers for home based care of elderly people, opportunities are available for Swedish companies that provide training to these caregivers.
- Institution/ training centre providing geriatric education can collaborate with various NGOs including Help Age to offer advanced geriatric services in India

1.2.6. Medical Devices

The medical device market in India was approximately worth USD 2.4 billion in 2010 and is likely to witness a CAGR of 13%-14% in the coming years, thereby reaching USD 5.2 billion by 2016. Establishment of new hospitals by major private sector chains as well as up gradation of infrastructure by public sector hospitals are among the factors that are likely to drive this demand.

The medical device market in India is segregated into five major product categories namely consumables, diagnostic imaging, dental products, orthopaedic products and patient aids. Below figure depicts the percentage share of various device segments in terms of market size.

![Figure 1-5: Indian Medical Device Market by Categories, 2010](Source: STC Analysis, Espicom Business Intelligence 2011)

The India market for medical devices is highly dependent on imports. Figure below depicts the key exporting countries, along with the level of import for major categories:
As per the current laws and regulatory policies, medical devices are considered as drugs and are regulated through the Drugs and Cosmetics (D&C) Act 1940. The act controls the manufacturing, sales, distribution and import of drugs including medical devices as well as diagnostic kits and cosmetics. The Government of India has planned to launch a new act i.e. Revised Schedule M III for medical devices. Under the Revised Schedule M-III, medical devices are divided into four classes according to their risk level—A, B, C and D. The regulatory requirement will be placed according to the device’s classification under various categories and the Central Licensing Approval Authority (CLAA), a branch of the CDSCO, will serve as the main regulatory body for medical devices.

1.2.7. Medical Education

India needs 600 000 doctors, 200 000 dental surgeons and one million nurses, going by the WHO recommendations of 1:1 000 doctor-patient ratio and 1:7 500 dentist-to-population ratio. With India producing only 23 000 new doctors, 13 000 dental doctors and 45 000 nurses every year, there is a significant demand supply gap at present in the country. As compared to other countries, the doctor to population ratio in India is considerably low at 6.3 doctors per ten thousand population.

There are around 820 000 doctors across India with required qualifications and who are registered with the state medical councils/ MCI. According to the Central Bureau of Health Intelligence, Maharashtra has the highest number of doctors registered with the state medical council in 2010. There were 137 824 doctors registered with the Maharashtra’s state medical council and it is followed by Karnataka and Tamil Nadu with 87 320 and 86 822 registrations respectively.

India has an established network of medical institutions that are engaged in imparting medical institution through conventional modes. Majority of medical colleges are public, though the number of private medical colleges is on a rise. Admissions to these medical colleges are based on entrance exams, which are highly competitive in nature.
1.2.7.1. Major Opportunities

- Indian institutes are looking at exchange programs at the faculty and student level. Also, these institutes are open for virtual classes as a supplementary tool for the existing classroom teaching, provided the content is approved by the MCI.

- With a number of new hospitals being established across the country, significant demand is likely to emerge for qualified health professionals in near future.

1.2.8. E-health and Telemedicine

The telemedicine market in India is likely to witness an average growth of around 20% per annum thereby growing from SEK 50 million at present to around SEK 124 million by 2016. This is mainly attributed to the fact that nearly 80% of physician’s reside in urban areas leaving only 20% of doctors to address the health and treatment needs of rural population in India. People staying in rural areas usually have to travel long distances to reach a doctor even for the most basic healthcare services.

Along with the Ministry of Health and Family Welfare, the Department of Information Technology, Indian Space Research Organization, and Centre for Development of Advanced Computing are the major public sector entities involved in telemedicine and e-health projects in the country. On the private front, Apollo Hospitals group, Columbia Asia and Narayana Hrudyalalaya are among the leading players providing telemedicine services in India.

Despite significant advantages, lack of infrastructure in rural areas, illiteracy and existing consumer behaviour of patients requiring human touch are among the major factors hampering widespread deployment of telemedicine technologies in India.

Major opportunities are available in the form of provision for enabling solutions and technologies i.e. devices and better software for integration of satellite telemedicine centres with nodal super speciality hospitals. There are also possibilities that medical institutions from both countries collaborate and consult each other for critical requirements and special cases.

1.2.9. Frugal Engineering

In India, there is a large section of population that struggles to meet basic healthcare needs. Existing infrastructure of the country, especially in smaller towns/ rural areas, is inadequate to meet the ever-growing needs of the Indian population. In order to address the challenge of low penetration and meet the healthcare needs of all income segments, the medical technology industry in India is focusing on innovation with the objective of introducing new low-cost products.

There are a number of products developed specifically for Indian market. These innovations have the capability to impact a larger segment of the population which is price conscious and driven by affordability. These products include Johnson & Johnson’s Simple Glucometer; Medived Innovations’ Affordable Pacemaker and Bigtec Labs Pvt. Ltd. – Micro PCR.
1.3. Perception Regarding Swedish Technologies and Solutions

Overall, Sweden has strong brand equity in India and Swedish companies are well known for their quality products across various sectors including telecom, engineering, and automotive. However, Indian healthcare industry and especially, the medical devices sector is dominated by the US and German companies including Siemens, GE, etc. Recently, Chinese companies have also started making inroads into the Indian healthcare market.

Among Swedish healthcare companies, Elekta, Bactiguard and Getinge are among the well known brands in India. Elekta’s Gamma Knife solutions are installed across a number of well-known hospitals including Government Medical College & Hospital, Sector 32 and Nehru Hospital (affiliated to Post Graduate Institute of Medical Education & Research) in Chandigarh. Bactiguard has recently signed up a distribution agreement with Indian pharmaceutical major Cadila Pharma to distribute its products in India.

Swedish solutions and technologies are yet to witness large scale deployment in India due to the cost conscious nature of the Indian healthcare industry, despite their high quality. As a result, Sweden’s share in the Indian medical devices sector is less than 1 percent, at present. With emergence of super-speciality hospitals, growth in presence of big hospital chains and rise in demand for quality healthcare services, there has been an improvement in the acceptance level for Swedish technologies in recent past in the country.

In order to gain further momentum and leverage various business opportunities across Indian healthcare market, there is an immediate requirement of a focussed effort from various stakeholders in the Swedish healthcare industry and deployment of innovative as well as customised business models by Swedish companies in India.
Introduction to Indian Healthcare Sector
2. Healthcare Sector in India

2.1. Overview

Healthcare industry in India is rapidly emerging as one of the key industries that are driving economic growth in India. It is expected to grow from SEK 161 billion (USD 23 Billion) in 2005 to SEK 1169 billion (USD 167 billion) in 2017, thereby witnessing an annual average growth of around 17%-18% per annum. Major factors that are likely to drive this growth include growing population, improving health insurance penetration, increasing disposable income, government initiatives and focus on Public Private Partnership (PPP) models.

Figure below depicts the growth in the Indian healthcare industry during 2005-2017:

Among various segments, hospitals account for approximately 71% of the total revenue generated. It is followed by pharmaceuticals and medical equipment & supplies segments with respective share of 13% and 9%. Figure below depicts the revenue-wise breakup of Indian healthcare industry.
2.1.1. Government Spend on Healthcare

According to the WHO’s World Health Statistics 2011, the Indian government spends around 4.2% of GDP on healthcare. Although growing, the expenditure is relatively low as compare to other countries as depicted in the chart below.

A considerable portion of this expenditure is undertaken through various programs including National Rural Health Mission (NRHM), National Vector Borne Disease Control Program (NVBDCP) etc. As a result of this, the county has improved its ranking on a number of health parameters including maternal and child mortality rates, life expectancy etc. E.g. the average life expectancy in India has increased from 57 years in 1990 to 65 years in 2011, as per World Health
Organisation (WHO)'s Health Statistics 2011. According to the Colin Mathers, Coordinator of Mortality and Burden of Disease at WHO "Life expectancy and overall health of Indians has been impressive notwithstanding high levels maternal and child mortality, high income disparities, and increasing infectious and non-communicable (heart diseases, stroke, diabetes and cancer) diseases,"

**Figure 2-4: Rise in Average Life Expectancy at Birth (For Both Sexes)**

Source: STC Analysis, World Health Organisation

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1 Rediff Website
2.1.2. Healthcare Infrastructure in India

The status of healthcare infrastructure in India is improving rapidly, which is mainly attributed to growing investment from both public and private sectors. As per the Central Bureau of Health Intelligence, there are around 13000 government hospitals located in urban and rural areas in India. Across majority of the states, the number of rural hospitals is more than that of the urban hospitals as depicted below:

![Figure 2-5: Number of Public Hospitals across select states](image)

In contrary, the number of beds across urban areas is much higher than that of the rural areas highlighting the fact that the majority of healthcare services in India are based in urban areas, which account for only 30%-35% of population at present. There are around 580000 beds across

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\[\text{CBHIDGHS}\]
public hospitals in India. The figure below depicts the bed scenario in public hospitals across select states in the country:

Figure 2-6: Number of Beds across Public Hospitals (in 000’s)\(^3\)

![Diagram showing number of beds across public hospitals in India](source)

Source: STC Analysis, World Health Organisation

According to Espicom, a leading medical intelligence company, public hospitals account for 60%-70% of total beds in India and the remaining beds are present across private hospitals. As a result, there are around 8 beds per 10000 population in India; although the figure is comparatively lower than other countries, the total number of beds in the country are around 840000. Figure below depicts the bed availability scenario for select countries as per the WHO:

\(^3\) CBHIDGHS
2.1.3. Health Workforce in India

Availability of health workforce in India varies from highly qualified consultants and super specialists to local healers. There are around 820000 doctors across India that possesses required qualification and are registered with the state medical councils/ MCI. Figure below depicts the growth in the number of doctors in India during 2005-2010.

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4 CBHIDGHS
According to the Central Bureau of Health Intelligence, Maharashtra has the highest number of doctors registered with the state medical council in 2010. There were 137,824 doctors registered with the Maharashtra’s state medical council and it is followed by Karnataka and Tamil Nadu with 87,320 and 86,822 registrations respectively. At present, the doctor to population ratio in India is around 6.3 doctors per 10,000 people in India with majority of doctors (80%) based in urban areas in the country. Despite growth in the number of doctors in recent years, India’s situation with respect to other countries is relatively poor. Figure below depicts availability of doctors in India vis-à-vis other countries:

Figure 2-9: Select Countries - Number of doctors per 10000 Population

The corresponding figures for other health workers i.e. nursing and midwifery personal and pharmaceutical personnel are depicted in the figure below:

Figure 2-10: Select Countries - Number of other health workers per 10000 population

Source: STC Analysis, World Health Organisation
In addition to these, there are 750000 registered Ayurveda, Yoga & Naturopathy, Unani, Siddha and Homeopathy (AYUSH) practitioners available in India. Bihar, Maharashtra and Uttar Pradesh are the leading states in terms of registered AYUSH practitioners with 166668, 109194 and 100332 respectively.

2.1.4. Healthcare Expenditure

At present, around 70%-80% of all health expenditure in India is paid for by people from their own pockets and this expenditure has been rising. The remaining 20%-30% expenditure is financed through medical insurance and corporate houses. Private healthcare accounts for approximately 75% of the total healthcare expenditure in India; the private hospital sector is fragmented and over 85% of the private sector hospitals have less than 25 beds. Figure below depicts the distribution of healthcare expenditure in India:

![Figure 2-11: Indian Healthcare Industry – Expenditure Breakup](source)

2.1.4.1. Penetration of Health Insurance

Although at a nascent stage, the penetration of health insurance is growing in India. Among the all non-life insurance segments, health insurance is the fastest segment and currently accounts for around 21% of total non-life insurance market. Change in diseases pattern, rise in cost of healthcare and limited support from the government are some of the factors driving medical insurance market in India. The demand will be supported by enhancing reach of medical insurance companies and growing FDI in the insurance industry. At present, only 14% of Indian population is covered through medical insurance and the number of policies issued is likely to double during 2005-2015 from 110 million 2005 to 220 million\(^5\). This in turn is likely to drive the demand for quality healthcare in India.

\(^5\) IBEF Website
Government Healthcare Programs in India
3. Major Healthcare Programs

The Ministry of Health and Family Welfare (MoHFW) is the apex body responsible for implementation of national health and family welfare programs in India. It also facilitates technical support and guidance to state bodies and works towards promoting the traditional and indigenous system of medicine. Under its aegis, it has four individual departments concerned with health & family welfare, AIDS control, traditional Indian system of medicine and health research. Figure below depicts the administrative structure of MoHFW:

With an aim of providing universal access to primary healthcare services to all the sections of the society and to eradicate public health hazards such as malaria, tuberculosis, HIV etc. The MoHFW runs various national health and family welfare programs such National Health Mission (NHM).

NHM consists of umbrella programs National Urban Health Mission (NUHM) and National Rural
Health Mission (NRHM) which run specific health programs such as National Vector Borne Disease Control Program (NVBDCP), Reproductive and Child Health Program (RCH) etc.

3.1. National Rural Health Mission

3.1.1. Overview

National Rural Health Mission or NRHM, an initiative by the Ministry of Health and Family Welfare, was launched in 2005 with an aim of rejuvenating the health care delivery system across rural India. The program had been launched initially for 7 years (2005-2012) with an aim to propose new mechanisms of healthcare delivery to provide services which would be accessible, affordable, quality and would have equity.

The NRHM covers the entire country, with special focus on 18 states such as Uttar Pradesh, Madhya Pradesh, Maharashtra, Bihar, and Jammu & Kashmir among others, where the challenge of strengthening poor public health systems is the greatest and thereby improving key health indicators. These states are allocated a larger share of the funding provided under NRHM and special support and review to work towards improving their health delivery systems. The program was launched with a number of goals, as depicted the figure below:

![Diagram of NRHM Goals]

**Figure 3-2: Goals of NRHM**

- Universal Health care, well functioning health system
- Provision of ASHA
- Village Health Plans Mainstream AYUSH
- Upgrading Health Facilities to IPHS
- Kala Azhar to be removed by 2010
- Filaria to reduce 80% by 2010
- Reduce IMR -> 30/1000 live births
- MMR -> 100/10,000 live births
- TFR -> 2.1

Source: NRHM Website
3.1.2. Implementation

Implementation of NRHM is based on two different types of strategies - core and supplementary strategies. The core strategies of NRHM focus on a number of areas including rural planning and management, appointment of ASHA etc. These also focus on improving the management capacity to organize health system and public health services.

Supplementary strategies include regulation of the private sector to improve equity and reduce out of pocket expenses, foster public–private partnerships to meet national public health goals, re-orienting medical education, introduction of effective risk pooling mechanisms and social insurance to raise the health security of the poor, and taking full advantage of local health traditions.

These strategies targeted towards a holistic development of rural health delivery system and had plans that aimed to incorporate every stake holder from female health activists to member of the panchayat. It further focuses on infrastructural strengthening at various levels.

One of the primary strategies is introduction of ASHA (Accredited Social Health Activist) who is responsible for creating awareness on health and its social determinants. ASHA also mobilizes the community towards local health planning; increased utilization and accountability of the existing health services. ASHA is supposed to escort pregnant women for delivery to institutions as PHC/FRU.

The mission also focuses on strengthening of rural health service delivery infrastructure at sub-centres, PHC and CHC level and aiming at upgrading them to be IPHS (Indian Public Health Standards) certified. IPHS are a set of standards in place to measure the quality of health service being provided.

It also works towards integrating vertical health programs at National, State, Block and District levels. It also focuses on mainstreaming AYUSH and hence revitalizes the local health traditions.

The supplementary strategies of NRHM, regulates private sector to provide quality and affordable health care services with focus on equity as well. In order to facilitate sustainable development NRHM focuses on restructuring the medical education to support rural health issues including regulation on medical care and medical ethics.

Besides these strategies NRHM also implements key national health programs like the Reproductive and Child Health II project (RCH II), the National Disease Control Programs (NDCP), Blindness Control Program (BCP) etc.

The NRHM besides promoting private-public partnerships also aims at exploring new health financing mechanisms including Risk Pooling for Hospitals. It promotes a model where health missions would move towards reimbursing for service provided on the principle “money follows the

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6 Vertical Health Programs: Programs with a strong central management dedicated to planning, managing and implementation. These programs have a clear objective/goal and an efficient and effective delivery mechanism. Ex: Leprosy, TB, Malaria etc.

7 AYUSH: Department of Ayurveda, Yoga, Unani, Siddha and Homeopathy is responsible for documenting and promoting traditional Indian medicine procedures.
“patient” and the CHCs to move towards a monthly wage component supposed to be funded by District Health Funds.

3.1.3. Funding Mechanism

The funding for NRHM as per the eleventh five year plan followed an 85-15 rule, where the 85 percent of funding was supposed to given by central government and the remainder 15 percent was supposed to be contributed by the state government, and is planned to be 75-25 in the 12th five-year plan.

The funding allocation to states majorly depends upon parameters such as rural population and position of the state on state backwardness index. These parameters assure of priority focus on fund allocation to the states. The process of fund allocation is as illustrated in the figure below:

![Figure 3-3: Flow of Funds Under NRHM](Source: NRHM Website)

3.1.4. Budget Allocation for NRHM

The budget allocation for NRHM for the duration 2005-06 to 2009-10 and actual utilization are as represented below:
3.1.5. Community based Monitoring

A key agenda of NRHM is to ensure that services provided actually reach those for whom they are meant. It is also seen as an initiative towards promoting community led action in the field of health. Reviews committees have been set up at all levels and are necessary to ensure that the work is being done in the manner required and to identify any roadblocks or obstacles.

3.1.6. Major Achievements

NRHM, in its endeavour to bring good health facilities to rural India, has registered many achievements in process. Some of them are:

3.1.6.1. Infrastructure Achievements:

- Around 2300 Specialist Doctors, 8300 M.B.B.S. Doctors, 9600 AYUSH Doctors, 26700 Staff Nurses and 53550 Auxiliary Nurse Mid-wives or A.N.M. have been added to the Rural Health System.
- New constructions and upgrades were taken up in 11856 Sub Centres, 4165 Primary Health Centres or P.H.C.s, 2921 Community Health Centres and 433 District Hospitals.
- Around 30,000 Rogi Kalyan Samitis or R.K.S. are formed in Primary Health Centres, Community Health Centres and District Hospitals.
- Around 500,000 village health and sanitation committees constituted and provided with Rs.10,000/- each, annually for their local health needs.

* Provisional Figures

Source: STC Analysis, NRHM Executive Summary 2011

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**Figure 3-4: Allocation and Utilization of Funds in NRHM**

- Budget Allocations
- Funds Utilized (RHS)

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8 NRHM Website
- Around 570,000 ASHA workers are provided with drug kits for treatment; and around 800,000 ASHA workers are now working for Rural Health Care in every village in India.

3.1.6.2. Healthcare Achievements:

- India is a polio free state, since no polio case has been registered for over a year now.

- More than 10 million pregnant women across India are covered in the year 2009-2010 under the Janani Suraksha Yojana (J.S.Y) as against only 739000 pregnant women covered during 2005-2006.

3.1.7. NRHM Beyond 2012

The NRHM Scheme though has had some major achievements, it still falls behind on some of the goals set for it in 2005, is likely to be extended. The scheme will be a part of the twelfth five year plan (2012-17) with a broader aim of increasing the spending on healthcare from currently 1.4% of GDP to around 3% of GDP among other goals. The Government had already announced a 13.4% increase in the budget allocation for NRHM for the fiscal 2012-13 to SEK 29.2 billion (USD 4.29 billion). It has also announced an introduction of National Urban Health Mission (NUHM) to focus on improving health care delivery system in urban areas simultaneously.
3.2. National Urban Health Mission

3.2.1. Overview

India is undergoing rapid urbanisation, with almost 38% of its total population now living in cities (provisional figures – 2011). During the last ten years, urban population in the country witnessed a rise of 32% resulting in addition of almost 91 million people\textsuperscript{9}. Also, the country has witnessed emergence of 2800 new towns\textsuperscript{10}, which along with the 5000 existing towns are now home to around 377 million people today. A quarter of India’s urban population of 97 million lives below poverty line.

Such unprecedented growth in urban areas and resultant urban poor posts a challenge to public healthcare delivery system in these areas. With prior experience of NRHM (National Rural Health Mission), the Government of India is planning to launch and implement National Urban Health Mission (NUHM). NUHM focuses on improving the urban healthcare delivery system to handle the growth of both urban areas and of urban poor. As highlighted in National Family and Health Survey – III report, the under-five mortality rate among urban poor at 72.7 is higher than the urban average of 51.9. More that 50% children are underweight, and almost 60% of the children miss total immunization before completing 1 year.

Hence, moving forward the NUHM and NRHM would be considered under the aegis of National Health Mission or NHM. Though, it still awaits final comments and approval from the planning commission, NUHM, through sound fiscal management structure, planning, improved managerial and monitoring capacities and community participation could ensure increased availability of healthcare service in urban areas.

3.2.2. Goal of NUHM

The mission aims at addressing the health care facilities for the urban poor and the disadvantaged sections of the society by providing affordable, accessible and quality healthcare facilities. This will be done through revamping the public health systems with partnership and support of non-government organizations.

It hopes to create harmony and synergy with existing programs which have similar goals o NUHM such as JNNURM, SJSRY and ICDS.

3.2.3. Funding

The financial arrangements for NUHM would be on similar patterns with NRHM. In the XII five year plan (2012-17) funding for the missions would be on 75-25 basis, where 75 percent would be funded by the Union Government and 25 percent by the respective State Government. The proposed budget for NUHM for the period of 2010-11 to 2016-17 is SEK 47.1 billion.

The allocation of funds from the Union Government to various state governments would depend upon a number of parameters such as urban population, state backwardness index (the same as

\textsuperscript{9} Business Standard Newspaper (website: http://www.thehindubusinessline.com/opinion/editorial/article2235885.ece?homepage=true)

\textsuperscript{10} Towns are defined those cities/ municipalities with populations of not less than 5,000 and majority of whom have non-farming occupations, and a population density of not less than 400 people per sq km (Source: Expressbuzz Website)
used in NRHM), Sustainability, Management Costs. Further flow of funds from state government to the end users is expected to be on the same lines as NRHM.

3.2.4. Key Strategies:

The key strategies involved under NUHM are as illustrated below:

![Figure 3-5: Key Strategies for NUHM](source)

Source: Framework for Implementation, NUHM, June 2010

3.2.5. Delivery System

The mission is proposed to be implemented in two phases:

- **Phase I**: In this phase, the mission aims to cover 430 cities with population more than 100,000 along with all the state capitals.
- **Phase II**: this phase will cover district headquarters with population below 100,000 during phase II. It does have a priority list of 100 cities to focus upon during the first year.
NUHM has a three tier delivery model as suggested below:

3.2.6. Community Level Programs

The community level services provided by NUHM are supported with strategies like USHA and MAS.

- USHA (Urban Social Health Activist) is the urban version of ASHA (NRHM) where the activist functions in urban poor settlements covering 200-500 households with total population of 1000-2500 and ensures community participations in healthcare programs through institutions like Mahila Arogya Samitis (MAS) and Rogi Kalyan Samitis.

- Community Risk Pooling and health insurance is provided via MAS, NUHM’s mode of promoting access to improved healthcare facilities at household level. The NUHM proposes the creation of Mahila Arogya Samiti (MAS) a community based federated group of around 20 to 100 households, depending upon the size and concentration of the slum population and would provide health insurances to these households.

- The Urban Local Bodies (ULBs) would be responsible for dispersal of funds to MAS and also would take charge of implementing the Individual/Family Suraksha Cards for families.

NUHM will follow similar system to NRHM and use health missions at city and state level for implementation. For the purpose of promoting transparency and accountability, it proposes to incorporate elements such as health service delivery charter, health service guarantee and concurrent audit at the level of funds released and utilized.
3.3. National Vector Borne Disease Control Program

3.3.1. Overview

National Vector Borne Disease Control Program (NVBDCP) is an umbrella program for prevention and control of vector borne diseases such as Malaria, Dengue, Lymphatic Filariasis, Kala-azar, Japanese Encephalitis and Chikungunya in India. The program was launched in 2005 under the purview of National Rural Health Mission and is being implemented by the Directorate of Health Services jointly with Mission Directorate, NRHM and other Health Directorates.

The Directorate of National Vector Borne Diseases Control Program is responsible for framing technical guidelines and policies so as to guide the states in the implementation process. It also carries out evaluation of the program implementation at regular intervals.

3.3.2. Program Objectives and Funding Scenario

The total budget under XI plan allotted for NVBDCP is SEK 4.9 billion\(^{11}\). In addition, a support program specifically focusing on control of malaria and kala-azar was launched along with the World Bank with a total approved funding of SEK 1.2 Billion\(^{12}\) for five years (2008-13). The major objectives guidelines as stated by Project Implementation Plan for the support project in association with the World Bank are:

- Reduce Malaria morbidity by 25% by 2013 (Base Year 2007)
- Reduce Malaria mortality by 50% by 2013 (Base Year 2007)
- Achieve Kala-Azar elimination by 50% of sampled blocks during the project period.

The major strategies comprise of early diagnosis and immediate treatment. The same is achieved with promotion of individual preventive measures such as insecticide treated bed nets including LLIN\(^{13}\), biological control measures and capacity building through training at all levels of healthcare delivery system.

The program also envisions collaboration with other health programs as well as public and private health care delivery systems to provide uniformity in diagnosis, treatment and prevention of these vector borne diseases throughout the country.

Under the program, the GoI provides the technical support as well as logistics as per approved pattern while the state governments ensure the program implementation. The various individual disease based objectives are as mentioned below.

<table>
<thead>
<tr>
<th>Diseases Covered</th>
<th>Objectives</th>
</tr>
</thead>
</table>
| Malaria          | • Aimed at to maintain Annual Blood Smear Examination Rate (ABER) at over 10% by active and passive surveillance  
|                  | • Bring down Annual Parasite Incidence (API) to less than 1.3 by 2012  
|                  | • The program provides for engaging multipurpose workers (MPWs) and Malaria Technical Supervisors (MTSs) in high endemic areas to strengthen  |

\(^{11}\) Source: Report, Working Group on Communicable and Non-Communicable Diseases For XI five year plan, 2006  
\(^{12}\) Source: Project Id: P094360, World Bank; Total Budget : SEK 3.6 Billion with 33% for Malaria and Kala-Azar  
\(^{13}\) LLIN: Long Lasting Insecticidal Nests, offer 70% more effective protection against malaria over no nets and can last for up to 5 years.
Diseases Covered | Objectives
---|---
support and supervision at micro-level with emphasis on malaria diagnosis, treatment, prevention and control activities. Each MTS would require supervising an area covering population of around 250,000.

Lymphatic Filariasis
- The aim of the program is interruption of transmission and eventual elimination of the disease by 2015
- The endemic districts identified were supposed to be covered with Mass Drug Administration (MDA)\(^\text{14}\)
- The strategy involves change from administering a single dose of DEC to co-administration of DEC + Albendazole

Kala-Azar
- The Kala-Azar incidents to be reduced to less than 1 per 10,000 at sub-district level with an aim to eliminate the disease by 2010
- The program provides for provision of Kala Azar Technical Supervisors (KTS) in the affected areas to facilitate early detection and their complete treatment along with other activities for prevention and controlling of kala-azar including residual spray
- The World Bank support for ‘Improving Access to and use of services to eliminate Kala-Azar’ is estimated to be at SEK 239 million\(^2\)

The component-wise breakup of the funding during the project duration (2009-2014) is depicted below:

<table>
<thead>
<tr>
<th>Component</th>
<th>Details</th>
<th>Cost (SEK Million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Improving Access to and Use of Services for Control of Malaria</td>
<td>682.8</td>
</tr>
<tr>
<td>2</td>
<td>Improving Access to and Use of Services for Kala-azar Elimination</td>
<td>239.4</td>
</tr>
<tr>
<td>3</td>
<td>Policy and Strategy Development, Capacity Building and Monitoring and Evaluation</td>
<td>297.7</td>
</tr>
<tr>
<td>Unallocated Amount</td>
<td></td>
<td>208.5</td>
</tr>
</tbody>
</table>

The chart below illustrates the disbursement and reporting arrangement between the different stakeholders:

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\(^{14}\) MDA: it is the community-wide mass treatment program implemented to treat the entire at-risk population. Based on yearly administration of single dose of two drugs given together.
3.3.3. Progress so far

The API for Malaria is under 1.3 per 1000 population at 0.26; however, the ABER is currently at 9.31%, slightly under the target of 10%. Further, the deaths due to malaria have registered a 72.8 percent drop over the last seven years (2006-11) to 463 fatal cases in 2011 from 1707 fatal cases in 2006.

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15 All India Health Status: Executive Summary Dec 2011, Ministry of Health and family Welfare
Kala-Azar was aimed to be eliminated by 2010. There has been a steady rise in cases of kala-azar over the last 3 years; however, total fatal cases due to the same has been reduced to 80 in 2011 from 187 in 2006.

Figure 3-9: Kala-Azar: Cases and Fatalities 2006-11

Source: MoHFW Annual Report 2011
3.4. Revised National Tuberculosis Control Program

3.4.1. Overview

India has had a long list of tuberculosis control programs starting from National Tuberculosis Program (1962-1992). It was later revised as RNTCP (Revised National Tuberculosis Program) which was launched a pilot study in 1992 and then as a national program in 1997.

RNTCP program based Direct Observed Treatment, Short-course (DOTS) strategy was launched in 1997 in phased manner and it is a five point strategy:

- **Political and administrative commitment.** Since TB can be cured and the epidemic reversed, it required the topmost priority, which it has been accorded by the Government of India. This priority must be continued and expanded at the state, district and local levels.
- **Good quality diagnosis.** Good quality microscopy allows health workers to see the tubercle bacilli and is essential to identify the infectious patients who need treatment the most.
- **Good quality drugs.** An uninterrupted supply of good quality anti-TB drugs must be available. In the RNTCP, a box of medications for the entire treatment is earmarked for every patient registered.
- **Supervised treatment** to ensure the right treatment, given in the right way.
- **Systematic monitoring and accountability.** The program is accountable for the outcome of every patient treated. This is done using standard recording and reporting system, and the technique of ‘cohort analysis’.

The first phase of RNTCP was from 1992-2006. While the current phase two of the RNTCP was scheduled for 2006 to 2012.

3.4.2. Goals and Objectives

Since March 2006, RNTCP has been successfully covering the entire nation reaching over population across 632 districts. The goal of RNTCP is to decrease mortality and morbidity due to TB and cut transmission of infection until TB ceases to be a major public health issue. The objectives of the program are:

- To achieve and maintain cure rate of at least 85% among New Sputum Positive (NSP) patients
- To achieve and maintain case detection of at least 70% of the estimated NSP cases in the community

Current focus of the program is on ensuring universal access to good quality early diagnosis and treatment for all TB patients from which ever provider they choose to seek care. RNTCP Phase two is aligned to the ‘Stop-TB’ strategy (2006-15) of WHO and covers all activities proposed under it.
3.4.3. Strategy

To achieve the objectives outlined by RNTCP, some of the strategies to be implemented are:

- Provision of high quality diagnostic and treatment services
- Capacity strengthening with up-gradation of Designated Microscopy Centres to PHCs.
- Implementation of QA protocols to ensure correct diagnosis and treatment for all TB suspect cases.
- Involvement of Medical colleges to establish and maintain diagnosis facilities at their premises.
- Scaling up public-private mix activities to proposed 70 sites.
- Implement Tribal Action Plan to improve access to tribal areas.
- DOTS Plus service for MDT-TB, introduction of diagnostic and treatment services for MDR-TB in a phased manner.
- Ensure uninterrupted drug supply

3.4.4. Funding

The second phase of RNTCP was supported by the World Bank and has a total budgeted outlay of SEK 2.06 billion which includes:

- SEK 1.19 Billion aid by World Bank
- SEK 437 million by Department for International Development (DFID) as commodity assistance for anti-TB drugs

The support by World Bank is proposed for an extension till March 2015 with an additional funding of SEK 2.7 billion. The World Bank financing would focus on new challenges in areas including:

- Health system improvements necessary for diagnosis and treatment of MDR-TB
- Public-private partnerships and contracting out of services (including the necessary accreditation, contract management and quality-control systems)
- Introduction and scale-up of new diagnostics
- Strengthening state-level capacity and integration with the primary health care system
- Improving capacity and results in lower performing states and districts
- Performance-based financing and incentive systems
- Impact evaluation.

3.4.5. Achievements

Key achievements under this program are depicted below:

- In addition to the 100 percent coverage, RNTCP has been putting estimated 1.52 million people on treatment annually for the period 2008-10; further, since inception 12.8 million patients have been put on treatment.

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16 Source: Planning Commission Report 2006
17 Source: Annual Report 2011, RNTCP
Since 2007, RNTCP has maintained a success rate of over 85% and NSP case detection rate of above 70%. For 2010, the corresponding figures were 87% and 71% respectively which are in line with the global targets.

- TB mortality in the country has reduced from over 42/100,000 population in 1990 to 23/100,000 population in 2010.
- The prevalence of TB in the country has reduced from 568/100,000 population in 1990 to 249/100,000 population by the year 2010.

3.4.6. RNTCP Phase III

After constantly achieving the twin goals of case detection (>70%) and treatment success rate (>85%) over the last phase, the new objective of RNTCP Phase III is “Universal Access for quality diagnosis and treatment for all TB patients in the community.” This entails sustaining the achievements of the program to date, and extending the reach and quality of services to all persons diagnosed with TB.

By end 2015, RNTCP plans to achieve:

- Early detection and treatment of at least 90% of estimated TB cases in the community, including HIV associated TB
- Initial screening of all re-treatment smear-positive TB patients for drug-resistant TB and provision of treatment services for MDR-TB patients
- Offer of HIV Counselling and testing for all TB patients and linking HIV-infected TB patients to HIV care and support
- Successful treatment of at least 90% of all new TB patients, and at least 85% of all previously-treated TB patients
- Extend RNTCP services to patients diagnosed and treated in the private sector.

The plan aims to achieve the same by deploying new rapid diagnostics, expand services for management of MDR-TB and coordinate with NACO and NRHM supervisory structure to ensure efficient implementation.

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18 Source: WHO Global TB report 2010
19 Source: Annual Report 2011, RNTCP
3.5. Reproductive and Child Healthcare -II

3.5.1. Overview

Reproductive and Child Healthcare (RCH) Phase II was launched in April 2005 for a period of five years till 2010 with a vision of bringing together the Millennium Development Goals as well as the goals of The National Population Policy 2000, the Tenth Plan document, the National Health Policy 2002 and Vision 2020 India in the fields of reproductive and child healthcare.

The vision of the program is to bring about a paradigm shift in the maternal and child healthcare delivery systems by offering services that are accessible, affordable, responsive, quality and equitable.

3.5.2. Goals and Objectives

The focus of the RCH program was on reduction of the maternal mortality ratio (MMR), the infant mortality rate (IMR) and total fertility rate (TFR). It also aimed at increasing the couple protection rate and the coverage of children through immunization. The major goals of RCH-II were:

- **Reduction in growth rates**
  - Decadal rate of population growth between 2001 and 2011 to 16.2%
  - IMR to < 45 per 1000 live births by 2007 and <30 per 1000 live births by 2010
  - TFR to 2.1 by 2010
  - MMR < 100 per 100,000 live births by 2010

- **Improve coverage in the following areas:**
  - Full Ante Natal Care (ANC) from 44.5% (RHS 2002-03) to 89% in 2010
  - Institutional deliveries/safe deliveries from 39.8% /54.07% (RHS 2002-03) to 80% in 2010
  - Fully immunized children from 48.2% (RHS 2002-03) to 100% in 2010

- **Improve the following:**
  - Contraceptive Prevalence Rate (CPR) from 44.8% (RHS 2002-03) to 65% in 2010
  - Management performance through establishment of state ownership for the program

- **Human resource development complemented by an efficient support system to enhance the quality of monitoring and evaluation (M&E), procurement, financial management and service delivery**

- **Expand essential RCH services through the universalization of RCH in small and medium towns, as well as introduce a package of essential RCH services for the vulnerable groups.**

3.5.3. Strategy Framework

The broad strategies to be implemented by RCH-II are:

- **Capacity Building:** This included
  - Building capacity at state and district levels to enable them to develop methodologies, identifying priorities and improved analysis capabilities to draw up region-specific implementation plans.
  - Upgrade pre and in-service training nationwide, including gender sensitivity, governance issues and provider attitudes
• **Performance Benchmarking**: Establishing state ownership and accountability through mutually agreed performance benchmarking

• **Usage of Public Private Partnership Model**: This included:
  - Public-private partnership to begin in-service delivery and gradually scaled up to cover preventive health.
  - Provision of private contractual service

• **Other**: This included:
  - Better and more focused BCC strategies
  - Increased involvements of Panchayati Raj Institutions (PRIs)
  - Make Good Manufacturing Practices**20** (GMP) mandatory for the pharmaceutical industry

3.5.4. Funding

The total budget approved for RCH Phase II was SEK 57.1 billion for the period 2005-10. In addition to the government funding, RCH II also received funding from various multilateral and bilateral organizations. The commitment of the World Bank is SEK 2.45 Billion (including SEK 280 million earmarked for polio eradication and SEK 140 million for retroactive financing) and that of Department of International Development (DFID) is SEK 2.65 Billion (excluding SEK 50 million for technical assistance which will not be included in the budget and including SEK 200 million for the year 2004-05). The UNFPA has also joined the common pool through a grant of SEK 175 million.

Audited expenditure for RCH-II was as mentioned below.

*Figure 3-10: Budgeted Expenditure and Utilization 2005-10*

![Budgeted Expenditure and Utilization 2005-10](image)

Source: JRM-7, RCH-II, 2010

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20 GMP: WHO certified production and testing practices that helps to ensure a quality product.
3.5.5. Progress so Far and way ahead\textsuperscript{21}

Major achievements under the program are as follows:

- Over 5.6 million Village Health & Nutrition Days (VHNDs) have reportedly been carried out across states in 2009-10\textsuperscript{22}.
- 366 Newborn Stabilization Units (NBSUs) operational by 2010, against a target of 2110.
- Of the 480 Special Newborn Care Units (SNCUs) planned by 2010-11, 192 (40%) are operational.
- Institutional deliveries increased from 9 million in 08-09 to 10 million in 2009-10.
- As of June 2010, 2383 facilities or 71% of the 2012 target have been converted as First Referral Units (FRUs); while 8716 Primary Health Centres (PHCs) i.e. 61% of the 2012 target, are reported to have been strengthened to provide 24-hour services.

Further, the goals for RCH-II were revised to 2012, the updated goals and progress so far is as illustrated below:

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Progress</th>
<th>RCH II Goals (2012)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maternal Mortality Rate (MMR)</td>
<td>301 (SRS 2001-03)</td>
<td>254 (SRS 2004-06)</td>
</tr>
<tr>
<td>Infant Mortality Rate (IMR)</td>
<td>60 (SRS 2003)</td>
<td>53 (SRS 2008)</td>
</tr>
<tr>
<td>Total Fertility Rate (TFR)</td>
<td>3.0 (SRS 2003)</td>
<td>2.6 (SRS 2008)</td>
</tr>
</tbody>
</table>

\textsuperscript{21} Source: JRM-7, RCH-II, 2010
\textsuperscript{22} Source: NRHM MIS Bulletin, 2010

3.6.1. Overview

India is home to roughly 2.5 million people affected with HIV, which is the third largest in the world. To counter the spread of HIV, a National AIDS Control Program (NACP) was started in 1987, including activities surveillance, blood screening and health education. During 1990s, as infection rates continued to rise, NACO (National AIDS Control Organisation) was set up to oversee policy formation, preventive and control measures relating to HIV/AIDS. NACO established the administrative and technical basis for program management and also set up State AIDS Control Societies (SACS) in 25 states and 7 union territories. It was able to make a number of important improvements in HIV prevention such as improving blood safety.

In 1999, the second phase - NACP II - came into effect with an aim to control the spread of HIV through promotion of behavioural change. During this phase, the prevention of mother-to-child transmission (PMTCT) program and the provision of free antiretroviral treatment were implemented for the first time.

With estimated HIV affected population at 5.2 million, the third phase - NACP III was launched in July 2007, with high priority placed on reaching 80 percent of the high-risk groups including sex workers and injecting drug users with targeted interventions.

3.6.2. Objectives

The third phase of NACP was developed for the period 2007-2012. In synergy with the Millennium Development Goals (MDGs)\(^3\), the primary goal of NACP – III is to halt and reverse the epidemic in India over the next 5 years by integrating programs for prevention, care, support and treatment. The four focus areas are:

1. Prevention of new infections in high risk groups and general population through:
   a. Saturation of coverage of high risk groups with targeted interventions (TIs), and
   b. Scaled up interventions in the general population

2. Providing greater care, support and treatment to a larger number of people living with HIV/AIDS.

3. Strengthening the infrastructure, systems and human resources in prevention, care, and support and treatment program at the district, state and national levels.

4. Strengthening a nation-wide strategic information management system.

3.6.3. Strategy

The strategies followed by NACP-III can be categorized as:

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preventive</td>
<td>● Mainstay of NACP-III, as 99% of population is not affected by HIV, so program can focus on preventive measures rather than on treatment.</td>
</tr>
</tbody>
</table>

\(^3\) MDG: Millennium Development Goals are eight international development goals that UN members hope to achieve by the year 2015.
### Strategy

- Set up 2100 TI (Targeted Intervention) Sites to cover 80% of High Risk Population.
- Focus on behavioural change communication and target voluntary testing to 21 million tests per year.
- Screening 150,000 HIV pregnant women for providing the prophylaxis under the PPTCT\(^{24}\) program, Revised National Tuberculosis Control Program (RNTCP) and the NRHM.
- Proposes to set up 3,222 blood storage units (BSUs) covering all CHCs over the next 5 years.
- The program also proposes to set up additional 80 blood component separation units (BCSUs) and additional 22 mobile blood units.
- The amount allocated for prevention is SEK 11.2 billion (67% of the total budget).

### Care, Support and Treatment

- Focus on assuring access to first line Anti Retro Viral (ARVI) drug
- To treat 320,000 OI (opportunistic Infection) episodes in a year
- Provide TB referrals to 2.8 Million PLHA\(^{25}\) and ART\(^{26}\) treatment to 300,000 PLHA, including 39,000 children.
- Amount allocated for the process is SEK 2.7 billion (16.9% of the total budget).

### Impact Mitigation

- Collaboration with other government and welfare agencies to provide nutritional support, opportunities for income generation and other welfare services
- Promote greater involvement of people living with HIV/AIDS (GIPA) and facilitate establishment of PLHA networks and civil society forums
- Capacity development for effective advocacy against discrimination and a right(s) based approach to the HIV mitigation program.

### Decentralization of Implementation

- Plan to be implemented now at district level.
- 611 districts to be covered; these districts are classified into four categories
- Proposed to set up District AIDS Prevention and Control Units (DAPCUs) and Regional AIDS Control Units (RACUs).

### 3.6.4. Funding

The total budget for the program is SEK 16.5 Billion\(^{27}\) with majority of the budget to be spent on preventive care. The financial allocations under the budget are as shown below:

\(^{24}\) PPTCT: Prevention of Parent to Child Transmission  
\(^{25}\) PLHA: People Living with HIV/AIDS  
\(^{26}\) ART: Antiretroviral Therapy  
\(^{27}\) Source: Strategy Implementation Program, NACP-III
A number of international organizations (16) are working in collaboration with NACO in India. Few of the organizations associated with NACP-III are:

<table>
<thead>
<tr>
<th>Agency</th>
<th>Comments</th>
</tr>
</thead>
</table>
| The Joint United Nations Program on HIV/AIDS (UNAIDS) | It brings together ten UN agencies in a common effort to fight the epidemic. Cosponsors include UNHCR, UNICEF, WFP, UNDP, UNFPA, UNODC, ILO, UNESCO, WHO and the World Bank. Specifically, UNAIDS supports the national response to HIV and AIDS by promoting:  
- Strengthened leadership and resource mobilization for a broad-based response at all levels, including governments, civil society and people living with HIV  
- Improved planning, financing, technical assistance and coordination at all levels  
- Assist in better monitoring and evaluation, surveillance, and resource tracking  
- Enhanced human resources and robust delivery systems  
- Strengthened human rights-based and gender-responsive policies to reduce stigma and discrimination. Increased coverage and sustainability of programs |
| Bill and Melinda Gates Foundation (BMGF)     | The Foundation through its liaison office (Avahan) directs service delivery and scaling up of HIV prevention services towards attaining high coverage.  
- Funding committed for AIDS initiative at SEK 1.8 Billion28 for five years (2006-11) |
| World Bank                                  | The World Bank’s support to the program focuses on:  
- Preventing new infections among high risk groups and vulnerable populations |

![Figure 3-11: Budget allocations under NACP-III](source: Implementation Plan, NACP-III)
Agency | Comments
--- | ---
| | • Bringing care, support and treatment to larger numbers of people living with HIV/AIDS
| | • Monitoring and surveillance of the epidemic
| | • Developing and strengthening skills within the National AIDS Control Organization (NACO), the State AIDS Control Societies, and of NGOs and CBOs associated with the program.
| | The total funding for NACP-III is SEK 1.7 billion.\(^{29}\)

International AIDS Vaccine Initiative (IAVI) | Supports research in the country to advance scientific progress in HIV vaccine development.
| | It also supports a range of advocacy, policy and community engagement activities to build widespread social and political support for AIDS vaccine R&D and a comprehensive response to the HIV epidemic in India.

The budget allocations and utilization for the program since 2007-08 are as described below:

**Figure 3-12: Budget allocations and utilization 2007-2010**

<table>
<thead>
<tr>
<th>Year</th>
<th>Budget Alloted (SEK Billion)</th>
<th>Utilization (RHS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007-08</td>
<td>1.3</td>
<td></td>
</tr>
<tr>
<td>2008-09</td>
<td>1.6</td>
<td></td>
</tr>
<tr>
<td>2009-10</td>
<td>1.4</td>
<td></td>
</tr>
<tr>
<td>2010-11</td>
<td>2.0</td>
<td></td>
</tr>
</tbody>
</table>

Source: Annual Report FY 10-11, NACP-III

### 3.6.5. Progress

On World AIDS Day 2007 India flagged off its largest national campaign to date, in the form of a seven-coach train called the ‘Red Ribbon Express’. A year later the train journey was completed, having travelled to 180 stations in 24 states and reaching around 6.2 million people with HIV/AIDS education and awareness. Following the success of the campaign, the ‘Red Ribbon Express’ took off for a second time in December 2009 and a third time in February 2012. The train now includes counselling and training services, HIV testing, treatment of sexually transmitted diseases (STDS) as well as HIV/AIDS education and awareness.

\(^{29}\) Source: World Bank Website
The HIV prevalence among the population is currently at 0.36 % and the total HIV affected population has come down from an estimated 5.2 million in 2006 to 2.4 million 2010-11. The estimate of People Living with HIV/AIDS (PLHA) is as shown below:

![HIV Affected Population Chart](source)

The total number of personnel trained in FY 2010-11 under NACP-III were 3,75,778 which consisted of doctors, nurses, medical officers, staff under the different divisions such as blood safety, counselling, CST, STI, DAPCU, mainstreaming etc.

![Personnel Trained Under NACP-III](source)
3.6.6. **National AIDS Control Program – IV**

Following the end of NACP-III in mid 2012, fourth phase of NACP is set to be launched under the XII Five year plan for the period 2012-2017. Keeping in line with the Millennium Development Goals, the major objectives for NACP-IV are:

- 80% reduction in new infections in high prevalence states
- 60% in low prevalence states
- Comprehensive Care, Support and Treatment to all persons living with HIV/AIDS.

It is envisionered that the above mentioned objectives would be achieved through following strategies:

- Intensifying and consolidating quality prevention services to HRGs and vulnerable populations
- Increasing access and promoting innovative and sustainable mechanisms for comprehensive Care, Support and Treatment
- Expanding IEC services for (a) general population and (b) High Risk groups with a focus on behaviour change and demand generation
- Strengthening institutional capacities and process of integration
- Enhancing access, coverage and quality of services by leveraging partnerships
- Strengthening program initiatives through innovations

The NACP-IV is expected to cover 3.4 million HIV affected people during its implementation and the estimated budget allocation for the fourth phase is SEK 22.59 billion which is a 36% jump over the previous phase. Additionally, the Bill & Melinda Gates Foundation (BMGF) have agreed to provide assistance worth SEK 2.6 billion in the form of technical support.

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30 Source: Gist of the deliberations of the meeting of Working Group on AIDS control, Planning Commission, 9/2011
31 Source: News Article, 6th April, 2012
Major Disease Areas
4. Disease Areas and Treatment Scenarios

4.1. Public Health

4.1.1. Summary

4.1.1.1. Maternal Care, Child Care

Maternal and Child health are among the biggest health concerns for the Indian Government today. Despite improving situation, the infant mortality rate (IMR) and maternal mortality rate (MMR) rates in India are significantly high at 47 per thousand live birth and 230-250 per 10000 live births respectively. The treatment quality varies across geographies, just like in any other developing country, which goes to show that there is a great divide when it comes to affordability and spending power. Some of the direct causes for maternal deaths include infections, unsafe abortions, hypertension, obstructed labour, excessive bleeding, etc.

There is a need to develop specialist hospitals / health care centres which cater to maternal and child care. Most often, the maternal care department is integrated into a multispeciality hospital which results in lack of specialised care for maternal and child diseases. The process of accountability at the time of mortality is largely missing, wherein there is no standard system in place to measure death rates, and various stakeholders are able to dodge responsibility for these.

The Ministry of Health and Family Welfare is the nodal ministry for maternal, child care and it has been especially instrumental in improving healthcare delivery within MCH through its flagship program, NRHM. The Ministry for Human Resource Development and the Ministry for Women and Child Development are other major influencers of maternal and child care in India.

Midwifery and Nursing care training is limited and scattered, but this could be a tool to improve maternal care and child care, especially in the rural areas where maternal deaths are maximum. This would be an interesting opportunity area as it would provide skilled employment to a number of women and the Central and various state government are very much open to collaborate in this area. There is a great demand for skilled support staff within maternal and child care institutions. Pipeline projects include better education, specialist clinics for maternal and child care, etc.

Other Opportunities for Sweden include widespread introduction and concentration on mammographic screening, as a tool to detect Breast cancer which is a Swedish methodology that could be implemented in India on a large scale. Breast cancer / women’s cancer care is a very nascent area for the country where there is scope for large scale development.

4.1.1.2. Tobacco, Alcohol, Drugs

Tobacco, alcohol and drugs abuse is a growing problem in India as it is in the rest of the World. Chewing tobacco and alcohol are considered legal in most states of the country, whereas all other drugs are deemed illegal across the country. The excise duties, age limits in terms of consumption and blood alcohol limits while driving are also state specific when it comes to various drugs including alcohol.
India has almost 63 million alcohol users, with approximate consumption of around 2 litres per person at present. Alcohol abuse is also leading to higher number of patients suffering from liver and heart disease in the country. It is also responsible for almost 30% in all cases of cancers, liver, chest and throat diseases, and raises the risk of close to 60 different diseases across all spectrums.

Among drugs, Cannabis, heroin, and Indian-produced pharmaceutical drugs are the most common types of drugs used in India. Tobacco abuse is among the largest causes of cancer in India. By 2025, the number of people suffering from cancer is likely to reach 5 million per annum from the current 1 million per annum, which will be mainly attributed to tobacco usage. By 2020, tobacco is likely to be the cause of almost 13% deaths in India.

Addiction is a huge point of concern for India and the average age for addiction has lowered to 14 years from 20 years. There are programs such as the National Drug De-addiction Program and Drug Dependence Treatment Program, but the states are still apprehensive to claim responsibility when it comes to these problems. Further, there is a social taboo that exists when it comes to addiction.

Overall, de-addiction centres are very much a recent phenomenon in the country. Swedish companies could be useful in sharing knowledge with regards to de-addiction centres and detection equipment as well. There is also a need to understand service delivery within de-addiction and trained staff for de-addiction centres is greatly lacking. Institutions are interested to understand more about courses within treatment of addiction and recovery with regards to substance abuse provided there is such expertise available in Sweden.

4.1.2. Overview

4.1.2.1. Maternal and Child Care

During recent years, India has witnessed a considerable drop in the IMR and MMR, which is mainly attributed to various programs being run at the state and central level and rise in awareness among public. Deployment of advance techniques and solutions such as mother and child tracking system and health management information system across all the states have also helped the government in reducing these rates. In line with this, the crude birth rate has also witnessed a decline in India. Figure below depicts the decline in IMR, MMR and birth rate in India during recent years:

32 Deaddictioncentres.in Website
In terms of IMR and MMR, India still fares poorer than a number of countries including its neighbouring countries. Figure below depicts the India’s position as compared to other countries in terms of IMR:

Child care in India is another concern, and is closely linked to maternal care. The government’s focus in the past few years is to concentrate on the reduction of the infant mortality rate (IMR) across all regions, which would lead to a decline all-India. The below figure is a rural-urban split of IMR across the years:
The figure above shows that while there has been a considerable decline in IMR over the years, the rural areas have performed better when compared to the urban areas. In the past five years, the National Rural Health Mission (NRHM) has also been concentrating on reducing IMR and MMR in rural areas especially.

Basic diagnostics and follow ups are lacking when it comes to this sector in India. Doctors also feel that there is a need to identify problems such as gestational diabetes, which is on the rise amongst pregnant women and treat thyroid and related ailments in order to reduce the impact on the children. From a public hospital treatment perspective, there is the need to develop better mobile birthing technologies in order to empower the rural areas.

WHO reports- 25.7% of all maternal deaths are from India and a majority of these deaths take place across rural areas, which are mainly attributed to lack of adequate care and unhygienic circumstances in these areas. Of these maternal deaths, almost 75 per cent are preventable with adequate care. Figure below depicts the India’s position as compared to other countries in terms of MMR:
This sector is given prime importance by the Government and all efforts are directed toward increasing the quality of maternal and child health. Apart from the other causes for maternal deaths in India, one of the major causes is the lack of proper diagnostics. This amounts to incorrect detection and diagnosis which hampers the chances of treatment to a large extent. In addition, screening and monitoring are heavily inconsistent, leading to weak follow ups of disease and chances of recurrence being high.

Absenteism of sufficient doctors/health providers and low levels of skills (among nursing and paramedical staff) is another issue plaguing the country which presents a number of opportunities to training and educational institutions. The figure below illustrates some of the leading causes of maternal deaths:

**Figure 4-5: Leading causes for maternal deaths, 2010**

Source: Planning Commission, India and UNESCAP
Almost 70% of all deaths take place during the post natal period which indicates that post-partum care is quite poor. This is followed by 24% of all deaths which take place during pre natal period, and about 6% of deaths that occur at the time of delivery.

4.1.2.2. Tobacco, Alcohol, Drugs

Substance abuse in India has reached at an alarming level in recent times. Smoking (cigarettes, ‘beedis’), chewing tobacco (‘gutkha’, ‘pan masala’), alcohol, cannabis (ganja, bhang, charas), opioids (cough syrups, opium and heroin), Sedative-Hypnotics (sleeping pills, Alprazolam, Diazepam) and Inhalants (correction fluid) are some of the most common forms of abused substance being used in India today. Below figure depicts the reasons for primary substance abuse collected by DAMS from various inpatient treatment centres and rehabilitation centres:

![Figure 4-6: Leading causes for Substance Abuse in India](source)

Alcohol is one of the largest and most popular forms of substance abuse in India. The consumption of alcohol is growing at a considerable pace in India with approximate consumption of around 2 litres per person at present. There are around 63 million alcohol users in India, with almost 14 million users needing assistance for de-addiction. Alcohol consumption in India has almost grown by 171% during the last fifteen years. Alcohol abuse is also leading to higher number of patients suffering from liver and heart disease in the country. It is also responsible for almost 30% in all cases of cancers, liver, chest and throat diseases, and raises the risk of close to 60 different diseases across all spectrums. Local alcohol, known as ‘Toddy’ in some parts of India, is one of the prime causes of poisoning. Figure below depicts the major states suffering from problem of alcohol abuse in India:

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33 The Drug Abuse Monitoring System (DAMS) is developed by the National Centre for Drug Abuse Prevention; National Institute of Social Defence; Ministry of Social Justice and Empowerment; India. Its objective is to create a monitoring system for the entire country, collect data from various sources, and develop a format for collecting information on a regular basis.

34 [Hindu Website](https://hinduwebsite.com)

35 [Deaddictioncentres.in Website](https://deaddictioncentres.in)
Drugs are completely prohibited in India but still form a large part of substance abuse in the country. Among drugs, cannabis, heroin, and Indian-produced pharmaceutical drugs are the most common types of drugs used in India. Almost 1 million heroin addicts are present in India as per the official counts; however, the figure is almost equal to 5 million by unofficial estimates. Due to its easy availability, cannabis is consumed in the form of various products such as charas, bhang, or ganja. Himachal Pradesh, Uttar Pradesh, Karnataka, etc are some states in India that supply illegally grown cannabis and opioids to the rest of the country. In terms of Indian-produced pharmaceutical drugs, injections of analgesics like dextropropoxyphene and codeine-based cough syrups are among the most common types used.

Tobacco abuse is among the largest causes of cancer in India. By 2025, the number of people suffering from cancer is likely to reach 5 million per annum from the current 1 million per annum, which will be mainly attributed to tobacco usage. By 2020, tobacco is likely to be the cause of almost 13% deaths in India. According to a recent survey conducted by the World Health Organisation, tobacco usage is rampant among school children in the country; almost one in five school children in India use some form of tobacco and around 17% of students aged under 16 use some form of tobacco (mostly cigarettes).

Smoking is another more prominent form of substance abuse. Close to 700 million beedis, filterless hand-rolled cigarettes, are consumed annually in the country which is one of the oldest forms of drug consumption. The following figure indicates tobacco consumption by gender and form in India:

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36 Pravara Website  
37 Hindustan Times Website  
38 Weswa Website
The above figure highlights that smokeless tobacco (which includes chewing tobacco) is the biggest health concern for India today due to the widespread availability and popularity of the same across both rural and urban areas. Figure below depicts the major states suffering from problem of Tobacco abuse in India:
### 4.1.3. Sub-sector specific Programs

In India, public health has been mainly focussing on maternal and child health along with infectious diseases. Since recently, non-communicable diseases have been given priority and so have addiction-related diseases. Some of the major government programs that are running within public health are listed below:

<table>
<thead>
<tr>
<th>Policy / Program</th>
<th>Janani Suraksha Yojana (JSY)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Key Stakeholders</strong></td>
<td>Ministry of Health and Family Welfare</td>
</tr>
<tr>
<td><strong>Details</strong></td>
<td></td>
</tr>
<tr>
<td>• Key aspects of this program are as follows:</td>
<td></td>
</tr>
<tr>
<td>o This is one of the largest programs within maternal care has been taken up by the Ministry of Health and Family Welfare’s flagship, National Rural Health Mission (NRHM)</td>
<td></td>
</tr>
<tr>
<td>o It is called the Janani Suraksha Yojana (JSY), or Safe Motherhood Scheme and is implemented on a national level by all states</td>
<td></td>
</tr>
<tr>
<td>o Launched in 2003, it uses cash incentives to encourage women to give birth in good health facilities</td>
<td></td>
</tr>
<tr>
<td>o The goal was to reduce the numbers of maternal and neonatal deaths in general. This program was successful when launched but fails to target the poorest of poor women.</td>
<td></td>
</tr>
<tr>
<td>o Every state has various attached programs that run along with the JSY, concentrating on pre-natal and post-natal care most of the time, along with neonatal care. This would include free treatment of expectant mothers, family counselling, infant care, etc.</td>
<td></td>
</tr>
<tr>
<td>o The states are responsible for the implementation of the various schemes and programs under JSY. They also have the freedom to introduce locally relevant sub-programs in addition to this program</td>
<td></td>
</tr>
<tr>
<td>• Financial management under JSY</td>
<td></td>
</tr>
<tr>
<td>o The budget allocation for JSY has been around SEK 2.4 billion (USD 342 million)</td>
<td></td>
</tr>
<tr>
<td>o However, the model JSY functions on is modelled on grants which will be released to the State Health Society (SHS) as part of Reproductive and Child Health (RCH) flexi pool and in line with the State’s Project Implementation Plan</td>
<td></td>
</tr>
<tr>
<td>o It would be upon the SHS to allocate and disburse the JSY fund to the District Health Societies (DHS)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Policy / Program</th>
<th>Mid Day Meal Scheme</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Key Stakeholders</strong></td>
<td>Ministry of Human Resource Development</td>
</tr>
<tr>
<td><strong>Key Benefits/Features</strong></td>
<td></td>
</tr>
<tr>
<td>It is the World’s largest school feeding program instituted by the Ministry of Human Resource Development, with inputs from the Ministry of Health and Family Welfare</td>
<td></td>
</tr>
<tr>
<td>It reaches out to around 1 200 000 children annually in over 126 000 schools and learning centres around the country</td>
<td></td>
</tr>
<tr>
<td>The major objective in this program is to prevent school drop-outs and encourage enrolments and education. The mid-day meal scheme is also aimed at managing malnutrition amongst children by providing at least one, balanced meal. The program has been quite successful with the involvement of many organizations</td>
<td></td>
</tr>
</tbody>
</table>
### Universal Immunization Program

**Key Stakeholders**

Ministry of Health and Family Welfare

**Overview**

This is one of the largest immunization programs in the World implemented by the Ministry of Health and Family Welfare.

Six vaccines are used to protect children and pregnant mothers against Tuberculosis, Diphtheria, Pertussis, Polio, Measles and Tetanus, under the immunization program. It is also proposed to include the Hepatitis B vaccine.

There are National Immunization Days across the country dedicated to this large-scale vaccination process and is supported by various agencies including the Polio Eradication Program, NGOs, Rotary clubs, etc.

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### National Drug De-addiction Program

**Key Stakeholders**

Ministry of Health and Family Welfare

**Overview**

The program was initiated in 1987-88 but was modified in 1992-93, as a scheme with funding given to the states by the Ministry of Health and Family Welfare to establish and run Drug De-addiction Centres.

The states were given a grant of around SEK 103 500 (INR 800 000) to construct such a centre for de-addiction and a recurring grant of approximately SEK 26 000 (INR 200 000) for centres in North Eastern Indian regions to manage medication and maintenance expenses.

There are around 134 centres established all over India as a result of this program, the largest and oldest one being at AIIMS, New Delhi (the centre has now been shifted to Ghaziabad, Uttar Pradesh).

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### 4.1.4. Main Stakeholders

#### 4.1.4.1. Maternal Care, Child Care

The Ministry of Health and Family Welfare is the nodal ministry for maternal, child care as well as tobacco, alcohol and drugs addiction. It has been especially instrumental in improving healthcare delivery within MCH through its flagship program, NRHM.

The NRHM works quite actively to promote programs for developing maternal and child care especially in rural areas. Some of its most prominent initiatives include the JSY (*discussed in the previous section*) and ASHA (Accreditation of Social Health Activist) who is a trained female community health activist, operating out of every village.

The Ministry for Human Resource Development and the Ministry for Women and Child Development are other major influencers of maternal and child care in India. These institutions promote education and holistic maternal and child development respectively, by formulating...
policies, reforms, programs, etc in efforts to improve the situation of maternal and child care in India.

4.1.4.2. Tobacco, Alcohol, Drugs

The major stakeholders within tobacco, alcohol and drugs addiction include the Ministry of Health and Family Welfare, Ministry of Social Justice and Empowerment (MoSJE), private NGOs and Associations.

The MoHFW plays the role of demand reduction by way of providing treatment services within drug de-addiction. Through the drug de-addiction centres, the Ministry not only aims to provide de-addiction and rehabilitation services but also provides a base to conduct research and training to doctors in the area of drug de-addiction.

The MoSJE implements the scheme of prohibition and drug abuse prevention since mid-1980s in India. It follows a state-community partnership as the method for service delivery. Therefore, while the cost of services is borne by the Government bodies, actual service delivery is undertaken by various NGOs through de-addiction cum rehabilitation centres, counselling and awareness centres, camps, and programmes. Under this, the Ministry supports almost 400 voluntary organizations for maintaining 450 such centres across the country. Large scale awareness through various media is also the Ministry’s initiative to prevent drug and alcohol abuse.

In order to be more streamlined, there is a cooperation agreement between the 2 Ministries which was signed in 2004 to increase effectiveness. This convergence is on the basis of three main points of the different service areas of the Ministries.

Aside from the Health Ministry, the Police and narcotics departments also play a major part in controlling the consumption of tobacco, alcohol, drugs. Through strict laws that are enforced by the police, driving under influence (DUI), banned tobacco consumption in public places and overall banning of drugs are efforts that are being driven constantly by the Government of India. There are a number of NGOs and other organizations that play a role in MCH and addiction medicine. Some of these are as follows:

<table>
<thead>
<tr>
<th>Institution</th>
<th>Website</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Association for Reproductive and Child Health of India (NARCHI)</td>
<td><a href="http://www.narchi.org">www.narchi.org</a></td>
<td>Non-profit institution to support communities and the ministry to promote RCH and maternal care</td>
</tr>
<tr>
<td>Child in Need Institute (CINI), India</td>
<td><a href="http://www.cinibelgium.org/cini_india.html">www.cinibelgium.org/cini_india.html</a></td>
<td>NGO working with MoHFW towards RCH and maternal care</td>
</tr>
<tr>
<td>Fortis Foundation</td>
<td><a href="http://www.fortisfoundation.in">www.fortisfoundation.in</a></td>
<td>Non-profit organisation run by Fortis group, concentrating on improving MCH in India</td>
</tr>
<tr>
<td>Atmata Kendram</td>
<td><a href="http://www.atmata.org">www.atmata.org</a></td>
<td>Non-profit NGO working with substance / drug abuse</td>
</tr>
<tr>
<td>Freedom Foundation</td>
<td><a href="http://www.thefreedomfoundation.org">www.thefreedomfoundation.org</a></td>
<td>NGO offering treatment and residential care for alcoholics, drug abuse and AIDS</td>
</tr>
</tbody>
</table>
4.1.5. Treatment Scenario

4.1.5.1. Maternal Care, Child Care

Treatment within maternal care is available on a large scale. Private hospitals offer advanced treatment options within maternal and child care, with large hospitals chains such as Columbia Asia, Fortis Healthcare, Max Hospitals, etc providing end-to-end services within this sub-sector. Public hospitals largely concentrate on births and neonatal care, apart from the family planning initiatives.

Since there is a large focus on development of maternal and child health in India, both by the Government and private players, there is a lot of treatment available for all sections of society. However, not all of it is completely affordable or comprehensive from a follow up point of view.

4.1.5.2. Tobacco, Alcohol, Drugs

The treatment scenario in India for abuse related to tobacco, alcohol and drugs is quite contrasting to the number of patients that the country has. While there are a number of treatment centres, both private and public, awareness is largely lacking and so is affordability of treatment. The rural areas are also grossly neglected within these areas. A major reason for this could be that these are still considered as taboo and hidden problems in the Indian society.

Overall, treatment available is very limited when compared to other countries. Screening process is fairly traditional and inaccurate, especially in smaller clinics which is where a patient is most comfortable owing to the discreetness of such centres. The camp concept was popularized in Tamil Nadu for alcohol de-addiction and worked quite well.

4.1.5.3. Mode of financing of treatment (government support/ self/ insurance companies)

4.1.5.4. Maternal Care, Child Care

All treatment at public hospitals and clinics is free of cost to the patients, especially if the case is within primary or secondary healthcare. Cost of treatment at private institutions is usually borne by the patient themselves. It is, of course, affordable by only a small section of the society (15%, perhaps). Insurance companies cover a very small percentage of treatment when compared to the overall costs incurred.

There are also certain insurance schemes that are state-specific or hospital specific which could help in covering expenses related to treatment.

4.1.5.5. Tobacco, Alcohol, Drugs

Similar to the scenario in maternal and child care, treatment at a private institutional level is completely borne by the patient. Most insurance schemes do not cover addiction related problems and a lot of patients therefore, try concealing the disease in order to secure insurance. Treatment can also be available for free at many no-charge de-addiction centres around the country. These are usually run on grants from either the Ministry of Health and Family Welfare, or the Ministry of Social Justice and Empowerment. Some state Governments also provide grants to underprivileged patients in case of extended recovery period.
Certain NGO run centres also provide free-of-cost treatment to patients by engaging them in business activities or handmade industries

4.1.6. Future Outlook and Prospect for Swedish companies

4.1.6.1. Maternal Care, Child Care

The most important aspect within maternal and child care is to reduce the IMR and MMR nationwide. This is the prime concern for all states as well since it is an important tool to assess the ‘health’ of a country. Reduction of MMR and IMR is a task given to the NRHM divisions of all states and they can be seen working towards improving the situation.

To combat the problem of malnutrition amongst women and children, a “multi-sectoral programme to address maternal and child malnutrition in selected 200 high burden districts is being rolled out during 2012-13. It will harness synergies across nutrition, sanitation, drinking water, primary health care, women education, food security and consumer protection schemes.

In this context, Integrated Child Development Services (ICDS) scheme is being strengthened and re-structured. For 2012-13, an allocation of SEK 2.1 million (INR 15.8 million) has been made as against SEK 1.3 million (INR 10 million) in 2011-12. This amounts to an increase of over 58%.

Midwifery and Nursing care training is limited and scattered, but this could be a tool to improve maternal care and child care, especially in the rural areas. There is great demand for skilled support staff within maternal and child care at all institutions. Pipeline projects include better education, specialist clinics for maternal and child care, etc. Mammographic screening, as a tool to detect Breast cancer is a Swedish methodology that could be implemented in India on a large scale. Breast cancer / women’s cancer care is a very nascent area for the country where there is scope for development.

4.1.6.2. Tobacco, Alcohol, Drugs

In order to reduce the purchasing power when it comes to tobacco, there would be excise duties levied on Pan masala, gutkha, (chewing tobacco), unmanufactured tobacco and zarda scented tobacco in pouches under the compounded levy scheme as proposed by the Union Budget 2012-13. The rates of duty specified per packing machine for these items are being stepped up taking into account improvements in the efficiency of machines used by this industry. The budget also speaks about strengthening legal provisions for implementation of the national policy on Narcotic Drugs and Psychotropic Substances in India.

There is a great demand for better equipped and more numbers of de-addiction centres in the country. This includes up gradation of the existing ones, and establishing more especially in rural areas. Of course, another priority includes greater awareness about addiction and its consequences to the larger public, and for states to take full responsibility of the diseases under public health. There is also talk about strengthened cooperation amongst the various stakeholders to improve de-addiction services at large.
Since de-addiction camps have slowly picked up momentum in the country and are increasing in popularity, mobile screening and detection equipment could be an interesting area to look at. Swedish companies could be useful in sharing knowledge with regards to de-addiction centres and detection equipment as well. Overall, there is also a need to understand service delivery within de-addiction. Trained support staff for de-addiction centres is greatly lacking. Institutions are interested to understand more about courses within treatment of addiction and recovery with regards to substance abuse provided there is such expertise available in Sweden.
4.2. Infectious Diseases

4.2.1. Summary

Traditionally, infectious / communicable diseases were the leading causes of mortality in India, and would affect rural population to a greater extent when compared to the people living in major cities. India today is undergoing what is known as an epidemiological, health and demographic transition whereby the disease focus is shifting from communicable diseases to non-communicable diseases, the prevalence of which is determined by changing lifestyles, increased life expectancy, etc.

Nevertheless, infectious / communicable diseases are still prevalent and cause about 34% of mortality in India. About one-quarter of all deaths in India are due to diarrheal diseases, tuberculosis, malaria, and respiratory infections. Rural areas report about 41% of all deaths to be due to infectious diseases. The proportion of deaths due to non-communicable diseases / lifestyle diseases in rural areas is also much less (40%) when compared to urban areas.

There were around 2.3 million HIV positive persons in India in 2010, of which 39% were female. Heterosexual contact is among the leading reason for contracting HIV/AIDS, followed by transmission from parent to child at birth. Another change witnessed in the country has been the incidence of malaria which has reduced drastically over the years with about 1.5 million patients afflicted with the disease currently. Tuberculosis is a major cause for concern in India, since it has 1/5th of the global TB cases, making it the highest TB burden country in the world.

Infection control is at a nascent stage in India, with varied focus across public and private hospitals. Private sector hospitals have relatively higher focus on controlling cases related to Hospital Acquired Infections. India is prone to water-borne, and this can be seen with there being over 10 million cases of diarrhoea detected in India annually. Rising pollution levels in the country along with increased tobacco consumption also contributes to the number of respiratory ailments that are prevalent, causing around 1.3 million deaths in 2010.

There are national programmes in place to combat the incidence of various diseases, initiated by the MoHFW. However, a number of infectious diseases are inter-linked as well and in order to address the issue of one such, TB-HIV co-infection, Revised National Tuberculosis Control Programme (RNTCP) and National AIDS Control Programme (NACP) have jointly drafted ‘The National TB-HIV framework’, which articulates the policy of TB/HIV collaboration in the country.

Prospects for Swedish companies include developing expertise within effective diagnosis, treatment devices, non-invasive treatment and training for infectious disease specialists, given that there is currently a lack of specialized professionals within this field currently. For HIV/ AIDS, knowledge sharing about service delivery, and related to technological and equipment expertise is also an interesting prospect from an Indian company’s point of view. R&D collaborations, better lab testing and cost effective methods of treatment are also opportunities that could be explored by Swedish healthcare institutions.

TB testing and diagnostics equipment especially within Multi drug-resistant TB is also another area where there could be opportunities, especially for portable testing equipment which could be integrated into the RNTCP as well. Equipment and technology within infection control is another interesting area for Indian institutions since this is an urgent need, given the number of HAIs.
4.2.2. Overview

Approximately 25% of disease burden in India is due to infectious diseases, which is also responsible for around 34% of all deaths. During recent times, the disease focus has started shifting from infectious diseases / communicable diseases to NCDs / lifestyle diseases in India. However it is still believed that infections are rampant in the country, and cause a major threat to the rural populace at large.

The below figure represents number of cases reported by disease type within infectious diseases, annually:

![Figure 4-10: Number of Reported Cases by Disease type, 2010](image)

Some of the major reasons for the spread of infectious diseases include unhygienic surroundings, lack of personal hygiene, hospital acquired infections (especially high in Government hospitals), Lack of awareness about infections and infectious diseases, etc. Precaution taken around persons suffering from infections is low, and so are precautionary measures during infectious epidemics.

According to the WHO, many communicable diseases such as leprosy, tuberculosis, water borne diseases, vector borne diseases, vaccine preventable diseases, zoonotic diseases, etc. are endemic in the country. The threat of emerging and re-emerging viral infectious diseases like the avian influenza, SARS, pandemic H1N1 influenza, etc, remains in addition to the above listed endemic infectious diseases. Outbreaks of these diseases have resulted in high morbidity, mortality and adverse socio-economic impact in the past.

About one-quarter of all deaths in India are due to diarrheal diseases, tuberculosis, malaria, and respiratory infections. Rural areas report about 41% of all deaths to be due to infectious diseases. The proportion of deaths due to non-communicable diseases / lifestyle diseases in rural areas is also much less (40%) when compared to urban areas. Sub-sector wise analysis of infectious disease is covered in the section below:
4.2.2.1. HIV / AIDS

There were around 2.3 million HIV positive cases were reported in India in 2010, of which 39% were female. Further, 3.5% of all AIDS patients were children below 15 years and around 60 000 children in India are born HIV positive annually. Around 83% of all AIDS patients were between the age groups of 15-49, and 50% of new infections were found to be between the age group of 15-24.

The overall incidence of HIV AIDS has decreased over the past 10 years, showcasing efforts made by the Ministry of Health and Family Welfare, and the National AIDS Control Organisation (NACO.)

The figure below shows the overall decline in number of AIDS patients annually in the past 10 years:

![Figure 4-11: Number of registered AIDS Patients (2000-2010)](source: NACO, STC Analysis)

Below figure indicates the number of deaths caused by HIV AIDS, and new cases reported annually in the past 10 years:

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29 NACO Website
The leading reasons for contracting HIV/AIDS in India is heterosexual contact, this is followed by transmission from parent to child at birth. The figure below illustrates the causes for transmission:

The geographical spread of HIV/AIDS in India is very scattered with Andhra Pradesh, Karnataka, Tamil Nadu, and Maharashtra accounting for 55% of all infections. According to NACO, the states of West Bengal, Bihar, Gujarat and Uttar Pradesh have over 100,000 people living with HIV AIDS (PLHA), and together constitute 22% of infections. These states are followed by Rajasthan, Punjab, Odissa, and Madhya Pradesh which have 50,000 – 100,000 PLHAs, and forming around 12% of all HIV infections in India.

When it comes to treatment and control, NACO is the primary body that looks into HIV AIDS in India. Its main objective includes implementation of the National AIDS Control Programme in order to slow down the spread of HIV infections, thereby reducing morbidity, mortality and impact of AIDS.
in the country. It also undertakes targeted intervention programs for various focus groups and high risk groups. Some other initiatives are Condom promotion programs, setting up of village information centres, mapping of high risk groups and migrants, developing training modules, etc. NACO also collects and analyses key indicators of HIV AIDS at a national level in order to gauge the incidence and prevalence of the disease in India.

From an affordability standpoint, since insurance does not cover AIDS patients, treatment at private establishments cannot be afforded by all. However, all treatment at public hospitals is free of cost.

4.2.2.2. Malaria

Malaria has been a major public problem in India since centuries, and would have high incidence during the rainy season. According to the Directorate of national vector-borne diseases control program, close to 95% of the Indian population resides in malaria endemic areas, and 80% of the cases reported are confined to areas which consist of 20% of the population, residing in tribal, hilly, inaccessible regions. The below figure indicates the number of cases registered in India over the past few years:

![Figure 4-14: Malaria Cases Registered in India (1995-2011)](image)

The above figure shows the steady decline in number of malaria cases per annum, which is indicative of the efforts employed by the MoHFW through the National vector borne diseases control program (NVBDCP)\(^4\), etc. In the 1950s, there were some 75 million cases of malaria registered with the MoHFW, with efforts and the NVBDCP in place, this incidence has come down to less than 1.5 million cases a year. Early diagnosis and treatment is advocated by the NVBDCP, as it is believed that malaria is curable if diagnosed early. The National Drug Policy on Malaria was adopted by the MoHFW in 2010 as a guide to aid healthcare personnel including clinicians in the treatment of Malaria. All of these have been collective efforts made by the various stakeholders in the aim to reduce malaria incidence in India.

\(^4\) NVBDCP Website
The number of deaths caused by Malaria has been volatile over the years, as indicative in the below figure:

![Figure 4-15: Number of Deaths Due to Malaria in India (1995-2011)](source: NVBDCP, National Institute of Malaria Research, STC Analysis)

The number of deaths has been less than 2000 across all regions, and a peak was witnessed in 2006 during an epidemic in north-eastern Indian states which caused 1707 deaths in total. All vector borne diseases, especially Malaria, is a constant problem for a tropical country like India. The MoHFW thereby makes continuous efforts to reduce the incidence of malaria by promoting early diagnosis and treatment.

4.2.2.3. Tuberculosis

Tuberculosis accounts for a loss of nearly 11 million Disability adjusted life years (DALYs) in India. India has 1/5th of the global TB cases, making it the highest TB burden country in the World. An estimated 1.98 million cases of the 9.4 million cases globally are from India, highlighting significantly high spread of this disease in the country. Figure below shows the global share of TB:
Therefore, it can be seen from the above figure that the high-burden countries account for over 63% of the global TB cases, and India has the highest number of cases.

Tuberculosis is considered to be one of the major infectious diseases that concerns the MoHFW, owing to the large mortality numbers associated with it. Multi-drug resistant TB (MDR-TB) is another growing concern for India with almost 63,000 cases reported in 2010, the highest in the South-East Asian region. WHO reported MDR-TB prevalence to be around 2.3% among new cases and 12-17% among re-treatment cases. However, due to the size of the population and number of annual TB cases, India ranks 2nd among the 27 MDR-TB high-burden countries worldwide after China.

One of the largest initiatives by the Ministry has been launching the Revised National Tuberculosis Control Programme (RNTCP) in 1997 which has now also completed 4 years of nationwide coverage. The programme since its inception has saved over 2.2 million lives and provided treatment to over 12.6 million patients. Approximately 500,000 deaths occurred in 1997 (when the programme was launched) but this has reduced to 260,000 deaths in the course of 14 years of implementation. In terms of population coverage, India has the second largest DOTS programme in the World implemented by RNTCP. It is also the fastest expanding programme, and largest in terms of patients initiated on treatment, placing over 100,000 patients on treatment per month.

4.2.2.4. Infection Control

Infection control in India is very low, especially in public sector healthcare establishments owing to the volume of patients they receive on a daily basis. Infections are classified as Hospital Acquired Infections (HAI) which includes anti-biotic resistant infections, infections from medical staff, fellow patients and infections from consumable equipment. According to the Global Antibiotic Resistance Partnership (GARP)-India Working Group and the Centre for Disease Dynamics, Economics and
Policy (CDDEP) report for 2011, a total of 190,000 neo-natal deaths in India occurred due to sepsis\(^\text{41}\) out of which over 30% are attributable to anti-biotic resistance in a year.

Close to 5 million children with age of less than 5 years get pneumonia or sepsis, and while the incidence rate of infections is not as high as African countries, the number of patients is high due to the population numbers in the country. Therefore, infectious disease burden in one of the highest in the world. Antibiotic use is increasing steadily as indicated in the figure below:

\[\text{Figure 4-17: Outpatient Antibiotic Purchase from Indian Retail Outlets (2005-2009)}\]

Anti-biotic resistance is a big cause of concern for a developing country like India. Recent studies also show that more often than not, anti-biotics are over prescribed to patients. Awareness about anti-biotic resistance is also quite low in comparison to the disease burden and risk.

Apart from anti-biotic resistance, another form of HAIs is infection caused to inpatients by infrastructure or medical staff. Lack of proper disposal, unhygienic health practices and the lack of an equipped infection control committee within most hospitals, are major causes for infections.

Private hospitals in India have a high focus on infection control and have developed specific departments/teams taking care of infections in the hospital. For example, Medanta Medicity in Gurgaon has formed a team comprising of doctors and nurses, to track and control infections. The hospital also focuses on conducting quick tests of patients to check any infections among admitted patients. Apollo Hospitals also has a comprehensive annual plan to control infections, which includes details such as a risk matrix, strategy and possible repercussions in case of failure. The hospital also deploys a third party to conduct annual audits. Urinary tract infections are the most common type of infection prevalent across hospitals.

**4.2.2.5. Diarrhoeal Diseases**

Diarrhoeal diseases are water-borne diseases which are known to be native to the Gangetic plateau including India and other countries in the sub-continent. Diarrhoeal diseases such as cholera and dysentery are known to have the highest prevalence in India, according to the National

\(^{41}\) Bacterial infection that overwhelms the bloodstream
Institute of Cholera and Enteric Diseases (NICED). NICED is responsible for conducting research on acute diarrhoeal diseases and epidemiological investigations of diarrhoeal diseases such as cholera and dysentery. It is also found that viral pathogens like Rotavirus account for nearly 70-80% of all diarrhoeal infections.

Over 10 million cases of diarrhea are detected in India annually. However, it is the cause of over 20% of all paediatric deaths (children under the age of 5), around 386,600 deaths, making it an important subject for Child care. Almost a third of all paediatric admissions in healthcare establishments are suffering diarrhoeal disorders. According to the WHO and UNICEF, India tops the list of countries in the total number of annual child deaths due to diarrhoeal diseases, followed by African countries. This is the second largest cause of child mortality followed by respiratory diseases in India.

4.2.2.6. Respiratory Diseases

The spectrum of respiratory diseases in India includes asthma, chronic obstructive pulmonary disease (COPD), occupational, environmental and interstitial lung diseases. In addition, there are a number of acute and sub-acute conditions such as lung tumours, respiratory failure, and respiratory infections (tubercular and non-tubercular). Respiratory infections and other respiratory diseases ranked third and seventh respectively in terms of disease burden and their effect on disability adjusted life years (DALYs).

COPD leads to premature deaths and respiratory crippling, affecting 5% of males and 2.7% of females over 30 years of age in India. Tobacco smoking is responsible for over 82% of COPD infections, which accounts for around 12 million adults suffering from tobacco-attributed COPD. Currently, there are around 25 million Indians affected by respiratory diseases in India, with a growing incidence of asthma in school children. Approximately 1.3 million deaths in 2010 were due to chronic respiratory ailments in India.

The below figure shows the number of registered cases of acute respiratory infections over the years in India:
Respiratory diseases are also linked with pollution control and public policy. Overall, the need of the hour within respiratory diseases is to promote the usage of preventive medicine and improve general work / living conditions.

### 4.2.3. Sub-sector specific Programs

Infectious / Communicable diseases were known to be one of the largest causes of mortality in historical India. This place has now been taken by lifestyle / non communicable diseases by and large, but the incidence of infectious diseases in rural India is still quite high. Infectious diseases usually come under the public purview and the Ministry of Health and Family Welfare is primarily responsible for the prevention, control and management of infectious diseases. Below mentioned are few program initiatives taken for the benefits of Infectious diseases:

<table>
<thead>
<tr>
<th>Policy / Program</th>
<th>National AIDS Control Program III (NACP III)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Key Stakeholders</td>
<td>Ministry of Health and Family Welfare, National AIDS Control Organisation</td>
</tr>
<tr>
<td>Details</td>
<td>Key aspects of this program are as follows:</td>
</tr>
<tr>
<td></td>
<td>o The third phase of the programme (NACP III) is ongoing currently and this phase will be completed by end of this year (2007 to 2012)</td>
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<tr>
<td></td>
<td>o The programme is implemented through 35 AIDS Control Societies in the States and the Union Territories</td>
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<tr>
<td></td>
<td>o There are also three Municipal AIDS Control Societies in Mumbai, Chennai and Ahmadabad</td>
</tr>
<tr>
<td></td>
<td>o Under NACP III, a major structural reform concentrating on constituting District AIDS Prevention and Control Units (DAPCUs) with teams on field was to be implemented. NACP III also aimed to cover 80% of the high risk groups by the end of this year</td>
</tr>
<tr>
<td></td>
<td>o It is also a mandate to strengthen all public health facilities at and above district level with the aim to have at least one NACO supported clinic per district</td>
</tr>
<tr>
<td></td>
<td>o NACO along with RNTCP are also working towards strengthening</td>
</tr>
</tbody>
</table>
coordination for effective control of the dual epidemic of HIV-TB

<table>
<thead>
<tr>
<th>Policy / Program</th>
<th>Revised National Tuberculosis Control Program (RNTCP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Key Stakeholders</td>
<td>Ministry of Health and Family Welfare</td>
</tr>
<tr>
<td>Key Benefits/Features</td>
<td>• Key aspects of this program are as follows:</td>
</tr>
<tr>
<td></td>
<td>o In 1992, the Government of India, together with the World Health Organization (WHO) and Swedish International Development Agency (SIDA), reviewed the national programme for TB and laid the framework for the RNTCP</td>
</tr>
<tr>
<td></td>
<td>o The programme has initiated over 12.6 million patients on treatment thus saving more than 2.2 million lives since its inception in 1995</td>
</tr>
<tr>
<td></td>
<td>o There’s been a 12% decline in TB cases since the implementation of the program</td>
</tr>
<tr>
<td></td>
<td>o It has achieved and sustained its twin objectives of Case Detection (73% against the objective of 74%) and Treatment Success Rate (88% against the objective of &gt;85%) amongst the New Smear Positive TB cases</td>
</tr>
<tr>
<td></td>
<td>o More than 13 000 Designated Microscopy Centres (DMCs) are functional throughout the country for quality assured diagnosis of pulmonary TB</td>
</tr>
<tr>
<td></td>
<td>o More than 400 000 people are trained as DOT Providers in all most all the villages of the country to ensure DOTS treatment</td>
</tr>
<tr>
<td></td>
<td>o Key focus of the programme is to prevent the emergence of drug resistance by provision of quality DOT services, the management of Multi Drug Resistant-TB (MDR-TB) patients is being undertaken in DOTS-plus services</td>
</tr>
<tr>
<td></td>
<td>o The programme has established 19 accredited Culture and Drug Sensitivity Test laboratories including 4 National Reference Laboratories, 10 State level Intermediate Reference Laboratories and 5 other sector laboratories for the diagnosis and follow-up of MDR-TB patients. 29 such labs are in the process of being accredited</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Policy / Program</th>
<th>National Vector Borne Diseases Control Program (NVBDCP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Key Stakeholders</td>
<td>Ministry of Health and Family Welfare, Indian Council for Medical Research</td>
</tr>
<tr>
<td>Key Benefits/Features</td>
<td>It works towards the prevention and control of vector borne diseases such as Malaria, Dengue, Lymphatic Filariasis, Kala-azar, Japanese Encephalitis and Chikungunya in India. Passive surveillance for malaria is carried out by Primary Health Centres (PHCs), Malaria Clinics, Community Health Centres (CHCs) and other secondary and tertiary level Health institutions. At present there are 22 975 PHCs, 2 935 CHCs &amp; 13 758 Malaria Clinics.</td>
</tr>
<tr>
<td></td>
<td>The ICMR also established the Malaria Research Centre in 1977 (now known as the National Institute of Malaria Research) for providing technical support to the National programme in the control of Malaria. It has 12 field stations across the country, along with 4 other research institutes.</td>
</tr>
</tbody>
</table>

### 4.2.4. Main Stakeholders

The Ministry of Health and Family Welfare is the nodal ministry for the awareness, control, prevention and treatment of Communicable / infectious diseases in India. MoHFW has established a number of institutions catering exclusively to some of the more severe diseases such as the National AIDS Control Organisation (NACO) for HIV-AIDS, the Directorate of Revised National Tuberculosis Control Programme, the National Institute of Malaria Research, etc. These
establishments focus on prevention and control of individual disease incidence at a national level and also undertake research.

Apart from these, the Indian Council of Medical Research (ICMR) is a major stakeholder, lending its research expertise to support various institutions within infectious diseases. Private and public healthcare delivery institutions, NGOs, associations and societies are the other stakeholders in communicable / infectious diseases providing varying assistance to patients nationally. Especially within HIV AIDS, there are a number of non-profit organizations that help patients cope and deal with the disease, this being a taboo in traditional India. In addition, there are number of autonomous non-profit institutions / associations which are involved in running awareness programs and providing treatment and other community based activities in selected districts and states. Some of these are as follows:

<table>
<thead>
<tr>
<th>Institution</th>
<th>Website</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Naz India</td>
<td><a href="http://www.nazindia.org">www.nazindia.org</a></td>
<td>Non-profit institution dedicated to prevention and control of HIV AIDS</td>
</tr>
<tr>
<td>Desire Society</td>
<td><a href="http://www.desiresociety.org">www.desiresociety.org</a></td>
<td>Non-profit institution which works with children afflicted with HIV AIDS</td>
</tr>
<tr>
<td>TB Alert India</td>
<td><a href="http://www.tbalertindia.org">www.tbalertindia.org</a></td>
<td>NGO working towards prevention and effective treatment of Tuberculosis, and to facilitate effective delivery by various stakeholders</td>
</tr>
<tr>
<td>Adventist Development and Relief Agency (ADRA), India</td>
<td><a href="http://www.adraindia.org">www.adraindia.org</a></td>
<td>NGO involved in Malaria, TB, HIV AIDS, and other diseases in India</td>
</tr>
</tbody>
</table>

4.2.5. Treatment Scenario

With the shift in focus from infectious diseases to lifestyle diseases, it is primarily the public sector that looks into treatment, and control of communicable diseases. This is also attributed to the fact that disease incidence is higher in rural areas when compared to urban areas. The MoHFW has established a number of healthcare institutions to tackle the diseases, and has instated specialized diagnostic and treatment centres. Select hospitals at and above the district level have been christened as DOTS centres, ART centres, etc which also take referral cases from private hospitals. District hospitals, along with community health centres, regional health centres, etc are also relatively equipped.

When it comes to private sector involvement, a number of hospitals do not provide treatment within infectious diseases yet. This is mainly due to the involvement of high costs of equipment and treatment, which are available free of cost at public hospitals. Treatment is of better quality in private hospitals when compared to public institutions, but it is a lot more expensive as well. Looking at medical professionals within infectious diseases on the whole, there are about 13 infectious disease super specialists who handle infectious diseases on the whole including infection control in Hospitals. The discipline is a nascent specialty but slowly gaining momentum with 2-3 institutes offering the course in India. The specialists also manage antibiotic resistance and have also commenced consultation on Family medicine (preventive disease planning).
4.2.5.1. Mode of financing of treatment (government support/ self/ insurance companies)

Treatment at Government set ups is completely free of cost for infectious diseases, but must be self-funded or covered by insurance at private hospitals. Most of the treatment at private establishments is very expensive which cannot be afforded by a large section of patients.

Insurance in India does not cover HIV AIDS patients, which makes it challenging for a majority of them to access good quality treatment at private hospitals.

4.2.6. Future Outlook and Prospect for Swedish companies

Majority of infections in India are known to be caused due to unhygienic circumstances and lack of timely diagnosis. Social implications of diseases such as HIV AIDS has also attributed to the high incidence of disease burden. Overall, there is believed to be an epidemiological transition in disease prevalence in India from the earlier prevalent infectious diseases to the now increasing lifestyle diseases. However, experts feel that this would not result in a drastic reduction of cases caused due to infectious diseases and these would still be rampant in most parts of the country.

The MoHFW has elaborate plans for making India TB free in the coming years, to set up a mechanism for controlling the spread of malaria, respiratory diseases and bringing down the incidence of HIV AIDS in the country. In order to implement these plans, various stakeholders believe that there is a need to educate and train the right professionals within infectious diseases.

The initiative of expanding the National Institute of Communicable Diseases into National Centre of Disease Control, adding responsibility for enhanced capabilities for lab-based surveillance of communicable diseases and rapid response for minimizing the effects of disease outbreaks is another plan in place for major development in this field. The ICMR is also supporting and encouraging biomedical research in communicable diseases in order to identify epidemic outbreaks before they actually set in.

According to the Ministry, the 12th Five Year Plan aims to address several public health challenges, such as ensuring primary health care to all, strengthening of health care infrastructure, increasing public health workforce, strengthening disease surveillance and response systems, formulation of appropriate public health laws and increasing public health allocation in order to improve and strengthen the framework of communicable diseases in India.

Prospects for Swedish companies include developing expertise within effective diagnosis, treatment devices, non-invasive treatment and training for infectious disease specialists, given that there is currently a lack of specialized professionals within this field currently.

For HIV AIDS, the NRHM is looking to scale up HIV testing and counselling to a large extent by setting up new clinics. Knowledge sharing about service delivery, and related to technological and equipment expertise is also an interesting prospect from an Indian company’s point of view. R&D collaborations, better lab testing and cost effective methods of treatment are also opportunities that could be explored by Swedish healthcare institutions.

Expertise within Multi drug-resistant TB is especially required since it’s a relatively new disease area which is affecting a number of Indians. TB testing and diagnostics equipment is also another
area where there could be opportunities, especially for portable testing equipment which could be integrated into the RNTCP as well.

Certain specific opportunities within respiratory diseases includes requirement for better preventive medicine technology and equipment, including screening and testing equipment (peak flow meters). Portable treatment equipment such as nebulizers is mainly imported for home use and during travel, which could be supplied by Swedish companies as well.

Equipment and technology within infection control is another interesting area for Indian institutions since this is an urgent need, given the number of HAI. Major private hospitals in Tier-I towns such as Fortis Hospitals, Apollo Hospitals and Medanta Medicity have high focus on control of infections in the hospitals and are very much open for advanced technologies and solutions to further reduce the number of HAI. Apart from the above, opportunities exist within training and development of professionals and support staff, research collaborations, clinical trials and co-operations for exchange programs and expertise exchange.
4.3. Lifestyle Diseases

4.3.1. Summary

Change in lifestyle and rapid urbanisation across India are bringing along a number of health challenges in the country. One of the major challenges among these is the growing acuteness of lifestyle diseases such as cardiovascular diseases, diabetes, cancers, hypertension, and obesity. At present, out of 10 deaths in urban India, 8 are due to non-communicable diseases/lifestyle disease, more prominently hypertension, obesity, cancers, cardio-vascular diseases (CVD), and diabetes. Around 53% of total deaths in India were due to lifestyle disease in 2010. CVDs remain the largest, singular cause of deaths in the country, followed by hypertension, cancers, etc.

There are around 2.5 million cancer cases registered per annum in India, of which 500,000 lead to deaths. Some of the prevalent cancers in India include that of the lung, cervix, breast, oral, oesophagus, and stomach. Tobacco related cancers account for almost 39% of the deaths in males where as for females; breast cancer is of highest concern in India, with approximate share of 25% in all cancer related deaths.

Cardiovascular diseases kill around three million people per annum in India. Around 33% of deaths in urban areas occur due to heart ailments, while in rural areas this number is much lower at 22.8%. In the next 5 years, India is projected to lose about 1% of its GDP to diseases such as CVDs.

Around 65% of Indians are either overweight, obese, or suffer from abdominal obesity, native to India. Approximately 20% of the world’s diabetics are Indians and it is forecasted that close to 70 million Indians would contract diabetes by 2025 as opposed to 39 million diabetics in India currently. More than half of these cases remain undiagnosed and untreated, which is another growing problem in India.

Hypertension is one of the largest causes of deaths in India. The overall prevalence of Hypertension among Indians is said to be 159 per 1000 population, and almost 20% of all Indians suffer from the disease which makes the incidence one of the highest in the world. Currently, there are around 50 million Indians affected by some form of hypertension.

The Ministry of Health and Family Welfare is the nodal ministry for the awareness, control, prevention and treatment of NCDs/Lifestyle disease in India. Apart from the Ministry, the Indian Council for Medical Research, hospitals, NGOs and other stakeholders play a major role, in close collaboration with the civil society. The ministry has also launched few programs focused on lifestyle diseases including National Program for Prevention & Control of Cancer, Diabetes, Cardiovascular diseases and Stroke (NPCDCS) and National Cancer Control Program (NCCP).

In terms of treatment scenario, there are number of private and public hospitals available for the treatment for lifestyle disease. Private hospitals are considered better in terms of quality of service delivery; however, these are more expensive. In addition, good, private hospitals are concentrated in developed urban areas / tier I cities. Specialty hospitals are also established in India catering to cancer care, cardiovascular diseases and endocrinology-related diseases such as Fortis Escorts Heart Hospital and Tata Memorial Cancer Hospital.
Prospects for Swedish companies include developing expertise within affordable diagnostics, non-invasive treatment and training for all lifestyle related diseases. Technology related partnerships are most interesting for large specialty hospitals like Narayana Hrudayalaya due to the increasing need of introducing better equipment for the management and control of CVDs. Expertise exchange on developing better specialty hospitals would also be an exciting opportunity to explore.

Other opportunity areas include research and development investments particularly to aid development in diagnostics and monitoring, diabetes monitoring, joint research opportunities, clinical trials for new equipment, staff exchange programs, and collaborative funding.

4.3.2. Overview

According to a report by the Federation of Indian Chambers of Commerce and Industry (FICCI), rapid urbanisation will add nearly 900 million people to Indian cities by 2050 which would mean that the cities need to grow nearly 400% in less than 40 years to accommodate this increase. Rapid urbanisation in India is causing significant changes in people’s living standards, social behaviours, lifestyles, and most importantly health. Some of the most evident health challenges that cities face include non-communicable diseases such as cardiovascular diseases, diabetes, cancers, hypertension, and obesity. These can also be collectively classified as Lifestyle Diseases termed such for the increased pressures that come with city living.

In a statistic by the World Health Organisation (WHO), it was found that diseases such as hypertension and diabetes are killing more Indians than communicable diseases. It said that out of 10 deaths in urban India, 8 are due to non-communicable diseases, more prominently hypertension, obesity, cancers, cardio-vascular diseases, and diabetes. A report jointly prepared by the World Economic Forum and WHO says India will incur an accumulated loss of around SEK 1759 billion (USD 237 billion) by 2015 due to unhealthy lifestyles and faulty diets.

India is known to have borne close to 60% of the world’s heart disease burden in the past couple of years. The average age of patients suffering from Lifestyle related diseases is lower amongst Indians than other countries, especially in the case of cardiovascular diseases.

The Ministry of Health and Family Welfare in India currently focuses on a number of prevention and awareness building programs within Lifestyle diseases but focus less on treatment and control. Dr. Nata Menabde, WHO Representative to India further emphasizes that a strengthened health system would ensure health services for all sections of society and has advised the health ministry to focus on prevention and control of NCDs.

According to the WHO, Public health foundation of India and the MoHFW, deaths caused by lifestyle diseases would increase from 53% currently to 67% by 2020. The figure below is a depiction of increasing incidence of lifestyle diseases through the years:
CVDs remain the largest, singular cause of deaths in the country, followed by hypertension, cancers, etc. The figure below illustrates the same:

The primary reasons for the prevalence of lifestyle diseases are known to be high usage of tobacco, unhealthy diets, high levels of stress, alcohol consumption, insufficient treatment, physical inactivity, and general lack of awareness. The following sub-sectors within lifestyle diseases are considered in this study:
4.3.2.1. Cancers

There are around 2.5 million cancer cases registered per annum in India, of which 500,000 lead to deaths. According to the Cancer Foundation of India (CFI), 70% of disease burden is related to prevailing lifestyles such as eating habits, personal habits, infections, consumption of tobacco, etc. Additionally, the cancer pattern is changing globally due to influencing factors such as rapid urbanization, industrialization and increasing life-spans. Some of the prevalent cancers in India include that of the lung, cervix, breast, oral, oesophagus, and stomach. The figures below are indicative of cancer mortality types for males in the age group of 30 to 69 years:

![Figure 4-21: Causes of cancer deaths in India for Males (aged 30-69), 2010](image)

Breast cancer probably is of the highest concern for females in India, with increasing incidence of the same. The corresponding figures for females are depicted in the figure below:

![Figure 4-22: Causes of Cancer Deaths in India for Females (aged 30-69), 2010](image)
From the above graphs, it can be seen that cumulatively tobacco related cancers are the most prevalent, followed by stomach and oral cancers. There are few qualified medical oncologists in India which makes diagnosis and treatment of cancers largely challenging. Screening is also limited, especially in smaller hospitals and rural areas due to the high costs of equipment.

However, cancers in India are also treated as a Public Health concern with a number of programs that have been formulated by the Government, looking into this sector. This year completes 50 years of Cancer control initiatives in the country. The National Cancer Registry Programme was launched by the Indian council of Medical Research in 1952 as a database for all cancer cases in India, giving a picture of the magnitude and patterns of cancer. The data collected through this program helps in making the National Cancer Control Programme more effective. Financial and geographic constraints and lack of manpower have contributed to the urban concentration of facilities which restricts the reach of treatment to a large extent.

4.3.2.2. Cardiovascular Diseases

Cardiovascular diseases are the leading cause for deaths in India and kill around 3 million people per annum. Almost 25% of deaths in the age group of 25-69 are due to CVDs, and this number is set to increase, according to the Indian Council of Medical Research (ICMR). Around 33% of deaths in urban areas occur due to heart ailments, while in rural areas this number is much lower at 22.8%.

Lifestyles play the most critical role in cardiovascular diseases, but apart from this every 25th Indian is known to carry a mutant gene which increases the vulnerability of a person to heart diseases. According to Dr. Devi Shetty, Chairman, Narayana Hrudyalaya\(^{42}\), genetics are primarily responsible for paediatric cardiovascular diseases which is very common in the country.

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\(^{42}\) Narayana Hrudyalaya is the brainchild of renowned cardiac surgeon, Dr. Devi Shetty, and happens to be one of the world's largest paediatric heart hospitals. It has performed nearly 15,000 surgeries on patients has a well-known centre for telemedicine which it offers free of cost.
In the next 5 years, India is projected to lose about 1% of its GDP to diseases such as CVDs. Further, in the absence of any national program for prevention and management of CVDs, it is expected to lose 17.9 million years of productive life by 2030. The cost of care for CVDs has also seen a drastic increase over the years, which means restricting the reach of treatment to only those who can afford it – probably 15% of the entire population in India.

### 4.3.2.3. Obesity

Morbid obesity affects almost 5% of the total Indian population, and around 65% of Indians are either overweight, obese, or suffer from abdominal obesity, native to India. This includes rising numbers of children who are obese or overweight, with reports suggesting that close to 16% of Indian children are suffering from obesity. Factors such as urbanisation, socio-economic class and eating habits are heavy influencers of obesity in India. These factors put the country under the risk of an obesity epidemic and are a large cause of concern for healthcare experts. It is believed that obesity would triple the risk of heart diseases in the coming years.

Overall, lack of physical mobility makes women more prone to obesity in India when compared to men. The figure below shows the incidence of obesity amongst men and women in India:

**Figure 4-23: Deaths due to CVDs in India and Other Economies**

<table>
<thead>
<tr>
<th>Year</th>
<th>India</th>
<th>China</th>
<th>Established Market Economies</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>2.3</td>
<td>2.6</td>
<td>3.2</td>
</tr>
<tr>
<td>2000</td>
<td>3.0</td>
<td>3.3</td>
<td>3.5</td>
</tr>
<tr>
<td>2010</td>
<td>3.8</td>
<td>3.8</td>
<td>3.5</td>
</tr>
<tr>
<td>2020</td>
<td>4.8</td>
<td>4.5</td>
<td>3.7</td>
</tr>
</tbody>
</table>

Source: STC Analysis
4.3.2.4. **Diabetes**

The WHO recently reported that around 20% of the world’s diabetics are Indians and India has come to be known as the diabetic capital of the world. It is forecasted that close to 70 million Indians would contract diabetes by 2025 as opposed to 39 million diabetics in India currently. More than half of these cases remain undiagnosed and untreated, which is another increasing problem in India. Diabetes foot is a common problem in India, as opposed to other countries.

In addition, gynaecologists suggest that gestational diabetes is a trend that is catching on fast in India with more numbers of pregnant women contracting diabetes during the course of their pregnancy. According to WHO, the largest age groups affected by diabetes is that of falling in 40 years – 59 years age group. This is illustrated in the below figure which shows the increase of diabetes in India over the years, according to the ages:
Select reports suggest that 1 in every 3 diabetics have little access to insulin or knowledge about the dosage of the same. This increases the risk of untreated diabetes in Indians drastically, which could be a major problem in the country as years go by. Awareness around diabetes and diabetic myths is also limited with inadequate communication.

4.3.2.5. Hypertension

It has been determined that one of the largest causes of deaths in India after CVDs and Cancers is Hypertension. The overall prevalence of hypertension among Indians is said to be 159 per 1000 population, and almost 20% of all Indians suffer from the disease which makes the incidence one of the highest in the world. Some experts claim that one of the major reasons for hypertension is the high amount of salt consumption in the Indian diet but others attribute it to remaining factors such as changes in lifestyles, stress, increasing population, etc. Hypertension is cited to have increased by about 30 times among urban inhabitants and by about 10 times among the rural dwellers between three and six decades.

4.3.3. Sub-sector specific Programs

Lifestyle / Non communicable diseases in India are taking prevalence over communicable / infectious diseases. The Ministry of Health and Family Welfare, therefore, is looking forward to focus on reduction/ control of Lifestyle diseases / non communicable diseases in Indian healthcare. Within the Ministry, the department of health and family welfare is directly concerned with various diseases including cancers, CVDs, obesity, diabetes, hypertension, etc. The department conceptualizes and initiates programs to benefit each sub-sector in health care for better prevention, control and manage the particular diseases that it is concerned with. Below mentioned are few program initiatives taken for the benefits of Lifestyle diseases:
### National Program for Prevention & Control of Cancer, Diabetes, Cardiovascular diseases and Stroke

**Key Stakeholders**
Ministry of Public Health and Family Welfare

**Details**
- Key aspects of this program are as follows:
  - The overall prevalence of the diseases considered for inclusion in this program is quite high when compared to most of the other diseases within the healthcare spectrum.
  - The program primarily focuses on promotion of healthy living and control of common Non-communicable diseases through behaviour and lifestyle changes.
  - It works to provide early diagnosis and management of the above diseases and aims to build capacity at various levels of healthcare to prevent, control and manage these.
  - Another primary objective of this program is to train resources in the Public health domain to cope with the increasing incidence of these diseases, and establish set-ups for palliative and rehabilitative care.
  - The program is meant to impact the citizens by way of ASHAs (Accredited Social Health Activist), Youth clubs, village-level parliaments, etc., with a special focus on high schools and workplaces by way of targeted intervention programs.
  - The implementation of the program includes activating 20,000 Sub Centres and 700 Community Health Centres in 100 Districts across 16 States through the NRHM. It is also proposed to establish NCD Clinics at District hospitals and Community health centres in order to provide for early diagnosis by also train 32 000 health care personnel.

- Financial Management under NPCDCS:
  - The budget for this program is estimated to be around SEK 158.5 million (INR 1230.9 million).
  - SEK 64.3 million (INR 499.4 million) for interventions on diabetes and cardiovascular diseases & stroke and SEK 94.2 million (INR 731.5 million) for cancer control on a cost sharing basis between the Central Government and the States.
  - This cost sharing would be at the rate of 80:20.

### National Cancer Control Program

**Key Stakeholders**
Ministry of Health and Family Welfare

**Key Benefits/ Features**
- Key aspects of this program are as follows:
  - Primary prevention of cancers through awareness building and basic health education, secondary prevention including early detection and diagnosis of cancers especially of the cervix, breast, etc by promoting self-examination methods.
  - Palliative care in late stages of cancers and strengthening of established cancer treatment facilities is also to be covered under this programme run by the Indian Council of Medical Research (ICMR) under the Ministry of Health and Family Welfare.
  - The programme was to be implemented by way of establishing Regional Cancer Centres (RCCs) across the country.
  - Currently there are about 25 RCCs up and running, and around 27 in the pipeline with the Government providing one-time grants of SEK 6.5 million (INR 50 million) for new centres, and one-time grants of SEK 3.8 million (INR 30 million) for up gradation of existing facilities to further strengthen cancer care facilities.
  - Apart from RCCs, development of Oncology wings at Government hospitals...
medical colleges and hospitals is also a focus area for the Ministry via this program
- A one-time grant of SEK 3.8 million (INR 30 million) is to be provided for the development of these departments, apart from the running of a District Cancer Control Programme (to be undertaken by a nodal agency such as an RCC), and a Decentralized NGO Scheme for running cancer prevention and treatment camps
- Additionally:
  - The NCCP also goes hand in hand with the National Cancer Registry Programme (NCRP), which uses Population based cancer registries and Hospital based cancer registries to record, analyze and control cancer cases in the country
  - Under the NCCP, a needy patient could avail of the ‘Health Minister’s Cancer Patient Fund’ when seeking treatment at a RCC. The patient could avail up to SEK 12 867 (INR 100 000) which would be disposed to the RCC directly

4.3.4. Main Stakeholders

The Ministry of Health and Family Welfare is the nodal ministry for the awareness, control, prevention and treatment of NCDs/ Lifestyle disease in India. Apart from the Ministry, the Indian Council for Medical Research, hospitals, NGOs and other stakeholders play a major role, in close collaboration with the civil society.

NGOs, associations and societies are quite essential in the lifestyle diseases ecosystem. Cancers and cardiovascular diseases, being the largest killers of Indians today, have a number of associated institutions that also campaign for better policies, awareness, prevention, etc. Social activists with cancer care and CVDs are very important too as they help provide relief care to poor patients and their families, and might also help with fund-raising for treatment that cannot be afforded by the larger sections of society. In addition, there are number of autonomous non-profit institutions / associations which are involved in running awareness programs and providing treatment and other community based activities in selected districts and states. Some of these are as follows:

<table>
<thead>
<tr>
<th>Institution</th>
<th>Website</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cancer Foundation of India (CFI)</td>
<td><a href="http://www.cancerfoundationofindia.org">www.cancerfoundationofindia.org</a></td>
<td>Non-profit institution dedicated to cancer prevention and control in India</td>
</tr>
<tr>
<td>World Heart Federation (India chapter)</td>
<td><a href="http://www.world-heart-federation.com">www.world-heart-federation.com</a></td>
<td>Non-profit institution which works to reduce the burden of heart diseases and stroke, the world over</td>
</tr>
<tr>
<td>Vision Mission Foundation</td>
<td><a href="http://www.vissionmission.ildoseinfo.com">www.vissionmission.ildoseinfo.com</a></td>
<td>Non-profit NGO which works with Diabetes and other lifestyle disorders</td>
</tr>
<tr>
<td>National Diabetes, Obesity and Cholesterol Foundation</td>
<td><a href="http://www.n-doc.org">www.n-doc.org</a></td>
<td>NGO committed to awareness and prevention of diabetes, obesity and cholesterol related disorders</td>
</tr>
</tbody>
</table>
4.3.5. Treatment Scenario

Private hospitals are considered better in terms of quality of service delivery when compared with the public institutions (Community health centres, NCD cells, etc). They are, of course more expensive also which limits their reach, besides the fact that good, private hospitals are concentrated in developed urban areas / tier I cities. Almost all large hospitals treat the lifestyle diseases since the incidence of these diseases is also higher than the others. Specialty hospitals are also established in India catering to cancer care, cardiovascular diseases and endocrinology-related diseases such as Fortis Escorts Heart Hospital and Tata Memorial Cancer Hospital. These tertiary care hospitals also play an influential role in determining treatment best-practices, programs, etc. However, treatment scenario in each of the sub-sectors is different, as discussed below.

There are a number of good, tertiary care hospitals that also look into cancer care in major cities. With the increase in medical oncologists in the country, treatment is available but to a very small section of the population. Most of the treatment is concentrated in urban areas and the rural areas are largely ignored. The RCCs in rural areas are mainly into primary treatment of cancers and are unable to tackle more complicated cases. Also, timely diagnostics of cancer is a major issue as proper diagnostic facilities are available across select locations only. As a result, non-detection and misdiagnosis of cancer are very prevalent in India, which, in turn lead to large number of deaths in the country.

All kinds of institutions provide cardiovascular care in India. Right from super specialty centres to multispecialty hospitals, public institutions and community health clinics, CVDs have the maximum number of treatment options available for patients. There are a number of specialist hospitals like Narayana Hrudalaya, Jayadeva Institute of Cardiovascular sciences and research that provide affordable, quality treatment to all sections of society. Tele-medicine within CVDs consultancy also enables remote treatment to be made available in order to practically cater to masses. Despite this, the care is unevenly distributed in urban and rural areas with limited primary care options at a rural level.

The treatment scenario for obesity and bariatric surgery is good in Tier I cities (which is where majority of the demand comes from) when compared to even Tier II towns. There are a number of dieticians and surgeons that run independent ventures catering to obesity, which works very well in educated areas of the country. Awareness however is lacking on the whole which makes it challenging to introduce newer methods of treatment to the people.

Hospitals generally provide treatment for diabetes of all kinds and types, especially for the diabetic foot. Public hospitals have a doctor (sometimes a general practitioner) to handle diabetic cases, which means treatment might not be entirely successful in controlling the disease. The procedures associated with diabetes include complications in case the patient is already suffering from obesity and bariatric surgery, thyroid disorders, and other endocrine disorders, including pituitary tumours. The challenge with diabetes is also low awareness about symptoms, which eventually ends up leaving most of the cases untreated.

Hypertension is definitely an ‘urban problem’ according to most hospitals and institutions. Hypertensive cases are usually handled by general practitioners, helping manage the disease over time as well. Opportunistic screening is also done at 20 000 sub-centres of the community health
clinics established by the Government for all persons above 30 years of age. This is as part of the NPCDCS and has helped with early diagnosis, although the overall management has been pretty poor.

4.3.5.1. Mode of financing of treatment (government support/ self/ insurance companies)

Treatment at all private hospitals is funded by the patients themselves, no matter what the disease. Public hospitals provide most treatment free of cost when it comes to NCDs, especially to needy patients. Middle income families might have to bear a part of the cost of treatment depending on the nature of the disease and the extent of treatment.

However, insurance does not cover some diseases like diabetes, which makes it challenging for a majority of diabetic patients to access good quality treatment at private hospitals.

4.3.6. Future Outlook and Prospect for Swedish companies

Experts believe that India is currently undergoing an 'epidemiologic transition', where the initial high burden of disease and mortality due to maternal and child mortality, infectious diseases, etc is declining, giving way to non-communicable diseases, and injuries as the main burden of disease. With the country already having gotten the distinction of becoming the capital for cardiovascular, cancer, diabetes, hypertension, and cerebrovascular diseases, this trend is expected to fuel demand for diagnostic and imaging technologies, and products.

Due to the increasing number of deaths because of lifestyle diseases, the Central Government plans to initiate an all-inclusive national programme to prevent and control diseases such as cancer, diabetes, strokes, obesity, and cardiovascular diseases. This is proposed to be rolled out during the 12th Five-Year Plan\(^{43}\) period in India (2012-2017) and will cover all 640 districts of the country. The programme will focus on health promotion, prevention of exposure to risk factors, early diagnosis, treatment of common non-communicable diseases and rehabilitation services.

When it comes to cancer care, super-specialty hospitals / centres are on the rise in Indian cities, and non-invasive treatment methods are preferred by doctors when compared to surgical / invasive treatment. The gamma knife, cyber knife, and the X-knife are upcoming forms of treating cancer being used and advocated by a number of doctors. Non-invasive treatment is however, more popular in private hospitals than public ones owing to the acceptability and large costs involved in these procedures. Also, there is significant requirement for diagnostic facilities for cancer all across India.

District Hospitals will be upgraded by setting up NCD Clinics in the premises, district cancer facilities and Tertiary cancer centres are planned to be set up to provide comprehensive treatment for common cancers. The Government is also looking to establish cardiac care clinics at district hospitals in order to make treatment available to a wider audience, especially the rural populace. Preventive medicine and early detection/ diagnosis are also expected to be implemented in a better manner.

\(^{43}\) The economy of India is based in part on planning through its five-year plans, which are developed, executed and monitored by the Planning Commission of India. The first five-year plan came into existence on 1st April, 1951. (Planning Commission Website)
Another initiative which the public institutions feel would help combat the incidence of lifestyle diseases is the inclusion of urban areas in the next phase (2012-2017) of MoHFW’s flagship, National Rural Health Mission. Since these problems have greater burden on the urban areas, this inclusion would go a long way in helping reduce the disease burden overall and broaden the reach for prevention and control.

Prospects for Swedish companies include developing expertise within affordable diagnostics, non-invasive treatment and training for all lifestyle related diseases, given that almost 80% of all medical technology and equipment for use in lifestyle diseases is imported from other countries.

Technology related partnerships are most interesting for large specialty hospitals like Narayana Hrudayalaya due to the increasing need of introducing better equipment for the management and control of CVDs. Expertise exchange on developing better specialty hospitals would also be an exciting opportunity to explore. Research and Development investments particularly to aid development in diagnostics and monitoring to improve the treatment and management of blood pump technology, cardiac surgery, interventional cardiology, etc.

Diabetes monitoring is also an opportunity that could be looked at from an Indian hospital perspective, to virtually be able to maintain records of the patient's diabetic history. Development of better, affordable mobile blood pressure monitoring equipment could be done in collaboration with Indian healthcare institutions.

Other prospects include, joint research opportunities, clinical trials for new equipment, staff exchange programs, collaborative funding, etc wherein Sweden and India can share best practices.
4.4. Elderly Care

4.4.1. Summary

The elderly population in India is growing at a significant pace. The share of population with age 60 and above is likely to grow from 7%-8% at present to around 11% by 2021, which will result in around 140 million elder people in the country. With changing demographic scenario, ageing has rapidly emerged as a major social challenge in India, with requirement of significant amount of resources towards support, care and treatment of the older population.

The elderly population in India suffers from a number of health problems such as Alzheimer, depression, poor vision and hearing etc. In 2010, an estimated 3.7 million Indian people aged over 60 were suffering from dementia, with women accounting for 58% of total dementia patients. Around 20% of the elderly people over 80 years of age suffer from Alzheimer in India, while the corresponding ratio for the 65 age group is 1 in 20. Further, around 1.6 million stroke cases are likely to get reported in India by 2015. The prevalence rate of strokes in the 60+ year age group is 625/100000, which is almost 30 times of the 20-40 age group.

With over 20% of people in the age group of 60—70 years being physical immobile, home based care is rapidly becoming popular in India. However, this type of care is much influenced by the Indian culture, where family members take care of the elder people in the family. Usage of trained external personal care givers is high across urban areas, attributed to the change in the family structure, urbanization and increasing number of nuclear families. There is also a significant demand for geriatric care services with about 64 per thousand elderly persons in rural areas and 55 per thousand elderly persons in urban areas suffering from one or more disabilities.

The Ministry of Health and Family Welfare launched National Program for the Healthcare of Elderly People (NPHCE) in 2010, with a planned outlay of around SEK 420 million (USD 60 million) during 2010-2012. The program mainly focuses on developing healthcare infrastructure specifically for elderly people and providing preventive, curative and rehabilitative support for elderly people.

The Ministry of Health and Family Welfare as well as the Ministry of Social Justice & Empowerment are the nodal ministries for various programs for elderly people include NPHCE; these are supported by various other organisations including National Council for Older Persons and Inter-Ministerial Committee on Older Persons, NGOs (Help Age India) etc. Also, the Ministry of Science and Technology has launched a new program Technology Interventions for Elderly (TIE) to provide information on various aspects of elderly care.

For Swedish companies/ institutions, opportunities are available across a number of areas including infrastructure development (day care centres, geriatric centres), supply of equipment of these centres and training programs for personal care givers and geriatric service providers.

4.4.2. Overview

According to a report published by Ministry of Statistics & Programme Implementation, Government of India in 2011, the share of elderly population is likely to be around 11% by 2021 from 7%-8% in...
2001. As a result, the number of elderly people in India is likely to increase from 77 million in 2001 to 140 million in 2021. Below figure shows the distribution of population by age across India:

For males, the share of elderly population is comparatively lower at 7.1%, while, the corresponding figure for females is 7.8%. At the age of 60, the average remaining length of life was found to be about 18 years (16.7 for males, 18.9 for females) and the corresponding figure for the population at the age of 70 was less than 12 years (10.9 for males and 12.4 for females). Below figure depicts the respective increase the share of elderly population by sex in India:

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[Note: The text above refers to a website for Ministry of Statistics and Programme Implementation (Mospi).]
The significant increase in the elderly population in the coming years indicates the requirement of immediate attention in the geriatric sector. According to a recent survey conducted by the Union Health Ministry, the elderly population in India suffers from a number of health problems such as Alzheimer, depression, poor vision and hearing etc. This category of population is often subjected to maltreatment at home, which in turn leads to physical injuries and long-term psychological consequences. Poverty and loneliness further add to these problems. Following sub-sectors are considered in this study:

### 4.4.2.1. Alzheimer and Dementia

According to the *Dementia India Report 2010*, around 3.7 million elder people were suffering from dementia in 2010. The prevalence of dementia increases steadily with age and higher number of cases have been registered for older women than men as mentioned below in the figure. This is mainly attributed to high life expectancy of woman as compared to man in India. At present, women account for 58% of total dementia patients in India.

**Figure 4-28: Prevalence of Dementia in India (2010)**

![Prevalence of Dementia in India (2010)](image)

*Source: STC Analysis, Alzheimer’s and Related Disorders Society of India*

In terms of geographic concentration of patients with Dementia (PwD), the situation across Maharashtra and Uttar Pradesh is likely to be worse with over 500 000 PwD by 2026. Other major states including Rajasthan, Gujarat, Bihar, West Bengal, Madhya Pradesh, Orissa, Andhra Pradesh, Karnataka, Kerala and Tamil Nadu are expected to have around 200 000 to 400 000 PwD. In terms of percentage increase, Delhi, Bihar and Jharkhand are expected to experience 200% (or greater) increment in total number of dementia cases over the 26 year period as compared to the number of PwDs in 2006.
According to the *Dementia Report 2010*, Alzheimer affected around 60% of the 3.7 million people suffering from dementia in 2010. Around 20% of the elderly people over 80 years of age suffer from Alzheimer in India, while the corresponding ratio for the 65 age group is 1 in 20. The situation for people below 65 years is much better with low number of occurrence of this disease. Alzheimer and Dementia are majorly unknown to Indian population and their proper treatment is hampered by a number of factors including social stigma, lack of awareness, absence of policy initiatives as well as training and support services, and lack of funds for dementia services, research and training programs.

### 4.4.2.2. Stroke

The problem of stroke is gradually getting acute in India and is one of the leading causes of mortality and morbidity in the country. Annually, around 20 million people suffer from stroke across the globe; stroke cases are relatively higher in India, as developing countries account for 85% of global deaths from stroke. Apart from deaths, stroke also results in functional impairment; 20% of survivors require institutional care after 3 months and 15% - 30% being permanently disabled.  

In India, stroke prevalence rate is about 55.6 per 100 000 at all ages and the disease cause around 600000 deaths annually. Around, 1.4 to 1.6 million cases of new acute strokes are reported every year, with 12% of strokes occurring in the population aged less than 40 years. Generally stroke increases with age with individual Indian studies estimating that the prevalence rates increases from 21/100000 for the 20-40 age group to 625/100000 in the 60+ year age group. Similarly, the incidence rates increase from 27-34/100000 in the 35-44 age group to 822-1116/100000 in the 75+ age group.

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45 Global Burden of Disease Study: [BMJ Website](#)
In India, men are more likely to have a stroke than women and the male/female ratio for people suffering from stroke is 7:1. Different factors such as smoking and drinking mainly attribute to this trend. The mean onset age of stroke for men in India ranges from 63-65 for men and 57-68 for women.

According to a research conducted by Indian Council of Medical Research, around 1.6 million stroke cases are likely to get reported in India by 2015. Major factors contributing to this expected rise in the number of stroke cases include growing life expectancy at birth, rising urbanisation, changing lifestyles and rising stress levels.

4.4.2.3. Home based Care and assistive devices

With changing demographic scenario, ageing has rapidly emerged as a major social challenge in India, with requirement of significant amount of resources towards support, care and treatment of the older persons. Home based care of elderly people in India has been mainly influenced by Indian culture, where family members take care of the elder people in the family. Despite being on decline, the culture is still prevalent in the country especially across rural areas. Following figure depicts the percentage distribution of physically immobile elderly by age in urban areas across India:

Situation across rural areas in India is comparatively better especially in elderly people with age 65 years and above, as depicted in the following figure:
With change in the family structure, urbanization and increasing number of nuclear families, there is a growing deployment of personal caregivers across large cities in India. For example, First-Seniors, a UK based elderly care established their operations in India in 2011; at present, the Indian subsidiary is serving over 3000 elderly people across eight cities in India. Similarly, India Home Health Care (IHHC), a Chennai based company, is providing services to around 50 elderly people in Bangalore and Chennai. Other companies that are involved in this kind of service include Epoch Eldercare and Maya Care.

In contrast to the service portfolio of European/ US-based elderly care companies (which include housekeeping, help with bathing and using the toilet); the Indian companies only focus on visiting elderly people at regular intervals, currently. These companies also advise the elder people on diet and medicine management and employ psychologists, social workers or gerontologists, who are also trained to provide basic life support.

The charge rate of services provided by these companies varies considerably depending on the requirement of elderly people. IHHC charges around SEK 500 per week, while the monthly charges for Epoch Eldercare is SEK 1400. The charges for First-Senior group vary between SEK 1400 – SEK 7000 depending on the type of service being provided.47

Usage of assistive devices for home based care of elderly people is at a nascent stage in India and is only popular in urban areas. Widespread usage of these devices is mainly hampered by lack of awareness, high cost and inadequate availability. As a result, the Ministry of Science and Technology, Government of India has been focusing on enhancing awareness regarding assistive and enabling technologies for elderly care. It has launched a portal on technology solution for elderly - http://www.oldagesolutions.org, under a new program - Technology Interventions for Elderly.

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47 Epocheldercare Website
4.4.2.4. Geriatric Care and assistive devices

Elderly population is more prone to suffer from chronic diseases such as heart disease, hypertension, diabetes, cancer, problem of joints etc, therefore signifying the need of geriatric care. Elderly citizens in India suffer from a large number of disabilities with people residing in rural areas more prone to these as compared to their urban counterparts. The prevalence of heart diseases among elderly men and women was much higher in urban areas than in rural parts. Such problems in elderly persons make situation even more vulnerable and demands high attention with advanced Geriatric Care and assistive devices.

![Figure 4-32: Numbers of Persons Aged 60 Years and Above Reporting A Chronic Disease (per 1000 persons)](image)

Source: Ministry of Statistics and Programme Implementation

About 64 per thousand elderly persons in rural areas and 55 per thousand elderly persons in urban areas suffer from one or more disabilities. Figure below depicts the most common type of disabilities among elder people in India:
India has been using traditional low cost assistive devices to address various disability factors. It is also quite clear from above chart that Indian elderly persons need assistive care devices most importantly in the segments like blindness, low vision, hearing aids and loco-motors.

There are 1018 Old Age Homes in India today, as per Help Age estimates. Out of these, 427 homes are free of cost while 153 old age homes are on pay and stay basis. A total of 371 old age homes all over the country are available for the sick and 118 homes are exclusively for women. Kerala has 186 old age homes which is highest across all the states. 48

4.4.2.4.1. Help Age initiative in Geriatric Care

Help Age India is the largest non-profit NGO that has been actively working for Geriatric care. Out of 98.5 million of elder persons in India during 2011, Help Age caters to around 1.5 million senior citizens across rural and urban areas. In general, Help Age has a higher focus in rural areas and the table below depicts major activities undertaken by the NGO:

<table>
<thead>
<tr>
<th>S. No</th>
<th>Activities in rural elderly care</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Formation of 2600 Elder Self Help Groups (ESHGs) of which 713 are fully operational</td>
</tr>
<tr>
<td>2</td>
<td>Reaching out to 20900 rural elders in 134 villages &amp; 250 locations</td>
</tr>
<tr>
<td>3</td>
<td>SEK 15.43 million (INR 110 million) allotted for micro credit money in rotation</td>
</tr>
<tr>
<td>4</td>
<td>130 community managed grain banks</td>
</tr>
<tr>
<td>5</td>
<td>18 ESHGs self managed health clinics</td>
</tr>
<tr>
<td>6</td>
<td>17 physiotherapy clinics</td>
</tr>
<tr>
<td>7</td>
<td>25600 cataract surgeries conducted</td>
</tr>
</tbody>
</table>

In addition for urban areas, Help Age has set up Age care Service Hubs (ASH) in all major states. Each city-hub provides various services such as a helpline, physiotherapy clinic, recreation centre/
library, mobilisation of senior citizens, computer literacy, helpdesk/ counselling etc. Other activities undertaken by Help Age India across urban areas are depicted below:

<table>
<thead>
<tr>
<th>S. No</th>
<th>Activities in urban elderly care</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>20 State Elders' Help lines (toll free)</td>
</tr>
<tr>
<td>2</td>
<td>3 Police Help lines</td>
</tr>
<tr>
<td>3</td>
<td>482 abandoned elders rescued from roads &amp; rehabilitated</td>
</tr>
<tr>
<td>4</td>
<td>23 Help Age managed Age care Service Hubs</td>
</tr>
<tr>
<td>5</td>
<td>40 Physiotherapy Clinics managed by Senior Citizens Associations</td>
</tr>
<tr>
<td>6</td>
<td>500 Senior Citizens Groups mobilised into 500 Senior Citizens Associations and 30 000 members</td>
</tr>
<tr>
<td>7</td>
<td>41 physiotherapy setups meted out 5298 treatments; 713 ESHGs (7800 elders)</td>
</tr>
<tr>
<td>8</td>
<td>769 elders are linked with pensions</td>
</tr>
</tbody>
</table>

4.4.3. Sub-sector specific Programs

In India, elderly care has started receiving attention at political and public fronts recently only. In order to develop healthcare infrastructure specifically focuses on elderly people and to provide preventive, curative and rehabilitative support for elderly people, the Ministry of Health and Family Welfare launched National Program for the Healthcare of Elderly People in 2010, with a planned outlay of around SEK 420 million (USD 60 million) during 2010-2012. At present, the program is running across 100 districts in 21 states in India and the government further plans to extend it to 540 more districts by 2017. Below mentioned are few program initiatives taken for the benefits of elderly care:

<table>
<thead>
<tr>
<th>Policy / Program</th>
<th>National Program for the Healthcare of Elderly People</th>
</tr>
</thead>
<tbody>
<tr>
<td>Key Stakeholders</td>
<td>Ministry of Public Health and Family Welfare</td>
</tr>
<tr>
<td>Details</td>
<td>Key aspects of this program are as follows:</td>
</tr>
<tr>
<td></td>
<td>• By 2017, develop 20 institutions with capacity to produce 40 post-graduates in MD in geriatric medicine per year, additional 6,400 beds in district hospitals and 1,000 beds in medical colleges</td>
</tr>
<tr>
<td></td>
<td>• Geriatric clinics in OPD and physiotherapy units in 640 district hospitals with more than 2,000 geriatric clinics in community and primary health centres</td>
</tr>
<tr>
<td></td>
<td>• Setting up of the National Institute of Aging in New Delhi and Chennai; these institutes will be attached to AIIMS Delhi and Madras Medical College, respectively</td>
</tr>
<tr>
<td></td>
<td>• Setting up of regional geriatric centres across 12 cities in India including Chandigarh, Lucknow, Hyderabad, Bangalore, Ahmadabad, Nagpur, Bhopal and Patna</td>
</tr>
<tr>
<td></td>
<td>• Training service staff six-month certificate course in geriatric medicine</td>
</tr>
<tr>
<td></td>
<td>• Organisation of geriatric clinics across civic health centres as well as primary health centres at regular intervals and annual checkups at village level</td>
</tr>
<tr>
<td></td>
<td>• Provision of health care services for bed ridden cases through village</td>
</tr>
</tbody>
</table>

49 Deloitte Website
workers; these workers will also provide training to family members

- Financial Management under NPHCE
  - Funds are released by the State Health Society to various states, which in turn provide funding to different facilities (CHCs, PHCs etc)
  - Funding assistance to the facility depends on type of facility and is further segregated in terms of recurring and non-recurring expenses. E.g. for primary health care centres, the recurring and non recurring financial assistance SEK 4300 and SEK 7200 respectively. While the corresponding figures for Regional Geriatric Centres are SEK 5.3 million and SEK 2.3 million respectively

<table>
<thead>
<tr>
<th>Policy / Program</th>
<th>National Policy On Older Persons (^{51})</th>
</tr>
</thead>
<tbody>
<tr>
<td>Key Stakeholders</td>
<td>Ministry of Social Justice and Empowerment</td>
</tr>
<tr>
<td>Key Benefits/ Features</td>
<td>The National Policy on Older Person focuses on ensuring various facilities including concessions, relief, services etc to older people and improving quality of life. It covers a number of areas such as financial security, health care, shelter education, welfare, protection of life and property etc. Under this policy, the state is required to provide support for financial security, health care, shelter, welfare and other needs of older persons</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Policy / Program</th>
<th>Integrated Programme for Older Persons (IPOP) (^{52})</th>
</tr>
</thead>
<tbody>
<tr>
<td>Key Stakeholders</td>
<td>Ministry of Social Justice and Empowerment</td>
</tr>
</tbody>
</table>
| Overview                                                | An Integrated Programme for Older Persons (IPOP) is being implemented since 1992 with the objective to improve the quality of life of senior citizens by providing basic amenities like shelter, food, medical care and entertainment opportunities and by encouraging productive and active ageing through providing support for capacity building of Government/ Nongovernmental Organizations/ Panchayati Raj Institutions/ local bodies and the Community at large

Under the Scheme, financial assistance up to 90% of the project cost is provided to nongovernmental organizations for establishing and maintaining old age homes, day care centres and mobile medicare units. The Scheme has been revised w.e.f. 1.4.2008

Besides increase in amount of financial assistance for existing projects, several innovative projects have been added as being eligible for assistance under the Scheme. Some of these are:
- Maintenance of Respite Care Homes and Continuous Care Homes;
- Running of Day Care Centres for Alzheimer’s Disease/Dementia Patients,
- Physiotherapy Clinics for older persons;
- Help-lines and Counselling Centres for older persons;
- Sensitizing programmes for children particularly in Schools and Colleges;
- Regional Resource and Training Centres of Caregivers to the older persons;
- Awareness Generation Programmes for Older Persons and Care Givers
- Formation of Senior Citizens Associations etc

\(^{51}\) JKHealth Website
\(^{51}\) SocialJustice Website
\(^{52}\) SocialJustice Website
4.4.4. Main Stakeholders

The Ministry of Health and Family Welfare as well as the Ministry of Social Justice & Empowerment are the nodal ministries for various programs for elderly people include NPHCE. These also focus on policies and programmes for the elderly people, in close collaboration with state governments, non-governmental organisations and civil society.

For implementation of National Policy on Older Persons (NPOP), the Ministry of Social Justice & Empowerment is supported by the National Council for Older Persons and Inter-Ministerial Committee on Older Persons. In addition, there are number of autonomous non-profit institutions/associations which are involved in running awareness programs and providing treatment and other community based activities in selected districts and states. Some of these are as follows:

<table>
<thead>
<tr>
<th>Institution</th>
<th>Website</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alzheimer's and Related Disorders Society of India (ARDSI)</td>
<td><a href="http://www.alzheimer.org.in">www.alzheimer.org.in</a></td>
<td>Non-profit institution to support families and communities in areas of Alzheimer and Dementia</td>
</tr>
<tr>
<td>Geriatric Society of India</td>
<td><a href="http://www.geriatricindia.com">www.geriatricindia.com</a></td>
<td>Non-profit NGO where doctors practice and contribute towards Indian Geriatric cause</td>
</tr>
<tr>
<td>Indian Stroke Association</td>
<td><a href="http://indianstrokeassociation.org">http://indianstrokeassociation.org</a></td>
<td>To improve stroke treatment and management in this country</td>
</tr>
<tr>
<td>Help Age India</td>
<td><a href="http://www.helpageindia.org">www.helpageindia.org</a></td>
<td>National NGO engaged purely in elderly care service</td>
</tr>
</tbody>
</table>

4.4.4.1. Treatment Scenario

Alzheimer and Dementia in India are still hidden problems with only 10% of 3.7 million patients getting diagnosed. There is a pressing need for greater awareness among the public, the policy makers and the physicians. There is also immediate requirement of opening large number of care centres that can take care of patients suffering from these diseases.

With an estimated 3.7 million PwD in 2010, the calculated total societal cost of dementia for India was estimated to be SEK 20.62 billion (INR 147 billion), thereby resulting in a total cost per person of SEK 6071 (INR 43285). Interestingly, the informal care cost per person in urban area (INR 12025; SEK 1687) was two and half times more than those in the rural area (INR 4538; SEK 636).

In order to cater to the alarming situation and proper management of stroke cases, the Indian government introduced National Guidelines for Stroke Management in 2010. These guidelines lay the foundation of Acute Stroke Team, written care protocols and an emergency department across hospitals to immediately take care of the stroke patients. These hospitals are also required to have the capability to perform CT scan/ MRI scan.53

In term of home care and geriatric care, most of the elderly patients receive treatment across general hospitals, which might have special programs/ clinics for this category of patients. The concept of special nursing homes for elderly people is at a very nascent stage in India with only a

53 TimesofIndia Website
few establishments. Following table includes the details of few hospitals that focus on Geriatric rehabilitation and related medical services:

<table>
<thead>
<tr>
<th>Treatment centres</th>
<th>Website</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chaitanya Mental Health Care Centre</td>
<td><a href="http://www.chaitanyarehab.com">www.chaitanyarehab.com</a></td>
<td>Geriatric rehabilitation centre</td>
</tr>
<tr>
<td>Agrawal Hospital (Prompt Medical Services)</td>
<td><a href="http://pcif.org/medical.html">http://pcif.org/medical.html</a></td>
<td>Geriatric medical services</td>
</tr>
<tr>
<td>Balaji Health Care</td>
<td><a href="http://www.balajihealthcare.in">www.balajihealthcare.in</a></td>
<td>Geriatric medical services</td>
</tr>
<tr>
<td>UR Clinic</td>
<td><a href="http://www.urclinic.com">www.urclinic.com</a></td>
<td>Geriatric medical services</td>
</tr>
</tbody>
</table>

4.4.4.2. Mode of financing of treatment (government support/ self/ insurance companies)

The annual budgetary allocations for elderly care by the Government of India are considerably low as compared to the extent of treatment requirement in India. As a result, many NGO and non-profit organisations have come up to address part of the issues in urban and rural areas. One of the major institutions that work on this area is Help Age India that depends largely on donations to fund its services and activities in India. Bilateral and multilateral agencies such as European Union, Disasters Emergency Committee (UK), Department for International Development (UK), Canadian International Development Agency (CIDA), US Agency for International Development, Japan Foundation, Help Age International and Cordaid are among the major donors for Help Age India.

However, treatment at large private hospitals in urban cities are individually paid by patient or their family members, mainly attributed to lower penetration of health insurance.

4.4.5. Future Outlook and Prospect for Swedish companies

The demographic profile depicts that in the years 2000-2050, the overall population in India will grow by 55% whereas population of people in their 60 years and above will increase by 326% and those in the age group of 80+ by 700% - the fastest growing group.

<table>
<thead>
<tr>
<th>Years</th>
<th>Total Population (millions)</th>
<th>60+ age group (in millions)</th>
<th>80+ age group (in millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>1008</td>
<td>76</td>
<td>6</td>
</tr>
<tr>
<td>2050</td>
<td>1572</td>
<td>324</td>
<td>48</td>
</tr>
</tbody>
</table>

Swedish knowledge for setting up of advanced Day-care facilities in India, considering the fact that there is a huge demand for well equipped and constructed old-age homes. Under NPHCE, the government has planned to set up a number of geriatric centres across India and has started to focus on improving healthcare delivery for elderly people in the country. Also, with growing deployment of personal caregivers for home based care of elderly people, opportunities are available for Swedish companies that provide training to these caregivers.

Help Age is also working with Planning Commission, Government of India to strengthen the existing policy framework for elderly care, which is called ‘National Policy for Senior Citizens 2011’. This policy focuses on various issues including income security, elderly healthcare, housing etc. It also offers certificate courses on elderly care. Any potential Swedish geriatric education institution/training centre can collaborate with Help Age.
Medical Devices and Other Areas
5. Other Areas

5.1. Medical Devices

5.1.1. Summary

Medical devices segment is one of the fastest growing segments in the Indian healthcare industry. The demand is mainly driven by the establishment of new hospitals by major private sector chains as well as upgradation of infrastructure by public sector hospitals. The medical device market in India was approximately worth SEK 16.1 billion in 2010 and is likely to reach SEK 34.7 billion by 2016, thereby growing at an approximate CAGR of 13%-14%.

The Indian medical devices market is quite mature in terms of requirements. It is highly dependent on imports which account for over 75% of medical devices purchased in the country, due to high R&D costs which local companies find difficult to support. The United States of America (USA) and Germany continue to top India’s import market, together accounting for almost 55% of India’s total imports.

Central Drugs Standard Control Organization (Drug Controller General of India also known as DCGI) is the nodal authority for medical devices in India. As per the current regulatory laws and policies, medical devices are considered as drugs and are regulated through the Drugs and Cosmetics (D&C) Act 1940. In line with the growing demand of medical devices, the Government of India has planned to launch a new act i.e., Revised Schedule M III specifically focusing on medical devices. All imported devices will be covered under the Revised Schedule and will be required to undergo a conformity assessment to ensure compliance with quality and safety standards.

Imaging devices, patient monitoring systems, therapeutic devices, homecare devices, assistive devices for elderly care and portable testing kits are some of the areas that present immediate business opportunities for Swedish companies.

5.1.2. Overview

The medical device market in India has been witnessing considerable growth in recent years, which is mainly attributed to establishment of new hospitals and growth in investment from private and public players. The government backed program NRHM has ensured adequate funding for upgradation of existing public hospitals as well as establishment of new hospitals. Meanwhile, the private sector healthcare chains such as Fortis Hospitals, Apollo Group, and Max Healthcare have been focusing on enhancing their reach by establishing new hospitals across the country.

Also, the level of service delivery is on a rise with some of the hospitals offering world class services through modern equipment and highly trained staffs. This in turn has led to a rise in the spending on medical devices in the country. Figure below depicts the growth in the medical device market in India in recent years:
In addition to the above mentioned factors, considerable growth in medical tourism in India is also forcing Indian hospitals to buy high technology products. The growth is driven by the lower cost of treatment in India, which costs only 10%-20% of that in other countries. As a result, there has been significant influx of patients coming from Africa, SAARC and West Asia for higher-end tertiary care.

The medical device market in India is segregated into five major product categories namely consumables, diagnostic imaging, dental products, orthopaedic products and patient aids. Below figure depicts the percentage share of various device segments in terms of market size.

In addition to the above mentioned factors, considerable growth in medical tourism in India is also forcing Indian hospitals to buy high technology products. The growth is driven by the lower cost of treatment in India, which costs only 10%-20% of that in other countries. As a result, there has been significant influx of patients coming from Africa, SAARC and West Asia for higher-end tertiary care.

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The medical device market in India is segregated into five major product categories namely consumables, diagnostic imaging, dental products, orthopaedic products and patient aids. Below figure depicts the percentage share of various device segments in terms of market size.

Figure below depicts the approximate growth rate of various products during 2006-10.
5.1.3. **Import of medical devices**

The Indian medical devices market is quite mature in terms of requirements for medical devices. It is highly dependent on imports, which account for over 75% of medical devices purchased in the country. The main reason behind higher dependence on imports is high R&D costs, which local companies find difficult to support. The United States of America (USA) and Germany continue to top India’s import market, together forming almost 55% of India’s total imports. Sweden’s exports to India have been volatile, and are comparatively small; however, it is a better performer than most European countries. Figure below depicts the country-wise breakup of imports of medical devices in India:

Source: STC Analysis, Espicom 2011
Consumables include wound care products, syringes, needles and other equipment. This is among the fastest growing sectors with varied dependence on imports. Around 20% of wound care products are imported from various countries including the USA, China and Singapore while the corresponding figure for syringes and needles is around 76%. Other equipments include blood grouping reagents, ostomy appliances, surgical glove etc which are mainly manufactured in India itself.

Diagnostic imaging equipment market is significantly dependent on imports which account for almost 70%-80% of the equipment used. Major supplier countries for this equipment include USA, Germany and China. Capital equipment (drills, chairs & X-rays) and instrument as well as supplies constitute the dental product sector in India. Around 73% of capital equipment in dental treatment is imported from countries such as South Korea, Italy and China. The corresponding figure for instrument and supplies is 84% and these are mainly imported from the USA and Germany.

Imports account for around 92% of the orthopaedic and prosthetic products used in India and the major supplier country is the USA. Patient aids include portable aids (hearing aids and pacemakers) and therapeutic appliances. Over 90% of these aids are imported from countries such as the USA, Singapore, South Korea and Germany. Table below depicts the dependency of imports across various categories of medical devices in India:

<table>
<thead>
<tr>
<th>Product Category</th>
<th>Level of Import</th>
<th>Major Countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumables</td>
<td>20%-76%</td>
<td>USA, China and Singapore</td>
</tr>
<tr>
<td>Diagnostic imaging equipment</td>
<td>70%-80%</td>
<td>USA, Germany and China</td>
</tr>
<tr>
<td>Dental Products</td>
<td>73%-84%</td>
<td>South Korea, USA, Germany Italy and China</td>
</tr>
<tr>
<td>Orthopaedic and prosthetic products</td>
<td>92%</td>
<td>USA</td>
</tr>
<tr>
<td>Patient aids</td>
<td>90%</td>
<td>USA, Singapore, South Korea and Germany</td>
</tr>
</tbody>
</table>

5.1.4. Domestic Manufacturing

Domestic manufacturing in India has been focused on low technology disposable equipment and consumables. According to the Association of Medical Disposable Equipment, around 60% of India’s requirement of disposable products such as IV sets is met domestically. Medical products are manufactured in India by both private companies and government-owned companies. A number of Indian manufacturers are either involved or interested in joint ventures with companies in the USA and Europe.

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Local manufacturer</th>
<th>Website</th>
<th>Major Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Anand Medicaid’s</td>
<td><a href="http://www.anandind.com/">www.anandind.com/</a></td>
<td>Deals with suction equipment, surgical disposables, UV sterilisers, foetal Doppler’s, infection control systems</td>
</tr>
<tr>
<td>2</td>
<td>Hindustan Syringes and Medical Devices Ltd</td>
<td><a href="http://www.hmdhealthcare.com/">www.hmdhealthcare.com/</a></td>
<td>Disposable syringes, disposable needles, IV cannulae, surgical blades and blood collection kits</td>
</tr>
<tr>
<td>3</td>
<td>Relisys Medical Devices Ltd</td>
<td><a href="http://www.relisysmedicaldevices.com">www.relisysmedicaldevices.com</a></td>
<td>Coronary stents, critical care products</td>
</tr>
<tr>
<td>4</td>
<td>Wadia Group</td>
<td><a href="http://www.wadiagroup.com/">www.wadiagroup.com/</a></td>
<td>Three medical companies operate</td>
</tr>
</tbody>
</table>
In addition, a number of international companies have set up manufacturing facilities in India, including Bausch & Lomb, Baxter International, B. Braun, Becton Dickinson, Dräger, GE Medical Systems, Johnson & Johnson, Siemens, Terumo and Zeiss.

5.1.5. Regulatory Policy and Purchase Procedures

Central Drugs Standard Control Organization (Drug Controller General of India also known as DCGI) is the nodal authority controlling medical devices in India. As per the current laws and regulatory policies, medical devices are considered as drugs and are regulated through the Drugs and Cosmetics (D&C) Act 1940. The act controls the manufacturing, sales, distribution and import of drugs including medical devices as well as diagnostic kits and cosmetics.

Section 3 (b) (iv) of D&C Act defines, Devices as “Devices intended for internal or external use in the diagnosis, treatment, mitigation or prevention of disease or disorder in human beings or animals” as specified from time to time by the Government. Till date, only 14 devices have been notified, which are as follows:

<table>
<thead>
<tr>
<th>S. NO.</th>
<th>Notified Device</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Disposable Hypodermic Syringes</td>
</tr>
<tr>
<td>2</td>
<td>Disposable Hypodermic Needles</td>
</tr>
<tr>
<td>3</td>
<td>Disposable Perfusion Sets</td>
</tr>
<tr>
<td>4</td>
<td>IVD Devices for HIV, HbsAg and HCV</td>
</tr>
<tr>
<td>5</td>
<td>Cardiac Stents</td>
</tr>
<tr>
<td>6</td>
<td>Drug Eluting Stents</td>
</tr>
<tr>
<td>7</td>
<td>Catheters</td>
</tr>
<tr>
<td>8</td>
<td>Intra Ocular Lenses (IOL)</td>
</tr>
<tr>
<td>9</td>
<td>I.V. Cannulae</td>
</tr>
<tr>
<td>10</td>
<td>Bone Cements</td>
</tr>
<tr>
<td>11</td>
<td>Heart Valves</td>
</tr>
<tr>
<td>12</td>
<td>Scalp Vein Set</td>
</tr>
<tr>
<td>13</td>
<td>Orthopaedic Implants</td>
</tr>
<tr>
<td>14</td>
<td>Internal Prosthetic Replacements</td>
</tr>
</tbody>
</table>
According to some sources, DCGI has also recently included 19 more medical devices under the Drugs and Cosmetics Act (DCA). Devices now requiring licenses for import, distribution and sale include: annuloplasty rings, blood tubing sets, cochlear implants, dialysis catheters, endotracheal tubes, insulin syringes, tracheotomy tubes, heart lung packs, measure volume sets, haemodialysis tubing sets, and spinal needles.

5.1.5.1. Revised Schedule M III

In order to improve the current scenario, the Government of India has planned to launch a new act i.e. Revised Schedule M III for medical devices. Under the Revised Schedule M-III, medical devices are divided into four classes according to their risk level—A, B, C and D. The regulatory requirement will be placed according to the device’s classification under various categories and the Central Licensing Approval Authority (CLAA), a branch of the CDSCO, will serve as the main regulatory body for medical devices.

All imported devices will be covered under the Revised Schedule and will be required to undergo a conformity assessment to ensure compliance with quality and safety standards. At the time of assessment, it will be mandatory for the manufacturer to provide the details of the authorized agent or representative in India. Also, the same details will be required to be published on the label or packaging of all imported devices marketed in India. However, the devices which are already approved by CE/USFDA or equivalent agencies will not be required to go for separate conformity assessment.54

The act also mandates registration of all contract research organizations (CROs) and ongoing clinical trials in India.

5.1.6. Main Stakeholders

The regulatory framework for drugs in India consists of five different ministries taking care of various aspects of medical devices, as depicted in the figure below:

54 Expresspharmasonline Website
The Directorate General of Health Services (DGHS) is attached to the Department of Health and Family Welfare and has subordinate offices throughout the country. The DGHS renders technical advice on medical and public health matters and is involved in the implementation of various health schemes. The Central Drug Standard Control Organisation, whose main functions are quality control of imported drugs, new drug approval, acting as the Central Licence Approving Authority with respect to blood and blood products, sera and vaccine, and to co-ordinate the activities of State/Union Territories Drug Control Authorities.

5.1.7. Procurement Process of Medical Devices

5.1.7.1. Public Hospitals

Public hospitals in India deploy tendering method for procurement of medical devices, which can be done at the state or central level. According to a WHO report, procurement process across public hospitals is a bit complex and on an average, it takes around 18 months from demand to commissioning stages. The public sector in India has many sub customer groups that procure medical devices at both Central and State levels. There is no central purchasing department of body that procures for the entire Government sector. Each individual departments and organisations have their own budgets and varying requirement of medical devices.
A bottom up approach is followed for submitting the requirements with each department head sharing their requisitions with the Medical superintendent of the hospital. For state level procurement, the superintendent shares the requirements with state level procurement committees which include technical committee, and bid evaluation committees/ rate finalization committees. These committees are responsible for technically evaluating the requirement and finalizing the specification for the products. Also, these are responsible for inviting tenders and selection of lowest bidders on the basis of tenders.

Usually, a two step tendering process is followed, wherein the companies are required to submit both technical and commercial bids. As a first step, the technical bids are opened and vendors whose products satisfy the technical criteria are selected for the next step. It is followed by opening of commercial tenders, wherein the vendor with lowest rates is selected for supply of equipment. Figure below depicts the general procurement process across government hospitals in India:
For centrally funded hospitals such as Safdarjung Hospital, the medical superintendent invited the tenders directly from various companies, post discussion with in-house screening committees.

### 5.1.7.1. Private Hospitals

The procurement process across private hospitals is comparatively efficient and it takes around 3 months from demand to commissioning of equipment. Individual and small hospitals adopt a direct procurement method, wherein the procurement manager or the head doctor is involved in the procurement of both devices and consumables.

Chain hospitals have a structured procurement system where the responsibility for procurement is shared between the corporate office and the individual hospitals. Various department heads across city hospitals submit their requirements with the local procurement manager. Along with the biomedical team, the local procurement manager is responsible for procurement and management of the medical devices in the hospital. High value requirements (\( \text{value} > \text{SEK} \ 300 \ 000 - \text{SEK} \ 400 \ 000 \)) are in turn submitted with the central material manager, who takes care of group level purchase; he is also responsible introduction of new products in the group. For new projects, the green field project manager is in charge procurement of equipment. Figure below depicts the procurement process of chain hospitals:
Figure 5-8: Procurement Across Private Hospitals/ Chains

5.1.8. Future Outlook and Prospect for Swedish Companies

Medical device segment in India has been growing at a significant pace and the trend is likely to continue in near future also. Companies such as Apollo Hospitals Group, Fortis Healthcare and Max India have been building advanced and high-quality hospitals, in order to cater to the growing demand of quality healthcare and medical tourism in the country. This, in turn is driving demand for high quality medical devices and the segment is characterized with strong presence of multinationals that have extensive service networks.

While on the public side, considerable funding is available through various government programs that focus on provide cost-effective/ free and basic healthcare services especially to the rural population. In this segment, few opportunities are likely to emerge for foreign manufacturers to provide equipment; however, the low to mid-tech end of the market will be met mainly by the domestic industry.

Major categories of medical equipment those are likely to generate business opportunities in medium and long terms are:

1. **Imaging devices:**
   a. Imaging product market stood at SEK 12.9 Billion in 2010. Products in this segment include ultrasound scanners, CT scanners, x-ray equipments, MRI scanners, PET scanners, mammograms and fluoroscopes
   b. At present, the market for imaging devices is the largest among all the segments in the medical devices market
   c. Major players in this segment include Philips Medical Systems, Siemens Medical Solutions, Toshiba Medical Systems Corporation, Hitachi Medical Corporation
2. **Patient Monitoring**
   a. Market size for these kind of products stood at SEK 1.6 billion, estimated to grow at CAGR of 17% till 2015
   b. Products in this segment include ECG and EEG monitors, surgical concentrators, multipara monitors, pulse oxymeters
   c. Some of the companies operating in this segment include Larsen & Toubro Ltd., Maestros Mediline Systems Ltd., and Opto Circuits (India) Ltd.

3. **Therapeutic devices**
   a. Market size for therapeutic devices stood at SEK 600 million in 2010
   b. This segment includes products such as optical aids, pacemakers, hearing aids, prosthetics and mobility aids
   c. Therapeutic devices form the third largest segment in the medical devices market and is poised to grow at a steady rate in the coming years
   d. Some of the companies operating in this segment include Siemens Medical Solutions, Silicon Labs Private Ltd., B. Braun Medical (India) Pvt. Ltd

4. **Homecare devices**
   a. High demand likely for home care products which can be self administered or administered with limited assistance in a home based setup
   b. Current homecare device market is estimated to be around SEK 670 million
   c. At present, the use of homecare and handheld medical devices in India is at just 8% which provides this segment and opportunities for huge growth

5. Import of assistive devices for elderly care has been witnessing good growth in requirement like specialized walkers, improved hearing aids, technologies to avoid bedsores, advanced standing support chair etc

6. With growing focus of the government on improving healthcare diagnostics and treatment scenario at the school level, high demand is likely to emerge for portable blood testing kits. Also, similar kits can be used by village health workers/ ASHA to diagnose disease across various villages.
5.2. Medical Education

5.2.1. Summary

Currently, there is a significant demand-supply gap in terms of medical professional in the country. Against a demand for around 6 million doctors (in line with the WHO recommendations), the country has around 820000 doctors across India that are registered with the state medical councils/Medical Council of India. The country has one of the lowest availabilities of doctors at 6 per 10000 population as compared to 14.2, 17.2 and 36 respectively in Brazil, China and Sweden.

India has an established network of medical institutions that are engaged in imparting medical institution through conventional modes. Majority of medical colleges are public, though the number of private medical colleges is on a rise. Admissions to these medical colleges are based on entrance exams, which are highly competitive in nature. The duration of MBBS courses in India is 4.5 years, which is followed by a compulsory rotating residential internship of one year. There are three different types of PG courses being offered in India; these include the diploma and degree courses of the Medical Council of India and the courses run by the National Board of Education. There are around 3000 seats available for super specialty courses.

The Medical Council of India (MCI) is the nodal agency and the statutory body for deciding the curriculum and developing standards for medical education in the country.

Indian institutes are forthcoming for exchange programs at the faculty and student level. Also, these institutes are open for virtual classes as a supplementary tool for the existing classroom teaching, provided the content is approved by the MCI. With a number of new hospitals being established across the country, significant demand is likely to emerge for qualified health professionals in near future.

5.2.2. Overview

Higher education in India has undergone significant changes in recent past, which is mainly attributed to the ongoing transformation of the Indian economy from agricultural-based to service oriented. As a result, the number of enrolments in higher education in India is expected to witness an annual average growth of around 11% in the coming years, thereby growing from 14.6 million in 2010-11 to around 20 million by 2013-14.

India needs 600,000 doctors, 200,000 dental surgeons and one million nurses in the country, going by the WHO recommendations of 1:1,000 doctor-patient ratio and 1:7,500 dentist-to-population ratio. With India producing only 23,000 new doctors, 13,000 dental doctors and 45,000 nurses every year, there is a significant demand supply gap at present in the country. As compared to other countries, the doctor to population ratio in India is considerably low at 6.3 doctors per ten thousand population.

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56 Cygnus India Website
This results in a total number of around 820000 doctors across India that have required qualification and are registered with the state medical councils/ MCI. Figure below depicts the growth in the number of doctors in India during 2005-2010.

According to the Central Bureau of Health Intelligence, Maharashtra has the highest number of doctors registered with the state medical council in 2010. There were 137824 doctors registered

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57 CBHIDGHS Website
with the Maharashtra’s state medical council and it is followed by Karnataka and Tamil Nadu with 87320 and 86822 registrations respectively.

5.2.3. Medical Education Structure in India

Doctors and engineers are the most sought after professions for Indians. Medicine, as a professional field, is the most expensive, and takes the most time to succeed in. Statistically, the probability of an Indian becoming a doctor is less than one in a thousand. Studying to become a doctor is a tedious process as the field is highly competitive.

Admission to MBBS courses is governed through entrance exams, which can be at central level or state level. The duration of MBBS courses in India is 4.5 years, which is followed by a compulsory rotating residential internship of one year. Medical colleges in India provide medical education as per a set pattern which includes one year of basic sciences, 1.5 years of Para-clinical sciences and 2 years focusing on clinical subjects. For admission to post graduation courses, the doctors are required to clear another entrance exam. All medical colleges in India are monitored and inspected by the Medical Council of India every year.

5.2.3.1. Under graduation Courses

Obtaining a medical degree in India is highly competitive due to the limited number of seats available. According to the MCI website, there were 41000 seats available in the under graduation and post graduation courses in India in 2010, present across private and public colleges. Figure below depicts the key states with highest number of MBBS seats in the country:

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Figure 5-11: Key States with Highest Number of MBBS Seats

Gujarat  
Institutions: 19  
Seats: 2380

Maharashtra  
Institutions: 41  
Seats: 4860

Karnataka  
Institutions: 41  
Seats: 5625

Andhra Pradesh  
Institutions: 37  
Seats: 4850

Uttar Pradesh  
Institutions: 25  
Seats: 3049

Kerala  
Institutions: 23  
Seats: 2800

Tamil Nadu  
Institutions: 40  
Seats: 4815

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Source: MCI website, STC Analysis

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59 P. Zachariah (2009). ‘Rethinking medical education in India’ The Hindu  
60 Hindustan times Website
At present, the number of seats is significantly low as compared to the demand of doctors in India. Addressing this problem, the Indian government and MCI have taken steps to relax the MCI regulations, thereby allowing more medical institutions to be recognized, thereby, increasing the number of MBBS seats. In 2011, the MCI created 4,452 additional MBBS seats in 21 new medical colleges, as well as increased the number of seats in existing institutions.

The number of colleges is set to increase significantly with the increase in the number of applications being submitted to the MCI. In 2011, MCI approved 21 applications out of 86, and is expected to approve of more in the coming years. The government’s interest in re-evaluating medical education in India has also led to a drive to encourage MBBS graduates to pursue their internship in rural areas of the country, where medical attention is needed the most, as well as providing new incentives to medical professionals.61

5.2.3.1.2. Post Graduation (PG) Courses

There are three different types of PG courses being offered in India; these include the diploma and degree courses of the MCI and the courses run by the National Board of Education. The diploma courses are focused on educating specialists that are involved at primary and secondary level of healthcare service delivery while the degree courses are meant for the academic stream and to provide care at the tertiary level. In addition, the number of seats under degree courses is much higher than that of the seats offered under diploma courses.62 There are around 22500 PG seats in India; the figure below highlights the distribution of PG seats across major disciplines:

Figure 5-12: Distribution of PG seats by Discipline

<table>
<thead>
<tr>
<th>Discipline</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medicine</td>
<td>8%</td>
</tr>
<tr>
<td>Surgery</td>
<td>7%</td>
</tr>
<tr>
<td>Obstetrics and gynaecology</td>
<td>7%</td>
</tr>
<tr>
<td>Public Health</td>
<td>7%</td>
</tr>
<tr>
<td>Pathology</td>
<td>5%</td>
</tr>
<tr>
<td>Anaesthesiology</td>
<td>4%</td>
</tr>
<tr>
<td>Orthopaedics</td>
<td>4%</td>
</tr>
<tr>
<td>Radiodiagnosis</td>
<td>3%</td>
</tr>
<tr>
<td>Ophthalmology</td>
<td>4%</td>
</tr>
<tr>
<td>Pediatrics</td>
<td>3%</td>
</tr>
<tr>
<td>ENT</td>
<td>3%</td>
</tr>
<tr>
<td>Others</td>
<td>44%</td>
</tr>
</tbody>
</table>

Source: National Medical Journal Of India

61 PTI (2011). * MCI creates 4,452 new MBBS seats; 21 new med colleges, IBN Live Website ; Hindustan times Website
62 NMJ Website
5.2.3.1.3. **Super Specialties**

At present, there are around 3000 super speciality seats in India, which are mainly distributed among traditional surgical and medicine disciplines. Figure below depicts the distribution of super speciality seats across various surgical disciplines:

![Diagram of Super Specialty Seats across Surgical Disciplines](source: National Medical Journal Of India)

Similarly, the distribution of super speciality seats among various medical disciplines is depicted below:

![Diagram of Super Specialty Seats across Medical Disciplines](source: National Medical Journal Of India)
5.2.4. Medical Council of India

The Medical Council of India (MCI) is the nodal agency and the statutory body for deciding the curriculum and developing standards for medical education in the country. The MCI registers doctors to practice in India, in order to protect and promote the health and safety of the public by ensuring proper standards in the practice of medicine. The objectives of the Council are as follows:

1. Maintenance of uniform standards of medical education, both undergraduate and postgraduate.
2. Recommendation for recognition/de-recognition of medical qualifications of medical institutions of India or foreign countries.
3. Permanent registration/provisional registration of doctors with recognized medical qualifications,
4. Reciprocity with foreign countries in the matter of mutual recognition of medical qualifications.¹

The MCI is an autonomous body set by the Indian parliament and governed by the Indian medical council act. It was established in 1934 under the Indian Medical Council Act, 1933, with the main function of establishing uniform standards of higher qualifications in medicine and recognition of medical qualifications in India and abroad. In 2010, the Union Government decided to dissolve the MCI and the Board of Governors (BO Gs) were asked to oversee the work of the MCI.

The MCI has committees which are made up of experts and other stakeholders, such as doctors, hospital management and government officials. The medical curriculum in institutions is designed by the MCI with modern Indian practice. These committees set the curriculum for medical courses and review the same for changes when needed.

Not all medical institutions fall under MCI regulations. AIIMS (New Delhi), PGIMER (Chandigarh) and NIMHANS (Pondicherry) are examples of such institutions. They are under the regulation of the government of India as they are regarded as institutions of national importance.

5.2.5. Exchange Programs

Exchange programs among Indian and foreign medical colleges is an upcoming concept with a primary focus on exchange of faculties among colleges. Some examples are listed below:

- NRI Medical College with Temple University (USA) Student Exchange Agreement; Faculty Exchange and Research Collaboration
- Government Medical College and Hospital, Chandigarh with Glasgow university and Singapore General Hospital
- Post Graduate Institute of Medical Education and Research, Chandigarh have exchange programs with Virginia Commonwealth University and Innsbruck University

Indian doctors going abroad to countries like Sweden through exchange programs face certain restrictions. They can only observe patients from a distance and not interact with them due to the stringent doctor-patient confidentiality laws. Private hospitals, such as Fortis, are looking into the possibility of tying up with foreign universities. Fortis has frequent exchanges are made with universities in the UK, though the school varies every year.
The exchange program for students is yet to become popular attributed to the requirement of practical training in medical education. Although, a number of colleges have student exchange programs with foreign universities. For example, Seth G. S. Medical College in Mumbai, one of the leading medical colleges in Maharashtra has a student exchange program with the University of Massachusetts Medical School in Worcester, USA.63

In 2008, a similar agreement was signed between Prathima Institute of Medical Sciences (PIMS), Karimnagar, and Southern Illinois University School of Medicine, Springfield, Illinois, USA. It is a two month exchange program and involves exchange of 24 students per annum.64 For these types of exchange programs, various issues such as duration of stay as well as hand on training need to be addressed at college level and then, the proposal can be forwarded to the MCI.

5.2.5.1.1. Staff training

In India, cross hospital sharing in skills and techniques is common practice. If one hospital is performing a unique procedure, doctors from other hospitals are invited to come and learn. Individual hospitals have their own personalized trainings. Continuous education programs are common.

5.2.5.1.2. Indian Student in Foreign Medical Universities

Up until 2009, students with MBBS degrees from a country with which India has a reciprocity agreement could practice in India. However, MCI tightened the requirements for degree conversion and now any Indian citizen with a foreign medical degree must appear for a screening test set by the MCI and obtain an RMP number in order to practice in the country.

Furthermore, foreign citizens from the developed world can only volunteer in India and cannot do so for a fee. Indian citizens educated abroad with MD degrees, are allowed to practice in private hospitals for a fee, but not in government hospitals.

63 KEM Website
64 Hindu Website
5.2.6. E-Learning and Virtual Classes

Conventionally, classroom teaching is popular in India. The government is currently exploring the possibility of implementation of the concept of virtual classes and e-learning in medical education. Due to the current modus operandi of the delivery of medical education, virtual classes are likely to be used only as a supplementary tool for training.\(^{65}\)

**National knowledge Commission’s Virtual Teaching Program**

National Knowledge Commission, in collaboration with the National Informatics Centre (NIC) has launched a pilot program to launch virtual classes as a supplementary tool for current classroom teaching in medical education. The program focuses on enhancing interaction among various medical colleges and improving quality of medical education.

With this project, AIIMS Delhi will be linked to PGIMER-Chandigarh, NEIGRIHMS-Shillong, JIPMER-Pondicherry, GMC-Bhopal, Lady Hardinge Medical College-Delhi and University College of Medical Sciences, Delhi. GMC- Bhopal has already conducted virtual teaching session for its students with the help of faculties from AIIMS Delhi.

In the private sector, Apollo Hospitals Group launched India, first medical e-learning venture – Medivarsity - in 2000, along with NIIT Ltd. The venture focuses on providing distance medical education to healthcare providers. Main services offered by Medivarsity are depicted in the figure below:

**Figure 5-15: Services provided by Medivarsity**

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\(^{65}\) Timesofindia Website
The company has been developing the course content as well as offering courses in association with a number of domestic and foreign institutions/associations. For example, in association with the Royal College of General Practitioners (RCGP), UK, Medivarsity offers courses in family medicine and emergency medicine. It is also involved in providing training on Hospital Administration to various health officials in Maharashtra.66

5.2.7. Hospital Management

"The expansion of the health care market will need efficient management professionals apart from the medical and technical professionals," Karthik KS, CEO and Founder of 24X7 Learning1

With the rapid expansion of private hospitals and upgradation of the public healthcare delivery system, the demand for trained and quality healthcare professional is on a rise. In line with this, a number of institutes have started offering specialized and professional courses in the field of hospital management. The content for the master program in hospital management is set by the All India Institute of Technical Education and the institutions offering such a program do not fall under the MCI regulations.

At present, around 50 institutes in India are offering various courses (degree and diploma) in hospital management in India. These courses range from certification programs to MD degrees in hospital management. Around 2500 trained professional in hospital management are available each year through various colleges including renowned institutes such as AIIMS Delhi and PGIMER Chandigarh, which offer masters degree in hospital management. In addition, 11 MD (hospital management) are produced by medical colleges every year in India.

The table below depicts that approximate number of trained profession produced under select degree and diploma courses in India67:

<table>
<thead>
<tr>
<th>Course</th>
<th>Trained Professional Produced</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master's in Hospital Administration (MHA)</td>
<td>450</td>
</tr>
<tr>
<td>Master's in Hospital Management (MHM)</td>
<td>200</td>
</tr>
<tr>
<td>MBA (Hospital Management)</td>
<td>540</td>
</tr>
<tr>
<td>Postgraduate Diploma in Hospital Management</td>
<td>858</td>
</tr>
</tbody>
</table>

5.2.8. Future Outlook and Prospect for Swedish companies

India has a very well established system for imparting medical education and at present, the system is mainly based on conventional form of teaching i.e. classroom teaching. A number of institutes in India are involved in exchange programs with foreign universities and colleges including premier institutes such as PGIMER Chandigarh. These institutes have been collaborating at both faculty and student levels. With new medical colleges and universities coming across the country including a common Medical University for all colleges in the state of Madhya Pradesh, a lot of opportunities are available for Swedish Institutes for collaboration on exchange programs.

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66 Medivarsity Website
67 IAPSMGC Website
However, issues such as absence of hands on training due to the stringent doctor-patient confidentiality laws need to be taken care of.

In recent past, various institutes have started exploring alternate form of teaching including virtual classes and online training. These modes are likely to only act as a supplementary tool for the current conventional form of training. National Knowledge Commission recently launched a pilot program to link AIIMS Delhi with select institutes to run virtual classes. Similar opportunities can be explored with Swedish institutes; however, the course content needs to be pre-approved by the MCI.

With Medivaristy, Apollo Hospitals Group ventured into medical education field. The group has been developing the course content as well as offering courses in association with domestic and foreign institutions/associations. Swedish institutes can also associate with similar group to offer e-learning in the field of medical education.

The demand for trained professionals for managing existing and upcoming hospitals is on a rise in India. The country produces around 2500 trained professional in hospital management, which is significantly low as compared to the demand of almost 22000 professionals. At present, around 50 institutes in India are offering various courses (degree and diploma) in hospital management in India and a number of new institutes are planning to offer these courses in near future.
5.3. Telemedicine and E-health

5.3.1. Summary

Nearly 80% of physician’s reside in urban areas leaving only 20% of doctors to address the health and treatments needs of rural population in India. People staying in rural areas usually have to travel long distance to reach a doctor even for most basic healthcare services. The government understands these inherent problems in delivery of healthcare services to all and has taken several initiatives including development of supporting infrastructure which includes internet and satellite connectivity, development of special software etc. As a result, the telemedicine market in India is likely to witness an average growth of around 20% per annum thereby growing from SEK 50 million at present to around SEK 124 million by 2016.

Along with the Ministry of Health and Family Welfare, Department of Information Technology, Indian Space Research Organization, and Centre for Development of Advanced Computing are the major public sector entities involved in telemedicine and e-health projects in the country. On the private front, Apollo Hospitals group, Columbia Asia and Narayana Hrudayalaya are among the leading players providing telemedicine services in India.

Despite significant advantages, lack of infrastructure in rural areas, illiteracy and existing consumer behaviour of patients requiring human touch are among the major factors hampering widespread deployment of telemedicine technologies in India.

Major opportunities are available in the form of provision of enabling solution and technologies i.e. devices and better software for integration of satellite telemedicine centres with nodal super specialty hospitals. There are also possibilities that medical institutions from both countries collaborate and consult each other for critical requirements and special cases.

5.3.2. Overview

According to the 2011 Census, India has an approximate population of 1.2 billion. A significant portion of this population resides in rural areas, which are not easily accessible and have poor access to healthcare services. This challenge is magnified by the fact that nearly 80 per cent of physicians reside in urban areas, leaving this segment of population with access to only 20% of physicians68.

Even as primary healthcare centres and makeshift dispensaries are being constructed at remote areas, India is experiencing a shortage of trained doctors and nurses. For example, India has just 6.3 doctors for every 10 000 people, and specialists are even rarer. In the absence of qualified doctors, predominant healthcare personnel in rural areas are unqualified practitioners, who have either limited or no training. In most cases, people in the rural areas have to travel long distances to reach a doctor for basic healthcare services. This is also a reason why not many people attend to their medical needs in the early stage of the disease cycle.

With advancements in technology, medical treatment and consultation is now able to reach out to people in remote areas with little access to physical medical care. Telemedicine allows patients to

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68 ISRO Website
seek medical care in case of an emergency and with this technology, they are able to share their medical reports - videos or radiology images to ensure an all-round investigation and an accurate diagnosis is delivered. Telemedicine is also useful in getting doctors in touch with their peers to discuss complicated cases or to get specialized help remotely.

With a current addressable market size of SEK 50 Million, the future for Telemedicine looks promising with the market expected to grow at a CAGR of around 20 per cent over the next five years taking the total market size to SEK 125 Million\(^69\).

![Market Size of Telemedicine in India](source: KIT, STC Analysis)

However, another estimate suggests that the size of India's telemedicine market is expected to be SEK 3.3 Billion by 2015\(^71\). Major areas where telemedicine technology is being used in India are depicted in the figure below:

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\(^{69}\) KIT: Telemedicine market in India: Business Standard Website

\(^{70}\) Business Standard Website

\(^{71}\) PWC
Investments and development within telemedicine have not been restricted to a specific department or organization, but multiple stakeholders have been active in the field to promote and increase the penetration of telemedicine in remotest part of the country. Some of the noteworthy initiatives are listed in the next section.

5.3.3. Government initiatives

5.3.3.1. Department of Information Technology (DIT)

Realizing the benefits and having the capability in terms of the technical and medical expertise in India, DIT has initiated various Telemedicine projects across India. DIT acting as a facilitator, has taken initiatives for development of technology, initiation of pilot schemes and standardization of Telemedicine in the country. It has established more than 75 nodes all over India and support research and development. Details of major project launched by DIT are as follows:

- Development of telemedicine software systems under the project “Development of Telemedicine technology and its applications towards optimisation of medical resources” by C-DAC and validation for three premier medical institutions: SGPGIMS, Lucknow, All India Institute of Medical Sciences (AIIMS), New Delhi and Postgraduate Institute of Medical Education and Research (PGIMER), Chandigarh using ISDN & Satellite connectivity.
- For diagnosis & monitoring of tropical diseases in West Bengal using Wide Area Network (WAN), developed by Webel (Kolkata), Indian Institute of Technology, Kharagpur and School of Tropical Medicine (2 nodes).
- Kerala Oncology Network for providing services for cancer detection, treatment pain relief, patient follow-up and continuity of care in peripheral hospitals of regional Cancer Centre, (RCC), Trivandrum (5 nodes).

\[ \text{Source: ISRO, STC Analysis} \]
- A Telemedicine solution to provide specialty health services to remote areas of north-eastern states of India at Naga Hospital Kohima and remote states of Mizoram and Sikkim with support from Marubeni India Ltd., Govt. of Nagaland and Apollo Hospital, Delhi.
- Undertook initiative, in a project mode, for defining "The framework for Information Technology Infrastructure for Health (ITIH)" to efficiently address information needs of different stakeholders in the healthcare sector.

In order to standardise services of different Telemedicine centres, a document, “Recommended Guidelines & Standards for Practice of Telemedicine in India”, has been prepared by DIT which is aimed at enhancing interoperability among the various Telemedicine systems being set-up in the country. These standards are expected to assist the DIT, state governments and healthcare providers in planning and implementation of operational telemedicine networks.

Department of Information Technology (DIT), Ministry of Communication and IT, in order to reduce the cost of the healthcare and to demonstrate use of ICT Technology to provide quality care to patients in rural/remote locations through specialist consultations for diagnosis and treatment, has initiated various pilot projects in different parts of the country.

5.3.3.1.2. Indian Space Research Organization (ISRO)73

Indian Space Research Organisation (ISRO) is a government organization with the prime objective to develop space technology and its application to various national tasks. As a part of application of space technology for health care and education, under GRAMSAT (rural satellite) programme, ISRO has initiated a number of Telemedicine pilot projects. These projects consist of, linking through Indian National Satellite (INSAT), remote/rural areas like Jammu, Kashmir & Ladakh in north near Himalayas, Offshore Islands of Andaman and Lakshadweep, North Eastern States District Hospitals/Health Centres.

ISRO’s telemedicine initiative includes providing connectivity between remote/rural hospital and super specialty hospital for tele-consultation, treatment and training, Continuing Medical Education (CME) and Mobile Telemedicine units for rural and community health.

Presently ISRO’s Telemedicine Network consists of 245 Hospitals – 205 Remote/Rural/District Hospital/Health Centre connected to 40 Super Specialty Hospital located in the major cities. With these initiatives from ISRO, more than 250,000 patients have been treated, till date.

5.3.3.1.3. Ministry of Health and Family Welfare, Government of India

The Ministry of Health and Family Welfare has implemented integrated Disease Surveillance Programme network with the help of ISRO. Some other noteworthy programs are74:

- Under the National Cancer Control Program, MoHFW is establishing OncoNET India, a network connecting 25 Regional Cancer Centres and 100 peripheral centres to provide comprehensive cancer treatment facilities and carry out cancer prevention and research activities.

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73 ISRO Website  
74 Telemedindia Website
• Approved tele-ophthalmology project to provide eye care specialty services to the patients of rural and remote areas of Punjab, Uttar Pradesh, West Bengal states of India through tele-ophthalmology mobile van.
• Draft proposal for National Telemedicine Grid has also been prepared by ISRO and submitted to MoHFW

In September 2005, Ministry of Health and Family Welfare has taken initiative to constitute National Task Force on telemedicine under the chairmanship of Secretary, Union Ministry of Health and Family Welfare, incorporating members from various concerned ministries of union government e.g. Health, Communication & Information Technology and Space; technical agencies e.g. Indian Space Research Organization, Indian Council of Medical Research, Medical Council of India, Centre for Development of Advanced Computing; academic medical institutions and corporate hospitals practicing telemedicine actively.

5.3.3.1.4. **Centre for Development of Advanced Computing**

Centre for Development of Advanced Computing (C-DAC) is the premier R&D organization of the Department of Electronics and Information Technology (DeitY), Ministry of Communications & Information Technology (MCIT) for carrying out R&D in IT, Electronics and associated areas. C-DAC has been working in the area of Health Informatics since early 90's. It has developed several solutions till date in this area. Among many projects that have been taken up within healthcare, some of the notable projects being taken under telemedicine are:

• Development of e-Health portal :
  o Swasthyaabaadi (also known as eHealth Portal) is an innovative initiative of C-DAC Mohali which fulfils the health information requirements of common public and the specialists. Swasthyaabaadi is a platform independent, browser-based application facilitating common public about disease, drugs, supplements etc. The health portal will come up with 15 specialties i.e. Ophthalmology, Gynaecology, Cardiology, Pathology, Surgery, Paediatrics, Diabetes, Dermatology, Nephrology, Psychiatry, Urology, Oncology, ENT, Orthopaedic Surgery and Orthodontics. Currently Ophthalmology & Gynaecology modules are functional and other modules are being developed.
  
• Development of Sanjeevani and eSanjeevani
  o Sanjeevani is a multi-speciality software solution that follows a hybrid model that integrates both store and forward and videoconferencing telemedicine technologies. It enables quick and easy creation of electronic telemedicine referrals that include digital images and patient information. It is developed using modern database software and provides a secure system that allows healthcare professionals to collect medical & demographic data and communicate it to other remote clinicians.
  o e-Sanjeevani has been developed to provide a low cost alternative against the existing desktop solution and meet all the demands of the telemedicine environment. It is a web based solution and so follows the client server architecture. Its primary
aim is to develop a world class telemedicine technology solution for providing health care to all at affordable cost.  

5.3.4. Academic Institutions initiatives

In addition to government's focus and initiatives, academic institutions have also been playing an active role in increasing the penetration of telemedicine in India. Some noteworthy contributions are listed below:

5.3.4.1.1. Telemedicine Program at SGPGIMS, Lucknow

Sanjay Gandhi Postgraduate Institute of Medical Sciences (SGPGIMS located in Lucknow, capital of Uttar Pradesh), is a tertiary level referral academic medical centre involved in teaching and training of super specialist medical professionals with 23 academic departments. It is the first tertiary care hospital in public healthcare sector in India to adopt Information Technology (IT) for healthcare delivery.

In 1999, telemedicine activities were initiated in the form of testing the concept and the technology. Regular tele-healthcare and tele-educational services were introduced for the postgraduate students of medical colleges of Orissa (an eastern state of India). These services have now been extended to educate the doctors of other medical colleges and community centres in other states. Looking at the need of skilled manpower in the field of telemedicine and e health, a School of Telemedicine and Biomedical Informatics is coming up in the campus which is recognized as the National Resource Centre by DIT to provide core infrastructure for research and development and trained manpower in various field of telemedicine.

The SGPGIMS has partnered with more than 10 national and international Medical partners including AIIMS, Ranguel University, Toulouse, France, Holy Family Hospital, Rawalpindi, Pakistan, and Oregon Health & Science University, Portland, USA.

5.3.5. Corporate Initiatives

Many entrepreneurs have ventured into the field of telemedicine, in recent times. Some noteworthy initiatives have been listed below:

5.3.5.1.1. Apollo Hospitals Group

Apollo Hospitals Group, one of the largest healthcare groups in India has dedicated not-for-profit divisions to telemedicine. The group offers services in second/special opinion through remote consultation, complex interpretations, education/Continuous Medical Education (CME), disaster management, disease management, virtual patient visits, healthcare knowledge base, tele-mentored procedure / surgery, leveraging on the telemedicine infrastructure.

Apollo's telemedicine division, known as the Apollo Telemedicine Networking Foundation (ATNF), is working with state government and rural villages, as well as large Indian conglomerates, to
implement telemedicine in India. It has established 166 centres and overall, 70,000 tele-
consultations have taken place approx till date. These consultations are also conducted for the Pan-
-African e-network, paid by Government of India to 20 African countries, covering 40 hospitals.
Apollo is currently in the process of developing mobile equipment in collaboration with different
manufacturers to increase the scope of mobile health (mHealth) and is also looking into mobile
medical units.

5.3.5.1.2. Narayana Hrudayalaya

Narayana Hrudayalaya initiated projects in telemedicine in 2002, with an aim to serve rural areas.
This initiative connects to a number of countries in Africa and the Indian sub-continent, including
Malaysia. Satellite connectivity is provided free-of-cost by the Indian Space Research Organisation
(ISRO) and high speed telephone or Integrated Services Digital Network connectivity is also used.
The ISRO network covers 332 hospital (299 rural / remote / district hospitals to 33 specialty
hospitals located in major cities) and hence, Narayana Hrudayalaya has been able to treat over
53,000 patients over the past 10 years. For this particular hospital chain, tele-consultation and ECG
are some of the most prominent services. Furthermore, the hospital is looking into mHealth as a
field.

5.3.5.1.3. Columbia Asia

Columbia Asia, an upcoming hospital chain in India, has also implemented some telemedicine
platforms. Internally, the hospital has created a platform which enables remote reporting from non-
Columbia Asia hospitals. This hospital is also developing a PAC (Picture Archiving system),
encouraging expertise exchange across the countries and research collaboration all through
telecommunications.

5.3.6. Limitations

Though the telemedicine has many advantages, the field has not been met with much success in
India. One of the main reasons for this is the lack of infrastructure in the country, especially in rural
areas where there is poor bandwidth at a very high cost. Also, implementing telemedicine is
cumbersome. Villages need trained technician and local doctors as well as sound co-ordination,
which is often not possible in highly illiterate parts of the country. Furthermore, it is difficult to
change the consumer behaviour; traditionally, Indian prefer human contact and therefore there is
little acceptance for using high end technology for a diagnosis.

It is supported by the fact that despite the massive increase in mobile phone penetration in the
country, the acceptance of mHealth solutions appears to be lagging. A major reason for this is that
most Indians, both education and uneducated, are unaware of how they can use their mobile
phone to better diagnose, treat or manage their health problems. Greater awareness requires a
concerted effort from providers, pharma companies, government and public health institutions81.

5.3.7. Future prospects and Opportunities for Swedish companies

With a current addressable market size of SEK 50 Million, the future for Telemedicine looks
promising with the market expected to grow at a CAGR of around 20 per cent over the next five

81 India’s Telemedicine Story – Promise or Pipe Dream? The Practice Brew
years taking the total market size to SEK 125 Million\textsuperscript{82}. However, another estimate suggests that the size of India’s telemedicine market is expected to be SEK 3.3 Billion by 2015\textsuperscript{83}. However, due to its nascent and evolving nature, estimates vary widely.

The advancement in technology and supporting infrastructure has provided an impetus to the government’s vision of quality health for all and at the same time controlling the increasing medical costs. Furthermore, telemedicine results in a decrease in the relocation of medical specialists to the patient, saving time and money. Also it ensures a cost effective method of health care delivery, a more efficient and effective use of medical and technological resources, enhanced diagnostic and therapeutic quality of care, as well as new possibilities for continuing education or training for isolated or rural health practitioners.

Narayana Hrudayalaya’s Dr. Singhvi expects to soon employ futuristic applications like health phones and robotic surgery. “Health phones are being developed and people can choose any health provider and get a pre-paid or post-paid service,” he says, adding that robotic surgery would be the next stop for Hrudayalaya in a decade or so.

A prototype mobile phone monitoring system developed by a team of engineers in Loughborough University of UK and Indian experts was unveiled in 2005. It transmits a patient’s vital signs such as blood pressure, blood glucose, oxygen saturation, and even electrocardiogram (ECG) heart signals to a hospital or clinic anywhere in the world. The team has tied up with London’s Kingston University, the Institute of Technology Delhi, Aligarh Muslim University, and the All India Institute of Medical Science to develop a more portable device.

Still, the promise of telemedicine is in its fundamentally basic enablers which are essentially cable connectivity and a screen. Telemedicine offers immense possibilities for technology providers and integrators along with medical institutions to take part in this developmental phase of telemedicine in India. Within telemedicine, two major areas seem to offer collaboration possibilities:

Essentially developments of infrastructure for telemedicine, starting from connectivity to easy to use devices and better software for integration of satellite telemedicine centres with nodal super specialty hospitals or diagnostic centres are major opportunities available in India. With their proven expertise in this field, Swedish companies can collaborate with various Indian players to commercially exploit these opportunities.

For critical requirements and special cases, medical institutions of both countries can collaborate to provide consultation to each other, as has been the case with Indian medical institutes joining hands with some global medical institutes.

\textsuperscript{83} PWC
5.4. Frugal engineering

5.4.1. Overview

Frugal Engineering can be defined as: new or significantly improved products (both goods and services), processes, or marketing and organizational methods that seek to minimize the use of material and financial resources in the complete value chain (development, manufacturing, distribution, consumption, consumption and disposal) with the objective of reducing the cost of ownership while fulfilling or even exceeding certain predefined criteria of acceptable quality standards.84

Frugal Innovations provides solutions that are aimed at consumers with relatively low purchasing power. It is a scientific approach that has compelled and inspired the companies around the world to re-evaluate and re-strategize their engineering processes and development new methodologies. India is fast becoming the global hub for products developed with frugal engineering.

Due to limited resource availability and the growing needs of the fast growing economy, India needs solutions which are affordable, reliable, resilient, easy to use and distribute. The country needs innovations which are capable of lowering the cost of the product/ delivery, are more suited in the short run and are as per the needs or demands of the consumer. Several companies like Tata Motors, Nokia, GE, Godrej, Tata Swach, etc have come up with the frugal products in India with the state-of-the-art technology.

5.4.2. Frugal Engineering in Indian Healthcare Industry

The Indian healthcare market was estimated at SEK 350 billion in 2011 and has witnessed double digit growth rates in the recent years. However, majority of this growth is coming from the Tier I towns such as Delhi, Mumbai, Hyderabad etc. wherein the patients are capable of paying for the costly treatments. In contrast, there is a large section of population that struggles to meet basic healthcare needs. Existing infrastructure of the country, especially in smaller towns/ rural areas, is inadequate to meet the ever-growing needs of the Indian population.

In order to address the challenge of low penetration and meet the healthcare needs of all income segments, the medical technology industry in India is focussing on innovation and bringing new low-cost products. The industry has been focussing on developing products which target customers that do not need the full performance. These innovations have the capability to impact a larger segment of the population which is price conscious and driven by affordability. Section below includes details regarding select healthcare products that have been specifically developed for the India market through frugal engineering.

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84 Global Innovation Website
5.4.3. Select Case Studies

5.4.3.1. General Electric (GE) - Portable Electrocardiogram (ECG) Machine

In order to cater to the requirements of poor consumers in India, GE launched MACR 400, a compact electrocardiograph in India. The product is completely designed and manufacturers in India and is based on the concept for frugal engineering. Following simplifications were included in the product:

- Usage of commercially available components instead of customized and proprietary parts in order to provide easy service (especially in remote areas)
- Deployment of four buttons instead of multiple buttons as on conventional ECGs to ensure easy operability with minimal training.
- Usage of printers similar to the ones used in portable ticket machines
- Compact size that can fit in small bags and run on batteries
- Low cost of only USD 800 which is 60% cheaper as compared to the conventional ECG; also the cost of each electrocardiogram reduced to SEK 7 per patient

5.4.3.1.1. USP of this product

The device has been conceptualized, designed and manufactured in India according to the requirements of the domestic market.

- Lower Price: With the Indian market in mind the MAC 400 is priced at one-third that of imported ECG systems of similar quality.
- Battery Operated: To deal with power outages in many parts of India, the MAC 400 is battery-operated.
- User friendliness: Easy to use and can be used by general physicians as well as cardiologists.
- Portable: Customers in the health care field wanted the machine to be portable so they could reach more patients; hence, it is lightweight

5.4.3.2. Perfint Healthcare – Efficient Robotic Tool

Perfint Healthcare Pvt. Ltd a medical device company based in Chennai has launched – PIGA CT, a high-tech medical positioning device that assists in clinical applications such as biopsies, FNAC, drug delivery, ablation, etc., of small tumours in the lungs, abdomen and pelvis. The device has been installed in over 50 Indian hospitals including All India Institute of Medical Sciences, New Delhi, Lilavati Hospital-Mumbai, Shri Ramachandra Medical Centre-Chennai, Amala Cancer Hospital and Research Centre-Thirssur, etc. Main attributes of this product are:

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85 Reuters Website; GEHealthcare Website; Indiatechonline Website
86 IBEF Website; Outlook India Website;
Leverages techniques of robotics and image processing to help clinicians accurately access small and difficult to reach tumours in the lungs, liver, pancreas and kidney, in order to detect early stage cancer.

- Reduces the number of check scans by 63%, lessens the number of times for needle adjustment by 55%
- Lowers the time required to do the CT scan procedure by 42%
- Enables doctors to conduct a biopsy/FNAC without repeating CT scans, thereby exposing patients to less radiation
- Helps the physician analyze the image data and mark the target and entry points on the images

5.4.3.2.1. **USP of this product**

- **Advanced Technology**: Uses robotic technologies to make soft-tissue biopsies simpler, safer and more accurate
- **Affordable**: The device is priced at SEK 23 000 (INR 1 500 000) almost half the cost of the other imported alternatives
- **Time Efficient**: Easy to use and the method takes about one third the time of that of the traditional methods

5.4.3.2.2. **Bigtec Labs Pvt. Ltd. – Battery Operated Micro PCR**

In order to provide rapid, low cost near care diagnostics to the clinicians in India, Bangalore-based Bigtec labs’ has launched handheld, battery operated real-time micro-PCR with disposable low temperature co-fired ceramics (LTCC) micro PCR chip.⁸⁷

5.4.3.2.3. **USP of this product**

- **Smaller Size**: Micro PCR is smaller in size than existing PCR.
- **Affordable**: The product is comparatively cheaper (almost five times) and costs around SEK 14000 (INR100000) as compared to a conventional PCR’s price tag of SEK 68000 (INR 1.5 million)
- **Efficient**: The new product is also faster than the conventional PCR systems and hence, reduces the analysis time from 45 minutes to 30 minutes.
- **Easy Usage**: It is also very easy to use and does not need any special skills for usage.

⁸⁷Free patents online Website; Economic Times Website
5.4.3.3. Medived Innovations – Affordable Pacemaker

Medived Innovations, Bangalore, India, started manufacturing cardiac Pacemakers in a technology tie-up with Uruguay’s CCC, with a focus on affordability and durability. In line with this, the company focused on refining the manufacturing process and reduce the cost of production. As a result, Medived’s cost of factory operation is one-sixth of that of a US operator.88

5.4.3.3.1. USP of this product

- **Programmable**: Device is externally programmable and allows the cardiologist to select the optimum pacing modes for individual patients
- **Lower cost**: Cost of the device is comparatively lower ranging between SEK 7 000 – SEK 14 000 (USD 1 000 – USD 2 000) in India as compared to the international markets where the price ranges between SEK 28 000 – SEK 56 000 (USD 4 000 – USD 8 000)

5.4.3.4. Johnson & Johnson, India – Simple Glucometer

Johnson & Johnson Medical runs an innovation centre in Mumbai, which has developed a simplified glucometer - *One Touch Select Simple*. The product has been specially designed to enable easier and faster tracking of blood sugar.89

5.4.3.4.1. USP of this product

- **User Friendliness**: Icon-driven interface without any need of coding, running setup and buttons. Further, the device provides instant results thereby enabling user to easily keep track of blood sugar
- **Self Monitoring**: It has high-low colour and audio alerts indicating different sugar levels in the blood
- **Affordable**: Affordable price for meter and strips in line with the user requirement of low cost products

5.4.4. Conclusion

In recent times, frugal engineering has emerged as an effective ways for medical equipment manufacturers to launch products in line with the cost conscious nature of the Indian healthcare market. A number of companies have conceptualized, designed and manufactured products according to the requirements of the domestic market. GE, Bigtec Labs Pvt. Ltd and Johnson & Johnson are some of the companies that have effectively used concepts of frugal engineering to modify their products as per the Indian market. With growing expenditure on healthcare infrastructure in India on both public and private fronts and enhance reach of healthcare

88 Economic Times Website
89 One touch Asia Website; Hindu Business Line Website
services, the trends of using concepts of frugal engineering to launch products for Indian consumer is likely to gain further momentum.
Visit across Select Cities in India
6. Opportunities Across Select Cities/ States

6.1. Selection of Cities/ States

Appended below is the methodology adopted for short listing the cities to be visited during phase II:

Figure 6-1: Framework for Selection of Cities

| The Next Urban Frontier: Twenty Cities to Watch* - Megacities, Boom Towns and Niche Cities | Mapping of Cities based on population, per capita income and annual healthcare expenditure per family | Shortlisted Cities |

*Based on research work carried out by National Council of Applied Economic Research (NCAER) and Future Capital Research

In the published research paper, upcoming cities were categorised into the following categories:

- **Megacities**: Included cities that are countries largest population centres with high income levels; these are also the major consumption centres and residents demand excellent quality of services including healthcare.
- **Boom Towns**: These include cities that have potential to become mega cities in the coming years. These are characterised with high population and considerable disposable incomes with growing demand for high-quality service.
- **Niche Cities**: Smaller cities in terms of population however with very high disposable income. Household expenditure in these cities is nearly the same as that found in megacities.

Following figure represents the various cities highlighted in the research paper.
Figure 6-2: Upcoming Cities in India

Post selection of cities, each city has been mapped on three parameters:

<table>
<thead>
<tr>
<th>S. No.</th>
<th>City</th>
<th>Population*</th>
<th>Approximate Number of Households**</th>
<th>Annual Household Income (INR)***</th>
<th>Expenditure on Healthcare per household (as % of total income) #</th>
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<td>5570585</td>
<td>1031590</td>
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<tr>
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<td>Bhopal</td>
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<td>228191</td>
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<tr>
<td>5</td>
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<td>196564</td>
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</tr>
<tr>
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<tr>
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<td>521408</td>
<td>387284</td>
<td>4%</td>
</tr>
<tr>
<td>16</td>
<td>Luchiana</td>
<td>1613878</td>
<td>298866</td>
<td>354530</td>
<td>5%</td>
</tr>
<tr>
<td>17</td>
<td>Mumbai</td>
<td>12478447</td>
<td>2310824</td>
<td>608208</td>
<td>3%</td>
</tr>
<tr>
<td>18</td>
<td>Nagpur</td>
<td>2405421</td>
<td>445448</td>
<td>426279</td>
<td>5%</td>
</tr>
<tr>
<td>19</td>
<td>Pune</td>
<td>3115431</td>
<td>576932</td>
<td>278594</td>
<td>5%</td>
</tr>
<tr>
<td>20</td>
<td>Surat</td>
<td>4462002</td>
<td>826297</td>
<td>595583</td>
<td>3%</td>
</tr>
</tbody>
</table>

*Population: Based on Census 2011;
**On the basis of average number of persons per household in India – 5.38 persons per household as published in Census 2001; corresponding date in census 2011 is yet to be published
Annual Household Income: Extrapolated data based on the income for 2007-08 and corresponding growth rates of the cities as highlighted in the research paper published by National Council of Applied Economic Research and Future Capital Research

#Primary Research; data available for 2007-08, same percentage have been assumed for 2010-11

On the basis of above mentioned data, total expenditure on healthcare per city has been calculated as Number of Households X Average Household Income X Expenditure on healthcare per household. Table below highlights the cities ranked as per total expenditure on healthcare:

<table>
<thead>
<tr>
<th>Rank</th>
<th>City</th>
<th>Total Annual Expenditure on Healthcare (INR Billion)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Delhi</td>
<td>67</td>
</tr>
<tr>
<td>2</td>
<td>Mumbai</td>
<td>42</td>
</tr>
<tr>
<td>3</td>
<td>Hyderabad</td>
<td>23</td>
</tr>
<tr>
<td>4</td>
<td>Bangalore</td>
<td>19</td>
</tr>
<tr>
<td>5</td>
<td>Jaipur</td>
<td>15</td>
</tr>
<tr>
<td>6</td>
<td>Surat</td>
<td>15</td>
</tr>
<tr>
<td>7</td>
<td>Ahmadabad</td>
<td>13</td>
</tr>
<tr>
<td>8</td>
<td>Kolkata</td>
<td>13</td>
</tr>
<tr>
<td>9</td>
<td>Chennai</td>
<td>12</td>
</tr>
<tr>
<td>10</td>
<td>Nagpur</td>
<td>9</td>
</tr>
<tr>
<td>11</td>
<td>Lucknow</td>
<td>8</td>
</tr>
<tr>
<td>12</td>
<td>Pune</td>
<td>8</td>
</tr>
<tr>
<td>13</td>
<td>Kanpur</td>
<td>6</td>
</tr>
<tr>
<td>14</td>
<td>Chandigarh</td>
<td>6</td>
</tr>
<tr>
<td>15</td>
<td>Coimbatore</td>
<td>5</td>
</tr>
<tr>
<td>16</td>
<td>Ludhiana</td>
<td>5</td>
</tr>
<tr>
<td>17</td>
<td>Jalandhar</td>
<td>5</td>
</tr>
<tr>
<td>18</td>
<td>Faridabad</td>
<td>3</td>
</tr>
<tr>
<td>19</td>
<td>Amritsar</td>
<td>3</td>
</tr>
<tr>
<td>20</td>
<td>Bhopal</td>
<td>2</td>
</tr>
</tbody>
</table>

In order to understand healthcare scenario across India, we suggest including cities from top, mid and low levels/ parts of the ranking table. This will help in understanding immediate opportunities as well as opportunities available in medium term and long term. Hence, a possible short list of cities can be:

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Level</th>
<th>City</th>
<th>Total Annual Expenditure on Healthcare (INR Billion)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Top-Level</td>
<td>Delhi</td>
<td>67</td>
</tr>
<tr>
<td>2</td>
<td>Top-Level</td>
<td>Mumbai</td>
<td>42</td>
</tr>
<tr>
<td>3</td>
<td>Top-Level</td>
<td>Hyderabad</td>
<td>23</td>
</tr>
<tr>
<td>4</td>
<td>Top-level</td>
<td>Bangalore</td>
<td>19</td>
</tr>
<tr>
<td>5</td>
<td>Mid-level</td>
<td>Nagpur</td>
<td>9</td>
</tr>
<tr>
<td>6</td>
<td>Mid-Level</td>
<td>Chandigarh</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td>Low-Level</td>
<td>Bhopal</td>
<td>2</td>
</tr>
</tbody>
</table>
### 6.1.1. Key Facts - Selected Cities

<table>
<thead>
<tr>
<th>Recommended City</th>
<th>Factors</th>
</tr>
</thead>
</table>
| **Delhi**        | • With a population of 16.7 million, it is one of the most populous cities in India  
• Delhi along with other cities in the National Capital Region (NCR)\(^9\) is a healthcare service hub for North India, and have a comprehensive set up of both public and private hospitals  
  o India’s first largest public medical college cum hospital called AIIMS (All India Institute of Medical Sciences), was first established in Delhi  
  o All major private national hospital chains are available in Delhi such as Max Hospital, Fortis Hospital, Apollo Hospital and others  
  o One of the largest medicities in India – Medanta Medicity is based in Gurgaon (neighbouring city of Delhi. The Medicity is spread over an area of 93 acres and is being established with an approximate investment of INR 12 billion (SEK 2 billion)  
  o Another Medicity – Fortis Medicity is also being established with an investment of INR 12 billion (SEK 2 billion) in Gurgaon  
• Delhi also houses Ministerial activities, policy makers and legal regulatory bodies  
  o Ministry of Health and Family Welfare  
  o DGHS, Directorate General of Health Services  
  o CDSCO, Central Drugs Standard Control Organisation  
  o Medical Council of India |
| **Mumbai**       | • Mumbai is India’s commercial capital, and the capital city of Indian state Maharashtra.  
• It has the highest GDP in India, and is one of most populous cities in India  
• The city contributes 25 per cent of industrial output and 70 per cent of capital transactions to India’s economy  
• It has one of the best Public healthcare systems in the country. It is home to a good primary, secondary and tertiary (specialty) healthcare system, with some of the country’s prominent hospitals located here.  
  • These include the Lilawati Hospital, King Edward Memorial Hospital, Breach Candy Hospital, etc.  
• It is also home to India’s most renowned cancer treatment hospital – Tata Memorial Hospital |
| **Hyderabad**    | • The city has 6.8 million population with many private hospitals  
• Global hospitals have made USD 9.75 million investment in Hyderabad including Singapore-based Parkway Group Healthcare PTE Ltd  
• Foreign players like Pacific Healthcare Holding have established their first hospital in Hyderabad  
• Hyderabad also houses some of world class healthcare campuses set-up by International Hospital Corporation  
• The city also houses one of the first medicities in India – Apollo Health City |
| **Bangalore**    | • Bangalore is the capital of the state of Karnataka and is the 3\(^{rd}\) most populous city in India with a total population of 8.4 million.  
• Considered the fourth largest GDP contributor in the country after Mumbai,  
\(^9\) The National Capital Region comprises an area of 33,578 square kilometers, covering select districts across the states of Haryana, Rajasthan, Uttar Pradesh and the National Capital Territory of Delhi. These include Gurgaon, Rewari, Faridabad, Sonepat, Rohtak, Panipat and Jhajjar, Ghaziabad, Bulandshahr, Meerut and Baghpat, Alwar district |
<table>
<thead>
<tr>
<th>Recommended City</th>
<th>Factors</th>
</tr>
</thead>
</table>
| New Delhi and Kolkata | - Bangalore is one of India’s healthcare hubs in Southern part of India with presence of major hospitals such as Narayana Hrudayalaya, Apollo Hospital, Fortis Hospital and Manipal Hospital  
- Under establishment, the health city in Bangalore is expected to have 5000 beds and will be spread over an area of 35 acres  
  - It will also have hospitals for specialities like orthopaedic, cancer, neurosurgery, ophthalmology, women and children.  
  - It will also focus on promoting telemedicine |
| Nagpur | - With a population of 4.7 million, it is one of the most populous cities in India.  
- Strategically ‘Central’ to upcoming towns like Chandrapur in South; Wardha & Amravati in West; Gadchiroli in east  
- One of the largest commercial and industrial centres in India with presence of major industrial estates like Butibori and Hingna industrial estate  
- The city is one of the largest healthcare hubs in central part of India  
- World-renowned Johns Hopkins Hospitals from USA would be setting up a health city in collaboration with Care Hospitals (Hyderabad), in the Special Economic Zone (SEZ) of MIHAN (Multi Modal International Passenger and Cargo Hub Airport) in Nagpur.  
  - About 75 acres of land has been earmarked for the state-of-the-art project that is expected to draw patients from far off places including USA, Europe and other countries to Nagpur  
  - The health city is envisaged to have the supervision and technical control of Johns Hopkins and would include 10 super speciality hospitals |
| Chandigarh | - Union Territory, and capital of the states of Punjab and Haryana, Chandigarh is one of the best planned cities in India  
- It is regarded as one of the richest cities in terms of per capita income, and is also reported to be one of the cleanest  
- The Union Health Ministry is also setting up India's first National Institute of Health care Engineering and Architecture in Chandigarh  
- The Postgraduate Institute of Medical Education & Research, Chandigarh is one of the three institutes appointed for mentoring of upcoming branches of AIIMS across India |
| Bhopal | - According to recent estimates, Bhopal has a population of around 1.8 million  
- The city is one of the major healthcare hubs in central part of India with a number of central and State owned hospitals, and diagnostic centres  
- Bhopal also has recognised academic institutions and medical colleges to support existing and future medical industry such as Gandhi Medical College, People’s Medical College etc  
  - AIIMS also has chosen Bhopal to establish its branch hospital |
6.2. Bhopal

6.2.1. Madhya Pradesh

Madhya Pradesh (MP) is the one of the largest states in India. Located in the central part in India, the state has rich mineral resources including largest reserves of diamond and copper in the country. In addition, large reserves of coal, coal-bed methane, manganese etc are also present in the state. Around 31 Percent of the state is under forest cover adding to its significant resource wealth.

MP is largely a rural state with almost three fourth of population still rural based. However, it is rapidly emerging as an industrial hub. It has about 1800 companies, 19 industrial growth centres and 171 000 Small scale industries (SSI).

The Gross State Domestic Product (GSDP) of MP has witnessed a compounded growth of around 13.75% to reach SEK 238 billion (INR 1 704 billion) in 2009 – 10 from SEK 162 billion (INR 1 157 billion). Per capita income of MP is still a modest SEK 2 217 (INR 15 840), compared to All India average of SEK 3 313 (INR 27 950)\(^1\).

### 6.2.1.1. Bhopal

Bhopal is the political and administrative capital of Madhya Pradesh. It is one of the largest cities in MP and is rapidly emerging as a major economic and industrial centre in the central part of India. According to 2011 Census, Bhopal has a population of around 1.8 million and is also home to major institutions/organizations including ISRO's Master Control Facility, the CSIR Advanced Materials and Processes Research Institute (AMPRI), Indian Institute of Science Education and Research (IISER Bhopal), School of Planning and Architecture, and Indian Institute of Forest Management.

The city is a big railway junction and is very well connected through services from various airlines. It was also the site of Bhopal Disaster in 1984, when a mixture of fatal gases leaked from the pesticide manufacturing plant of Union Carbide India Limited (UCIL). This resulted in one of the largest industrial tragedies, killing thousands of people.

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\(^1\) Annual Plan (2011 – 12), Planning, Economics and Statistics department, Govt. of MP
6.2.2. Healthcare Status and Service Delivery in the State

In line with central government of India, the state government of Madhya Pradesh has been allocating 2%-3% of its annual budget to improve the healthcare system in the state. Year wise allocation of healthcare sector in Madhya Pradesh is depicted in the chart below:

Figure 6-3: Healthcare Budget in Madhya Pradesh

6.2.2.1. Health Infrastructure

Health infrastructure in Madhya Pradesh is distributed among district hospitals, civil hospitals, and health centres (civic, primary and secondary). These are supported by urban family welfare centres and civil dispensaries. As of April 2009, MP has approximately 13400 beds spread across various types of facilities. The figure below depicts the number of various healthcare institutions in the state:
The state has also achieved some progress in terms of e-health with ongoing implementation of state wise hospital information management system especially for tracking of medicine supply.

6.2.2.2. Major Disease in the State/ City

Following figure depicts the state’s performance on major healthcare parameters viz-a-viz the average figures for India. Although the state’s performance on vital health parameters has been improving over a couple of years, the government is still concerned about the above average maternal mortality rates (MMR) and infant mortality rates. Also, malnourishment in infant and kids is also a major concern area for the state government.

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92 MP Government Website
As per discussions with the State Secretary for Health and other relevant stakeholders, the state government in Madhya Pradesh is concerned about the above average MMR and IMR rates in the state. Only 33% of births during 2005-09 were assisted by doctors/ nurse/trained medical professionals, while the percentage of institutional deliveries was reported as 26% during the same period. The corresponding figures for India were 47% and 39% respectively, during the same period.93 Also, malnutrition among infants and kids has also emerged as a major problem.

According to the Ministry of Health and Family Welfare, approximately 20 million people in MP are addicted to one of the form of tobacco consumptions, thereby resulting in highest number of oral cancer incidences in India.

Over 27000 patients were reported to be suffering from cancer last year in MP and the number of cancer patients in MP is likely to touch 6.6 million by 2022 due to high consumption of tobacco and related products.94 As a result, lung, tongue and mouth cancers are the most prevalent form of cancer for males in MP. In females, breast cancer is the most common form with almost 3000 women deaths reported due to this form in 201195. One of the primary reasons for significant number of deaths is absence of diagnostics facilities in the state especially across small towns and villages.

Following figure includes the number of cases registered under various diseases in the state:

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93 CBHIDGHS Website
94 Pioneer Website
95 Times of India CBHIDGHS Website; CBHIDGHS Website
During recent times, the cases for vector borne disease in Madhya Pradesh are on the rise and the around 70 deaths from Malaria in 2011 in the state, which is almost twice of that of the cases in 2010. As a result, the government is laying considerable emphasis on control of Malaria and has launched National Vector Borne Disease Control Programme across all districts. Along with the World Bank, it is also running a project which focuses on usage of ACT in confirmed Falciparum malaria cases. The project was started in 2009 across 9 districts in the state; the project will end in 2013.

The percentage of positive TB cases against a total number of suspects examined in MP was around 15% during January to September 2010, which is 2% higher than that of the national average of 13% during the same period. Further, around 107 deaths were reported out of around 305438 cases registered for acute diarrhoeal disease in 2010 across the state.

According to survey conducted by Help age India in 2009 in the city of Bhopal, 30% of elderly people surveyed are found to be suffering from one or more chronic diseases such as diabetes, hypertension and arthritis. Across 75% of the cases, the medical expenses of the elderly are taken care of by the children. Further, around 83% of the elderly people were found to be staying with their families including son. There are also plans to establish clinics for elderly people under NRHM framework in the state.

6.2.2.3. Progress of NRHM Projects

Madhya Pradesh has been nominated as one of the high focus non-North Eastern states under NRHM. In line with the objectives of National Population Policy and Millennium Development
Goals, the Government of Madhya Pradesh has achieved significant progress in the field of maternal mortality (Janani Suraksha Yojana), community mobilization by Accredited Social Health Activist (ASHA), referral transport, institutional deliveries and OPDs cases.

Following figure shows year-wise allocation and utilization of funds under NRHM in MP:

![Figure 6-7: Madhya Pradesh - Fund Allocation Under NRHM](source: STC Analysis, MP Public Health and Family Welfare Department)

With the funding and guidance available under NRHM program, the state government of MP has significantly improved the healthcare delivery system in the state. Key achievements under NRHM are as follows:

<table>
<thead>
<tr>
<th>Focus Area under NRHM</th>
<th>Achievement&lt;sup&gt;100&lt;/sup&gt;</th>
</tr>
</thead>
</table>
| Human Resources        | • Enforcement of compulsory rural posting of specialists  
                          • Training of 7 doctors for emergency anaesthesia and 40 for emergency obstetric care  
                          • Recruitment of 161 medical officers on contract and 55 specialists  
                          • Selection and training of 48783 and 26830 ASHA workers respectively  
                          • Formation of 1244 Rogi Kalyan Samitis (RKS) and 24520 Village Health and Sanitation Committees |
| Infrastructure Development | • Addition of 772 sub centres, 99 PHCs and 49 CHC’s in the state budget under NRHM  
                              • Establishment of over 90 mobile medical units under NRHM as well as 100 emergency transport system and ambulances  
                              • Addition of over 2000 hospital beds during 2005-09, up to CHC level |

<sup>99</sup> MP Government Website  
<sup>100</sup> MoHFW Website
Main achievements under various programs under NRHM in the state are as follows:

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Program</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Maternal Care</td>
<td>• The government has launched/ implemented a number of schemes under Reproductive and Child Health Program including</td>
</tr>
<tr>
<td></td>
<td></td>
<td>o Janani Suraksha Yojana</td>
</tr>
<tr>
<td></td>
<td></td>
<td>o Janani Express Yojana</td>
</tr>
<tr>
<td></td>
<td></td>
<td>o Janani Sehyogi Yojana</td>
</tr>
<tr>
<td></td>
<td></td>
<td>o Dhanwantri Yojana</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Around 11.38 beneficiaries availed benefits under Janani Suraksha Yojana in 2008-09.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Under Janani Express Yojana, provision of free referral transport facility through PPP to pregnant mother for institutional delivery</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Over 200 private hospitals have been accredited in 34 districts in the state for provision of safe motherhood services for BPL families</td>
</tr>
<tr>
<td>2</td>
<td>Revised National Tuberculosis Control Programme (RNTCP)</td>
<td>• Revised National Tuberculosis Control Programme was started in 1995 as Pilot Project across select hospitals.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• The scope for the first phase was gradually expanded to cover five districts - Bhopal, Vidisha, Rajgarh, Sehore and Raisen in 2001</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• In 2004, entire state covered under RNTCP with a district TB centre established in each district</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• In 2010, (January to December 2010) 30,804 New Sputum Positive Patients Registered for Treatment out of which 27,114 patients</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cured and remaining patients are under treatment.</td>
</tr>
<tr>
<td>3</td>
<td>National Vector Borne Disease Control Programme (NVBDCP)101</td>
<td>• The program covers various vector borne diseases including Malaria, Filaria, Dengue, Chikungunya, Kala Azar and Japanese Encephalitis</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• NVBDCP is under execution in 50 districts of the state through 40 District Malaria Units</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Fever Treatment Depot (FTDs), Drug Distribution Centres (DDCs) and malaria clinics have been set up for early detection and treatment of malaria cases across the state</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• The program has resulted in:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>o Increase in Annual Blood Examination Rate (ABER) from 12.73 in 1996 to 13.35 in 2009</td>
</tr>
<tr>
<td></td>
<td></td>
<td>o Decline in Annual Parasite Incidence (API) from 4.43 (in 1996) to 1.17 (in 2010)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>o Decline in Slide Positivity Rate (SPR) and Slide Falciparum Rate (SFR) from 3.48 and 0.89 in 1996 to 0.93 and 0.33 respectively in 2010</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Along with the World Bank, a project which focuses on usage of ACT in confirmed Falciparum malaria cases was started in 2009</td>
</tr>
<tr>
<td></td>
<td></td>
<td>across 9 districts in the state; the project will end in 2013</td>
</tr>
</tbody>
</table>

101 MP Government Website
### 6.2.2.4. Major State-Level Health Programs

Main reasons for high MMR rates in the state include high proportion of home deliveries by unskilled birth attendant especially in the rural areas of the state, low acceptance of ANC services and lack of timely identification of complications during the pregnancy. In order to improve healthcare delivery model in the state as well as the state’s performance on health parameters (infant mortality rate and maternal mortality rate), the state government has launched a number of programs. Some of these are as follows:\(^{102}\):

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Program</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>National Polio Surveillance Project</td>
<td>• MP has witnessed a constant decline in number of polio cases with no cases being reported since 2008. &lt;br&gt; • Under the immunization campaign, there are 15 Surveillance Medical Officers in the state which are responsible for providing training to government counterparts, helping in planning for Supplementary Immunization Activities (SIAs) and maintaining AFP surveillance at highest</td>
</tr>
<tr>
<td>5</td>
<td>Swastha Gram Swastha Panchayat Programme</td>
<td>Involves deployment of private sector specialist to provide medical care and health services across various villages</td>
</tr>
</tbody>
</table>

The state government launched *Vijaya Raje Janani Kalyan Bima Yojana* which included various benefits such as free of cost normal delivery for below poverty line (BPL) woman in accredited

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\(^{102}\) [MP Government Website](#)
private hospital, discounts on caesarean delivery and compensation in case of death during delivery. Also provision has been made to safely bring the pregnant women to nearby hospitals, with round the clock transport facility under Janani Express Yojana.

In order to reduce IMR rates in the state and improve immunization coverage, the state has launched *Alternative Vaccine Delivery Transportation System* in order to ensure that vaccines are available at the outreach sites on specified day and time. Further, in order to reduce high dropout rates owing to various systemic and cultural factors, the state government has adopted a defaulter tracking system. Also, the government has launched *Bal Shakti Yojana* for medical treatment and nutritional rehabilitation of severely malnourished children.

Beside, the government has taken a number of other steps such as the launch of state-wide management information system to track progress (physical and financial) of NRHM and a new drug policy to ensure timely availability of quality medicines and supplies in health institutions.

### 6.2.2.5. New Drug Policy 2009

In order to streamline the procurement process, the state government has launched a *New Drug Policy* in 2009. Under this policy, rates for essential equipment, instruments and drugs are fixed and decided by an authorized agency. Purchasing officers at district levels are allowed to purchase equipment and instrument below SEK 70000 (INR 500 000) themselves; above this amount, prior permission are mandatory from relevant authorities.

Further, a technical committee has been set up to decide the specifications of the drugs/goods/equipments to be procured. The committee is also allowed to visit manufacturers’ production facility if required. Other committees are also set up to evaluate bid and finalize prices of equipment, drugs and instruments.

### 6.2.3. Concrete Projects from Sweden’s point of view

#### 6.2.3.1. Existing Hospitals

Bhopal is one of the major healthcare hubs in central part of India with a number of central and State owned hospitals, and diagnostic centres. It also has recognised academic institutions and medical colleges to support existing and future medical industry such as Gandhi Medical College, People’s Medical College etc.

<table>
<thead>
<tr>
<th>Hospital</th>
<th>Private/Public</th>
<th>No. of beds</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hamidia Hospital</td>
<td>Public</td>
<td>1000</td>
<td>• Attached with the Gandhi Medical College, Bhopal and is one of the largest hospitals in Bhopal</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• A new Sick Newborn Care Unit is being established in the hospital through financial assistance from United Nations Children's Fund (UNICEF)</td>
</tr>
<tr>
<td>Bhopal Memorial Hospital</td>
<td>Semi-govern</td>
<td>350</td>
<td>• It’s a super specialty hospital established mainly to treat victims of Bhopal gas tragedy and is funded by the Government of India</td>
</tr>
</tbody>
</table>

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103 MP Government Website  
104 TimesofIndia Website
<table>
<thead>
<tr>
<th>Hospital</th>
<th>Private/Public</th>
<th>No. of beds</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research Centre</td>
<td>Private</td>
<td>1128 (650 operational)</td>
<td>- Follows a two bid tender-based procurement process</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Various department send their requests to the purchase department, which in turns call for tenders</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Also has a nursing college and a paramedical institute</td>
</tr>
<tr>
<td>People’s Hospital</td>
<td>Private</td>
<td>1128 (650 operational)</td>
<td>- Attached with People’s College of Medical Sciences and Research Centre;</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- It receives around 1000 OPD patients per day and has an average bed occupancy of over 80%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Medical College and Hospital has 350 faculty staff in all the specialties and 900 non-teaching staff.</td>
</tr>
<tr>
<td>Ayushman Hospital</td>
<td>Private</td>
<td>100</td>
<td>- ISO 9001 certified super specialty hospital</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Plans to start the first tele-medicine centre, first of its kind in the central part of India</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Runs Post Graduate Diploma in Hospital Management in association with Sarojini Naidu Government Girls Post Graduate College, Bhopal.</td>
</tr>
</tbody>
</table>

### 6.2.3.2. Upcoming Hospitals and Up-gradation Projects for Hospitals

Attributed to the growing population and rising disposable income, the city of Bhopal has been witnessing considerable rise in the number of hospitals recently. In addition, it is also one of the six cities shortlisted by the Government of India to establish a branch of AIIMS.

<table>
<thead>
<tr>
<th>Hospital</th>
<th>Private/Public</th>
<th>No. of beds planned</th>
<th>Other details</th>
</tr>
</thead>
<tbody>
<tr>
<td>People International Hospital</td>
<td>Private</td>
<td>400</td>
<td>- The project has an approximate budget of SEK 280 million and is being funded by the People’s Group,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Kinder Group is the project consultant and the construction started in April 2009.</td>
</tr>
<tr>
<td>AIIMS Bhopal</td>
<td>Public</td>
<td>930</td>
<td>- One of the six branches of AIIMS Delhi, the hospital is being established to provide affordable tertiary health over an area of 154 acres</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- The hospital is likely to have 930 beds distributed among 30 departments</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Approximate investment planned for the projects is SEK 1180 million (INR 8400 million)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Different contractors are selected through open tenders for construction and other activities, which are:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>o Nagarjuna Construction: for Medical College and Hospitals</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>o JMC Constructions: Hospital</td>
</tr>
</tbody>
</table>

---

106ExpressHealthcare Website
Medical equipment and devices will also be procured through tendering process under the guidance of Hindustan Lifecare Limited, a Government of India enterprise.

Attached medical college is also expected to be operational by 2012 with 100 seats.

6.2.3.3. Medical Colleges

A number of medical colleges are present in Bhopal. Gandhi Medical College is one of the six government-owned medical colleges based in Madhya Pradesh and was established in 1955. It has 140 seats for under graduation degree courses and 68 seats for post graduation courses; all these seats are recognized by Barkatullah University, Bhopal as well as Medical Council of India & State Paramedical Council M.P.

There are 23 departments in the college including cardiology, paediatric, neurosurgery etc. The college also offers and nursing courses; it has recently launched post doctoral course in paediatric surgery and it further plans to offer cardio thoracic surgery, plastic surgery and cardiology under the same umbrella.

There are also a number of private medical colleges including Peoples’ College of Medical Sciences and Research Centre established under Peoples’ University, Lakshmi Narayan College of Medicine and Ram Krishna Dharmarth Foundation College of Medicine.

6.2.3.3.1. Madhya Pradesh Medical Sciences University Bill, 2011

In 2011, the Government of Madhya Pradesh has passed a bill - Madhya Pradesh Medical Sciences University Bill, 2011 - to open state’s first medical university in Jabalpur. The new university will enhance co-operation among colleges and strengthen their functioning. It will cover all colleges run by the state government (6 medical colleges, 1 dental and 1 Nursing college) as well as those run by the private sector (5 medical colleges, 11 dental, 149 nursing and 158 Para medical colleges) in Madhya Pradesh.

6.2.3.3.2. Openness of exchange programs

As per the discussion with the Directorate of Medical Education (DME), Madhya Pradesh as well as other relevant stakeholder, possibilities regarding faculty exchange program between State’s universities and Swedish institutes can be explored. Select faculties from the Gandhi Medical College have visited Sweden under exchange program in the past. However, absence of hands on training with patients due to confidentiality reasons seemed to major hindrance in making these programs a huge success. In terms of student exchange program, various issues such as duration of stay as well as hand on training need to be addressed at college level and then, the proposal can be forwarded to DME for further discussions.

Also, possibilities can be explored in terms of exchange program for internships at rural training centres. There are three rural health centres established in Sanchi, Berasia and Obedualganj.

106 IBNLIVE Website
under the guidance of community medicine centres; the government plans to further develop these centres in order to benefit rural patients.

6.2.4. Opportunities for Swedish Companies

Key opportunities identified in Bhopal/ Madhya Pradesh are as follows;

6.2.4.1. Disease Treatment and Care Area

1. **Maternal and Child Care**: There is an immediate need for enhance availability of qualified professional for child delivery and post delivery care in order to improve state’s performance on related health indicators. Among the priority areas for the state government, there is considerable funding available under NRHM and state level programs for this area.

2. **School Health**: Need to improve framework for ensuring medical checkups across school children especially checkups for anaemic girls in the state. There is a need for portable and cost-effective diagnostics/testing kits that can be provided to health workers for medical checkups

3. **Procurement Process of Equipment and Supplies**: The state is looking forward to develop a well defined procurement process and establish a procurement cell. Department for International Development (DFID) is consulting the state government in the areas of procurement and logistics of medical equipment and medicines. The state government also plans to have a pharmacist and data operator across each district to manage an online system.

4. **Cancer Diagnostics and Treatment**: Limited presence of capabilities in terms of cancer diagnostics and treatment in the state; as a result, deaths due to cancer in the state are significantly high e.g. over 3000 females deaths due to breast cancer in 2011. Hence, demand of advance equipment for diagnostic and treatment in the state is high.

5. **Equipment Procurement for New Projects**: With new hospital such as People’s International Hospital and AIIMS being set up in Bhopal as well as new super specialty centres coming up at Gandhi medical College, there is likely to be considerable demand for advanced medical equipment in the city.

6. **Care for Migrated Population and HIV patients**: The state government is looking forward to find out ways to provide healthcare services to the migrated population and HIV affected children with the help of NGOs.

6.2.4.2. Education and Training

1. **Virtual Classes**: The Medical Council of India has a high focus on up gradation of medical education technology including the classroom teaching. Virtual classes are already being conducted at the Gandhi Medical College in association with the AIIMS Delhi. Hence, there is an opportunity for Swedish institutes to undertake virtual classes in the state/ city, along with the ongoing classroom teaching; however, the curriculum of the virtual class as well as the training course needs to be approved by the MCI.

2. **Exchange Program**: Possibilities of faculty level exchange program and for internships at rural training centres can be explored. Select faculties from the Gandhi Medical College have also visited Sweden under exchange program.
3. **Hospital Management Courses**: With a number of new hospitals coming up in the city as well as new super specialty centres across existing hospitals, the requirement for qualified people is likely to rise in the city. This will, in turn, result in higher demand of hospital management courses in the city and other training courses.

6.2.4.3. **Other Opportunities**

1. **R&D Infrastructure**: Swedish institutes can also collaborate to improve research and development infrastructure especially investigative research in the state. A new research lab can be set up in the state/city in collaboration with the Indian Council of Medical Research or Department of Biotechnology, Government of India.
6.3. Chandigarh

6.3.1. Union Territory of Chandigarh

Chandigarh was constituted as a Union Territory of India on 1st November 1966. It is also the administrative capital of the states of Punjab and Haryana, however, it is not under the jurisdiction of either state. Chandigarh is ruled directly by the Central Government, through the Administrator of Chandigarh, who is appointed under the provisions of Article 239 of the Constitution.

Chandigarh is home to about 1.1 million people. The Gross State Domestic Product (GSDP) of Chandigarh has witnessed a compounded growth of around 11% to reach SEK 14.0 billion (INR 99.7 billion) in 2008–09 from SEK 5.3 billion (INR 37.9 billion). The city has one of the highest per capita incomes in the country at SEK 17000 and is also one of the well planned as well as cleanest cities in India.\(^\text{107}\)

6.3.2. Healthcare Status and Service Delivery in the State

Being a major regional centre in northern part of India, Chandigarh is a well-known hub of political and bureaucratic activities of the 3 neighbouring states of Punjab, Haryana and Himachal Pradesh. As a result, the Chandigarh Administration and Municipal Corporation focuses on providing high quality services including healthcare. The principal responsibility for public health funding lies with the state governments, which provide about 80% of public funding. The federal government contributes another 15%, mostly through national health program.

6.3.2.1. Health Infrastructure

The city state has developed a unique health care system conforming to a four-tier model. It has 18 villages on its periphery. There are five rural polyclinics in the villages Ottawa, Maloya, Sarahgpur, Ram Darbar and Mauli Jagran, which have been established in close collaboration with a NGO. While the accommodation, electricity and water supply is being provided by the government, the entire bio-medical equipment, the daily operating cost and management is being met by the NGO.

Each rural polyclinic covers 3 – 4 villages / colonies, up to a distance of 1-2 km from it. Free consultation, medicines, X-ray, lab tests, ECG and dental services are provided at each polyclinic.

\(^\text{107}\) Economic times Website
In this way the city administration ensures 100 per cent primary health care with basic investigation services in the entire rural periphery of the Union Territory.

The 2nd tier specialist services are available at the two well equipped mini hospitals located in Sectors 22 and 45, while 3rd & 4th tier multi-specialty and super-speciality services are provided at the Government Multi-Speciality Hospital in Sector 16 and the Government Medical College & Hospital located in Sector 32, respectively. As on date, Chandigarh has approximately around 3500 beds spread across various types of facilities.

The health facility infrastructure in Chandigarh is depicted in the figure below:

Chandigarh also has health infrastructure available in satellite towns, namely Mohali, Kharar and Panchkula. Mohali has an ESI hospital and civil dispensaries; private hospitals such as Fortis and Max Healthcare have also established their hospitals in this town. While, Kharar and Panchkula, both have civil hospitals, private dispensaries and private nursing homes.

Chandigarh has successfully achieved all national health goals under the national policy. Telemedicine project has been undertaken so as to integrate the IT services with the medical services. The healthcare administrative framework of Chandigarh is chaired by the Home Secretary cum Secretary of the UT. He is supported by the Director Health & Family Welfare and Director, National Rural Health Mission. Following figure depicts the healthcare administrative framework of Chandigarh:
6.3.2.2. Major Disease in the State/ City

Attributed to well established healthcare network in the city as well as high literacy rate, the UT of Chandigarh has performed significantly well on major health parameters. Following figure depicts the UT’s performance on IMR, MMR and birth rate parameter:

![Figure 6-11: Chandigarh - Performance on Select Healthcare Parameters (2009-10)](image)

Source: STC Analysis, NRHM Department, Chandigarh

Alcohol abuses are reaching at an alarming level in Chandigarh because of easy and cheap availability of alcohol from neighbouring Haryana. According to a survey conducted by The Associated Chambers of Commerce and Industry of India (ASSOCHAM), the city accounts for almost 6% of the total liquor consumed across India. Further, it indicated that approximately 5.3 million liquor bottles were consumed in Chandigarh during May 2011 to September 2011. Attributed
to high income levels in the city, the problem of drug abuse is going acute in the city. This is indicated by a fivefold rise in the amount of drugs seized by the police; around 190 injections and 3864 capsules, 66.375 kg of cannabis, 68.027 gram of smack and 5.990 kg of opium was seized by police in 2011\textsuperscript{108}.

In recent times, lifestyle diseases such as obesity and diabetes have emerged as major health concern in Chandigarh. According to the Department of Community Medicine at Postgraduate Institute of Medical Education & Research, Chandigarh (PGIMER), over 6 per cent of the residents in the 35-54 age group and more than 10 per cent of the residents above 55 years are suffering from diabetes. Further, around 45\% of citizens above 30 in the UT are suffering from hypertension while, 34 per cent of men aged between 35 and 54 and 53 per cent females in the same age group are obese.

As a result, number of people suffering from cardiovascular diseases and heart ailments is on the rise. For example, Department of Cardiology at the PGMER receives nearly 2,000 cases of heart attacks in a year and out of these, around 20 per cent are of people in the age group of 20-30\textsuperscript{109}. The situation is likely to further worsen with a number of Delhi-based companies opening sub-offices in Chandigarh, due to higher cost of operation in the national capital region.

Following figure includes the number of cases registered under various diseases in the state:

<table>
<thead>
<tr>
<th>Figure 6-12: Chandigarh– Cases registered under various diseases (2010)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
</tr>
<tr>
<td>1600</td>
</tr>
<tr>
<td>1200</td>
</tr>
<tr>
<td>800</td>
</tr>
<tr>
<td>400</td>
</tr>
<tr>
<td>0</td>
</tr>
<tr>
<td>Malaria</td>
</tr>
<tr>
<td>347</td>
</tr>
<tr>
<td>1799</td>
</tr>
<tr>
<td>TuberClousis (Jan-Sep)</td>
</tr>
</tbody>
</table>

*Provisional Figure  
Source: Central Bureau of Health Intelligence

The situation regarding malaria in the UT of Chandigarh is stable with only 347 cases (no deaths) reported during January-September 2010. The percentage of positive TB cases against a total number of suspects examined in Chandigarh was around 15\% during January to September 2010, which is 2\% higher than that of the national average of 13\% during the same period\textsuperscript{110}. Around 1800 people were diagnosed with positive smear in the city.\textsuperscript{111}
Chandigarh has a large number of senior citizens which makes elderly care an important segment. There are no Geriatrics Units at the secondary level hospitals to tackle the problems of the aged person. With senior citizens (above 65 years) accounting for almost 4% of the population, the demand of specific treatment centres for elderly people is expected to rise in near future.\textsuperscript{112}

6.3.2.3. Progress of NRHM Projects

NRHM in UT Chandigarh has succeeded in implementing the activities like infrastructure development, provision of human resources, decentralizing decision making and participation of people in managing health services locally.

Some of the initiates taken up by NRHM Chandigarh in 2010 – 2011 were the Swasthya Manch (Intersectoral-Convergence), Project Uddhar (Slum Intervention) & Project Foundation ((Adoption of Villages), Cancer control programme, Mental Health Programme, National Tobacco Control Programme, National Programme for Non Communicable Diseases.

Apart from these programmes, NRHM has also initiated other activities in Chandigarh such as opening of Geriatric Care Services for inmates of Old Age Home, providing terminal cancer care services to the patients admitted I HOSPICE, providing financial aid to children with congenital heart diseases.

![Figure 6-13: Chandigarh: Fund Allocation Under NRHM (2008-09)\textsuperscript{113}](source: NRHM Chandigarh)

Key achievements under select national health programs in Chandigarh are depicted in the following table:

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Program</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Revised National Tuberculosis</td>
<td>Chandigarh has been rated as one of the top five performing states</td>
</tr>
<tr>
<td></td>
<td>Control Programme</td>
<td>so far as the achievements of targets is concerned under RNTCP</td>
</tr>
<tr>
<td></td>
<td></td>
<td>In 2010, (January to December 2010), 91000 New Sputum Positive</td>
</tr>
</tbody>
</table>

\textsuperscript{112} MED India Website
\textsuperscript{113} MoHFW Website
Patients Registered for Treatment out of which 87000 patients Cured and remaining patients are under treatment.

2 National Vector Borne Disease Control Programme (NVBDCP)\textsuperscript{114}  
- The program covers various vector borne diseases including Malaria, Filaria, Dengue, Chikungunya, Kala Azar & Japanese Encephalitis  
- Fever Treatment Depot (FTDs), Drug Distribution Centres (DDCs) and malaria clinics have been set up for early detection and treatment of malaria cases across the state  
- Chandigarh has witnessed  
  - Chandigarh reported about 571 cases for Malaria in 2011 out of 72148 total slides examined.  
  - No deaths have been reported so far in Chandigarh due to Malaria

3 Maternal Health, including Janani Suraksha Yojana (JSY)  
- The number of JSY beneficiaries in the state increased from 199 in 2009 – 2010 to 309 in 2011 – 2012 (up to 30.11.11)  
- Two New Born Car services has been established in two Community Health Centres.  
- Chandigarh has trained its link volunteers to identification and early referral of all sick neonates, infants and severely malnourished children.

6.3.2.3.1. School Health Programs

The School Health Programme, is a unit of Health Department U.T. Chandigarh working towards the health needs of the school children. The School Health Programme is presently working with 6 teams, which in turn work across different schools in Chandigarh. Table below provides the student population across various category of schools in Chandigarh:

<table>
<thead>
<tr>
<th>School Category</th>
<th>Number of Schools</th>
<th>Student Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government Schools</td>
<td>106</td>
<td>1,32, 000</td>
</tr>
<tr>
<td>Private Schools</td>
<td>75</td>
<td>76014</td>
</tr>
<tr>
<td>Kendriya Vidyalaya</td>
<td>5</td>
<td>6692</td>
</tr>
<tr>
<td>AIE Centres</td>
<td>81</td>
<td>6562</td>
</tr>
</tbody>
</table>

Under the School Health Program, there are certain parameters under which student’s health is measured such as under nutrition, children anaemia, and children with worm infestations, children with dental caries and children with refractive error.
6.3.3. Concrete Projects from Sweden's point of view

6.3.3.1. Existing Hospitals

In contrary to the other states and cities in India, the public hospitals in Chandigarh are well managed and funded. As a result, most of these hospitals are planning either up gradation of departments or inclusion of new facilities. For example, Government Medical College & Hospital in Sector 32 is looking forward to open up a new trauma hospital with a capacity of 300 beds. Swedish companies such as Elekta and Absolicon already have some presence in Chandigarh and are supplying equipment to various hospitals.

<table>
<thead>
<tr>
<th>Name of the Hospital</th>
<th>Private/ Public</th>
<th>No. of beds</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government Multi Specialty Hospital, Sector 16</td>
<td>Public</td>
<td>540</td>
<td>• Planned expansion (New OPD Block, Renovating &amp; expanding Emergency Department)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Procurement - Local &amp; Imported purchase through limited, regular and e-tendering Imported machines only through distributor</td>
</tr>
<tr>
<td>Government Medical College &amp; Hospital, Sector 32</td>
<td>Public</td>
<td>696</td>
<td>• Going in for a new trauma hospital for which land has already been acquired. This is going to be a 300 bed hospital</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Planning for a Mother &amp; Child hospital in the new future</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• National Institute of mental health, Regional Institute of Para Medical Sciences</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• All communicable and non communicable diseases are treated</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Have both Indian and imported machines. For imported machinery, it is through the foreign company having their office in India or through distributors</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Has a gamma knife installed in their hospital which is supplied directly through India Elekta</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• They also have a solar panel in their hospital supplied by Absolicon (Swedish)</td>
</tr>
<tr>
<td>Nehru Hospital affiliated to Post Graduate Institute of</td>
<td>Public</td>
<td>1765</td>
<td>• This is the oldest tertiary hospital in Chandigarh</td>
</tr>
<tr>
<td>Medical Education &amp; Research</td>
<td></td>
<td></td>
<td>• This is an autonomous body governed by the Ministry of Health which funds the hospital</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• 70% of their machines are imported machines</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• The hospital has a Gamma knife supplied directly by Elekta India</td>
</tr>
<tr>
<td>Max Hospital</td>
<td>Private</td>
<td>250</td>
<td>• This is a two month old hospital with majority of patients undergoing treatment for cancer and cardio vascular problems</td>
</tr>
<tr>
<td>Fortis Hospital</td>
<td>Private</td>
<td>280</td>
<td>• The hospital is spread over an area of 8.22 acres</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• It is a JCI and NABH certified facility</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Has a number of specialties including dermatology, diabetes and endocrinology, ENT, gastroenterology,</td>
</tr>
</tbody>
</table>
6.3.3.2. Upcoming Hospitals

Columbia Asia group is in the process of establishing a 100 bed hospital in Chandigarh through investment of around SEK 100 million. The hospital is likely to have offer all specialties and multispeciality, except invasive cardiology, radiation oncology and few neuro procedures.

6.3.3.3. Existing and New Medical Colleges

Chandigarh has a well developed network of medical education colleges with presence of institutes such as PGMIER, Government Medical College and Hospital (GMCH) and Scholl of Nursing. Among these, GMCH already have exchange programs with Singapore General Hospital & Glasgow University for the faculty members.

<table>
<thead>
<tr>
<th>Name of Medical College</th>
<th>Programs Offered</th>
</tr>
</thead>
</table>
| School of Nursing; Affiliated to the government Multi Speciality Hospital Sector 16 | • Major programs offered  
  o Nursing and Midwife training for 3.5 Years (20 Students)  
  o Auxiliary Nurse and Midwife training for 2 years (20 students)  
  o Midwife training for 6 months (1-2 Students)  
  • Open to exchange Programs |
| Government Medical College and Hospital | • Major programs offered  
  o MBBS (50 students per year)  
  o MD  
  o BSC  
  o Radiology  
  o Micro MLT (Medical Lab Technicians)  
  • Already have exchange programs with Singapore General Hospital and Glasgow University; open to exchange programs for both students and faculty |
| Post Graduate Institute of Medical Education and Research, affiliated to Nehru Hospital | • One of the most renowned colleges in India offering Post Graduation course; have also been selected as a mentoring college for two of the six upcoming AIIMS in India  
  • Open to exchange programs for both students and faculty.  
  • Already have ongoing exchange programs with: -  
    o Virginia Commonwealth University  
    Innsbruck University |

6.3.4. Opportunities for Swedish Companies

Major opportunities available for the Swedish companies/ institution are as follows:
6.3.4.1. Disease Care and Treatment Areas

1. **Supply of Advanced Equipment for Treatment**: Swedish companies already have presence across hospitals in the UT of Chandigarh. With a number of up gradation projects planned across existing hospitals, a significant demand for advance equipment is likely to emerge in the near future.

2. **Elderly Care**: Approximately 4% of population in Chandigarh is over 65 years in age. There are no geriatrics units at the secondary level hospitals to tackle the problems of the aged person. As a result, one of the initiatives taken by NRHM in Chandigarh is to open geriatric care service centre for inmates of Old Age Home. With a life expectancy of around 78 years, the demand of specific treatment centres for elderly people is expected to rise in near future\(^{115}\).

3. **Public Health**: Alcohol abuses are reaching at an alarming level in Chandigarh because of easy and cheap availability of alcohol from neighbouring Haryana. The city accounts for almost 6% of the total liquor consumed across India per annum. Attributed to high income levels in the city, the problem of drug abuse is going acute in the city. The state government of Punjab and Haryana are laying considerable focus to reduce drug and alcohol abuse. For example, the Punjab Government is running a counselling centre at Chandigarh for drug addicts. The addicts are given free treatment, Yoga Therapy and counselling services as well as family counselling services are provided by qualified psychiatrists.

4. **Lifestyle Disease**: Due to higher cost of operation in Delhi, a number of companies have started setting up their offices and centres in Chandigarh. Along with changing lifestyle patterns, the high stress levels on the professional front have led to the emergence of various lifestyle related disease including diabetes, hypertension and cardiovascular diseases. Hence, the requirement for counselling institutes and consultants is expected to rise in the city. Also, various hospitals have started focusing on establishment of specialty treatment centres for these diseases.

6.3.4.2. Education and Other

1. **Exchange Programs with Medical Institutions**: Government medical colleges such as Post Graduate Institute of Medical Education and Research are already having exchange programs with Virginia Commonwealth University and Innsbruck University, both at the faculty and student levels. Hence, possibility of similar exchange programs with Swedish Universities can also be explored.

\(^{115}\) JAG Website
6.4. Mumbai and Nagpur

6.4.1. Maharashtra

<table>
<thead>
<tr>
<th>Key Facts</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Area (Sq KM)</td>
<td>308 000</td>
</tr>
<tr>
<td>Population</td>
<td>112.4 million</td>
</tr>
<tr>
<td>Key Industries</td>
<td>Finance/banking, film-making industry, agriculture, sugar, chemical, electrical, textiles, petroleum, metal, wine, jewellery, pharmaceutical, engineering goods, machine tool, steel/iron castings</td>
</tr>
<tr>
<td>Major Cities</td>
<td>Mumbai, Pune, Nagpur, Nasik</td>
</tr>
<tr>
<td>Number of districts</td>
<td>37</td>
</tr>
<tr>
<td>Literacy Rate (%)</td>
<td>82.91</td>
</tr>
</tbody>
</table>

Maharashtra is one of the most progressive states in India. Maharashtra occupies the western and central part of the country and has a long coastline along the Arabian Sea. Maharashtra is the second largest state in India both in terms of population and geographical area.

Maharashtra's gross state domestic product for 2010 was SEK 1201 billion (INR 8564 billion). Maharashtra contributes about 15% to national industrial output and over 40% to India's national revenue. Over 64% of the people are employed in agriculture and allied activities.

Maharashtra accounts for more than 30 percent of the country's software exports. Maharashtra has been one of the major foreign investment destinations. Total 796 industrial projects including Foreign Direct Investment (FDI) projects with an investment of SEK 212 billion (INR 1512 billion) and proposed employment of 225 710 people (in number) were approved during September 2009 to August 2010.

6.4.1.1. Mumbai

Mumbai, formerly known as Bombay, is the commercial and entertainment capital of India. Mumbai contributed slightly more than 6% of India's economy contributing 10% of factory employment, 40% of income tax collections, 60% of customs duty collections, 20% of central excise tax collections, 40% of foreign trade and SEK 56 billion (INR 400 billion) in corporate taxes to the Indian economy.

Mumbai also headquarters a number of Indian financial institutions such as Reserve Bank of India, Bombay Stock Exchange, National Stock Exchange, the Mint. In addition, a number of major Indian group companies such as the Tata Group, Essel Group, Vedanta Resources and Reliance Industries, are headquartered in Mumbai.

Mumbai had one of the highest per capita income of SEK 20070 (INR 143103) in India, as of 2009-10. This is 16.6% higher than 2008-09 levels of SEK 17282 (INR 123220). In the past decades, Mumbai has been experiencing a rapid growth. By 2020-21 fiscal, Mumbai's GDP Per capita at PPP is expected to reach SEK 162903 (INR 1.16 million) USD 23000.
6.4.1.2. Nagpur

Nagpur is the winter capital of the state of Maharashtra, the largest city in central India and the third largest city in Maharashtra after Mumbai and Pune. According to 2011 Census, Nagpur has a population of around 4.6 million and is one of the largest commercial and industrial centres in India with a presence of major industrial estates like Butibori and Hingna.

Nagpur Metropolitan Area is the 13th largest urban conglomeration in India. It has also recently been ranked as the cleanest city and the second greenest city of India after Bangalore. Nagpur is also a major commercial and political centre of the Vidarbha region of Maharashtra.

6.4.2. Healthcare Status and Service Delivery in the State

The Public Health Department of the Government of Maharashtra is responsible to formulate and deliver required policies and schemes in order to ensure adequate health care services for the state’s population. While implementing appropriate healthcare model, various steps are being taken to make improvements in the existing health care system in the State of Maharashtra. Below figures shows the internal structure of healthcare system for Maharashtra.

![Organisational hierarchy diagram](image)

Source: STC Analysis, Government of Maharashtra, Public Health Department

Maharashtra spends about SEK 5 billion (INR 35 billion) per annum on various healthcare programs. Out of which, SEK 1.1 billion (INR 8 billion) is used for planning purposes on various program departments such as infrastructure, medicine, equipment and others.

6.4.2.1. Health Infrastructure

Maharashtra has a fairly good healthcare infrastructure, as compared to other states in India. Below figure depicts the Maharashtra’s current infrastructure.
6.4.2.2. Major Disease in the State/ City

The state’s performance on major health parameters is better than the corresponding average figures for India. Figure below depicts the state’s performance:

As per a study research conducted by ASSOCHAM during 2011, Mumbai ranked second in terms
of number of persons afflicted to lifestyle diseases especially of eating habits, chronic diseases and acute ailment. Obesity is the largest lifestyle disease observed in Mumbai residents, whereas other forms witnessed are depression, high blood pressure, diabetes, spondylitis, heart disease, cervical, asthma, slip disc and arthritis. The state government of Maharashtra has indicated lifestyle and communicable disease to be major concern areas for the city. Along with Uttar Pradesh, Maharashtra accounted for 25% of deaths due to cancer in India in 2011. Around 51000 fatalities due to cancer were reported in the state last year.

Following figure includes the number of cases registered under various disease in the state:

**Figure 6-17: Maharashtra – Cases registered under various diseases (2010)**

Maharashtra is among the top-five states in terms of cases registered for Malaria and the situation in the state worsened in 2011. Approximately 140000 cases were reported for malaria in the state in 2011 as compared to around 124860 in 2010; out of these, around 55% cases were registered in Mumbai due to widespread construction work and high density of population.

The state has been doing well in terms of tuberculosis identification and treatment; the percentage of positive TB cases against a total number of suspects examined in Maharashtra was around 11% during January to September 2010, which is 2% lower than that of the national average of 13% during the same period. However, the state has witnessed a recent emergence of totally drug resistant tuberculosis (TDR-TB) with around 12 cases registered in Mumbai. In addition, around 12 deaths were reported out of around 813445 cases registered for acute diarrhoeal disease in 2010 across the state.
According to a report published by Ministry of Statistics and Programme Implementation, the percentage of elderly population in Maharashtra is around 8.7% of the total population; further, the old age dependency ratio in the state is 14.8% which is lightly higher than that of the India’s average ratio of 13.1%. Among these, around 35% of the elderly population reports one or more types of illness.

Nagpur being the hub for medical services for its surrounding cities, it gets a lot of patients from surrounding regions. Lately, the city has received a lot of patients suffering from waterborne diseases, Gastro-Enteritis including jaundice which are on the rise. As per Epidemic Report of 2011-12 available with Nagpur Municipal Corporation (NMC), 1,272 persons have suffered from gastroenteritis in last 12 months. The number of patients in 2011-12 has been comparatively higher than the earlier two years, especially in summer months. Similarly, 202 persons suffered from dysentery in last 12 months and 33 from diarrhoea. This is due to the unsafe drinking water supply and leakages of the pipelines in Nagpur.

As per annual epidemiological survey conducted in 18 primary schools 14 secondary school children, around 10.23% children had prevalence of asthma 22.23% children had allergic rhinitis and 8.51% children had eczema out of the total 8500 children tested. It was seen that the prevalence of asthma and eczema in school children from the city of Nagpur is close to the Indian average reported previously, but the prevalence of allergic rhinitis was higher than the Indian average.

The city also ranks second and third respectively in terms of cases reported for cervical cancer and breast cancer in India. Among the four cities being monitored in Maharashtra (Mumbai, Pune, Aurangabad and Nagpur), Nagpur reported the highest number of cancer cases in both females (88.6%) and males (80.2%).

6.4.2.3. Progress of NRHM Projects

The National Rural Health Mission (NRHM) was launched with the goal of improving the availability of and access to quality health care for people, especially for those residing in rural areas, the poor, women, and children. A new concept called ‘Community Based Monitoring’ was introduced as important component in order to ensure that the services reach those for whom they are meant.

Maharashtra is making all efforts towards identifying gaps and adopting measures to achieve the goal and objectives of the mission. NRHM has transformed public health service delivery in the state. The decentralization, responsiveness to local needs, paradigm shift in health system management and availability of untied funds has improved the facilities and their credibility among members of the public. Key achievements under NRHM are as follows:

<table>
<thead>
<tr>
<th>Focus Area under NRHM</th>
<th>Achievement</th>
</tr>
</thead>
</table>
| Human Resources       | - Promotes programs like ASHA (Accredited Social Health Activist) to create health awareness in society  
                        | - ASHA works in 15 tribal and 31 non-tribal areas  
                        | - 8161 ASHAs have been provided with drug kits. A total of 8100 |

121 MOSPI Website
122 MOHFW Website
### Focus Area under NRHM

<table>
<thead>
<tr>
<th>Sub-centres are functional with an ANM (Auxiliary Nurse Midwife)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• 4318 Sub-Centres are strengthened with 2nd ANM.</td>
</tr>
<tr>
<td>• 407 specialists, 50 SN, 5045 ANMs recruited on contractual basis</td>
</tr>
</tbody>
</table>

### Infrastructure Development

| • ROGI Kalyan Samiti (Patients welfare drive) is now is operational at 23 DH, 365 CHCs & 1804 PHCs |
| • 102 new ambulances to PHCs to enhance the referral transport mechanism |
| • Adarsh PHC Yojana: an incentive scheme to recognize the top 3 PHCs in the state. |
| • 397 PHCs operationalised to provide 24x7 service. |

### School Health Program

| NRHM has started School Health Check-up Program from Feb 2008 in Maharashtra in coordination with Education Department (SSA) where it covers 1st to 10th standard students from the rural area |
| NRHM has appointed total 440 School health teams for health check up of students (356 for Rural, 29 for Corporation, 18 for Municipal Corporation and 37 for Ashram Schools in tribal areas) |
| Around 3.5 Million Kids screened for any Eye related issues and 10.5 million kids checked under the program so far. |
| Budget of SEK 49 million for the fiscal 2011-12 |

### Mobile Medical Units (MMU) and Emergency Medical & Referral Services (EMS)

| Mobile Medical Units is one of the innovative schemes which will provide health coverage to people living in the un-served and underserved deep interior and remote areas in the state |
| To provide first aid to preserve life, prevent further injury and promote recovery |
| To provide comprehensive 24 hours emergency response services. |
| System will leverage all the stake holders to offer comprehensive range of services in emergencies. |
| Expected reduction in mortality approximately 20% and reduction in morbidity. |

### Main achievements under various programs under NRHM in the state are as follows:

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Program</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Reproductive &amp; Child Health (RCH)</td>
<td>• 33 out of 35 districts are implementing IMNCI and about 29,000 personnel have been trained so far.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• State is conducting all key child health training e.g. IMNCI, FBNC, HBNC etc.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• State has proposed to establish Child Treatment Camps for management of severely malnourished children in State plan for 09-10.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Further, state has 438 Nutritional Rehabilitation Centres in place.</td>
</tr>
<tr>
<td>S. No.</td>
<td>Program</td>
<td>Details</td>
</tr>
<tr>
<td>--------</td>
<td>---------</td>
<td>---------</td>
</tr>
</tbody>
</table>
| 2      | National Aids Control Program | - Three societies have been created:  
  o Maharashtra State AIDS Control Society (MSACS)  
  o Mumbai District AIDS Control Society (MDACS)  
  o AVERT  
  - Key achievement are as follows:  
    o The ANC clinic HIV positivity has decreased from 1.25 to 0.88 %.  
    o The HIV positivity rate in people attending the STD clinics has come down from 18 in 1998 to 10.4 in 2005.  
    o Seropositivity among voluntary blood donors has come down from 1.35 to 0.66  
  - A number of programmes have been implemented like the STD control programme, targeted intervention, condom promotion, Information Education Communication strategy, blood safety, Family health awareness Campaign, APEP, VCTC, PPTCT programme, Drop in Centres, Community Care Centres and others. |
| 3      | Revised National Tuberculosis Control Program | - Maharashtra was the first state in India to be covered under Revised National TB Control Programme in 2003  
  - The State TB control Society and 48 Districts/City TB Societies were established. These societies later merged with the State and districts health societies under the NRHM (with separate accounting system)  
  - Following services to common people are provided:  
    o Free diagnosis of tuberculosis through sputum microscopy  
    o Treatment is directly observed by DOT provider  
    o Treatment on tuberculosis is available free |
| 4      | National Vector Borne Disease Control | - World Bank Assisted Enhanced Malaria Control Project was started in 16 tribal districts in the State, in addition since 2005-06 three districts viz. Ratnagiri, Sangli and Akola have been included in the project.  
  - District Malaria Control Societies are established for the implementation of the project in tribal area of the district.  
  - The State Malaria Control Society is established during December 2001 for more active implementation of the project.  
  - From 2003 the programme is converted in to National Vector Borne Disease Control Programme and includes monitoring of all vector borne diseases like Malaria, Filaria, Dengue, J.E. Plague, Chandipura, Kala Azar etc. |

6.4.2.4. Major State-Level Health Programs

Maharashtra has been a healthcare policy-driven state which is very actively utilizing not only national policies but also NRHM (National Rural Health Mission) and its own derived policies. Maharashtra's policies are mainly focused on following factors:
1. To reduce infant mortality & maternal mortality
2. To improve comprehensive health of family
3. To provide special services to tribal area, small size villages and urban slum areas
Following main objectives were kept into consideration while formalizing health programs for Maharashtra:

- To provide adequate preventive and curative health care
- To ensure greater access to primary health care by bringing medical institutions as close to the people as possible or through mobile health units, particularly in the under-served and backward districts
- To improve maternal and child health with a view to reducing maternal and infant mortality
- To improve hospital services at the secondary levels both in terms of infrastructure and personnel
- To give training to doctors, nurses and other paramedical staffs to meet the needs of health care by upgrading their skills and knowledge
- To improve the maintenance of buildings
- To implement various national health programmes
- To give health education for improving knowledge, attitude and behaviour of the community

Besides above programs, Maharashtra also has its own individual programs that focus on state level, as mentioned below.

<table>
<thead>
<tr>
<th>S. No</th>
<th>Policies 123</th>
<th>Details</th>
</tr>
</thead>
</table>
| 1     | Navsanjivani Yojana | To reduce Infant Mortality Rate and Maternal Mortality Rate in the 6 tribal districts viz Thane, Nasik, , Nadurbar, Amravati, Gadchiroli and Nanded  
  - Various schemes are introduced such as examination of sick children, establishment of paediatric ICU's, pre-monsoon check of mothers and children, water quality monitoring etc |
| 2     | Jeevandai Aarogya Yojana | To provide financial help the weaker sections of Society and the people below poverty line, for providing Super Speciality Services to by treating serious diseases of heart, kidney and brain and Spinal cord  
  - These patients can avail medical services for these ailments in recognized Government and private hospitals |
| 3     | Biomedical Waste Management | The intra-hospital hazards to the waste generators / handlers such as needle prick injury and hospital acquired infections and the extra-hospital hazards to rag pickers and general public make the problem multidimensional |
6.4.3. Concrete Projects from Sweden’s point of view

6.4.3.1. Existing Hospitals

6.4.3.1.1. Mumbai

Mumbai is a growing hub of healthcare services with a number of specialty and super specialty hospitals. With over 160 major hospitals with around 58,000 beds (37,000 in public sector and 21,000 beds in private sector) serving around 13 million residents, Mumbai has a bed to population ratio of roughly 2.5 beds per 1000 people.

The city has approximately 90 private hospitals and 70 hospitals serving in the public sector. Three Hospitals have Joint Commission International (JCI) accreditation and 5 hospitals have NABH accreditations. Some of the prominent public and private hospitals are:

<table>
<thead>
<tr>
<th>Name of the Hospital</th>
<th>Private/Public</th>
<th>No. of beds</th>
<th>Comments</th>
</tr>
</thead>
</table>
| King Edward Memorial Hospital                 | Public         | 1800        | • Established in 1926 and is funded mainly by municipal corporation of Greater Mumbai  
• Treats about 1.8 million out-patients and 85,000 in-patients annually  
• Also has an attached medical college, the Seth Gordhandas Sunderdas Medical College (GSMC)  
• All major specialties are supported by the hospital. |
| Bombay Hospital                                | Trust          | 830         | • Established in 1952 and ranks among the leading multi-speciality tertiary level medical centres in the country  
• Has recently entered a tie-up with American College of Cardiology to draw up India Specific treatment rules  
• Specializes in Cardiovascular and Thoracic surgery. |
| Hiranandani Fortis Hospital, Vashi             | Private        | 150         | • It is a tertiary care multi-speciality hospital  
• It has 5 OTs and 42 critical care beds  
• Key departments include cardiac sciences, cancer, minimally invasive surgeries, renal sciences, neuro sciences, obstetrics and gynaecology, orthopaedics and joint replacements, gastroenterology (medical and surgical)  
• Has an active CSR program through Fortis Foundation |
| Dr L H Hiranandani Hospital                    | Private        | 130         | • It was commissioned from 2004  
• Their major department include Medicine, Surgery, Obstetrics & Gynaecology, Paediatrics, Dentistry, Anaesthesiology and Complementary Medicine  
• One of the five NABH accredited hospitals of Mumbai  
• All the major specialties are supported by sub-specialties such as Oncology, Non-invasive and Invasive Cardiology, Endocrinology, Gastro-Enterology, Psychiatry, Dermatology, Pulmonology, Neurology, Nephrology, Rheumatology, Immunology and |
Gerontology

<table>
<thead>
<tr>
<th>Name of the Hospital</th>
<th>Private/Public</th>
<th>No. of beds</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breach Candy Hospital</td>
<td>Private run trust</td>
<td>173</td>
<td>• Established in 1958, it is a 173 bedded hospital</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Pioneer hospitals in a number of procedures including</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>coronary angioplasty, magnetic resonance imaging,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>critical care ICU and hysteroscopy</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Other services include outpatient clinics, preventive</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>health checks, dialysis unit, physiotherapy, ante-natal</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>classes, dentistry, endoscopy, non invasive cardiology,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>pulmonology and others</td>
</tr>
</tbody>
</table>

6.4.3.1.2. Nagpur

Among the Government hospitals, Nagpur has Government Medical College and Hospital, Daga Hospital & Indira Gandhi Medical College & Hospital, while, Wockhardt Heart Hospital, Orange City Hospital, Lata Mangeshkar Hospital are the leading hospitals on the private side. The city has 750 nursing homes; also, 39 dispensaries, 10 RCH, 12 Health Post Centres and 6 mobile dispensaries run by the NMC.

<table>
<thead>
<tr>
<th>Name of the Hospital</th>
<th>Private/Public</th>
<th>No. of beds</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government Medical College &amp; Hospital</td>
<td>Public</td>
<td>1400</td>
<td>• The hospital is attached with the Government Medical</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>College.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• This is a super speciality hospital and has all major</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>departments that a super speciality hospital should have</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>like Cardiology, Nephrology, Cardiology, Cardio</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Thoracic ward, Trauma centre, Cancer unit, ENT, Dental etc</td>
</tr>
<tr>
<td>Wockhardt Super Specialty Hospital</td>
<td>Private</td>
<td>115</td>
<td>• Super speciality medical care in the areas of</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Neurology, Neurosurgery, Orthopaedics, Minimal</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Access Surgery and Critical care</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Part of the chain of eight national specialty hospitals</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>under the Wockhardt Group.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Accredited by NABH</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• The parent company has strategic alliances with</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Harvard Medical International and Cigna International, USA</td>
</tr>
<tr>
<td>Orange City Hospital and Research Centre</td>
<td>Private</td>
<td>150</td>
<td>• This is a tertiary care hospital and they are ISO</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>9001:2000 certified</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>• Recognized by South Eastern Central Railway and Central Railway for</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>aiding them in emergency care for railway accident cases.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• The hospital has plans to increase the number of beds</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>in their Cardiac, Critical, Stroke &amp; Nephrology department</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Has just opened a new 50 bedded Secondary care</td>
</tr>
<tr>
<td>Name of the Hospital</td>
<td>Private/Public</td>
<td>No. of beds</td>
<td>Comments</td>
</tr>
<tr>
<td>--------------------------------------------</td>
<td>----------------</td>
<td>-------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| CARE Nagpur                                | Private        | 105         | • Part of the national chain of CARE Hospitals  
• Highly sophisticated technology  
• 45 critical beds  
• Well equipped casualty centre with 24 hour service facility |
| Lata Mangeshkar Hospital                   | Private        | 1000        | • This is a multi specialty hospital affiliated to NKP Medical Institute of Medical Sciences  
• This is biggest private hospital in Nagpur doing about 25 – 30 surgeries per day. |
| Rashtra Sant Tukdoji Regional Cancer Hospital & Research Centre | Private | 90 | • Only Tertiary Cancer hospital in Central India.  
• Nearly 4000 new patients & 30,000 follow up cases visit the hospital from all over Maharashtra and neighbouring states.  
• 1500 operations are performed annually and 3000 patients treated with Radiotherapy and Chemotherapy  
• The only Cancer Institute in the whole Central India having Palliative treatment centre - Snehanchal.  
• Only hospital having Tele-medicine facilities to combat the dreaded disease for the people of far flung places of Central India |

### 6.4.3.2. Upcoming Hospitals and Up-gradation Projects for Hospitals

#### 6.4.3.2.1. Mumbai

In line with the growing population and increasing demand for healthcare services, a number of new hospitals are being established in the city. Some of these are as follows:

<table>
<thead>
<tr>
<th>Name of the Hospital</th>
<th>Private/Public</th>
<th>No. of beds planned</th>
<th>Details</th>
</tr>
</thead>
</table>
| Apollo Hospitals                           | Private        | 1200                | • The group plans to invest SEK 42 million (INR 300 million) on establishing sugar clinics for diabetes management and care  
• Planning to set up three additional hospitals in Mumbai |
| Parkway Group Healthcare                   | Private        | 500                 | • Greenfield joint-venture project between Koncentric Investments Ltd and Parkway Group Healthcare Pte Ltd to build a leading 500-bed international-standard tertiary hospital |
| Jupiter Hospital                           | Private        | 200                 | • Joined Venture with Siemens Medical Solutions (SMS)  
• Also supposed to be Asia’s first multi- |
<table>
<thead>
<tr>
<th>Name of the Hospital</th>
<th>Private/ Public</th>
<th>No. of beds planned</th>
<th>Details</th>
</tr>
</thead>
</table>
| Global Hospitals     | Private        | 400                 | - Special Focus on Organ Transplant  
                           - Planned investment of SEK 1 billion to open four hospitals including the one in Mumbai. |

### 6.4.3.2.2. Nagpur

Some of the major upcoming projects in healthcare sector in Nagpur are:

<table>
<thead>
<tr>
<th>Name of the Hospital</th>
<th>Private/ Public</th>
<th>No. of beds planned</th>
<th>Details</th>
</tr>
</thead>
</table>
| Indira Gandhi Government Medical College and Hospital (IGGMCH) / Mayo Hospital | Public         | 650                 | - The project has an approximate budget of SEK 428 million and is being funded via PPP model through Nagpur Improvement Trust (NIT) for the purpose of renovation, re-construction and modernization.  
                                                                   - The hospital will have all major departments like cardiology, nephrology, gastroenterology, neurosurgery, cardio vascular thoracic surgery, anaesthesia, radiology, pathology, blood bank, ENT, Dental |
| BSR Nagpur                                                | Private        | 150                 | - Apollo BSR Hospital is planning to come up with a multi-specialty hospital in Nagpur.  
                                                                   - The hospital will receive a funding of SEK 70 million by Aureos Capital, private equity fund management from UK |
| Lata Mangeshkar Hospital                                  | Private        | 1000                | - The hospital has big plans for expansion.  
                                                                   - There have been discussions to have collaboration between Narayana Hrudayalaya Hospital & NKP Medical Institute of Medical Sciences where Narayana Hrudayalaya will be running the hospital and NKP Salve will be responsible for the course content of the Medical College  
                                                                   - The hospital has huge land available for expansion purpose and they are planning to expand / include new departments  
                                                                   o Cardiology  
                                                                   o Cardio Thoracic ward  
                                                                   o Trauma centre  
                                                                   o Cancer unit |
Name of the Hospital | Private/ Public | No. of beds planned | Details
--- | --- | --- | ---
| | | | o Nephrology  
| | | | o Urology  
| | | | o Neuro surgery  
Mihan Medicity | Private | 2000 | • US-based healthcare major John Hopkins and Hyderabad-based CARE Hospital is coming up with a 2000-bed health city is being planned in Nagpur  
• The consortium will invest around SEK 1.07 Billion in the project through a combination of debt and equity

### 6.4.3.3. Existing and New Medical Colleges

#### 6.4.3.3.1. Mumbai

Mumbai is one of the popular destinations for medical education, not only in India but also in entire South Asia. Metro city, Mumbai boosts progressive medical history, such as Bombay Hospital and Medical Research Centre situated in South Mumbai. Medical colleges in Mumbai majorly are tertiary educational institutions that educate students in the discipline of medical science and sub-disciplines. The common degree awarded is the Bachelor of Medicine and Bachelor of Surgery (MBBS). Such undergraduate programs are generally consists of nine semesters, followed by one-year internship. The medical education and its qualifications in Mumbai are governed by the Medical Council of India (MCI). Some major existing medical colleges in Mumbai are stated below:

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Medical Colleges in Mumbai</th>
<th>Seats Offered</th>
<th>Comments</th>
</tr>
</thead>
</table>
| 1 | Grant Medical College | 200 | • Associated with Sir JJ Group of Hospitals  
• Among Top 10 Medical Colleges in the country  
• Established in 1845 |
| 2 | Topiwa National Medical College and Nair Hospital | 120 | • Attached to the Bai Yamunabai Laxman (B.Y.L.) Nair Charitable Hospital, a 1800-bed tertiary care centre.  
• Training courses in more than 25 medical and allied branches, including 9 super specialty courses. |
| 3 | Seth Gordhandas Sunderdas Medical College | 180 | • Attached to King Ed hospital |
| 4 | Lokmanya Tilak Municipal Medical College | 100 | • Attached to 1400 bed Lok Manya Tilak Municipal General Hospital  
• Also offers fellowship and foreign exchange programs |

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STC analysis and interviews, State Health Department, Government of Maharashtra
6.4.3.3.2. Nagpur

Being the hub of medical services in central Maharashtra, Nagpur also has 15 colleges both in public and private domain for the purpose of providing education in the field of medical sciences. Among these, Government Medical College was established in 1947 with a sanctioned intake capacity of 200 students. It is on the biggest medical college in Nagpur and offers courses in both undergraduate and post graduate fields. The college consists of 25 departments including microbiology, pharmacology, anaesthesiology etc. Indira Gandhi Medical College established in 1862 as Mayo College has a sanctioned intake capacity of 100 students.

Among the private medical college, N.K.P. Salve Institute of Medical Sciences and Lata Mangeshkar Hospital, Nagpur, is affiliated to Maharashtra University of Health Sciences, is one of the most progressing colleges in Nagpur. The college offers MCI recognized UG, PG, MD, MS, MBBS & diploma courses. The college has an intake of about 150 UG course, 64 seats for degree course and about 11 seats for the diploma courses.

Cancer Relief Society's RST Regional Cancer Hospital is another private medical college where they run 2 years MSBTE approved teaching courses for PG Diploma in Radio therapy and Medical Laboratory Technology. The institute also has Post Graduate Diploma in X-ray, Radiography and Ultra-Sonography Techniques (Under Consideration of MSBTE, Mumbai) (RS) which is for 1.5 years.

6.4.3.3.3. Openness of exchange programs

Medical colleges in Mumbai are quite open for exchange programs at student and faculty levels. There has been many exchange activities between foreign medical institutions and Mumbai’s major medical colleges. For example, the University of Louisville, School Of Medicine, periodically welcomes students from Rajiv Gandhi Medical College for Clinical Electives and staffs exchange programs. Hospital Management is another medical academic area that many medical institutes have large focus. There also has been some initiatives to impart international academic knowledge for nursing programs, as Maharashtra foresee significant increase in number of beds in coming years.

6.4.4. Opportunities for Swedish Companies

Below table depicts the opportunities for Swedish companies in Maharashtra State.

6.4.4.1. Disease Treatment and Care Area

1. **E-health and e-governance**: Maharashtra has been quite active on e-governance for healthcare system in its State region. They have so far launched and implemented few initiatives in some of their healthcare departments.

2. **Lifestyle disease treatment services**: Mumbai is a fast moving urban city in India with significantly high stress levels among citizens. As a result, number of patients that are suffering from various lifestyle diseases such as HIV, cancer and others, is on a rise. Health infrastructure in Mumbai lack in technology and expertise for lifestyle diseases. Public Health department of State government of Maharashtra have shown interest to
cooperate under PPP model (or other suitable models) to support this concern area. Major hospitals also have plans to expand their expertise areas in this segment. In addition, as per available statistics, Nagpur tops Maharashtra in terms of the percentage of population affected by cancer. The city is also the third highest in number of women having breast cancer, after Mumbai and New Delhi. Nagpur women are among the third urban group with highest number of oesophagus cancer incidence being reported and the city ranks second in the country in the number of men affected by tongue cancer.

3. **Infection control/ Hospital infrastructure**: With the growing awareness of hospital infections, hospitals are aiming towards better and safe hospital infrastructure procedures. Many hospitals like Hiranandani Hospital, Fortis are keenly looking for knowledge sharing in the domain of infection control and technology advancements.

4. **Procurement of imaging devices**: Private Hospitals in Mumbai like Hiranandani and Breach Candy Hospital have given positive impressions for upcoming high demand on imaging devices, patient monitoring systems, therapeutic devices and homecare solutions. These hospitals will soon be undergoing major expansion of existing infrastructure. Private procurements are generally taken care by their respective materials or procurement departments. Decision for capital intensive equipments are generally at centralized level, whereas low cost devices/ consumables are at local hospital level.

5. **Plastic surgery**: Mumbai is quite attractive destination for plastic surgeries or make-over therapies. Many global personalities often stop-over at Mumbai for their beauty enhancements. With the growing need and demand, Mumbai needs more advanced and better modern facilities.

6.4.4.2. **Education and Other**

1. **Exchange programs**: Medical colleges in Mumbai are quite open for exchange programs at student and faculty levels. Possibilities of faculty- and student-level exchange program; select colleges have prior experience in exchange activities also.

2. **Staff and nurse training**: State government of Maharashtra is also open to look at short term course to train their local nursing staffs with modern techniques and services. A strong expression of interest has been shown by some of Medical colleges and Public Health department of Government of Maharashtra. Nurses for geriatric care will also be on high demand in coming period for Maharashtra region.
6.5. Delhi

6.5.1. Delhi State

<table>
<thead>
<tr>
<th>Key Facts</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Geographical Area</td>
<td>1,483 Sq. Km</td>
</tr>
<tr>
<td>Population</td>
<td>16,753,235</td>
</tr>
<tr>
<td>Key Industries</td>
<td>Information Technology, Media, Telecommunications, Banking and Tourism</td>
</tr>
<tr>
<td>Major Satellite Cities</td>
<td>Gurgaon, Faridabad, Noida, Ghaziabad</td>
</tr>
<tr>
<td>Number of districts</td>
<td>9</td>
</tr>
<tr>
<td>Literacy Rate (%)</td>
<td>86.34</td>
</tr>
</tbody>
</table>

Delhi is the national capital of India. It is given a status of National Capital Region (NCR) which includes major cities such as - Gurgaon and Faridabad (Haryana) and Noida and Ghaziabad (Uttar Pradesh), apart from nine districts in the state. With a population of 16.7 million inhabitants, Delhi is the eighth largest metropolis by population in the world. Construction, power, telecommunications, health and community services, and real estate form integral parts of the state’s economy. Furthermore, Delhi has India's largest and one of the fastest growing retail industries. Per capita income of Delhi was SEK 17,860 (INR 135,820) in 2010 placing it at third rank in terms of cities/ states with highest per capita income after Chandigarh and Goa.

6.5.2. Healthcare Status and Service Delivery in the State

Delhi is one of the best equipped states in terms of health infrastructure and health expenditure. However state’s high population, heavy migration from the neighbouring states and uneven distribution of health facilities are some of the factors hampering adequate availability of treatment. The state health mission focuses on introducing various schemes and programs to maintain and improve on the healthcare facilities in the state.

6.5.2.1. Health Infrastructure

Healthcare facilities in Delhi are being run by both government and non-government organizations. Among the government bodies- Directorate of Health Services (DHS) (largest department under Department of Health and Family Welfare, Govt. of NCT) provides healthcare facilities at both primary and secondary levels to the citizens through various healthcare outlets such as dispensaries and health centres, school health clinics and mobile health clinics. In addition, a number of facilities are operated by municipal corporations, railways, cantonment boards, government agencies, autonomous bodies and private institutions.

In totality, there are over 23858 beds spread across the state available across government institutes. Following figure depicts the number of government / public health care institutions in Delhi:
On the private side, Delhi is also home for a large number of super specialty privately owned hospitals such as Apollo hospitals, Fortis – Escort hospitals, Max healthcare, Rockford Hospitals etc. Majority of these hospital/hospital chains are on an expansion mode and are in the process of establishing new facilities across India.

6.5.3. Major Disease in the State/ City

In terms of vital parameters, situation in Delhi is far much better as compared to India’s average performance. This has been mainly attributed to focussed effort from the state government including promotion of the ASHA scheme. Following figure depicts the state’s performance on major healthcare parameters
Several communities like Patient Welfare Committees and Health and Sanitation Committees are formed in every village to aid for the system reforms. To monitor and facilitate the working of the state run programs and schemes, urban surveillance has been initiated by the centre in the city.

With high rate of urbanisation and rise in stress levels, lifestyle diseases in Delhi are increasingly become acute and are among the highest causes of mortality. As per Dr. Ashok Jhingan-Chairman, Delhi Diabetic Research Centre\(^{127}\), around 14% of Delhi's population are diabetics and an equal number are undiagnosed or pre-diabetics, which means they will develop the disorder over the next few years. Diabetes has been a major risk factor which leads to an increased cholesterol and triglyceride levels which in turn has the potential to block arteries and spur heart attacks.

Further, Obesity- another lifestyle disease has also been prevalent in the city. According to a study conducted by the Scientists from India and US\(^{128}\), “the prevalence of abdominal obesity in Delhi - 70 - is higher than in urban population of Chennai at 46.6 per cent. Women were found to be more obese at waist at close to 75 per cent than man at around 62 per cent”. Sedentary lifestyle and lack of physical inactivity has been the major cause of Obesity in the city.

As per the Indian Council of Medical Research's (ICMR)\(^{129}\), 27% of women in Delhi are suffering from breast cancer and 14.6% from cervix cancer. Among men, lung cancer is the most common at 10%, while 7% of all cancers are of the prostate. Further, tongue cancer was the third commonest cancer (6.8%) among men, followed by larynx (5.9%). In women, cancer of the ovary (7.6%) and cancer of gall bladder (6.9%) are the other two common prevalent forms of cancer. As far as “sites
of cancer associated with the use of tobacco is concerned, the prevalence is high among men in Delhi.

Two in every five cases of cancer among men in Delhi is due to tobacco (39.4%), while it is one in every 10 women (11%). Air pollution has been the other major cause of lung cancer in the city. AIIMS figures have found that out of 13,000 new cancer cases each year, almost one-third are in non-smokers. As per Dr. Amit Agarwal- Fortis Hospital, Noida- Mouth cancer due to smoking and chewing of gutka has been on rise among the youngsters in Delhi. Delhi and the Central Tobacco Control Acts are working on a Tobacco Control Programme (Smoke free Delhi) which will ensure a smoke free environment in the public and work places in the city.

Following figure includes the number of cases registered under various infectious diseases cases registered in the state:

![Figure 6-20: Delhi – Cases Registered Under Various Diseases (2010)*](image)

*Provisional Figure  
Source: Central Bureau of Health Intelligence 2010

According to Dr. J.C. Suri, HOD- Respiratory Medicine at Safdarjung Hospital, “they have seen an increase in the number of patients complaining of chronic obstructive pulmonary disease (one of the most common lung diseases which make breathing difficult).” Attributed to high pollution levels, the situation related to respiratory diseases is getting worse in Delhi. Various hospitals reported that over the past 5 years there has been a tremendous increase in the level of Particulate Matter (PM) almost 350% in the air, which has resulted to an increase in the cases for Asthma, Bronchitis and other respiratory diseases. Also, and unhygienic and inadequate water supply in the state has led to large number of cases for acute diarrhoeal disease in the state.

According to a community based study conducted in 2012 in Delhi, the major problems prevalent among 10,000 elderly people are related to vision, backache, hearing and arthritis. It is also believed that the elderly people from middle and higher income groups are more prone to develop
obesity and its related complications due to a sedentary lifestyle and decreased physical activity. In lieu with the present condition of elderly problems in the city, AIIMS hospital under the National Programme for Health Care of the elderly (NPHCE) has introduced a new geriatric OPD with a team of multidisciplinary doctors.

6.5.4. Progress of National Rural Health Mission

Delhi falls under the Non high Focus – small and Union Territory area. NRHM is being implemented to achieve the goals of National Population Policy and Millennium Development Goals. The performance of Janani Suraksha Yojana (Indian Pregnancy Health Program), community mobilization by ASHAs (Accredited Social Health Activists), proper referral transport through ambulances and Mobile Medical Units, number of deliveries, OPDs have all improved under NRHM.

Following figure shows year-wise allocation and utilization of funds under NRHM in Delhi:

![Figure 6-21: Delhi Fund Allocation under NRHM*](source)

With the funding and guidance available under NRHM program, the state government of Delhi has significantly improved the healthcare delivery system in the state. Key achievements under NRHM are as follows:

<table>
<thead>
<tr>
<th>Focus Area under NRHM</th>
<th>Achievement</th>
</tr>
</thead>
</table>
| Human Resources       | • Selection of 2266 number of ASHAs has been done under NRHM  
                        | • A total of 295 doctors and specialists, 73 staff burses, 155 Paramedics, and 630 ANMs are also added |

*Latest figures not available Source: STC Analysis, Delhi Public Health and Family Welfare Department

133 BlogSpot Website
Focus Area under NRHM

<table>
<thead>
<tr>
<th>Achievement</th>
</tr>
</thead>
<tbody>
<tr>
<td>• 31000 representatives are recruited to work for Janani Suraksha Yojana</td>
</tr>
<tr>
<td>Infrastructure Development</td>
</tr>
<tr>
<td>• In total, 8 Public Health Care units have been established with 3 nurses each to make them functional for 24 * 7 health services.</td>
</tr>
<tr>
<td>• Overall 35 facilities are functional 24 * 7 in the state.</td>
</tr>
<tr>
<td>• 20 First Stage Referral Units (FRU) have been added till 2009.</td>
</tr>
<tr>
<td>• Addition of 41 sub centres and 9 DH in the state budget under NRHM.</td>
</tr>
<tr>
<td>• Each of the 9 districts have functional Mobile Medical Units.</td>
</tr>
</tbody>
</table>

Main achievements under various programs under NRHM in the state are as follows:

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Program</th>
<th>Details</th>
</tr>
</thead>
</table>
| 1      | Maternal Care* | • The government has launched/ implemented a number of schemes under Reproductive and Child Health Program including  
|        |          | o Janani Suraksha Yojana  
|        |          | o MAMTA  
|        |          | • MAMTA is a scheme to provide comprehensive obstetric care to poor and schedule castes and tribes.  
|        |          | • Under Janani Suraksha Yojana, the numbers of beneficiaries have increased from 242 in 2006-07 to 7238 in the year 2007-08. A total of 23,829 beneficiaries availed the services in 2008-09. |
| 2      | Revised National Tuberculosis Control Programme (RNTCP) | Under the Revised National Tuberculosis Control Programme, Delhi has 30 TB Units and 192 Designated Microscopy Centres (till 2009) and 465 private practitioners who are involved in the tuberculosis control programmes (till 2007)  
|        |          | • Further, 96 NGOs are involved in various aspects of the RNTCP such as health education, service delivery, training and evaluation etc.  
|        |          | • The aggregate performance figures of the RNTCP in Delhi indicate good performance in terms of detection of tuberculosis and its treatment. The Sputum conversion rate is 91%, new smear positive case detection rate of Delhi as a whole is 75 per cent and the cure rate of new smear positive patients is 86 per cent. |
| 3      | National Vector Borne Disease Control Programme (NVBDCP)134 | • The program cover various vector borne diseases including Malaria, Filarial, Dengue, Chikungunya, Kala Azar and Japanese Encephalitis  
|        |          | • NVBDCP is implemented for surveillance and early diagnosis and treatment. Passive surveillance is carried out through 251 Fever Treatment Depots (FTD) established in various Hospitals, Dispensaries and M&CW Centres etc. and at Malaria clinics. And active surveillance is carried out by Fortnightly visits to houses in
<table>
<thead>
<tr>
<th>S. No.</th>
<th>Program</th>
<th>Details</th>
</tr>
</thead>
</table>
| 4     | National Tobacco control Programme          | • National Tobacco control Program was launched in 2008-09 in Delhi.  
• Under this programme, a State Tobacco control cell is maintained along with the District Tobacco Control centre.  
• The District Tobacco Control Centre comprises of Monitoring and implementation of tobacco control Laws, launching of a mass media campaign, running a school health an awareness programme, training and capacity building for the enforcement of various provisions of the act, and establishment of a Tobacco Cessation Centre.  
• The Delhi government has fined over 1.1 million people for smoking in public places and earned around SEK 2.1 million (INR 15 million) during 1997-2010. |

*latest data not available

6.5.5. Concrete Projects from Sweden’s point of view

6.5.5.1. Existing Hospitals

Delhi has several recognised academic institutions and medical colleges to support existing and future medical industry such as All India Institute of Medical Science (AIMS), Maulana Azad Medical College (MAMC), Lady Hardinge Medical College, University College of Medical science (Delhi University), etc.

<table>
<thead>
<tr>
<th>Hospital</th>
<th>Private/Public</th>
<th>No. of beds</th>
<th>Comments</th>
</tr>
</thead>
</table>
| All India Institute of Medical Sciences (AIIMS) | Public         | 2424        | • AIIMS, New Delhi has over 1323 doctors, 1810 nurses operating in 25 clinical departments and 4 specialty centres.  
• The institute has average bed occupancy of over 82.4%, and average hospital stay of about 6 days.  
• AIIMS is the among the leading institutions in the field of medical research and have over 600 research publications by its faculty and researchers in a year. |
| Apollo Hospitals, Delhi          | Semi-government | 695         | • Established in 1979, Apollo Hospitals is a super specialty hospital chain of hospitals with over 8500 beds, in 54 hospitals, within and outside India and have a patient size of 20 million across 55 countries.  
• The group employs over 7000 doctors across 50 departments.  
• In the Delhi NCR region, it has two operational units, in Delhi and NOIDA. |
| Max Healthcare, Delhi             | Private         | 930         | • Presently, Max Healthcare group has eight hospitals in Delhi – NCR region and is expanding in the state of Punjab, north of India.                                                                 |

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### Hospital Information

<table>
<thead>
<tr>
<th>Hospital</th>
<th>Private/Public</th>
<th>No. of beds</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max Healthcare</td>
<td>Private</td>
<td>930</td>
<td>With over 930 beds, 275 ICU beds, 1500 physicians and 3500 support staff Max Healthcare is a leading super specialty hospital in Delhi.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>275</td>
<td>It has dedicated hospital units operating for mother and Child Care, Max Eye and dental care and super specialty hospital.</td>
</tr>
<tr>
<td>Fortis</td>
<td>Private</td>
<td>1200</td>
<td>Fortis Hospitals Group was incorporated in the 1996 and operates four hospitals at present in the NCR with 1580 number of beds and 772 doctors working under 38 departments.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>It acquired Escort Hospitals in the Sep. 2005; which has more than 329 beds and 85 doctors working in 22 departments.</td>
</tr>
<tr>
<td>Safdarjung Hospital</td>
<td>Public</td>
<td>1531</td>
<td>One of the leading public sector hospitals in Delhi</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>There are 815 doctors, 1170 nursing staff and around 1866 other staff working in the hospital.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Also has an associated college as Vardhman Medical College.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>The hospital runs a disaster management plan and committee to handle unexpected and significantly large rush of casualties/emergencies</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>A Sports Injury Centre is also present which was developed at an estimated cost of SEK 99 million (INR 750 million)</td>
</tr>
<tr>
<td>ASIAN Institute of Medical Sciences</td>
<td>Private</td>
<td>350</td>
<td>Super specialty tertiary care hospital based in the NCR</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Major departments include Orthopaedics, General Surgery, Nephrology, Endocrinology, Gastroenterology, General Medicine, Gynaecology, Paediatrics, Laboratory Medicine, Neurology, Ophthalmology, Radiology, Respiratory Medicine, and Urology</td>
</tr>
</tbody>
</table>

#### 6.5.5.2. Upcoming Hospitals and Up-gradation Projects for Hospitals

Attributed to the growing population and rising disposable income, major healthcare chains are in the process of expanding in Delhi market and new players like ESI are coming up with new medical facility projects:

<table>
<thead>
<tr>
<th>Hospital</th>
<th>Private/Public</th>
<th>No. of beds planned</th>
<th>Other details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safdarjung Hospital</td>
<td>Public</td>
<td>800</td>
<td>Hospital is planning to start the Kidney transplants by end of 2012</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Hospital will receive SEK 596 million this year for expansion, which is 27 per cent more in comparison to the allocation last year.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>It also plans to start a Super Specialty wing with 800 beds and 500 emergency beds</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Plan to start the set up in September’2012 and hospital by 2014</td>
</tr>
<tr>
<td>ASIAN Institute of Medical Sciences</td>
<td>Private</td>
<td>745</td>
<td>Asian Hospital group is coming up with three hospitals including:</td>
</tr>
</tbody>
</table>
A Medical college with PG courses and Hospital with 500 beds in Greater Noida by 2013
A 170 bedded hospital in Tertiary Care in Ghaziabad by 2013
A 75 bedded hospital by 2012 in Doha with specialization in Mother & child, Paediatrics, radiology, Emergency and surgery

| Rockland Hospital | Private | 350 (Manesar) | Rockland hospitals have projects for 2 hospitals in the pipeline, to be opened up in the Manesar (Gurgaon-NCR) and Dwarka (Delhi).
The estimated project cost is around SEK 393 million
The project would be funded by the owners funding along with International Finance Corporation (IFC). |
| Paras Hospitals | Private | 280 | Paras hospitals have 2 hospitals in Delhi NCR.
The chain is coming up with a new 300 bedded hospital in the NCR region by 2012 |
| All India Institute of Medical Sciences | Public | | Budget allocation for central government hospitals in the capital has been increased for the 2012 fiscal year, with AIIMS getting SEK 1403 million which is nearly six per cent more as compared to the last year.
This is done in view of expansion and improvement of existing facilities at AIIMS. |

6.5.5.3. Medical Colleges

Delhi is a hub for medical education in the country. There are a number of renowned medical colleges based in NCR including AIIMS, Vardhman Mahavir College, Maulana Azad Medical College etc. Most of the major hospital chains like Max Hospitals and Medanta Medicity are also coming up with their privately owned medical institutes.

Following table presents a brief overview of the medical colleges in Delhi:

<table>
<thead>
<tr>
<th>Medical College</th>
<th>Programs Offered</th>
</tr>
</thead>
</table>
| AIIMS           | AIIMS offers 42 disciplines and various training programs as well as courses.
Following are the courses offered: o Under Graduate Courses (MBBS/ B.Sc Nursing (post certificate)/ B.Sc. (Hons.) Nursing/ B.Sc. (Hons.) Ophthalmic Techniques/ B.Sc. (Hons.) Medical Technology in Radiography/ B.Sc. (Hons.) Speech & Hearing/ B.Sc. (Hons.) Human) o Post Graduate Courses (M.D/M.S/M.D.S/ M.Ch. (5 year course)/ M.Sc.) |
| Maulana Azad Medical College | 200 students are admitted annually for the MBBS degree, 40 students for the B.D.S degree.
Among the Post Graduation Programs, M.D, M.S., Post Graduate diploma Courses in medicine like Post-Graduate Diploma in Geriatric Medicine, Post-Graduate Diploma in Maternity and Child Health, Post-Graduate Fellowship in HIV/AIDS Medicine, Associate Fellowship in Industrial Health are also offered.
Recently signed MOU with Edinburgh University of UK, which will focus on the |
short courses, faculty exchange programs and other research activities

| Lady Hardinge College | • Lady Hardinge College was established in 1914. It offers following courses:  
| | o **Under Graduate**: MBBS/ Diploma Nursing for Female candidates  
| | o **Post Graduate**: M.D, M.S.  
| | o **Diploma**: Anaesthesiology (DA), Ophthalmology (DO), Otorhinolaryngology (DLO), Gynaecology and Obstetrics(DGO), Child Health(DCH), Medical Radio-Diagnosis (DMRD)  

| Sharda University | • It offers a wide range of courses in Engineering, Business Studies, Dental Sciences, Allied Sciences and Creative Arts, Health services and allied health services, Law, Foreign Language and Architecture.  
| | • Medical courses offered at the University are:  
| | o **Undergraduate**: B.D.S., MBBS, B.Sc in nursing, Bachelors in Physiotherapy  
| | o **Post Graduate**: M.D.S., M.Sc  

6.5.6. Opportunities for Swedish Companies

Key opportunities identified in the Delhi region are as follows:

6.5.6.1. Disease Treatment and Care Area

1. **Elderly Care**: With a rapid growth in the elderly population in the city, there has been an increase in the number of Dementia and Alzheimer’s cases and elderly problems among the senior citizens. The State Ministry of Family & Health Welfare has initiated a new policy for elderly people in the city, which focuses on setting up a National Centre for Older Persons suffering from dementia and mental diseases in Delhi.

2. **Equipment Supply for New Projects and Up-gradation Projects**: Delhi government is looking forward to develop the health care infrastructure in the city. In the public sector, the government plans to establish eight new hospitals in the city, which will be constructed as per Green buildings concept. Apart from this, there are other upgradation projects for hospitals at both government and private level coming up in the city.

3. **Lifestyle diseases**: Along with changing lifestyle patterns, the high stress levels on the professional front have led to the emergence of various lifestyle related disease including diabetes, hypertension and cardiovascular diseases. Delhi is among the worst affected cities in India in terms of lifestyle disease and a number of super-specialty hospitals have come up in the city. Also, there is a growing requirement for counselling institutes and lifestyle consultants in the city.

4. **Respiratory diseases**: Over the past 5 years, city has witnessed an increase in number of respiratory track diseases mainly because of pollution and unhygienic living conditions. The city also suffers from shortage of various equipment used in diagnosis and treatment of respiratory disease including Spirometer. Hence, there is a significant requirement for better preventive medicine technology and equipment, including screening and testing equipment (peak flow meters). Equipments like nebulizers, steamers; etc are mainly imported, which could be supplied by Swedish companies as well.
5. **Maternal & Child care**: It has been observed that 50% of the children in Delhi live in slum areas and are suffering from diseases like Diarrhoea, typhoid and respiratory diseases. There is an immediate need for training programmes for health workers that can assist on management of childhood and new borne illness across these areas.

6.5.6.2. **Education and Training**

1. **Virtual Classes**: Maulana Azad Medical College is likely to deploy Virtual classroom mode as a supplementary mode to the existing classroom teaching. Hence, there is an opportunity for Swedish institutes to propose and undertake virtual classes across other colleges in the state. However, the curriculum of the virtual class as well as the training course needs to be approved by the MCI.

2. **Exchange Program**: Possibilities of faculty level exchange program and for internships at can be explored. Maulana Azad Medical College, Delhi is introducing the concept of faculty exchange programs in collaboration with a University in UK. In addition, it showed interest in similar kind of exchange program with Swedish institutes.
6.6. Bangalore

6.6.1. Karnataka

<table>
<thead>
<tr>
<th>Key Facts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geographical Area</td>
</tr>
<tr>
<td>Population</td>
</tr>
<tr>
<td>Key Industries</td>
</tr>
<tr>
<td>Major Satellite Cities</td>
</tr>
<tr>
<td>Number of districts</td>
</tr>
<tr>
<td>Literacy Rate (%)</td>
</tr>
</tbody>
</table>

Karnataka is the eighth largest and ninth most populous state located in the south west part of the country. The state has well developed physical and industrial infrastructure with virtual connectivity with good distribution of supply and power and eleven airports.

The state has emerged as a top player in the knowledge based industry of Information Technology (IT), Bio technology and engineering with a large number of IT companies set up in the state. There are also a large number of engineering institutions present in the state providing the much needed work force to the industries. A majority of the exports from the state belong to the IT, biotechnology and Business Processing Outsourcing sector which amounts to SEK 134 billion (USD 19.13 billion) in 2009-10.135

The state experiences a wide network of banks with each bank serving 11000 persons as against the nation’s 16000 persons per bank ratio. Despite the advanced industry set up of the state, agriculture employs around 56% of the population and irrigation is highly dependent on the erratic south west monsoons. Floriculture136 is also an upcoming industry in Karnataka with 75% of India’s floriculture being contributed by Bangalore. A majority of silk industries are also set up in the state, with government focus on the textile industry as one of the thrust sectors. Karnataka’s GDP grew by 15% in 2009-10 to reach about SEK 497 billion.

6.6.1.1. Bangalore

Bangalore is the state capital of Karnataka. It is the third most populous city of the country and fifth most populous urban agglomeration. Bangalore is often called the Silicon Valley of the East due to the presence of large number of Information Technology companies contributing to almost 33% of the country’s IT exports. In terms of Bio technology industry, the city tops the charts with 191 biotech companies present in Bangalore out of the total 380 biotech firms in India.

135 IBEF Website
136 Karnataka Website
It is also considered an education hub, being home to some of the best medical colleges in the country along with engineering and management institutions. Premier institutions such as the Indian Institute of Science and the Indian Institute of Management are located in the city as well.

6.6.2. Healthcare Status and Service Delivery in the State

In the field of health care, Karnataka stands very competitive with respect to the rest of the country. It has a performing fairly better than the rest of the states in terms of health care and child care. Karnataka has been a forerunner in providing quality, comprehensive healthcare under the guidance of the Government of India’s overall objectives. The state concentrates on providing promotive, preventive, rehabilitative and curative healthcare to its citizens. Being the 8th largest state in India, and a large biotechnology and information technology hub, health has been a focus for the Government, visible by the budgetary allocation for healthcare and medical education over the years, depicted in the figure below:

![Figure 6-22: Healthcare Budget in Karnataka](source)

**6.6.2.1. Health Infrastructure**

Karnataka’s healthcare system is governed by the State Ministry for Health and Family Welfare. In order to provide impetus to the State Government for improvement and modification of the healthcare system, periodical review and meetings are held at various levels of service delivery. This is also supported by a sound healthcare administrative framework, depicted by the figure below:
The state is divided into 27 administrative districts, and has an established health infrastructure with district hospitals, primary health centres and sub centres, community health centres, etc., catering to rural and urban areas. There are also some urban specialty-care hospitals set up by the state government which offer tertiary care for some of the diseases. The below figure talks of the number of various healthcare institutions in the state, as of 2008-09:

Under the public healthcare infrastructure, there are 63741 beds spread across the various public healthcare establishments in the state. However, there is a great shortfall of healthcare personnel at the establishments on an average. The shortage exists not only in terms of permanent staff, but also persons employed for the purpose of execution of healthcare programs.
6.6.2.2. Major Disease in the State/ City

Karnataka has performed relatively well on the major health parameters when compared to a number of other Indian states. Following figure depicts the state’s performance on IMR, MMR and birth rate parameters:

IMR and MMR reduction are still on the state government's radar for the upcoming 5-year plan, despite above average performance on this parameter over the past few years. About 70% of all births in the period of 2005-06 were assisted by a healthcare professional according to the last National Family Health Survey (NFHS) released during that period. It was further said that 65% of all births were institutional deliveries. While these numbers reflect that Karnataka is at par with most developing states, it still lags behind its objectives of 100% institutional and assisted deliveries, which it hopes to achieve in the next 5-year plan. The Government also plans to reduce iron and iodine deficiency among pregnant and lactating mothers in 2012-13.

The Directorate of Health and Family Welfare is also expressing concern over the increasing incidence of lifestyle diseases in the state, especially in urban areas such as Bangalore, Mysore, Belgaum, Shimoga and Mangalore. With around 45% of men and 5% of women between the ages of 15-49 using any kind of tobacco in the state, cancers and respiratory illnesses are also on the rise. Around 2.16 million cases of acute respiratory illnesses were reported in 2009, making Karnataka the 4th largest in terms of cases of acute respiratory illnesses.

Cancers are also a huge cause for concern, with almost 35000 new cancer cases reported each year. It is also said that citizens in the city of Bangalore are exposed to a high cancer risk, with 1 of every 6 persons bearing the risk of developing cancer during their lifetime in the city. Most of these cancers are known to be related to unhealthy lifestyles, and go undetected due to lack of awareness. Cardiovascular diseases are another lifestyle disease prevalent in Karnataka with a crude mortality of about 175 / 100 000 persons.
Communicable diseases such as Malaria, Filaria, Tuberculosis, Cholera, and several other vaccine preventable diseases are also given due importance in the state, being a public health issue even at the state level.

Following figure includes the number of cases registered under various diseases in the state:

![Figure 6-26: Karnataka– Cases registered under various diseases (2010)*](image)

*Provisional Figure  
Source: Central Bureau of Health Intelligence

The state fares satisfactorily in terms of the above mentioned diseases when compared to some of the other states. However, the Government hopes to achieve 50% less deaths due to diseases like Malaria and Dengue during 2012. The state’s performance on vaccination has also been disappointing with only 55% of children between the ages of 12-23 being vaccinated in 2006.

Karnataka is also considered one of the six high HIV-prevalence states in India, bearing about 10% of the national burden of the disease. Bowring and Lady Curzon hospital in Bangalore is a member of the Network of Indian Institutions / Organisations for HIV AIDS research (NIHAR), apart from being a nodal testing centre for National AIDS Control Organisation (NACO.)

The state of Karnataka has a large number of senior citizens which makes elderly care an important segment. Close to 8% of the total population in Karnataka is above the age of 60, which is a little above the national figure of 7.4%. However, there is a lack of awareness about geriatric care, and relatively few set-ups catering to the elderly population which makes it an opportunity area for new entrants. The need for home-care nursing staff is quite substantial as well.

**6.6.2.3. Progress of NRHM Projects**

Karnataka has implemented the activities of NRHM fairly efficiently in order to attain the goals and objectives laid out by National Population Policy and Millennium Development Goals. The focus for NRHM’s activities in the state has been improving health outcomes amongst women, children, reserved and vulnerable sections of the population such as scheduled castes, tribes, and tribal groups.
The Mission Director for NRHM in Karnataka, Mr. Selva Kumar was positive about meeting 75% of the objectives laid out for the State in the first phase of NRHM. While diseases such as Leprosy and blindness are progressing fairly, TB, vector-borne diseases, water-borne diseases and HIV AIDS are still areas of concern for the state.

Apart from these initiatives, NRHM has also initiated state-specific incentive schemes such as Thayi Bhagya, Prasuti Araike, Madilu, etc in line with Government of India’s Janani Suraksha Yojana in order to motivate women and children to get improved health care facilities.

Following figure shows year-wise allocation and utilization of funds under NRHM in Karnataka:

**Figure 6-27: Karnataka: Fund Allocation Under NRHM**

<table>
<thead>
<tr>
<th>Year</th>
<th>Allocation</th>
<th>Release</th>
<th>Expenditure</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005-06</td>
<td>239</td>
<td>254</td>
<td>158</td>
</tr>
<tr>
<td>2006-07</td>
<td>381</td>
<td>363</td>
<td>204</td>
</tr>
<tr>
<td>2007-08</td>
<td>506</td>
<td>402</td>
<td>422</td>
</tr>
<tr>
<td>2008-09</td>
<td>543</td>
<td>601</td>
<td>638</td>
</tr>
</tbody>
</table>

*Source: NRHM Report, Karnataka*

With availability of funding and guidance under the NRHM program, Karnataka was able to achieve a number of targets that were set by the State for its healthcare development. Key achievements under the NRHM are given below:

<table>
<thead>
<tr>
<th>Focus Area under NRHM</th>
<th>Achievements</th>
</tr>
</thead>
</table>
| Human Resources       | - Promotion of Accredited Social Health Activists; a total of 27195 ASHAs were selected, 11205 were trained and provided with drug kits  
- 7028 sub centres are functional with an Auxiliary Nurse Midwife (ANM) of which about 134 centres are strengthened with a 2nd ANM  
- The state has appointed 701 contractual AYUSH Doctors  
- 59 Specialists, 514 Doctors, 4012 SN, 1126 ANMs recruited on contractual basis to improve the health services in the State |
| Infrastructure Development | - 898 Primary Health Centres have been strengthened with three Staff Nurses each to make them functional round the clock  
- 325 Community Health Centres are operational 24X7 & facility surveys have been completed in 143 (including other health institutions below district level) |
- 13 Sub divisional hospitals, 17 District hospitals, 117 CHCs and others below district level are operating as First referral units
- 19 districts have functional Mobile Medical Units (MMU)

<table>
<thead>
<tr>
<th>Services</th>
<th>First phase of community monitoring has been operational in the state</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The number of Institutionalized deliveries has been increasing steadily with 682,000 in 2008-09</td>
</tr>
<tr>
<td></td>
<td>There were 331,000 beneficiaries of JSY in 2008-09, a 17% increase from the previous year</td>
</tr>
<tr>
<td></td>
<td>14 districts are implementing IMNCI (Integrated Management of Neonatal and Childhood Illnesses) &amp; 6,900 people have been trained so far</td>
</tr>
<tr>
<td></td>
<td>266,721 Village Health Nutrition Days held since the launch of NRHM (in 2009)</td>
</tr>
</tbody>
</table>

Apart from the above achievements, NRHM in Karnataka has also instituted various health programs in line with National programs. Details of these are listed below:

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Program</th>
<th>Details</th>
</tr>
</thead>
</table>
| 1      | Maternal Care: Janani Suraksha Yojana (JSY) | Maternal and child health has been one of NRHM’s biggest priorities even at the State level
State specific incentive schemes are being implemented in addition to the Government of India’s JSY programme:
- Thayi Bhagya
- Prasuthi Araike
- Madilu
- Janani Suraksha Vahini
Janani Suraksha Vahini is an innovative scheme implemented by the Govt wherein mobility support is extended to pregnant mothers to reach FRUs and if needed, higher centres of treatment
The Madilu programme is an incentive based scheme which gives out kits containing 19 items essential to the mother and the baby in the post delivery period to women (BPL) who have delivered in institutions in tribal areas
The number of JSY beneficiaries increased by 17% in 2009 to 331,000 from the previous year |
| 2      | Revised National Tuberculosis Control Programme | RNTCP was implemented in 1998, and extended coverage to the entire state in 2004
There are 125 Tuberculosis units (TU) and 644 Designated Microscopic centres (DMCs) functioning in the State. One TB unit and 16 DMCs are in NGO operated hospitals and 24 DMCs are at Private sector hospitals
For the convenience of the TB patients nearly 40,000 DOTs centres have been established and made functional in the state.
Cure rate amongst New Smear Positive cases registered during 2008-09 was 78% against the minimum bench mark of 85%
Total case detection (TCD) rate has been low, with 114/100,000 in
2009
- 2010-11 focused on 7 districts, and strengthened RNTCP in these districts as well

| 3 | National Vector Borne Disease Control Programme (NVBDCP) | • Appropriate detection and treatment of Malaria cases and integrated vector control / management are regular activities implemented for malaria control in Karnataka
  
  - The state has 1,044 functioning Fever Treatment Depots (FTDs) and 1,203 Malaria Clinics
    - The number of malaria cases has seen a considerable decrease from 62,842 cases in 2006 to 41,861 in 2010
  
  - 7 high endemic districts would be covered under World Bank Assisted National Vector Borne Disease Control Project during Phase-II of NRHM in Karnataka |

| 4 | Arogya Kavacha – 108 (Ambulance service) | • Innovating life-saving scheme by the Government of Karnataka implemented since August 2008 under PPP with Emergency Management and Research Institute (EMRI), Secunderabad
  
  - Under the scheme, 517 well-equipped ambulances along with trained paramedical staff have been deployed all over the state to provide medical aid during emergencies
  
  - A toll-free number “108” has been created
  
  - The total estimated cost of this programme is SEK 283 million, with NRHM contributing SEK 57 million towards the operational expenses |

### 6.6.3. Concrete Projects from Sweden’s point of view

#### 6.6.3.1. Existing Hospitals

Bangalore offers some of the best healthcare facilities in the country with institutes like NIMHANS of national importance and hospitals such as Bowring and Lady Curzon Hospital established for more than five decades now. The city offers medical education not only to the state but also attracts students from the entire nation and international students as well, as in case of Manipal University.

<table>
<thead>
<tr>
<th>Hospital</th>
<th>Private/Public</th>
<th>No. of beds</th>
<th>Comments</th>
</tr>
</thead>
</table>
| Narayana Hrudayalaya Hospitals | Private | 5000 (across India) | Narayana group consists of super specialty chain of hospitals with five of its centres operational in Bangalore
- One of the largest paediatric heart hospitals in the World, the group also runs diagnostic centres and dental clinics
- Narayana Hrudayalaya Hospitals has entered into a joint venture with a US based Ascension Health Alliance to build a health city in Cayman Islands, UK
- The hospital also specializes in the area of telemedicine, spread over to Malaysia and Tanzania along with the remote areas of India |
<p>| Columbia Asia | Private | 290 | Columbia Asia has two hospitals in Bangalore and a clinic at |</p>
<table>
<thead>
<tr>
<th>Hospital</th>
<th>Private/ Public</th>
<th>No. of beds</th>
<th>Comments</th>
</tr>
</thead>
</table>
| Fortis Hospital                                 | Private         | 675         | - Fortis Hospital operates 5 hospital centres in Bangalore, with the one at Bannerghatta Road with 400 beds being the largest hospital of the group all over India  
- Fortis is a chain of super specialty hospitals providing healthcare in Heart care, Brain and Spine, Bone and joint, Women care, Fertility, Digestive, Urology and other fields of medicine |
| National Institute of Mental Health and Neurosciences (NIMHANS) Hospitals | Public          | 300         | - The hospital came into being from the lunatic asylum built in late 19th century, later renamed to Mental Hospital in 1925 and later in 1974, All India Institute of Mental Health (established in 1954) and the hospital was amalgamated in November 1974 to become NIMHANS  
- NIMHANS is an autonomous Deemed University by the government and gets the funding from national and international funding for research  
- It provides medical education in the fields of neurosciences and psychiatry |
| Jayadeva Institute of Cardiovascular Sciences and Research | Public          | 600         | - Jayadeva Institute of Cardiac Sciences is a government owned autonomous cardiac hospital with an average of 800 - 1000 patients attended every day  
- The hospital recorded a 250% growth in 2010  
- There is an attached institute with the hospital providing Post Basic Diploma in Cardio-Thoracic Nursing, 3 seats for Doctorate in Medicine (DM) Cardiology and Magister Chirurgiae (MCh) Cardio-thoracic surgery every year |
| Manipal Hospital                                | Private         | 600         | - Manipal Hospitals is part of Manipal Education and Medical Group  
- It consists of 55 clinical departments, 11 centres of excellence  
- The group runs 2 more hospitals and 1 clinic in Bangalore  
- The hospital is India’s first hospital to be ISO 9001:2000 certified for Clinical, Nursing, Diagnostics and Allied Areas.  
- Also, the hospital is the winner of the Golden Peacock National Quality Award 2005 in the service category and also awarded the best super specialty hospital in Bangalore 2011, by the WEEK |
| Bowring and Lady Curzon                         | Public          | 696 + 190   | - One of the oldest hospitals in Bangalore; the Bowring Hospital was established in 1867 and the Lady Curzon hospital in 1890 |
6.6.3.2. Upcoming Hospitals and Up-gradation Projects for Hospitals

Owing to the growing population and income level of the metropolitan population of Bangalore, many international groups like Columbia Asia are looking to invest in new projects as well as expanding their facilities in the state. The below table illustrates some of the new projects in the pipeline:

<table>
<thead>
<tr>
<th>Hospital</th>
<th>Private/Public</th>
<th>No. of beds planned</th>
<th>Other details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Columbia Asia</td>
<td>Private</td>
<td>800</td>
<td>• Planning to launch a 11 000 square feet, 11 bed clinic near Bangalore in 2012.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• The group is reported to be using telemedicine and radiology for cost effective treatment. They are also planning to have ambulatory surgery services in Bangalore.137</td>
</tr>
<tr>
<td>Narayana Hrudayalaya Hospitals</td>
<td>Private</td>
<td>1000</td>
<td>• Narayana Hrudayalaya Hospital has started construction in July 2011 to build a 1000 bedded super specialty hospital in Mysore, Karnataka</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• The group has tied up with Larsen and Toubro to execute the project</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• The facility would be eco friendly and use day light to the desired levels in most of the hospital area</td>
</tr>
<tr>
<td>Yashoda Hospitals</td>
<td>Private</td>
<td>500</td>
<td>• Yashoda Hospitals, based in Hyderabad are looking to expand in Bangalore, Mumbai and Chennai by 2012, with a bed capacity of 500 each</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• In the first phase the group has planned to invest SEK 1.27 billion138 to create infrastructure and other facilities</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• The group is presently having a chain of 5 hospitals in Andhra Pradesh</td>
</tr>
</tbody>
</table>

137 Business Standard Website
138 Business Standard Website
## 6.6.3.3. Medical Colleges

Bangalore is a hub for medical education not only in the state, but also in the entire Southern region of the country. It is home to many significant institutes like St. John’s Medical College, and others which are present in the city for longer than five decades and have established a benchmark for medical education excellence in the country.

<table>
<thead>
<tr>
<th>Medical College</th>
<th>Programs Offered</th>
</tr>
</thead>
</table>
| **Bangalore Medical College** | Government run institution, which has Victoria hospital, Bowring and Lady Curzon Hospital as teaching hospitals  
250 students are admitted for Undergraduate program, 135 for Postgraduate and 71 for diploma courses.  
Following are the courses offered:  
  - Under Graduate Courses  
    - MBBS  
  - Post Graduate Courses  
    - M.D/M.S  
    - M.Ch. (5 year course)  
    - Fellowship program - Diploma Program and Nursing |
| **MS Ramaiah Medical College** | MS Ramaiah medical College was started in 1979 and it is a teaching hospital with 1050 beds  
150 students are admitted for the Undergraduate program, MBBS  
The institute also has a dental college offering undergraduate and postgraduate degree in dental surgery  
Among the Post Graduation Programs, M.D., M.S., are offered in Anatomy, Biochemistry, Physiology, Microbiology, Pathology |
| **Manipal University, (Kasturba Medical College(KMC))** | Kasturba Medical College established in 1953, was the flagship institute for the Deemed university called Manipal University later, which came into picture in 1993  
KMC started off as a preclinical section and later in 1969 became a full fledged institute  
KMC runs four campuses in Karnataka and offers undergraduate - MBBS, postgraduate – MD, MS, MSc., super specialty – DM, MCH, M. Phil, and certificate courses  
Along with the medicine college, the university also runs other institutions across the state in the field of Allied Health Sciences, Applied Sciences, Dentistry, Health Sciences, Life Sciences, Nursing, pharmacy and other disciplines |
| **St. John’s Medical College** | The college started in 1963, by the Catholic Bishop conference in India  
A total number of 726 students are admitted each year which are supported by 608 staff members  
The institute has also started a research institute in the year 2004  
St John’s Medical College has an associated 1200 bedded hospital with it, which offers super specialty services  
The number of patients visited the hospital in 2007 were 503,274  
Courses offered by the institute are undergraduate courses:  
  - MBBS, Paramedical courses, Nursing courses for girls and super specialty |
Kempegowda Institute of Medical Sciences (KIMS)

- Kempegowda Institute of Medical Sciences and Hospital was founded in 1980 and was inaugurated by the then prime minister Mr. R. Gundu Rao
- The institute is located in two sections; Pre medical & Para Clinical departments and Clinical departments
- KIMS offers
  - Under graduation courses: MBBS
  - Post graduation courses: MD in Anatomy, Physiology, Medicine etc.; MS courses and Diploma courses in medicine

### 6.6.4. Opportunities for Swedish Companies

Key opportunities identified for Swedish companies / healthcare institutions in Bangalore / Karnataka are given as follows:

#### 6.6.4.1. Disease Treatment and Care Areas

1. **Development of portable equipment**: The government of Karnataka sees the need for development of equipment and technology that would enable testing across rural areas and non-urban areas. This would aid detection and diagnosis of various diseases, thereby helping public institutions with reducing disease mortality rates and increasing effectiveness.

2. **Care for HIV AIDS patients**: Karnataka being one of the 6 high incidence states for HIV AIDS, bearing about 10% of the total number of patients has HIV AIDS on its radar and is making slow progress on bringing down the disease burden. Therefore, expertise within service delivery, training of support staff for home care and inpatient care of persons living with HIV AIDS is an opportunity area for foreign companies.

3. **Equipment for Diagnosis and Treatment of Lifestyle diseases**: The Government of India, along with State Governments would be developing NCD clinics across various district hospitals in order to combat the increasing burden of lifestyle diseases in the country, including the rural areas. Therefore, equipment expertise within effective diagnosis and treatment of diseases such as CVDs, Cancers, Diabetes, etc would be opportunities for companies.

4. **Maternal and Child Care**: Maternal and Child Care was and is the prime focus of the State Government, and reduction of mortality rates remain major objectives. Technology and training to aid maternal and child care would be essential from the Government’s point of view. NRHM is also focusing on increasing awareness related to institutional deliveries.

5. **Infectious Diseases**: Apart from HIV AIDS, the Department of Health and Family Welfare, including NRHM also concentrates on reduction of vector-borne and water-borne diseases in the State. These topics come under the purview of public health which increases concentration on control and treatment of the diseases. Karnataka is also home to the Rajiv Gandhi Institute of Chest Diseases (also called the TB Sanatorium) which is a well-established Government institute dealing with Tuberculosis. The institute is looking to improve service delivery and treatment implementation.
6. **Geriatric care:** Another interesting area to look at would be the setting up of geriatric care institutions and training centres, the care for elderly population becoming an area of focus for the Government in the coming 5-year plan.

6.6.5. **Education and Training**

1. **Exchange Programs:** Various medical institutions are looking at the prospect of exchange programs with foreign universities in addition to the ones already established. This could be considered from both a public university as well as a private university perspective.

2. **Virtual Training and e-learning:** Continuous medical education is becoming a focus for many hospitals and institutions in the state. Due to time and cost constraints, virtual learning is fast catching on and could be an opportunity for many training institutes in Sweden.

3. **Capacity Development:** There is a lack of skilled professionals across all sectors in healthcare within the state. The State Government considers training and development of support staff as the need of the hour and has this on its agenda for the next phase of NRHM as well. Collaborations to create institutes of training could be an interesting opportunity for Swedish companies.
6.7. Hyderabad

6.7.1. Andhra Pradesh

Andhra Pradesh is the fourth largest and fifth most populous state in India. Agriculture is the chief source of income for the state, owing to the irrigation facilities. The state also has one of the longest coastlines in India making it one of the most important hubs for the shipping industry. Andhra Pradesh has the second most abundant mineral resources in India and owing to its water resources; it is the largest hydro electricity generating state in the country.

The presence of advanced Research & Development Institutions, Andhra Pradesh is a recognised as a pharmaceutical hub and a bulk drug capital of India with more than 266 bulk drug manufacturing companies. The state has also registered pharmaceutical exports worth SEK 25.6 million and the industry is growing at a rate of 20%. Presently there are around 3200 large scale industries and more than 2500 proposals for upcoming projects in Andhra Pradesh.

6.7.1.1. Hyderabad

Hyderabad, the capital city of Andhra Pradesh, is the fourth most populous city in the country and one of the largest in area. The twin cities of Hyderabad and Secunderabad come under the single municipal unit Greater Hyderabad Municipal Corporation. The city is the highest contributor in the state’s GDP and one third of the tax earnings.

Hyderabad is one of the largest Information Technology hubs of India, with major multinational players like Google, Microsoft, Oracle and IBM present in the city. The city is also the industrial hub for the biotechnology, and pharmaceutical industry. It has the maximum number of Special economic zones in the country.

Key Facts

<table>
<thead>
<tr>
<th>Key Facts</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Geographical Area</td>
<td>275,045 Sq km</td>
</tr>
<tr>
<td>Population</td>
<td>84,655,533</td>
</tr>
<tr>
<td>Key Industries</td>
<td>Information Technology, Biopharmaceuticals, Power, Automobiles, Religious Tourism, Textiles, Retail, Leather and Mining</td>
</tr>
<tr>
<td>Major Satellite Cities</td>
<td>Hyderabad, Secunderabad, Vishakhapatnam, Vijayawada, Warangal</td>
</tr>
<tr>
<td>Number of districts</td>
<td>23</td>
</tr>
<tr>
<td>Literacy Rate (%)</td>
<td>67.77</td>
</tr>
</tbody>
</table>

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Hyderabad is one of the largest Information Technology hubs of India, with major multinational players like Google, Microsoft, Oracle and IBM present in the city. The city is also the industrial hub for the biotechnology, and pharmaceutical industry. It has the maximum number of Special economic zones in the country.
6.7.2. Healthcare Status and Service Delivery in the State

Universal access to healthcare (UAHC) seems to have become the current slogan for health services development in Andhra Pradesh. This is in sync with international treaties such as Health for all by 2000, Millennium Development Goals, etc. One important approach for universal healthcare is enhanced public spending with a central role for the state in provision of services and funding. Andhra Pradesh has also been increasing its budgetary allocation on health and family welfare over the past years, visible in the below figure:

**Figure 6-28: Healthcare Budget in Andhra Pradesh**

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Budget</th>
<th>Budget for Healthcare</th>
<th>% spend on Healthcare (RHS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008-09</td>
<td>92.4</td>
<td>3.7</td>
<td></td>
</tr>
<tr>
<td>2009-10</td>
<td>98.8</td>
<td>4.1</td>
<td></td>
</tr>
<tr>
<td>2010-11</td>
<td>114.7</td>
<td>5.3</td>
<td></td>
</tr>
<tr>
<td>2011-12</td>
<td>142.4</td>
<td>6.5</td>
<td></td>
</tr>
<tr>
<td>2012-13</td>
<td>169.2</td>
<td>7.4</td>
<td></td>
</tr>
</tbody>
</table>

*Source: STC Analysis, Government of AP*

6.7.2.1. Health Infrastructure

The State Ministry for Health and Family Welfare is the nodal agency for administration of the healthcare delivery system. The state provides curative and preventive services to urban and rural areas through various agencies. The administrative framework for healthcare is depicted by the figure below:
The state is divided into 23 administrative districts, and has a developed health infrastructure with district hospitals, primary health centres and sub centres, community health centres, etc., catering to rural and urban areas. There are also some urban specialty-care hospitals set up by the state government which offer tertiary care for some of the diseases. The AP Govt is also concentrating on strengthening tertiary care in Public health institutions. The below figure talks of the number of various healthcare institutions in the state, as of 2008-09:

Under the public healthcare infrastructure, there were 38 050 beds spread across various healthcare establishments in the state in 2011. However, there is a shortfall of healthcare personnel at the community health centres by and large, especially professional staff such as doctors and health workers.
6.7.2.2. Major Disease in the State/ City

Andhra Pradesh’s performance on IMR, MMR and birth rate parameters is considerably better as compared to most of other Indian states. It has performed well even when compared to the country’s average, although the government is still far behind its set targets in terms of these parameters. Following figure depicts the state’s performance on IMR, MMR and birth rate parameters:

![Figure 6-31: Andhra Pradesh - Performance on Various Healthcare Parameters (2009-10)](image)

Maternal and Child care have been the primary focus for AP in the past 7 years, and would remain a top priority for the State in the coming years as well. Institutional deliveries in 2010-11 were almost 90.5% of total estimated deliveries, which makes it one of the top ranking states in terms of assisted and institutional deliveries in the country. Fully immunized children against reported live births were 97% in 2010-11. MMR and IMR reduction would be a continued focus as well.

The incidence of lifestyle diseases is relatively high in the state, although factors such as tobacco consumption and alcohol consumption are lower than most other Southern Indian states. However, there were 3.12 million cases of Acute respiratory infections which makes it the 2nd highest state in India in terms of respiratory infections. Urbanisation of cities like Hyderabad, Secunderabad, Vijayawada, etc., has overall added to the increase in burden of lifestyle diseases in the State.

Water-borne and vector-borne diseases such as Malaria, Diarrhoea, Cholera, Tuberculosis etc are also major threats to the State. Diarrhoeal diseases are the cause of close to 7% of all deaths in rural AP, while it causes close to 5% of all deaths in urban areas. TB causes about 5% of deaths on an average in both urban and rural areas. AP has the second highest number of smear positive patients in the country, which makes TB a big priority for the state.

Following figure includes the number of cases registered under various diseases in the state:
In addition to the above statistics, Andhra Pradesh is also considered one of the six high HIV-prevalence states in India, bearing about 21% of the total number of people living with HIV AIDS. AP is also the second highest state showing Adult HIV prevalence in India, after Mizoram. The AP State AIDS Control Society (APSACS) actively works towards the reduction of HIV AIDS incidence in the country.

The Commissionerate also aims to establish 4-5 geriatric clinics each in about 8 districts of the state in the coming 5-years in order to cater to the elderly population of the state. Establishment of NCD clinics catering to Diabetics care, Asthma control, Cardiovascular disease prevention and treatment, etc in different district hospitals and community health centres.

### 6.7.2.3. Progress of NRHM Projects

As per the Mission Director for NRHM in Andhra Pradesh, AP achieved about 82% of the planned objectives and goals laid out for the previous phase of NRHM. NRHM was rolled out in 2005 nationwide with an intent of architectural correction of existing health system through Self or flexible finance of health institutions and community participation.

Key strategies under NRHM in AP include, upgrading 2000 CHCs to FRUs capable of providing emergency obstetric and neonatal care services, fully operationalising all CHCs and 50% of PHCs to provide 24/7 delivery services and newborn care, empowering non-specialist medical officers to undertake emergency obstetric procedures and administer anaesthesia, and promotion of assisted births, strengthening the skills of ANMs to provide life-saving care and stimulating demand for safe delivery through programs such as JSY.

Following figure shows year-wise allocation and utilization of funds under NRHM in Andhra Pradesh:
Key achievements under the NRHM are given below:

<table>
<thead>
<tr>
<th>Focus Area under NRHM</th>
<th>Achievements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human Resources</td>
<td>• Promotion of Accredited Social Health Activists (ASHAs); 70 700 ASHAs have been recruited, of which 68 500 have been trained</td>
</tr>
<tr>
<td></td>
<td>• About 51 201 ASHAs have been provided with drug kits</td>
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<tr>
<td></td>
<td>• 10 322 Sub-centres are functional with an ANM, 9 505 SCs are strengthened with a 2nd ANM</td>
</tr>
<tr>
<td></td>
<td>• As far as manpower expansion is concerned, 121 Staff Nurses, and 9 505 ANMs have been recruited on contractual basis</td>
</tr>
<tr>
<td>Infrastructure Development</td>
<td>• 690 PHCs have been strengthened with three Staff Nurses each to make them functional 24x7. The facility survey was completed in 168</td>
</tr>
<tr>
<td></td>
<td>• A total of 58 SDHs, 120 CHCs including facilities below district level and 16 District Hospitals are functioning as FRUs</td>
</tr>
<tr>
<td></td>
<td>• 17 districts have functional Mobile Medical Units (MMU)</td>
</tr>
<tr>
<td>Services</td>
<td>• Institutional deliveries increased to about 91% of the total</td>
</tr>
<tr>
<td></td>
<td>• JSY beneficiaries increased significantly from zero in 2006-07 to about 435 000 in 2007-08. And, a total of 450 000 deliveries were recorded under JSY during the year 2008-09</td>
</tr>
<tr>
<td></td>
<td>• 2 districts are implementing IMNCI (Integrated Management of Neonatal and Childhood Illnesses) &amp; 1 555 people have been trained so far</td>
</tr>
<tr>
<td></td>
<td>• There have been around 2 million Village Health Nutrition Days held since the launch of NRHM (in 2009)</td>
</tr>
</tbody>
</table>

Apart from the above achievements, NRHM in Andhra Pradesh has also instituted various health programs in line with National programs. Details of these are listed below:
<table>
<thead>
<tr>
<th>S. No.</th>
<th>Program</th>
<th>Details</th>
</tr>
</thead>
</table>
| 1     | Maternal Care: Janani Suraksha Yojana (JSY)                              | • Maternal and child health has been one of NRHM’s biggest priorities even at the State level  
       |                                                                         | • About 34% of the total expenditure on RCH was spent on JSY in 2008-09  
       |                                                                         | • The number of JSY beneficiaries is increasing every year. The state has also accredited 1 100 private institutions under the scheme  
       |                                                                         | • Training on life-saving anaesthesia skills, emergency obstetric care, skilled birth attendant training, etc., has been ongoing |
| 2     | Comprehensive Emergency Obstetric and Neonatal Care (CEMONC)             | • Strengthening of First Referral Units with CEMONC Services  
       |                                                                         | • 151 CEMONC Centres have been set up with the objective of providing life-saving emergency care to mothers and children  
       |                                                                         | • Every CEMONC centre is designed to have 4 obstetricians, 1 paediatrician, 1 anaesthetist, blood bank or blood storage centre  
       |                                                                         | • Additional budget for drugs & consumables for each case of delivery has also been provided |
| 3     | Revised National Tuberculosis Control Programme                          | • RNTCP was implemented in the entire state in 2004  
       |                                                                         | • The State has 178 tuberculosis units and 918 Designated Microscopy Centres  
       |                                                                         | • During 2011 till Sep, 28 077 cases were detected of which 12 600 were New Smear Positive cases. The new smear positive case detection rate is 79%; Sputum conversion is 92% and cure rate of 87% in new smear positive cases |
| 4     | National Vector Borne Disease Control Programme (NVBDCP)                | • Malaria, Dengue, Chikungunya, Japanese Encephalitis and Filariasis are prevalent in the State. Kala-azar is not reported till date  
       |                                                                         | • All 23 districts in AP are known to be Malaria and Dengue Endemic  
       |                                                                         | • 6 high endemic districts would be covered under World Bank Assisted National Vector Borne Disease Control Project during Phase-II of NRHM in AP  
       |                                                                         | • The state has 3 823 Fever Treatment Depots (FTDs) and 1 135 Malaria Clinics |
| 5     | 108 (Ambulance service)                                                 | • There are 752 Emergency Transport Service Vehicles running in the state under a PPP initiative between GVK-EMRI and NRHM  
       |                                                                         | • AP has pioneered the 108 EMRI referral transport system  
       |                                                                         | • The target group is pregnant women, infants, children and people with chronic diseases  
       |                                                                         | • These 108 EMRI services are provided for free and are popular in the State having also been implemented in the state of Karnataka  
       |                                                                         | • The service attends to around 4 500 emergencies in a day |
6.7.3. Concrete Projects from Sweden’s point of view

6.7.3.1. Existing Hospitals

Hyderabad is home to major private healthcare players in the country. All the eminent hospital chains like Apollo, Fortis and Kamineni hospitals have their presence in the city with various facilities to cater the needs of the large population of the metropolitan capital city.

<table>
<thead>
<tr>
<th>Hospital</th>
<th>Private/Public</th>
<th>No. of beds</th>
<th>Comments</th>
</tr>
</thead>
</table>
| Apollo Hospitals                  | Private        | 350         | • It is a chain of super specialty hospitals with 3 centres operational in Hyderabad itself  
• The hospital handles 100,000 patients every year with an average staff to patient ratio is 3:1  
• The focus area of the hospitals is Cardiology, Cardiothoracic surgery, Trauma & Critical Care, Neurosurgery and Orthopaedics  
• Apollo hospitals was also a pioneer in establishing telemedicine in India |
| Krishna Institute of Medical Sciences | Private      | 1000        | • It’s a super specialty, ISO certified hospital chain spanning across Andhra Pradesh  
• The hospital is one among the pioneers to open the Epilepsy centre in Oct 2010  
• It also has a paramedical Nursing institute associated with the hospital |
| Global Hospitals                  | Private        | 450         | • Global Hospital offers tertiary level super specialty care and multi organ transplant services; operating with 2 centres and a satellite branch in Hyderabad along with 2 other centres in India  
• The hospital chain is known for performing liver, heart, lung, kidney, heart - lung transplantation and bone marrow transplantation with around 15% of its revenues coming from transplants |
| Care Hospital                     | Private        | 763         | • Care hospital is a chain of hospitals providing tertiary and primary healthcare services with a bed capacity of 1600 beds in 12 cities and 450,000 out patients per year  
• The group has 4 hospitals operational in Hyderabad area  
• The Care Group is known for their services in cardiac care, neurology, nephrology and general medicine |
| Kamineni Hospitals                | Private        | 350         | • Kamineni hospital is a super specialty chain with 2 hospitals and 1 fertility centre operational in Hyderabad and 1 in Nalgonda district of Andhra Pradesh. The overall bed capacity is 1600 for the group  
• The hospital has associated medical institutes for medical sciences, dental sciences, paramedical sciences and institute for nursing |

143 ExpressHealthcare Website
### 6.7.3.2. Upcoming Hospitals and Up-gradation Projects for Hospitals

Hyderabad is an upcoming destination for major healthcare investors like Apollo Group and Fortis. Being the bulk drug capital of the country, it makes an attractive centre for the healthcare setups to expand and invest.

<table>
<thead>
<tr>
<th>Hospital</th>
<th>Private/Public</th>
<th>No. of beds planned</th>
<th>Other details</th>
</tr>
</thead>
</table>
| Care Hospital    | Private        | 200                 | - The Advent International Group from UK has reportedly planned to invest SEK 670 million for the Care Hospital expansion plans by 2012.  
- The group is planning to spread across the 2 tier cities and improve the existing facility of one of the Hyderabad centre;¹⁴⁴ by increasing the bed capacity from 300 to 500. |
| Fortis Hospital  | Private        | 150                 | - Fortis has planned to open another hospital in Hyderabad with a bed strength of 150 |

### 6.7.3.3. Medical Colleges

The city is equipped with a number of private and government owned medical institutes. Many of the medical institutes have hospitals associated with them and are renowned across the nation. Osmania Medical College and Nizam’s institute of Medical Sciences are among the oldest in the city.

<table>
<thead>
<tr>
<th>Medical College</th>
<th>Programs Offered</th>
</tr>
</thead>
</table>
| Osmania Medical College                | - Osmania Medical College was founded in 1946  
- It has nine teaching hospitals affiliated to it offering Under graduation courses such as MBBS, BPT (Bachelors in Physical Therapy), Post Graduation Courses such as Doctor of Medicine, PG Diploma and Non clinical Courses. It also offers super specialty courses in Medical and Surgery domains |
| Deccan College of Medical Sciences (DCMS) | - Deccan College of Medical Sciences, established in 1984 is a medical college for Muslim minority with an intake of 150 students each year  
- There are 2 hospitals i.e. Princess Esra Hospital and Owaisi Hospital and |

¹⁴⁴ India mart Website
Research Centre attached to the institute
- There are other institutions for hospital management, Owaisi School of Nursing, Owaisi College of Nursing, Deccan School of Pharmacy and DCMS College of Pharmacy associated with the institute
- The college offers graduation degree i.e. MBBS, post graduation degree in Medicine, Surgery and Radiology and Diploma courses in Obstetrics and Gynaecology

Nizam’s Institute of Medical Sciences (NIMS)
- NIMS is an autonomous university established under the Act of Andhra Pradesh State Legislature in June 1989
- The institute has a medical facility with 985 beds and a staff of 2219 members
- The institute offers Under Graduate courses in Nursing, Physiotherapy, Post Graduation courses in Medicine, Paramedical Sciences and hospital management. It also offers part time post graduation courses in Clinical research

Kamineni Institute of Medical Sciences (KIMS)
- KIMS was established in 1999 as a teaching hospital, presently operating as a with 1050 beds and super specialty facilities
- It offers undergraduate courses such as MBBS, post graduate courses in Medical Sciences

6.7.4. Opportunities for Swedish Companies

The Government of Andhra Pradesh has shown keen interest in collaborating with Swedish Institutions in order to develop the healthcare situation in the State. Therefore, given below are some key opportunities identified for Swedish companies / healthcare institutions in Hyderabad / Andhra Pradesh:

6.7.4.1. Disease Treatment and Care Areas

1. **Tele diagnostics**: In order to increase effectiveness, with minimal time and investment, telediagnostics or remote diagnostics is a focus area for the Government which is looking to increase the spread of telemedicine in the State. Equipment and expertise alike would be interesting for AP to look at, and it considers tele diagnostics the need of the hour

2. **Sick New Born Care Units (SNCU)**: SNCU is expected to provide care at birth, resuscitation of asphyxiated newborns, managing sick newborns (except those requiring mechanical ventilation and major surgical interventions), post natal care, follow up of high risk newborns, referral and immunization services. The setting up of SNCUs is expected to provide a requisite answer to the challenges posed by the NRHM and any expertise in the process of establishing these SNCUs would be of help to the State Government

3. **Gene Mapping and Gene diagnostics**: The Government is also looking at commencing gene mapping and gene diagnostics at various tertiary care hospitals such as Niloufer hospital in order to reduce the incidence of newborn diseases. Opportunities via partnerships could exist within this area, along with any possibilities of joint research, sharing of best practices across the countries, etc

4. **Infectious diseases and HIV AIDS**: The other focus of the government is to reduce the number of cases and deaths reported due to infectious diseases, including HIV AIDS.
there are a number of awareness programs and campaigns being executed by the
Government as well as NGOs and other institutions, the need for hands on training and
development of equipment is essential. Infection control is another opportunistic area for
Swedish companies

5. Geriatric care: The Government intends to set up 4-5 geriatric centres in about 7 districts in
the coming 5-year plan. It has also expressed interest to explore a collaboration within
knowledge sharing and implementation of such centres

6. Infrastructure development and establishing a model healthcare institute: The
Government was also keen on establishing a model healthcare delivery institute in
collaboration with a Swedish institution. This could be used as a benchmark for future
expansion plans in the State by various public and private stakeholders

6.7.4.2. Education and Training

1. Exchange Programs: One of the most exciting opportunities that Indian universities see is
exchange programs. In addition to the existing exchange programs with foreign universities
already established, various medical universities would be interested in considering more of
such opportunities both from a student side as well as a faculty exchange possibility. This
could be considered from a public university as well as a private university perspective.

2. Virtual Training and e-learning: Virtual education in medical universities is a concept that is
slowly catching up across the country. AP is also open to the idea of e-learning even from the
focus of continuous medical education (CME.) CME is becoming a focus for many hospitals
and institutions in the state. Due to time and cost constraints, virtual learning is fast catching
on and could be an opportunity for many training institutes in Sweden.

3. Capacity Building: One of the biggest challenges faced by hospitals and healthcare
institutions in India is the lack skilled persons across all sectors in healthcare. The
Governments are impacted the maximum owing to the financial compensation attached to a
public sector job. Therefore, the Commissioner for Health and Family Welfare, AP as well as
the Mission Director in the State consider it the need of the hour to develop skill-sets and
improve training of non-qualified staff. Collaborations to create institutes of training could be an
interesting opportunity for Swedish companies.
Conclusion and Next Steps
7. Conclusion

India today is undergoing what is known as an epidemiological, health and demographic transition whereby there is a gradual shift in the disease pattern. Changing lifestyles and increased life expectancy are some of the factors that are leading to the higher growth of non-communicable disease or lifestyle disease in terms of level of acuteness and prevalence as compared to various communicable diseases. As a result, lifestyle disease/non-communicable disease including cancer, CVDs, diabetes, etc. have emerged as the largest cause of mortality in the country and are responsible for over 50% of deaths.

Infectious/communicable diseases are still prevalent and cause about 34% of mortality in India. About one-quarter of all deaths in India are due to diarrheal diseases, tuberculosis, malaria, and respiratory infections. Rural areas report about 41% of all deaths to be due to infectious diseases.

The public sector has been focusing on improvement of basic healthcare infrastructure and provision of adequate healthcare services to rural population in India. Meanwhile, the private sector has started covering tier II and small towns in India through new and innovative business models. With rapid expansion in the healthcare delivery system, easy availability of funds and enhanced focus from the government as well as the private sector, a number of opportunities have emerged across healthcare sector in India.

Upcoming hospitals as well as upgradation projects for existing hospitals has resulted in a considerable demand for advanced medical equipment across the country. Rise in the disposable income (15.6% in 2010-11) in India has led to patients demanding high-quality healthcare services, which in turn has forced the hospitals to invest in high-quality equipment. India’s growing popularity as a preferred medical tourism destination especially for patients from Middle East and South East Asia have further added to this trend. Also, the requirement of portable diagnostic and treatment solutions in India is very high, given the government focus on expanding the coverage of healthcare services to rural areas.

There is also significant requirement for assistance in capacity building especially training of health workers involved in child care, maternal care and elderly care and sharing of expertise. R&D collaborations and better lab testing are also opportunities that could be explored by Swedish healthcare institutions.

Almost all sectors covered in the study showcase significant business potential. However, there are certain sectors that look more promising and exhibit business opportunities in near future. A number of factors were considered for selection of high-potential areas, which included current size, future potential in terms of magnitude of the problem, governmental programs, dependency on imports etc. Following table depicts shortlisted potential areas:
### Area

<table>
<thead>
<tr>
<th>Area</th>
<th>Diagnostics</th>
<th>Devices</th>
<th>Training and education</th>
<th>R&amp;D Collaborations</th>
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</thead>
<tbody>
<tr>
<td><strong>Public Health</strong></td>
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<tr>
<td>Maternal care, child care</td>
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<tr>
<td>Tobacco, Alcohol, Drugs</td>
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<tr>
<td><strong>Lifestyle Diseases</strong></td>
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<tr>
<td>Cancer care</td>
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<td>Cardiovascular diseases</td>
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<td>Obesity</td>
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<td>Diabetes</td>
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<tr>
<td>Hypertension</td>
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<td><strong>Infectious Diseases</strong></td>
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<td>HIV AIDS</td>
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<td>Malaria</td>
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<td>Tuberculosis</td>
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<tr>
<td>Infection Control</td>
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<tr>
<td>Diarrhoeal diseases</td>
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<td>Respiratory diseases</td>
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<tr>
<td><strong>Elderly Care</strong></td>
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<tr>
<td>Alzheimer and Dementia</td>
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<tr>
<td>Stroke</td>
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<tr>
<td>Home based care and devices</td>
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<tr>
<td>Geriatric care and devices</td>
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</tbody>
</table>

*shortlisted sectors are highlighted in bold

7.1. **Next Steps**

Sweden has a strong brand equity in India and Swedish companies are well known for their quality products across telecom, engineering, automotive and other sectors in the country. However, the healthcare industry and especially the medical devices sector are dominated by the US and German companies including Siemens, GE, etc. Recently, Chinese companies have also started making inroads into the Indian healthcare market.
Among Swedish companies, Elekta, and Getinge are well known brands in India; however, significant effort is still required to develop Sweden as a strong brand in the Indian healthcare industry. Hence, probable next steps are depicted in the figure below:

### 7.1.1. Promotion of Symbiocare Concept

During the meetings with various stakeholders across different states in India, the Swedish Healthcare concept—Symbiocare—was introduced and discussed. Hence, this concept can be further promoted and can also be used as a starting point of discussions among various Swedish companies and Indian stakeholders. Following means can be adopted to promote Symbiocare concept in India:

- Road shows in multiple cities across India
- Participation in relevant events and exhibitions
- Creating unique events to showcase Swedish capabilities in healthcare

### 7.1.2. Collaboration between Swedish and Indian SMEs

There is an immediate requirement of a business development forum that focuses on fostering cooperation Swedish and Indian organisations. A sustainable forum needs to be developed to follow upon projects made between international companies and local Indian businesses. Following activities are proposed:

- Innovation workshops
- Match making activities
- Events with delegations
- Skill building and CSR promotion

Given their prior experience and proven expertise, Swecare and STC can act as facilitators for Swedish companies and help them in meeting the right stakeholders in India.

### 7.1.3. Information Gathering and Dissemination

Due to a dynamic nature of the Indian healthcare industry, timely information becomes critical in order to leverage business opportunities in India. Hence, regular information gathering and dissemination needs to be done, which will include:

- Study and report developments at the market for Health Technologies in India through a quarterly newsletter
- Find and actively convey potential mutual opportunities (e.g. tracking tenders, and forwarding enquiries)
- Be a point of contact in India for Swedish Companies to get general information, discuss business opportunities and to get access to contacts
Major Stakeholders – Hospitals
8. Major Hospitals in India

8.1. Max Healthcare

8.1.1. Overview of the Hospital


8.1.2. Geographical Locations

Max Healthcare has 9 facilities in Delhi-NCR with a capacity of 930 beds and 2 hospitals in Mohali & Bhatinda. Among the chain of 11 hospitals, Max has 7 super-specialty hospitals and 3 multi-specialty hospitals. Max Healthcare has its presence across India as shown in the below map:

**Figure 8-1: Max Healthcare – Presence Across India**

8.1.2.1. Major Departments and Facilities

Max Healthcare offers medical services in various disciplines. Below is an extract of some specialties and major departments.
Other major departments include the departments for Minimal Access Surgery, Bariatric and Metabolic Surgery, Cardiology, Cardiac Surgery, Eye and Dental Care, Nuclear Medicine, and Physiotherapy and Rehabilitation, etc.

8.1.3. Education Courses Offered

Max Healthcare Institute runs a medical education and training division by the name of “Max Institute of Medical Excellence (MIME)”. The Institute focuses on imparting healthcare education and trainings to doctors, nurses, paramedical staff and non-medicos. It offers 50 courses and also offers specially designed modules for non medical background including executives, and school students. The courses offered include First aid, Stress management, etc.

The institute holds a certification from the American Heart Association as an International Training Organization. The Institute offers the following courses:
8.1.4. Future Plans

Max Healthcare is planning to start its operations in Dehradun by mid of year 2012. It will be a multi-specialty division with a capacity of 206 beds. Over the period of next 2 years, the hospital is expected to increase the number of beds to 1900 across the country.

It is also planning to set up a medical education institute in Greater Noida\textsuperscript{145} with an investment budget of SEK 1.42 billion. The institute will have an in house medical college (50-150 seats), nursing college (100 seats) and a college for allied health services (300 seats). It is planned to be operational by 2013. In addition, it is planning to set up 3 additional nursing colleges in Dehradun, Noida and Punjab in the coming 3 years and eventually plans to increase its bed strength to 5000 in-patient beds over the next five years.

8.1.5. International Collaboration

Max India has collaborated with Harvard Medical International, an arm of the Harvard Medical School, at the time of its establishment for laying down the foundation for its clinical protocol and processes. It also has collaboration with Singapore General Hospital in areas such as clinical practice, nursing, paramedical, research and training. Recently, Max Healthcare entered into an academic affiliation with the U.S. based Baylor College of Medicine’s Centre\textsuperscript{146} for Globalization through a memorandum of understanding (MoU).

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure8-3.png}
\caption{Education courses offered at Max Healthcare}
\end{figure}

\begin{itemize}
\item Masters in Emergency Medicine
\item Post-graduate Diploma in Community Cardiology
\item Fellowship in Non Invasive Cardiology
\item Egaz Muniz Fellowship in Neurointervention and Stroke
\item B.Sc. in Emergency and Trauma Care Technology
\item Neuro Endovascular Cath Lab Technician Training
\item Sterilization (CSSD) Course
\item Critical Care Nursing
\item Operation Theatre Nursing
\item Labour Room Nursing
\item Basic Orientation to Laproscopic Surgery
\end{itemize}

\textsuperscript{145} Economic Times Website
\textsuperscript{146} BCM Website
8.2. All India Institute of Medical Sciences

8.2.1. Overview of the Hospital

All India Institute of Medical Sciences also known as AIIMS was established in the year 1956 as an autonomous institution by an Act of Parliament. The main objective behind the creation of AIIMS was to nurture excellence in the field of healthcare. It provides facilities for teaching and research in 42 disciplines and patient care.

The Institution provides education in the field of Medical Sciences at both undergraduate and postgraduate level. It also runs a college of Nursing and has 25 clinical departments which include 4 super specialty centres.

The research centre at AIIMS undertakes investigations in the field of neurosciences, genetics and computer simulation of hormone-receptor interaction. The centre also undertakes clinical and epidemiological studies on the prevention and treatment of national health problems.

AIIMS hospital has a capacity of 1766 beds (including emergency and private wards), 1323 doctors and 1810 nurses. The average occupancy of beds at the hospital is 80%.

8.2.2. Geographical Locations

The AIIMS hospital is located at Ansari Nagar in New Delhi. It also operates a 60-bedded hospital in Ballabgarh, district Faridabad in Haryana. The Health Ministry of the Government of India\textsuperscript{147} is in the process of setting up six new AIIMS like institutes in the cities of Bhubaneswar, Bhopal, Raipur, Jodhpur, Rishikesh and Patna. All the institutes are under construction and will start their operations by end of year 2012. The AIIMS facility at Jodhpur\textsuperscript{148} and Bhopal\textsuperscript{149} will be functional by August 2012.

All the institutes are being set up with the aim of correcting regional imbalances in quality tertiary level healthcare in the country and also for attaining self-sufficiency in graduate and postgraduate medical education.
8.2.3. Education Courses Offered

AIIMS institute offers courses at both Undergraduate and post graduate level. It is the only institution in the country which offers a B Sc (Hons) course in Human Biology. The institute has about 600 research publications by its faculty and researchers. A separate division – Centre for Medical Education and Technology (C-MET) – makes new educational technologies available to faculty and students alike.

AIIMS offers the following medical education courses:
8.2.3.1. **Major Departments and Facilities**

AIIMS has 7 specialty centres and around 41 major departments. Its super specialty centres are depicted below:

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### Figure 8-5: Education courses offered at AIIMS

<table>
<thead>
<tr>
<th>Post-graduate Courses</th>
<th>Undergraduate Courses</th>
<th>Paramedical Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>• M.D./M.S./M.D.S.</td>
<td>• MMBS</td>
<td>• B.Sc. (Hons.) in Ophthalmic Techniques</td>
</tr>
<tr>
<td>• M.Ch. (5-year course)</td>
<td>• B.Sc. Nursing (Post Certificate)</td>
<td>• B.Sc. (Hons.) in Medical Technology</td>
</tr>
<tr>
<td>• M.Sc./M. Biotechnology</td>
<td>• B.Sc. (Hons.) Nursing</td>
<td></td>
</tr>
</tbody>
</table>

---

### Figure 8-6: Super Specialty Centres At AIIMS

- Cardio Thoracic Sciences Centre
- Centre for Dental Education and Research
- Superspeciality Centers
- Neuroscience Centre
- Jai Prashah Narayan Apex Trauma Center
- Dr. B.R.A. Institute - Rotary Cancer Hospital
- Dr. R.P. Centre for Ophthalmic Sciences

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Source: AIIMS Website
Other major departments include departments for Anaesthesiology, Biotechnology, Dermatology and Venereology, Nuclear Medicine, Paediatric Surgery, and Reproductive Biology. Finally, some areas pioneered by AIIMS include Cardiac Catheterization, Heart Valve Surgery, PortaCaval Surgery, Neonatal Surgery, Joint Replacement, Cochlear Implant, and Multi Organ Transplants.

8.2.4. Future Plans

Apart from the 6 Institutes being under construction, the Union Health Ministry150 under the 12th five year plan is planning to start up 4 more institutes. As per the Ministry, the location of these institutes will be decided based upon the regional health indicators, local disease burden and other factors such as geographical location, physical infrastructure and transportation.

AIIMS Delhi has also come up with a proposal for expanding and re developing its facilities151. The institute has submitted its Master plan 2009-2014 to the Federal Health Minister for approval. The proposal includes construction of separate block for testing and screening patients, central laboratory block, underground parking spaces, over-bridges connecting various departments, an in-house sports centre, amphitheatre, swimming pool, and a shopping mall.

8.2.5. Swedish Presence

AIIMS has adopted Swedish technology Elekta Gamma Knife152, a radio surgery machine for conducting minimally invasive surgery. At present 8 Gamma Knife machines have been installed in India, out of which 4 are in Delhi. The hospital treats about 250 patients annually with Gamma Knife Radio surgery. According to doctors at AIIMS153, the machine has, “improved the treatment and made it cost-effective”.

8.2.6. International Collaboration

AIIMS has established India’s first organized familial gynaecologic cancer clinic154 in 2010 in an ongoing collaboration with the Institute for Women’s Health (IfWH) at University College London in the field of Gynaecological Oncology. Both institutions are working towards creating opportunities of further collaborations to other areas of gynaecological cancer and women’s health issues.

The Dr. R.P. Centre for Ophthalmic Sciences at AIIMS has been designated as a World Health Organization (WHO) Collaborating Centre. The centre is collaborating with WHO across fields such as clinical; applied and basic research.

150 India mart Website
151 Worldinteriordesignnetwork Website
152 Top news Website
153 Aalatimes Website
154 UCL Website
8.3. Apollo Hospitals Group

8.3.1. Overview of the Hospital

Apollo Hospitals Group with 8500 beds across 54 hospitals within and outside India is one of the largest healthcare groups in Asia. The group started its first 150 bedded hospital at Chennai. The group is an integrated healthcare organization with owned and managed hospitals, diagnostic clinics, dispensing pharmacies and consultancy services. It also has interests in insurance and education and research.

8.3.2. Presence in India

Apollo hospitals own and manage 41 hospitals in India with a total capacity of 7000 beds spread across 20 cities. Seven of its hospitals have received JCI (Joint Commission International, USA) accreditations. Some of the major Apollo hospitals are:

<table>
<thead>
<tr>
<th>Hospitals</th>
<th>Comments</th>
</tr>
</thead>
</table>
| Apollo Hospital, Chennai                 | • Flagship hospital established in 1983, currently has over 650 beds and 60 departments
                                              • First Indian hospital to be awarded the ISO 9001 and ISO 14001 Certifications.
                                              • Accreditation from the Joint Commission International (JCI) USA.
                                              • Declared as a ‘Centre of Excellence’ by the Government of India. |
| Indraprastha Apollo Hospital, New Delhi  | • 550 bedded hospital
                                              • First hospital in India to have JCI accreditation and reaccredited in 2008
                                              • Offers 52 medical and surgical disciplines in fields such as Cardiology, Oncology, Neurology, Nephrology, Orthopaedics, Urology etc.
                                              • Largest Sleep Lab in Asia.
                                              • First Hospital Laboratory to be accredited by NABL (National Accreditation Board for Testing and Calibration Laboratories) |
| Apollo Gleneagles Hospital, Kolkata      | • 510 bedded hospital
                                              • Joint venture of Apollo Group of Hospitals and Parkway Health of Singapore
                                              • JCI accredited and NABL certified
                                              • Initiated a 100 bedded Apollo Gleneagles Cancer Hospital, to improve the cancer care scenario in West Bengal |
| Apollo Hospitals, Hyderabad              | • 350 bedded multi-specialty hospital
                                              • 50 specialties and super specialties
                                              • It has institutes for Heart Diseases, Cancer, Joint Diseases, Emergency, Renal Diseases, Neurosciences, Eye and Cosmetic Surgery |

Some of the owned and managed hospitals by Apollo Hospitals Group are illustrated below:
8.3.3. Presence across Healthcare Spectrum

Apollo Hospitals Group follows an integrated healthcare delivery model with interests spread across the healthcare spectrum. The total revenues earned by Apollo Hospitals group were SEK 2.9 billion for the fiscal year 2011.
8.3.4. Initiatives by Apollo Hospitals Group

Apollo Hospitals Group in an effort to improve the healthcare delivery system in India has undertaken a lot of initiatives such as:

8.3.4.1. Apollo Telemedicine Network Foundation (ATNF)

ATNF was founded in 1999 as a non-profit organization with an aim of delivering healthcare service and education in regions that are geographically less accessible using latest in telecommunication technology. At present there are 135 telemedicine centres (including 10 overseas). The foundation has a tie-up with Ericsson\textsuperscript{155} to promote telemedicine in remote areas of the country via the HSPA (High Speed Packet Access Network) network.

\textsuperscript{155} Economic times Website
8.3.4.2. **Apollo Reach Hospitals**

In order to provide quality and affordable healthcare facilities to the rural and semi-urban India, Apollo Hospitals initiated the launch of Apollo Reach. It started with its first 120 bedded hospital at Karim Nagar, Andhra Pradesh in 2008.

Other initiatives by Apollo Hospitals Group include:

- DISHA - Distance Healthcare Advancement Project
- SAHI – Society to Aid the Hearing Impaired
- CURE - An Apollo Hospitals cancer care initiative
- SACHI – Saving a Child’s Heart Initiative
- Billion Hearts Beating
- Disaster relief Programs
- CSR initiatives

8.3.5. **Future Projects**

Over the next 3-5 years, Apollo Hospitals Group plans to add over 2500 beds with an estimated investment of SEK 2.1 Billion. It also plans to set up acute care hospitals in tier-II cities under the ‘Reach’ initiative with a capacity of around 100-200 beds.
8.4. Bombay Hospital

8.4.1. Overview of the Hospital

Bombay Hospital is a privately owned hospital with its headquarters in Mumbai, India. The hospital was established in 1950 by R.D. Birla (Birla Group is one of the India’s foremost business houses).

The hospital has a capacity of 830 beds, including 110 beds for critical care and recovery area. It has 22 operation theatres. Around 33% of the patients admitted in the general ward are given free treatment at this hospital. The free OPD (Out Patient Department) treats more than 100,000 patients annually. In all, an average of 200,000 patients and 28,000 inpatients visit the hospital each year. Since 2004, Bombay Hospital has been considered as one of the top 10 multi speciality hospitals in Mumbai for its Emergency and Super Speciality care services.

The Hospital has its operations in Indore as well. It operates as a 600 bedded super speciality tertiary care referral centre with world class facilities.

8.4.2. Geographical Locations

The hospital has its presence across two locations in India- Mumbai and Indore. It also plans to set up a 600 bedded hospital in Jaipur by 2012, with a focus on providing treatment to the weaker section of the society. Around 10% of the beds at the hospital will be reserved for the Below Poverty Line category. Apart from housing advanced diagnostic centre and blood bank, the hospital will also have nursing college and Physiotherapy College in the campus.

The presence for Bombay Hospitals in India is shown in the map below.
8.4.3. Education Courses Offered

Bombay Hospital runs an “Institute of Medical Sciences” in Mumbai. The institute was established in 1952 in Mumbai. The institute offers 3 year Post Graduate courses such as M.D. in Anaesthesiology, General Medicine, Pathology, Radiology, General Surgery, Obstetrics & Gynaecology, Ophthalmology and Orthopaedics. It also offers Doctorate Courses in Cardiology, Nephrology, Neurology, etc.

In 2008, Bombay Hospital Trust established a Bombay hospital- college of nursing in Indore for female applicants. It offers 4 year course in B.Sc. Nursing.

Bombay Hospital along with Christian Medical College, Bangalore has collaborated with BITS (Birla Institute of Technology and Science) located at Pilani (Rajasthan). BITS offers a 2 year programme such as M.Phil. Hospital and Health Systems Management for employed professionals.

8.4.3.1. Major Departments and Facilities

Bombay Hospital, Mumbai has an associated RD Birla International Cardiac Centre which is the coronary Artery Bypass Grafting Complex. It conducts 1800 surgeries and 4000 angioplasties & angiographies every year.

The hospital has 5 clinical departments and other areas of specialisation such as Plastic Surgery, Paediatrics, Medical oncology, Ophthalmology, Haematology, Anaesthesiology, ENT, Dental Care, Dialectology, Gastro-enterology, Gynaecology and General Medicine.
8.4.4. Future Plans

Bombay Hospital Trust is on the improvising mode and has inaugurated a new intensive care unit and first class ward. Besides, Bombay Hospital College of Nursing is also planning to start M.Sc. Nursing course and short term specialisation courses in the near future.
8.5. Columbia Asia

8.5.1. Overview of the Hospital

Columbia Asia, founded in 1994 is a Kuala Lumpur, Malaysia based hospital chain with 16 hospitals present across India, Malaysia, Vietnam and Indonesia.

The chain follows a model where they build small 100 bedded secondary care hospitals in non-prime neighbourhoods. The chain of hospitals provides a wide range of specialties; however the core specialties are in the field of kidney transplants, Orthopaedics and Neurology and Spine surgery.

8.5.2. Presence in India

Columbia Asia is currently present at 8 locations across India and plans to set up 13 additional facilities including an airport clinic in India in the near future.

Figure 8-11: Columbia Asia Hospitals, India

Source: Columbia Asia Website and Desktop Search
Some of the hospitals present in India are:

<table>
<thead>
<tr>
<th>Hospitals</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Columbia Asia Hospital, Ghaziabad</td>
<td>• 90 bedded Hospital</td>
</tr>
<tr>
<td></td>
<td>• Focuses on non-invasive cardiac care, medical oncology, neurosurgery,</td>
</tr>
<tr>
<td></td>
<td>minimally invasive surgery, critical care among others</td>
</tr>
<tr>
<td>Columbia Asia Hospital, Patiala</td>
<td>• 90 Bedded Hospital</td>
</tr>
<tr>
<td></td>
<td>• Focus on secondary care facilities</td>
</tr>
<tr>
<td>Columbia Asia Hospital, Mysore</td>
<td>• 100 bedded hospital</td>
</tr>
<tr>
<td>Columbia Asia Hospital, Bangalore</td>
<td>• 100 bedded hospital, started in 2005</td>
</tr>
<tr>
<td>Columbia Asia Hospital, Palam Vihar</td>
<td>• 90 bedded hospital</td>
</tr>
<tr>
<td>Columbia Asia Hospital, Kolkata</td>
<td>• 100 bedded hospital</td>
</tr>
<tr>
<td>Columbia Asia Referral Hospital, Yeshwanthpur,</td>
<td>• 200 bedded hospital</td>
</tr>
<tr>
<td>Bangalore</td>
<td>• Focuses on Tertiary Care such as cardiac diseases, orthopaedics and</td>
</tr>
<tr>
<td></td>
<td>neuroscience</td>
</tr>
</tbody>
</table>

8.5.3. Future Ahead

The hospital chain is in the middle of expansion, especially in India. At present, 13 of its hospitals are under construction and own the property for another 12. Upon completion, the chain will have 21 hospitals and an airport clinic in India, 11 hospitals in Malaysia, 3 hospitals in Vietnam and 3 hospitals in Indonesia, together representing an investment of over SEK 4.2 Billion.

Some of the planned expansion sites in India are:

- Chandigarh
- Dehradun
- Jalandhar
- Lucknow
- Meerut
- Trivandrum
- Ahmadabad
- Pune
8.6. Fortis Healthcare

8.6.1. Overview of the Hospital

Fortis Healthcare - a fastest growing hospital chain in India was founded in the year 2001. Fortis has a multi-vertical presence across 10 countries, with a focus on emerging markets.

The chain is the second largest provider of integrated healthcare services in the Asia-Pacific, with over 12,000 beds in more than 75 hospitals, 580 primary care centres, 188 day care specialty centres, and 190 diagnostic centres. Since 2005, the Fortis Network includes the Escorts Hospital Network, and in 2009, it acquired 10 Wockhardt Hospitals.

8.6.2. Geographical Locations

Fortis Healthcare has presence across 12 states in India. At present, it operates 48 hospitals in India with a total capacity of 7700 beds. These locations are shown in the map below.

Some of the major hospitals run by Fortis are:

<table>
<thead>
<tr>
<th>Hospitals</th>
<th>Comments</th>
</tr>
</thead>
</table>
| Fortis Hospital, Mohali | • Flagship hospital established in 2001, currently has installed capacity of 340 beds  
<p>|                     | • Accreditations by Joint Commission International  |</p>
<table>
<thead>
<tr>
<th>Hospital Name</th>
<th>Key Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fortis Escorts Hospital, Faridabad</td>
<td>• 210 bedded hospital</td>
</tr>
<tr>
<td></td>
<td>• ISO 9001-2000 certified</td>
</tr>
<tr>
<td></td>
<td>• Runs DNB Program of post graduate medical education in various specialties.</td>
</tr>
<tr>
<td>Fortis Hospital, Noida</td>
<td>• 200 bedded hospital</td>
</tr>
<tr>
<td></td>
<td>• Centre of excellence in orthopaedics and Neuro-Sciences with key focus on cardiac care services</td>
</tr>
<tr>
<td></td>
<td>• Tie up with International Oncology to set up state of the art cancer program.</td>
</tr>
<tr>
<td>Fortis Flt. Lt. Rajan Dhall Hospital, Vasant Kunj</td>
<td>• 200 bedded multi-specialty hospital</td>
</tr>
<tr>
<td></td>
<td>• NABH Recognized</td>
</tr>
<tr>
<td></td>
<td>• Specializes in Renal Sciences, Orthopaedics, Cardiology, Pulmonology, Rheumatology</td>
</tr>
</tbody>
</table>

8.6.3. Education Courses Offered

The Fortis School of Nursing in Mohali was established in 2001. The main objective was to bring international standards and modern professional techniques to patient care for its nursing graduates. It provides training programs to students with clinical experience in a 250-bedded hospital. Moreover, Fortis furthers the medical knowledge of its staff with Continuous Medical Education seminars (CMEs) and conferences.

8.6.3.1. Major Departments and Facilities

Fortis has several Centres of Excellence and provides multi and super-specialty medical services in critical illnesses and other areas:
Other major departments include the departments for Psychiatry, Radiology, Diabetes and Endocrinology, Gastroenterology, Neurosurgery, Pulmonology, Nephrology, and Ophthalmology, to name a few.

### 8.6.4. Future Plans

Fortis Healthcare is constructing two Greenfield hospitals in Delhi and Gurgaon. The hospital in Delhi (Shalimar Bagh) will be a 250-bedded (in the first phase) super-specialty hospital.

The facility in Gurgaon –“Fortis International Institute of Medical and Biosciences (FIIMBS)” – will be a Medicity comprising a medical college for 500 students as well as two multi-specialty hospitals with 750 beds (350 beds in the first phase).\(^{156}\)

Fortis is also planning to set up six new hospitals in Bangalore, Chennai, Pune, Hyderabad, Indore and Jabalpur, with an investment budget of nearly SEK 1.5 billion. This will add 1,400 beds to the group. Apart from this, the group is also planning to set up 50 dialysis centres across India within the next year. In addition to setting up new facilities, the existing Fortis Malar in Chennai will be expanded with an investment of SEK 428 million and the bed strength would expand from 300 beds to 1000 beds by December 2012.

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\(^{156}\) Source: CRISIL Report, Fortis Healthcare 2010
Fortis will invest SEK 1.43 billion to set up six medical colleges in the regions of Haryana, Punjab, Uttar Pradesh, Gujarat, Madhya Pradesh and Rajasthan. These colleges will have a 500-bedded hospital for providing practical experience and will be up and running as soon as the state governments give their approval.

Fortis will also cooperate with Chitkara University in providing a post-graduate management degree program in healthcare management. It will leverage on the strengths of both Fortis and Chitkara and will prepare graduates for middle and senior-level management positions by complementing theoretical training with practical internships.

8.6.5. International Collaboration

In order to provide world-class integrated health services for its members, Fortis Healthcare has formed an alliance with some globally renowned service providers within infrastructure technology and medical treatments. Partner companies include Atna, BUPA, GMC Services, CIGNA International Expatriate Benefits, HTH Worldwide, Vanbreda International, Surgical Tourism Canada, World Access, and Lufthansa.
8.7. Narayana Hrudayalaya Hospitals

8.7.1. Overview of the Hospital

Narayana Hrudayalaya (NH) Hospitals is one of the largest multi-specialty hospital chains in India. It was established in 1999 under the aegis of Asian Health Foundation and Dr. Devi Shetty, India’s most renowned heart surgeon. The first hospital “Rabindranath Tagore International Institute of Cardiac Sciences (RTIICS)” was established in 2000 in Kolkata. At present, it has 5000 beds in India and aims to grow its facilities to 30,000 beds in the next 5 years.

The hospital chain specializes in providing Cardiac, Oncology, Surgical, Medical and Diagnostic Support. It is one of the world’s largest paediatric heart hospitals.

8.7.2. Presence in India

The chain currently runs 12 hospitals across seven cities in India and is planning to come up with hospitals across four cities in India and one Medical University in Cayman Islands.

Figure 8-14: NH Hospitals, India

Source: NH Hospitals Group Website
Some of the major NH hospitals are:

<table>
<thead>
<tr>
<th>Hospitals</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rabindranath Tagore International Institute of Cardiac Sciences (RTICS), Kolkata</td>
<td>• Flagship hospital established in 1999, currently has 550 beds&lt;br&gt;• Runs Post Graduate courses in fields of General Surgery, Cardio, Ophthalmology, Nephrology and Anaesthesiology.&lt;br&gt;• Also runs courses in critical care, nursing and paramedics&lt;br&gt;• Has a telemedicine centre specializing in cardiology treatment&lt;br&gt;• NABL&lt;sup&gt;157&lt;/sup&gt; accredited</td>
</tr>
<tr>
<td>NH Multispecialty Hospital, Bangalore</td>
<td>• 1400 bedded hospital&lt;br&gt;• Handles Neurosurgery, Neurology, Paediatric, Nephrology, Urology, Gynaecology, Gastroenterology, ENT among others.</td>
</tr>
<tr>
<td>Rotary Narayana Nethralaya, Kolkata</td>
<td>• Super-Specialty eye care hospital&lt;br&gt;• Eye Care in the field of Cataract, Glaucoma, Occuloplasty, Paediatric Ophthalmology &amp; Retinal Surgeries.&lt;br&gt;• Has tele-ophthalmology facilities</td>
</tr>
<tr>
<td>Brahmananda Narayana Hrudayalaya, Jamshedpur</td>
<td>• 200 bedded super-specialty hospital&lt;br&gt;• Specialties like Nephrology, General Surgery, Laparoscopic Surgery, Gastroenterology, Paediatrics, Orthopaedics among others&lt;br&gt;• Has started PGDCC course in association with Indira Gandhi National Open University. (IGNOU)</td>
</tr>
<tr>
<td>Narayana Hrudayalaya Cardiac Hospital, Bangalore</td>
<td>• 1000 bedded Hospital&lt;br&gt;• Only centre in Asia to implant 3rd generation artificial heart from Ventracor&lt;br&gt;• Home to Asha Dinesh Institute for Organ Transplant specialized in transplantation of heart, lung, kidney, liver, pancreas and Bone marrow.</td>
</tr>
</tbody>
</table>

8.7.3. Health Cities

Narayana Hrudayalaya aims to operate 30,000 beds in the next five years. The hospital focuses on leasing equipments rather than buying, to save on the cost of up gradation. On the lines of the successful health city model consisting of NH Cardiac Hospital, NH Multispecialty Hospital and Mazumdar Shaw Cancer Centre in Bangalore, Narayana Hrudayalaya Hospitals are currently in process of building health cities in Ahmadabad and Hyderabad.

8.7.4. Presence across Healthcare Spectrum

Narayana Hrudayalaya Hospitals have interests across various fields of healthcare. A summary of the same is illustrated below.

<sup>157</sup> NABL: The National Accreditation Board for Testing and Calibration Laboratories
8.7.5. Telemedicine

Narayana Hrudayalaya Hospitals have created a telemedicine network with 20 centres and has treated over 53,000 patients over the past ten years. The telemedicine centre is connected to patients in Malaysia, Tanzania, Nigeria, Burundi, Zambia, and Bangladesh. The services offered are: Tele-Consultation, TT ECG\textsuperscript{158}, CME - Tele-Education\textsuperscript{159} and Hrudaya Post.

8.7.6. Collaborations

Narayana Hrudayalaya and Maastricht University (MU), Netherlands signed a MoU in 2009. The broad theme of this MoU is to carry out the following:

- Joint research programs where the degree is offered by MU
- Fellowship programs at MU
- Work on proposals for joint research and development
- Knowledge exchange programs like Conferences and workshops

\textsuperscript{158} TT ECG: consists of 308 centers from all over the world
\textsuperscript{159} Over 550 CME programmes conducted in the past 5 years
8.8. Post Graduate Institute of Medical Education & Research

8.8.1. Overview of the Hospital

Post Graduate Institute of Medical Education & Research (PGIMER), Chandigarh was founded in 1962 by late Sardar Pratap Singh Kairon, then Chief Minister of Punjab. It was supported by the first Prime Minister of India Pt. Jawahar Lal Nehru who inaugurated the hospital, which is now called “Nehru Hospital”.

After the reorganization of the state Punjab, the institute was controlled by Union territory of Chandigarh in 1966. It became an autonomous body under the Act of Parliament in 1967, functioning under the ministry of Health and Family Welfare, Government of India. The institute focuses on providing patient care, medical education and training and community based research services.

PGIMER is an institute of national importance and is a referral centre for several northern states to provide specialized care including cardiac surgery, kidney dialysis and transplantation, neurosurgery, orthopaedic surgery, intensive burns care and plastic surgery, and radiotherapy.

The Nehru Hospital associated with PGIMER has 1959 beds with a bed occupancy rate of 87.5, as per year 2011.

8.8.2. Geographical Locations

The institute is located in Chandigarh as represented below in the map.

Figure 8-16: PGIMER – Presence Across India

Source: Desktop Research
8.8.3. Education Courses Offered

The institute offers post graduation programmes, paramedical programmes, training programmes and some elective programmes in all important aspect of healthcare. It runs a continuous full time residency post graduate medicine programmes in surgery, pathology, medicine and other specialities of medical sciences. There are 330 teaching faculty doctors, 246 senior residents and 370 junior residents registered for the post graduation courses such as MD, MS, M.Ch, and DM.

PGIMER also has an associated institute National Institute of Nursing Education (NINE) which offers nursing education. The institute has been selected as a mentoring college for two of the six upcoming programs by All India Institute of Medical Sciences, Delhi.

8.8.4. Research

PGIMER is actively involved in research for the rural and community related environment and health problems. The focus diseases for the research are: diarrhoea, tuberculosis, malaria, amoebiasis, HIV, leprosy, hepatitis, anaemia, leukaemia, hypertension, atherosclerosis, stone disease, dental caries, cancer, thalassemia, and sexually transmitted diseases. There are 2 basic research blocks designated for basic sciences in the institute.

A number of departments in the institute have been designated as research centres by WHO and other international agencies. Below are the designated research centre departments:

- Clinical research in human reproduction (Obstetrics and Gynaecology)
- Mental Health Centre (Psychiatry)
- Quality Control in Clinical Chemistry (Biochemistry)
- Coagulation (Haematology)
- Clinical Parasitology
- Blood Transfusion and Haematology

Every year 400 research articles are published from the institute in international and national journals.

8.8.4.1. Major Departments and Facilities

Major departments in PGIMER are represented below:
In addition to the departments above, the institute has a dedicated Community Medicine & School of Public Health. It functions along with the Paediatrics, Medicine, and Obstetrics and Gynaecology to conduct studies related to the community health needs. PGIMER has also been recognized by National AIDS Control Organization and has a Voluntary Testing and Counselling Centre (VCTC) which provides free drugs for treatment of HIV patients.

8.8.5. Future Plans

PGIMER is looking forward for improvement and expansion in its present facility at Chandigarh. It plans to modernize the present Nehru Hospital, Research Blocks. It is also focusing on further development of Advanced Cardiac Centre and Trauma Centres, some miscellaneous engineering works and to further augment the various healthcare departments.

Other areas of focus include, Patient friendly measures such as offering packages for procedures, Strengthening of poor patient cells, strengthening Medical Oncology and cancer facilities, modernisation of old hospitals and research locks, stem cell and genetic research, strengthening of cadaver organ transplant programme, and computerisation of hospital.

8.8.6. Foreign Association

- Around 70% of the machines incorporated in the hospital and institute is imported. The hospital has a Gamma knife supplied directly by Elekta India.
- The Institute is running exchange programs with institutes like Virginia Commonwealth University and Innsbruck University.
Other Stakeholders
9. Other Stakeholders

9.1. Help Age India

Help Age India is a not-for-profit organization and was established in 1978. It is involved in raising resources to protect the rights of Indian elderly population and provide them with financial, health and emotional security. The organization generates its resources through Individual contributions, corporate and business houses, trusts & foundations and bi lateral & multi lateral funders. For example: some of the programmes are funded by European Union, Disasters Emergency Committee (UK), Department for International Development (UK), Canadian International Development Agency (CIDA), US Agency for International Development, Japan Foundation, Help Age International and Cordaid.

9.1.1. Sector Focus and Strategy

Along with the healthcare, Help Age India also provides livelihood support for the elderly through old age homes, day care centres and special programmes such as Adopt-A-Grandparent scheme. Out of 98.5 million of elder persons in India during 2011, Help Age caters to around 1.5 million senior citizens across rural and urban areas. Over the years, it has shifted its focus on development projects such as income-generation and micro-credit projects that enable the participation of Older Persons in the mainstream of society. Furthermore, Help Age India support the elderly and promotes their cause with the central and state governments.

It also operates Mobile Medicare units, Physio care units, eye care units, Alzheimer care units and cancer care units.

9.1.2. Geographical Presence

Headquartered in Delhi, the organisation has national office in Chennai, Mumbai and Kolkata. In addition, the organization has 52 offices across 22 states in India, as depicted in the figure below:
In general, Help Age has a higher focus in rural areas and the table below depicts major activities undertaken by the NGO:

<table>
<thead>
<tr>
<th>S. No</th>
<th>Activities in rural elderly care</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Formation of 2600 Elder Self Help Groups (ESHGs) of which 713 are fully operational</td>
</tr>
<tr>
<td>2</td>
<td>Reaching out to 20900 rural elders in 134 villages &amp; 250 locations</td>
</tr>
<tr>
<td>3</td>
<td>SEK 15.43 million (INR 110 million) allotted for micro credit money in rotation</td>
</tr>
<tr>
<td>4</td>
<td>130 community managed grain banks</td>
</tr>
<tr>
<td>5</td>
<td>18 ESHGs self managed health clinics</td>
</tr>
<tr>
<td>6</td>
<td>17 physiotherapy clinics</td>
</tr>
<tr>
<td>7</td>
<td>25600 cataract surgeries conducted</td>
</tr>
</tbody>
</table>

In addition for urban areas, Help Age has set up Age care Service Hubs (ASH) in all major states. Each city-hub provides various services such a helpline, physiotherapy clinic, recreation centre/library, mobilisation of senior citizens, computer literacy, helpdesk/ counselling etc. Other activities undertaken by Help Age India across urban areas are depicted below:

<table>
<thead>
<tr>
<th>S. No</th>
<th>Activities in urban elderly care</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>20 State Elders' Help lines (toll free)</td>
</tr>
<tr>
<td>2</td>
<td>3 Police Help lines</td>
</tr>
<tr>
<td>3</td>
<td>482 abandoned elders rescued from roads &amp; rehabilitated</td>
</tr>
<tr>
<td>4</td>
<td>23 Help Age managed Age care Service Hubs</td>
</tr>
<tr>
<td>5</td>
<td>40 Physiotherapy Clinics managed by Senior Citizens Associations</td>
</tr>
<tr>
<td>6</td>
<td>500 Senior Citizens Groups mobilised into 500 Senior Citizens Associations and 30 000 members</td>
</tr>
<tr>
<td>S. No</td>
<td>Activities in urban elderly care</td>
</tr>
<tr>
<td>-------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td>7</td>
<td>41 physiotherapy setups meted out 5298 treatments; 713 ESHGs (7800 elders)</td>
</tr>
<tr>
<td>8</td>
<td>769 elders are linked with pensions</td>
</tr>
</tbody>
</table>

9.1.3. Other information

Help Age India operations abroad:

- Help Age India is one of the founding members of Help Age International, a high profile body having 97 member countries representing the cause of the elderly at the United Nations.
- It is closely associated with Help the Aged, UK.
- It has received a special testimonial from the United Nations for "Dedicated service in support of the United Nations Programme on Ageing".

9.1.4. Future Plans

The organization is looking forward to collaborate with various institutions for offering certification programs, training modules for nurses and others in geriatric education. Help Age is also working with Planning Commission, Government of India to strengthen the existing policy framework for elderly care, which is called ‘National Policy for Senior Citizens 2011’. This policy focuses on various issues including income security, elderly healthcare, housing etc.
9.2. MAMTA – Health Institute for Mother and Child

MAMTA is a Non Government Organization established in 1990 and based in New Delhi, India. The organization is involved in addressing the health and development issues in context of poverty, gender and rights with life cycle approach of adolescents. It started its operations on a micro level in an urban slum of Delhi, Tigri in 1990 by providing clinical services to mother and child to improve their health status and improve pregnancy outcomes.

In course of time, it has broadened its focus on adolescent issues and concerns specifically related to sexual and reproductive health. The organization is currently, expanding its operations in the field of adolescent’s health, education, entrepreneurship development and empowerment with a thrust on community participation. There are 196 Staff members in the organization presently working for the cause.

9.2.1. Focus Area & Strategy

The organization focuses on Mother and Child Health and Sexual Reproductive Health (SRH) related issues. In April 2009, MAMTA received funds from the UN for a project on sexual reproductive health of youth by promoting right age at marriage.

It also organizes National Training Program for YFHS (Youth Friendly Health Service), under ARSH (Adolescent Sexual Reproductive Health). The program is done in partnership of National Institute of Health and Family Welfare (NIHFW) and Lund University, Sweden.

In the area of SRH, MAMTA has been working on the project, Community Action program for Sexual and Reproductive Health and Rights Policies in Asia supported by European Union. It is also working on another project, Facilitating and strengthening Policy & Programme for SRH of Young People through an Advocacy approach in India.

MAMTA is also helping the government of India in capacity building by training the front line workers (ASHA’s) under National Rural Health Mission Program.

The organization also runs several programs for TB Prevention, Community Immunization and HIV.

9.2.2. Geographical Presence

At present MAMTA is working on 19 projects ranging across 17 states in India, and 5 districts each in Bangladesh and Nepal. The below figure shows the office locations for MAMTA.
9.2.3. Other Information

The organization is supported by various corporate and government agencies. Some of the International collaborations are listed below:

<table>
<thead>
<tr>
<th>Bilateral &amp; Multilateral Collaborations*</th>
<th>Technical Collaborations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sida, Sweden</td>
<td>Oregon State University</td>
</tr>
<tr>
<td>RSFU, Stockholm, Sweden</td>
<td>Lund University</td>
</tr>
<tr>
<td>European Union</td>
<td>Australian International Health Institute</td>
</tr>
<tr>
<td>Action Aid, UK</td>
<td>Karolinska Institute Stockholm</td>
</tr>
<tr>
<td>British High Commission</td>
<td>Uppsala University</td>
</tr>
<tr>
<td>United Nations Development Programme (UNDP)</td>
<td>Population Council</td>
</tr>
<tr>
<td>United Nations Development Fund for Women (UNIFEM)</td>
<td></td>
</tr>
<tr>
<td>United Nations Children’s Fund (UNICEF)</td>
<td></td>
</tr>
<tr>
<td>European Union</td>
<td></td>
</tr>
</tbody>
</table>

*Indicative List only

9.2.3.1. Future Plans

Projects in pipeline include:

- Urban Poor Intervention for Mother & child Health in Delhi
- Urban Poor Intervention for enhanced Adolescent Health & Nutrition in the states of Uttar Pradesh, Bihar and Rajasthan.
- Community Based Care and Support for Children Living with HIV in Delhi

In addition, MAMTA plans to get involved in the mental health and non communicable disease segments.
9.3. NAZ India

Established in 1994, the NAZ Foundation India Trust is a NGO working for HIV/AIDS victims and other Sexual Diseases. Funding for the foundation largely comes from the individual and organization donations. Major contributors are Standard Chartered Bank and Levis Strauss Foundation.

9.3.1. Focus Area & Strategy

The foundation is following a right based approach for HIV/AIDS and focuses on its prevention and treatment. The focus areas include:

1. Providing care to the HIV/AIDS infected population
2. Address the unawareness and unbiased information about AIDS and HIV prevalence in India.

The foundation runs several programs for the homosexuals, transgendered. The services provided include

- Home based medical care and other support to HIV infected patients.
- Peer education training on sexuality, HIV/AIDS and sexual health
- Care home for children affected from HIV/AIDS
- Outpatient health clinic in New Delhi
- GOAL program to support underprivileged girl population. The program is conducted with the support of other NGOs and includes mix of sports and education modules on social inclusion. The program is carried out twice in a week.
- The Milan project - to support the MSM (Male having Sex with Men) and trans gender population by providing them with drop in Centres to discuss their concerns and Outreach workers to help them with their needs.

9.3.2. Geographical Presence

NAZ India Foundation is based in Delhi as depicted in the map below:
9.3.3. Future Plans

The foundation plans to open a new Care home in New Delhi, which is expected to compass an area of 27,000 square feet.
9.4. Adventist Development and Relief Agency (ADRA) India

ADRA was established by Seventh-day Adventist Church and operates in six main areas of activities:

- Providing food and water
- Establishing Livelihoods
- Promoting health
- Supporting families
- Responding to emergencies
- Protecting the vulnerable

9.4.1. Focus Area & Strategy

ADRA India focuses on the programs under the heads of: Health, Livelihood and Emergency Management.

<table>
<thead>
<tr>
<th>Focus Areas</th>
<th>Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health</td>
<td>• ADRA has association with hospital to provide antenatal care to the newly born and health assistance to mothers&lt;br&gt;• ARDA is also working towards millennium development goal to combat HIV/AIDS, malaria and other diseases&lt;br&gt;• ARDA has been working for Polio control with USAID since 10 years now&lt;br&gt;• Axshya Project is implemented for building TB awareness and building leadership skills to empower the community for handling healthcare concerns</td>
</tr>
<tr>
<td>Livelihood</td>
<td>• The organization provide agriculture support to rice farmers through System of Rice Intensification, providing livestock assistance such as goat banks and vocational training on crafts making, sewing, small business enterprise development, vermin-culture, community fish ponds, environ-livelihood options and others&lt;br&gt;• Stop Trafficking project is being carried out by ARDA India to control the human trafficking on India-Pakistan border</td>
</tr>
<tr>
<td>Emergency Management</td>
<td>• In 2007, ARDA India established National Emergency Preparedness and Response Plan (NERP) to handle emergency situations and providing provision for shelter, food, non food items, clean water, sanitation facilities, education and training etc&lt;br&gt;• Orissa Post Flood Recovery project to support flood victims of the state of Orissa&lt;br&gt;• Sunderbans Disaster Preparedness and Risk Mitigation project is started in 2011 to develop family level and community level preparedness and strengthen livelihood on agro forestry model</td>
</tr>
</tbody>
</table>
Children are the major beneficiaries of the ADRA international Programs that seek to integrate health, clean water, sanitation, food production, small businesses and basic education including literacy.

9.4.2. Geographical Presence

ARDA is present in more than 120 countries. In India they have their head office in Gurgaon.

9.4.3. Other Information

- ADRA is a founding member of Inter Action, the alliance of US based international development and humanitarian nongovernmental organization.
- 90% of the private donations are used for the direct humanitarian services

9.4.4. Future Plans

ADRA has plans to continue the implementation and development of its projects like Sunderbans Disaster Preparedness and Risk Mitigation project (DIPECHO Project) and Orissa Post Flood Recovery project for the coming year.
9.5. WHO India

World Health Organisation is a specialised agency of the United Nations (UN) concerned with the international public health. Established in 1948, it works as an inter governmental organisation wherein it assists government in policy development, capacity building and advocacy.

9.5.1. Sector focus and Strategy

The organisation provides technical assistance to the government for various programmes including:

- Communicable diseases like malaria, tuberculosis, HIV/AIDS, Leprosy and Filariasis;
- Child health
- Women healthcare
- Cardiovascular diseases
- Tobacco control
- Elderly health segment.
- It also conducts special programmes such as Revised National tuberculosis Programme, Roll Back Malaria, Tobacco free initiative and relief programmes for people impacted by epidemic like Tsunami.

9.5.2. Geographical Presence

WHO India is headquartered in Delhi as depicted in the figure below:

Figure 9-5: WHO Presence across India

Source: Desktop Research
9.5.3. Other Information

- National Polio Surveillance Programme (NPSP), started in 1997, is a collaborative project of WHO and the Ministry of Health & Family Welfare, Government of India. NPSP aims at effective surveillance of for polio eradication.

- Revised National Tuberculosis Control Programme (RNTCP) was started in 1993 and launched as national programme in 1997. It is a WHO initiative in association with Government of India to implement DOTS strategy and later in 2003, the ‘Stop TB Strategy’ to address the challenges in TB control. Majority of funding comes from Government of India, World Bank and global donor agencies.

- Tobacco Free Initiative by WHO was adopted by India in 2004 with an aim at curbing tobacco related death and diseases.

- WHO also supports disease control and surveillance programs for roll back malaria, called National Anti Malaria Programme (1953) and National Leprosy Eradication Program of India.

- WHO is in process of developing a global health sector strategy for HIV, 2011- 15 and India is the major input provider for the programme.

- World Health Day is organised every year to mark the anniversary of the founding day of WHO. The topic of World Health Day celebrated on 7 April 2012 was Ageing and health with the theme: “Good health adds life to years”.

9.6. TeleVital India Pvt Ltd

TeleVital was established in 2002 and is focused on providing telemedicine services in India. It provides an integrated Electronic Patient Medical Record which can be retrieved real time for any medical assistance. It also offers real-time telemedicine software modules with auto-recognition and configuration architecture which enables plug-n-play for a wide variety of medical devices.

9.6.1. Sector focus and Strategy

It offers the telemedicine facilities in all prominent disciplines of medicine, e.g. Cardiology, Radiology and Orthopaedics specialities. Some of the achievements of TeleVital are mentioned below:

- The company has established 100 Village Resource Centres across India. These facilities are used for telemedicine, tele-training, Continuous Medical education for doctors and health awareness programs for the people.
- TeleVital's telemedicine network is used to connect the Super Speciality hospitals to Remote clinics in rural areas with around 430 centres established in India.
- It has established a super speciality hospital, AIMS (Amritha Institute of Medical Sciences) in Kochi, Kerala, India to serve the 60,000 population of the Lakshadweep Islands, India.

9.6.2. Geographical Presence

The company operates through its head office in Bangalore in India. Besides, it also has an office established in the USA.

Figure 9-6: TeleVital presence across India

Source: Desktop Research
9.6.3. Other Information

- TeleVital received the “Indian Telemedicine Company of the year 2009” award by Frost & Sullivan.
9.7. MEDIVED

MediVed is a certified research based advance medical device company. It specializes in the design, development, manufacturing and export of pacemakers, cardiac leads, diagnostic cardiac devices such as ECG programmers, Patient wands and Pacing system Analyzer. It also offers strong Off-Shore Manufacturing opportunities.

9.7.1. Sector Focus & Strategy

- MediVed offers products in the field of Cardiology. Some of the products are: Implantable medical devices (cardiac implants, spinal implants etc), Surgical equipment (cardiac catheters, endoscopes, laparoscopes etc), Patient monitoring system/Diagnostic equipment (ECG machines, Pulse oximeters etc).
- MediVed is also engaged in contract manufacturing for medical, aerospace and defence.
- It also develops medical products such as Cardiac Rhythm Management (CRM) devices, in collaboration with medical devices players across world.
- Also, it is involved in implantation of these products in countries like US, Argentina, Ukraine, China and Dominican Republic etc.

9.7.2. Geographical Presence

MediVed has their corporate office and manufacturing facility located in Bangalore, India, as shown in the figure below.

![Figure 9-7: MediVed presence across India](source: Desktop Research)
The company has been focussing on enhancement of their reach through new channel partners across various countries in Asia / Middle East / Europe/ Africa and South America for distribution purpose.

9.7.3. Future Plans

- Contract manufacturing can be a good opportunity for companies to attain low cost manufacturing.
- MediVed is open to distribution partnership and supply chain partnerships.
- It can be a prospect for collaboration for product development.
9.8. Medisoft Telemedicine

Established in 2001, Medisoft Telemedicine develops Software’s for maintaining electronic medical record of patients, Live image conferencing, transfer of medical data in electronic format such as Patient's demographical information, history, images like X-ray, CT scan and MRI.

9.8.1. Sector Focus & Strategy

- It provides telemedicine and e-health solutions and has developed its own telemedicine system ‘Tele Doctor’ which is a specialized software for imaging, video conferencing equipment, digital camera for X-ray and MRI.
- It has an online web application ehealthopinion which connect patient with doctors and referring doctors to expert doctors.
- It is also involved into customized medical software and product development, mobile health solution, and medical tourism.

9.8.2. Geographical Presence

The company is headquartered in Ahmadabad, where it also has software development centre and a marketing office. Medisoft also has branch offices in Hyderabad and New Jersey, USA.

Figure 9-8 : Medisoft presence across India

9.8.3. Other Information

- Its eHealth opinion panel includes doctors/hospitals form 28 countries.
• The company has customized telemedicine application projects in Pakistan, Cameroon, Tanzania, Nigeria, Nepal, France, Israel, Columbia and clinical Trial Management application in USA.

• They have tie ups with more than 15 hospitals/doctor s across India including the leading hospitals such as Wockhardt, Nanavati hospitals, Mumbai etc.

9.8.4. Future Plans

• The company is looking forward for expansion in the product categories of eHealth and telemedicine

• It is also looking forward to enter in collaboration with foreign players to expand its presence.
9.9. Anand Medicaid’s

Anand Medicaid’s is an exporter, manufacturer and supplier of surgical suction equipments and accessories in India. The company was established in 1996, but has presence for around 35 years in the medical suction devices industry.

9.9.1. Sector Focus & Strategy

It manufactures suction units and related accessories, surgical disposables, UV sterilizers, foetal Doppler’s, infection control systems, infant care products and breast feeding products. Amprodental is one of the Anand group companies which is the manufacturer, importer and exporter of dental laboratory equipments in India.

The company also offers contract manufacturing services.

9.9.2. Geographical Presence

The company in headquartered in Delhi and has distribution partners all across India. Anand Medicaid’s have supplied the products to around 40 countries in the world.

Figure 9-9 : Anand Medicaid’s Presence in India

Source: Desktop Research
9.10. Hindustan Syringes & Medical Devices Pvt. Ltd (HMD)

The company established in 1957, is a manufacturer and exporter of medical syringes and needles across the globe. It claims to have 60% market share in the single use syringe market and 70% market share in the single use needle market.

9.10.1. Sector Focus & Strategy

The products offered are medical disposables such as syringes, needles, I.V. cannulas, blades and blood collection systems; the stainless steel capillary to make the needle points. DISPOVAN is the most popular single use syringes brand from HMD in Indian market.

9.10.2. Geographical Presence

The company has a manufacturing plant in Faridabad (Delhi –NCR ), India and supplies its products across India with the help of around 4000 dealers. The company also has 120 distributors in 60 countries across the globe.

9.10.3. Other Information

For exports, it has set up two wholly owned subsidiaries - HMD Healthcare Ltd (UK) and HMD Healthcare (USA) Inc. Exports forms 20% of the total sales turnover of the company with major products exported are Syringes and Needles, Surgical blades, Scalpels, I.V. Cannulas and Scalp Vein sets.
9.11. Relisys Medical Devices Ltd

Relysis Medical Devices Ltd. was established in 2009. It is into manufacturing of critical care intervention product segment, which include cardiac devices such as stents and catheters. The company has recently started with commercial selling in the Indian market. The company’s manufacturing facilities include a stent coating division and an integrated catheter manufacturing facility.

9.11.1. Sector Focus & Strategy

The company offers products such as coronary stents, catheters, occlusive devices, cardiac surgery disposables and critical care products.

9.11.2. Geographical Presence

The company has a manufacturing facility in Hyderabad, India and most of its exports are to Turkey.

![Figure 9-11 - Relisys Presence in India](source: Desktop Research)

9.11.3. Future Plans

- The company has future plans to expand in the Middle Eastern and European markets.
- It is open for collaborating in terms of a sourcing partner and technological alliance for Research & Development.

Narang Medical Limited, formerly Narang Enterprises, was established in 1989. The company manufactures and exports a range of medical equipment, hospital furniture, orthopaedic implants and instruments.

The company is a *Star Export House* company certified by Government of India and exports to more than 80 countries with total average annual growth rate in export sales of 40%.

9.12.1. Focus Area & Strategy

The company manufactures and sells medical and surgical equipments, anaesthesia equipment, diagnostic equipment, disposables, general surgical instruments, dental instrument, orthopaedic instruments and implants, surgical and medical rubber products, hospital hollowware, autoclaves and sterilizers, suction units, rehabilitation aids, laboratory equipment, hospital/medical furniture, gynaecology and obstetrics products, emergency medical products and cold chain equipment.

9.12.2. Geographical Presence

The company is headquartered in New Delhi, India with distributors operating worldwide.

9.12.3. Future Plans

It is planning to create a chain of retail medical equipment stores globally and has already established its first showroom in India in January 2012.
## 10. Appendix

### 10.1. Key contacts

<table>
<thead>
<tr>
<th>City</th>
<th>Name</th>
<th>Designation</th>
<th>Organisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ahmedabad</td>
<td>Mr. Devendra Patel</td>
<td>Director</td>
<td>Medisoft Telemedicine Pvt. Ltd</td>
</tr>
<tr>
<td></td>
<td>Dr. A N Mittal</td>
<td>Director</td>
<td>MP Govt.</td>
</tr>
<tr>
<td></td>
<td>Dr. K K Thassu</td>
<td>MD Medicine</td>
<td>DHS</td>
</tr>
<tr>
<td></td>
<td>Mr. Nitin Bhatia</td>
<td>Sr. Manager</td>
<td>BMHT</td>
</tr>
<tr>
<td>Bhopal</td>
<td>Dr. D K Pal</td>
<td>Prof. &amp; Head</td>
<td>Gandhi Medical college</td>
</tr>
<tr>
<td></td>
<td>Dr. S C Tiwari</td>
<td>Director</td>
<td>Directorate Of Medical Education</td>
</tr>
<tr>
<td></td>
<td>Mr. Indraneel Shankar Dani</td>
<td>Additional Chief</td>
<td>Medical Education Department</td>
</tr>
<tr>
<td></td>
<td>Dr. Rashmi Dwivedi</td>
<td>HOD Of Paediatrics</td>
<td>Gandhi Medical college</td>
</tr>
<tr>
<td>Bangalore</td>
<td>Dr. Sugandhi Gopal</td>
<td>Doctor - Cardiology</td>
<td>Elbit / Consultant at Fortis Healthcare</td>
</tr>
<tr>
<td></td>
<td>Dr. Latha Venketraman</td>
<td>Doctor - Gynaecology</td>
<td>Fortis Healthcare</td>
</tr>
<tr>
<td></td>
<td>Dr. Swarna Tiwari</td>
<td>Doctor - Obesity and Diabetes</td>
<td>Clinic for Obesity and Diabetes Care</td>
</tr>
<tr>
<td></td>
<td>Mr. Selva Kumar</td>
<td>Mission Director</td>
<td>NRHM, Karnataka</td>
</tr>
<tr>
<td></td>
<td>Dr. PK Srinivas</td>
<td>Programs Director</td>
<td>Directorate of Health and Family Welfare</td>
</tr>
<tr>
<td></td>
<td>Dr. Devan PP</td>
<td>Doctor (Lifestyle diseases)</td>
<td>AJ Institute of Medical Sciences</td>
</tr>
<tr>
<td></td>
<td>Dr. Sathish Chandra</td>
<td>Medical Superintendent</td>
<td>Bowring and Lady Curzon Hospital</td>
</tr>
<tr>
<td></td>
<td>Dr. Julius Punnen</td>
<td>Doctor and Chief Administrator</td>
<td>Narayana Hrudyalaya</td>
</tr>
<tr>
<td></td>
<td>Dr. Devi Shetty</td>
<td>Chairman</td>
<td>Narayana Hrudyalaya</td>
</tr>
<tr>
<td></td>
<td>Dr. Milind Inamdar</td>
<td>Head - Purchases</td>
<td>Narayana Hrudyalaya</td>
</tr>
<tr>
<td>City</td>
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<td>Designation</td>
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<tr>
<td>Dr. Baliga</td>
<td>Doctor - Paediatrics</td>
<td>Narayana Hrudyalaya</td>
<td></td>
</tr>
<tr>
<td>Dr. Gopala Krishnan</td>
<td>Principal Secretary</td>
<td>Directorate Of Medical Education</td>
<td></td>
</tr>
<tr>
<td>Dr. Anil BG</td>
<td>General Manager - QA</td>
<td>Columbia Asia Hospitals</td>
<td></td>
</tr>
<tr>
<td>Ms. Santosh Rathi</td>
<td>VP - Biomedical</td>
<td>Columbia Asia Hospitals</td>
<td></td>
</tr>
<tr>
<td>Dr. Harsha Rajaram</td>
<td>General Manager - Telemedicine</td>
<td>Columbia Asia Hospitals</td>
<td></td>
</tr>
<tr>
<td>Dr. Swati Rajagopal</td>
<td>Doctor - Infectious Disease</td>
<td>Columbia Asia Hospitals</td>
<td></td>
</tr>
<tr>
<td>Dr. Karthik Vasudevan</td>
<td>Doctor - Cardiology</td>
<td>Columbia Asia Hospitals</td>
<td></td>
</tr>
<tr>
<td>Dr. HV Shivaram</td>
<td>Doctor - Obesity</td>
<td>Columbia Asia Hospitals</td>
<td></td>
</tr>
<tr>
<td>Mr. KP Nadig</td>
<td>Founder</td>
<td>Plus at Home Lifecare</td>
<td></td>
</tr>
<tr>
<td>Mr. Ramaprasad</td>
<td>Commissioner</td>
<td>Directorate of Health and Family Welfare</td>
<td></td>
</tr>
<tr>
<td>Dr. Vivek Benegal</td>
<td>Doctor - Substance Abuse</td>
<td>National Institute of Mental Health and Neuro Sciences (NIMHANS)</td>
<td></td>
</tr>
<tr>
<td>Chandigarh</td>
<td>Mrs. Amarjit Kaur, Principal</td>
<td>Principal School of Nursing</td>
<td>School of Nursing, Multi Speciality Hospital, Sector 16, Govt</td>
</tr>
<tr>
<td>Dr. Rajeev Wadhera</td>
<td>Medical Superintendent</td>
<td>Govt Multi Speciality Hospital, Sector 16, Chandigarh</td>
<td></td>
</tr>
<tr>
<td>Dr. Chander Mohan</td>
<td>Mission Director</td>
<td>NRHM</td>
<td></td>
</tr>
<tr>
<td>Dr. Sangeeta Ajay</td>
<td>Nodal Officer - NRHM</td>
<td>NRHM</td>
<td></td>
</tr>
<tr>
<td>Prof. Raj Bahadur</td>
<td>Dean &amp; Medical Superintendent</td>
<td>Dean of Govt. Medical College &amp; Hospital</td>
<td></td>
</tr>
<tr>
<td>City</td>
<td>Name</td>
<td>Designation</td>
<td>Organisation</td>
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</tr>
<tr>
<td></td>
<td>Prof. R.K. Vasishta</td>
<td>Professor In charge - Equipment Purchase (PIEP) - Procurement (Import)</td>
<td>Nehru Hospital affiliated to PIMER, Sector-12</td>
</tr>
<tr>
<td></td>
<td>Prof. A.K. Gupta</td>
<td>Professor of Hospital Administration cum Medical Superintendent</td>
<td>Postgraduate Institute of Medical Education &amp; Research, Sector-12</td>
</tr>
<tr>
<td></td>
<td>Dr. Yogesh Chawla</td>
<td>Director</td>
<td>Postgraduate Institute of Medical Education &amp; Research, Sector-12</td>
</tr>
<tr>
<td></td>
<td>Dr. Pallav Gupta</td>
<td>GM Operations</td>
<td>Max Super Speciality Hospital</td>
</tr>
<tr>
<td></td>
<td>Dr. Dharmesh Lal</td>
<td>Director</td>
<td>IIHRM</td>
</tr>
<tr>
<td>Delhi</td>
<td>Anoop Rawat</td>
<td>Head- Training and Development</td>
<td>Fortis Delhi</td>
</tr>
<tr>
<td></td>
<td>Anjana Nath</td>
<td>Regional HR Head</td>
<td>Fortis Delhi</td>
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<tr>
<td></td>
<td>Dr. Shyama Nagarajan</td>
<td>Chief Quality Officer</td>
<td>Fortis Delhi</td>
</tr>
<tr>
<td></td>
<td>Dr. Aditi Chopra</td>
<td>ENT Specialist</td>
<td>Maulana Azad Medical</td>
</tr>
<tr>
<td></td>
<td>Ambuj Sharma</td>
<td>Under secretary-international cooperation</td>
<td>Ministry of Health and Family Welfare</td>
</tr>
<tr>
<td></td>
<td>Dr. A K Agarwal</td>
<td>Dean and Director</td>
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<td>Medical Superintendent</td>
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10.2. MoU on Healthcare


The Government of the Republic of India and the Government of the Kingdom of Sweden hereinafter referred to as “Parties”,

Recognizing the necessity of further developing the state of health of the people of the two countries through joint efforts and the importance of health in the context of bilateral relations, especially noticing the contribution of such cooperation to the development of relations between the two countries,

Have reached the following understanding:

ARTICLE I

The objective of this Memorandum of Understanding is to promote bilateral cooperation between the Parties in the field of health care and public health, on the basis of equality; reciprocity and mutual benefit, taking into account the applicable laws and legal provisions in each country.

The cooperation under this Memorandum of Understanding will be complementary to the ongoing cooperation between the two countries.

ARTICLE II

The Parties shall develop and strengthen co-operation in the following priority areas:-

(i) Non Communicable Disease including controlling the associated risk factors of tobacco, alcohol and unhealthy foods.
(ii) Communicable diseases and antimicrobial resistance
(iii) Public Health Policy
(iv) Maternal and Child Health
(v) Health Resource Development, especially strengthening of midwifery and nursing skills
(vi) Sexual and Reproductive Health and Rights
(vii) Strengthening Health Systems including eHealth and governance
(viii) Indigenous Systems of Medicine
(ix) Health and Medical Services
(x) Health and Medical Research
(xi) Medical Equipment and Pharmaceutical Products
(xii) Health, Environment and Climate Change

ARTICLE III
The cooperation between the Parties may be carried out in the following form:

a) Collaboration between governments, governmental agencies, regional and local governments, knowledge and private sector institutions, commercial actors and civil society institutions;
b) Collaboration between academic and research institutions, exchange of information, documentation and results of research, and information on the state of the health;
c) Arrangement of bi-lateral meetings, symposia and other meetings; participation of experts, advisors and other concerned partners from the Parties in such meetings;
d) Coordination and consultation, as required, on Global Health issues of common interest; and
e) Any other form of cooperation as mutually decided upon.

ARTICLE IV
1. The financial terms of cooperation shall be based on the principle of cost sharing.
2. Upon mutual agreement, specific cooperation activities or projects may be undertaken.
3. Administration and internal control regarding programmes, projects and other activities, as well as obligations in respect of experts participating in programmes, projects and other activities, should be undertaken in accordance with Article 3 of the Agreement on Technical Cooperation between the Government of the Republic of India and the Government of the Kingdom of Sweden.

ARTICLE V
1. The Ministry of Health and Family Welfare of the Government of the Republic of India and the Ministry of Health and Social Affairs of the Government of the Kingdom of Sweden shall be the designated agencies for the implementation of this Memorandum of Understanding.
For coordination of all activities under this Memorandum of Understanding, an Indo-Swedish Working Group on Cooperation in the field of Health care and Public health shall be set up (hereinafter referred to as “Joint Working Group”)

The Joint Working Group will meet, at intervals agreed upon by the Parties, alternately in Sweden and India, and shall examine concrete activities and programmes of cooperation, coordinate with the participating organizations responsible for the implementation of these programmes, and shall make recommendations to the Parties, through an accepted procedure. The composition, place of the meetings and procedure to be followed in the Joint Working Group shall be determined by mutual consent of the Parties.

ARTICLE VI
The present Memorandum of Understanding will not affect the rights and obligations of the Parties under other bilateral or multilateral Treaties and Agreements to which they are a Party.

ARTICLE VII
Any dispute arising out of the interpretation or application of this Memorandum of Understanding shall be settled by negotiations and mutual consultations.

ARTICLE VIII
The present Memorandum of Understanding shall come into effect from the date of its signing and shall remain effective for an indefinite period. Either Party may terminate this Memorandum of Understanding by means of a written notice to the other Party. The termination shall take effect six months following the date of notification.

The termination of this Memorandum of Understanding shall not affect the completion of activities under agreements and contracts concluded on the basis of the present Memorandum of Understanding, which may have been completed by the date of its termination.

In witness whereof, duly authorized representatives of the Parties have signed this Memorandum of Understanding at New Delhi on the 24 February 2009 in two originals, each in Hindi, English and Swedish languages, all texts being equally authentic. In case of divergence of interpretation, English text shall prevail.
FOR THE GOVERNMENT OF THE REPUBLIC OF INDIA

Name: Naresh Dayal
Designation: Secretary Ministry of Health & Family Welfare

FOR THE GOVERNMENT OF THE KINGDOM OF SWEDEN

Name: Lars-Olof Lindgren
Designation: Ambassador of Sweden
10.3. Table of Acronyms

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<td>Annual Blood Examination Rate</td>
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<td>Absolute neutrophil count</td>
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<td>Auxiliary Nurse Midwife</td>
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<td>Alzheimer's and Related Disorders Society of India</td>
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<td>Adolescent Reproductive and Sexual Health</td>
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<td>Anti Retro Viral</td>
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<td>Age care Service Hubs</td>
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