

# Impact Assessment Supporting Healthcare Infrastructure

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Research Triangle Institute Global India Pvt. Ltd. 6th Floor, Commercial Tower, Pullman – Novotel Hotel, Aerocity, New Delhi – 110037



Prepared by



with you, right through Prepared for

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## LIST OF ABBREVIATIONS

Abbreviations	Full Form		
AERB	Atomic Energy Regulatory Board		
СGНS	Central Government health Scheme		
СКD	Chronic Kidney Diseases		
DHC	District Hospital Churachandpur		
GHE	Government's Health Expenditure		
IC	Intensive Care		
ICU	Intensive Care Unit		
КШ	Key Informant Interviews		
u	Lowest Cost		
LTMGH	Lokmanya Tilak Municipal General Hospital		
NE	Northeastern		
NHM	National Health Mission		
OECD	Organization for Economic Co-Operation and Development		
OPD	Outpatient Department		
PBCR	Population Based Cancer Registries		
PSA	Pressure Swing Adsorption		
QA	Quality Assurance		
ті	Technical Specifications		
UNEG	United Nations Evaluation Group		



## **EXECUTIVE SUMMARY**

India's healthcare system has made significant progress over the years. However, in a massive country like India, with more than 1.4 billion population, gaps still exist. Amongst the many other issues, affordability and accessibility remain the biggest challenges affecting healthcare in India today. With respect to affordability, more than half (55%) of healthcare expenditure comes out from the pockets of citizens.<sup>1</sup> While this figure has significantly improved over the years, it remains high and poses a threat of pushing many into poverty.<sup>2</sup> Inequitable access further enhances the burden of treatment for many. While the Government is working towards addressing these issues, support from the private sector and philanthropists is a must.

HDFC envisions an inclusive India where vulnerable communities have the access and opportunity to transform their lives and move from a state of 'surviving to thriving'. With this vision, HDFC CSR, spent more than INR 59 crores between 2018 and 2022, to improve healthcare infrastructure of government and charitable hospitals in India. It has funded 219 advanced equipment for diagnosis and treatment of various illnesses, including but not limited to, cancer, chronic kidney disorders, covid-19, gastrointestinal disorders, respiratory disorders and for emergency support.

An independent impact evaluation study was conducted through virtual key informant interviews with hospital staff and implementation partners to assess the extent to which the objectives of these interventions have been achieved.

Study findings indicate that the interventions were appreciated by all stakeholders and had successfully impacted more than  $96,000^3$  under privileged patients (from the equipment evaluated) between 2017 and 2022.

HDFC supported **41** hospitals across **15** states, between 2018 and 2022, to improve healthcare infrastructure



<sup>&</sup>lt;sup>1</sup> How public-private partnerships could be the booster dose for India's healthcare ecosystem', published by World Economic Forum, September 2022



<sup>&</sup>lt;sup>2</sup> India's persistently high out-of-pocket health expenditure continues to push people into poverty, published by Down to Earth magazine, September 2022

<sup>&</sup>lt;sup>3</sup> All beneficiary numbers stated in the report are based on estimations provided by the hospitals during the key informant interviews.

A sample of 139 pieces of equipment from 14 hospitals across 8 states were covered under the study. Key observations are summarized below:

- Aligned to emerging needs and government priorities, the equipment aimed at enhancing affordable and quality healthcare services.
- Government and charitable hospitals serving the most needy and underprivileged were identified.
- Advanced technologies, in consultation with sector experts, were selected, and most costefficient vendor was finalized.
- All equipment were operated and maintained efficiently by trained staff.
- Installation at high demand centers and coverage by long term maintenance contracts ensure sustainability of interventions.

#### Estimated beneficiaries\* from evaluated hospitals



#### Modern day radiation requires simulation. The CT stimulator has enhanced quality and logistics of treatment thereby reducing time and providing more accurate results.

Dr. Gautam Bhattarcharjee Saroj Gupta Cancer Centre and Research Institute

Being the largest govt hospital in Pune district, all below poverty line and socioeconomically weaker patients are referred here. The ventilators proved extremely useful during COVID and now serve the patients in respiratory ICU.

> **Dr. Harish Tatiya** B J Govt. Medical College, Sasoon Hospital

Our hospital caters to almost entire N-E India region. We never had our own plant but now our demand for commercial oxygen has reduced. Post COVID, the PSA oxygen plant provides oxygen support to 50-60 cancer patients on daily basis.

> Dr. Bibhuti Borthakur Dr. B. Booroah Cancer Institute

Lot of women beneficiaries were observed to be appreciating the free of cost dialysis procedures. Due to affordability and proximity to their home, they could prioritize their treatment in a male prioritizing (dominating) society.

> Mr. Himashu Dave Fairfax India Charitable Trust



## I BACKGROUND

The occurrence of COVID-19 pandemic has drawn the nation's attention towards its healthcare system. To build a shock resistant and robust healthcare system, India has to overcome various challenges like inadequate and dated infrastructure, unequitable access, lack of awareness, lack of resources, etc. In a massive country of more than 1.3 billion people, overcoming these challenges requires huge investments in terms of both time and money. Government alone may not be able to fill these gaps. As per a recent National Health Report, the Indian Government's Health Expenditure (GHE)<sup>4</sup> is 1.28% of its GDP<sup>5</sup> and support from private sector is inevitable to strengthen our healthcare ecosystem.

HDFC envisions an inclusive India where vulnerable communities have the access and opportunity to transform their lives and move from a state of 'surviving to thriving'. HDFC CSR works towards provision of affordable and quality healthcare to children and women vulnerable that are or economically marginalized. It has helped hospitals to procure advanced equipment for diagnosis and treatment of various illnesses, including but not limited to, cancer, chronic kidney disorders, gastrointestinal disorders, tuberculosis, respiratory disorders, and emergency support, thereby improving the healthcare service delivery. H. T. Parekh Foundation is the primary implementing agency for executing these projects.

An independent impact evaluation has been undertaken by RTI International Global India Private Limited to assess the healthcare infrastructure projects.



Figure 2.1: HDFC CSR's healthcare interventions

This report details the methodology and findings from the study in the following sections.



<sup>&</sup>lt;sup>4</sup> According to National Health Accounts Estimates for India 2018-2019, GHE constitutes spending under all schemes funded and managed by Union, State, and Local Governments including quasi-Governmental organizations and donors in case funds are channeled through Government organizations. It has an important bearing on the health system as low Government health expenditures may mean high dependence on household out-of-pocket expenditures.

<sup>&</sup>lt;sup>5</sup> National Health Accounts Estimates for India 2018-2019, a report by National Health Systems Resource Centre (NHSRC), Ministry of Health and Family Welfare, Government of India, published in 2022.

## 2 EVALUATION METHODOLOGY

#### 2.1 Evaluation objectives

The purpose of the evaluation was to:

- Assess the extent to which the project objectives have been achieved.
- Assess the outcomes of the project.
- Identify lessons learnt and best practices for informing future interventions.

#### 2.2 Scope of Work

The healthcare infrastructure funded by HDFC CSR can be categorized, based on its use, as follows:

- General healthcare emergency
- General healthcare other
- Cancer diagnosis and treatment

The unit of evaluation for the study is 'type of equipment' installed. Study locations (hospitals) were selected to cover various types of equipment under each category.

A total of 41 hospitals across 15 states have been supported by HDFC CSR with more than 200 pieces of equipment. Of these, the study covers 139 equipment and 14 hospitals across 8 states. The map alongside highlights the states which were selected for the study and marks the locations of intervention sites.

A detailed list of equipment funded by HDFC CSR, and the sample selected for evaluation is provided in Annexure A.



Figure 3.1: Geographic spread of study



## 2.3 Type of study and study design

The evaluation used qualitative analysis to get an in depth understanding of the interventions. The assessment was based on aspects derived from the Organization for Economic Co-Operation and Development (OECD) evaluation criteria.

Data was collected through virtual key informant interviews (KIIs) with stakeholders including doctors, senior administrative staff, and implementation partners. This was supported by secondary research, and desk review of documents available with HDFC.

#### 2.4 Quality assurance measures

Quality assurance was ensured at every step of the study to establish the integrity of our findings. All the interviews were recorded, and interview notes were improved with the help of raw recordings.

#### 2.5 Ethical consideration

Evaluations conformed to the 2020 United Nations Evaluation Group (UNEG) Ethical Guidelines. Accordingly, the RTI team responsibly safeguarded and ensured ethics at all stages of the evaluation cycle. This included, but was not limited to, ensuring informed consent, protecting privacy, confidentiality, and anonymity of participants, ensuring cultural sensitivity, respecting the autonomy of participants, ensuring fair recruitment of participants (including women and socially excluded groups) and ensuring that the evaluation results in no harm to participants or their communities.



# 3 EQUIPMENT CATEGORY I: GENERAL HEALTHCARE -EMERGENCY SUPPORT

This category equipment were installed for emergency support during the COVID-19 pandemic. A total of 103 pieces of equipment were funded by HDFC CSR of which a sample of 25 were evaluated under the study.



#### Table 3.1. Equipment wise name and location of hospitals covered under equipment category 1

Equipment	Hospital	State	Quantity
Ventilator	B J Government Medical College, Pune	Maharashtra	4
Ventilator Jayadeva Hospital		Karnataka	5
Ventilator	Mahatma Gandhi Institute of Medical Sciences	Madhya Pradesh	2
PSA Plants	Yenepoya Medical College	Karnataka	I
PSA Plants	District Hospital Pulwama	Kashmir	I
PSA Plants	Dr B Borooah Cancer Institute	Assam	I
Para monitors	Dr M L Dhawale Memorial Trust Hospital	Maharashtra	10
Ambulance	District Churachandpur Hospital	Manipur	I



#### 3.1 Relevance

# 3.1.1 Aligned to national needs, the equipment were funded to help the country manage the COVID-19 pandemic.

India was facing shortages of resources to deal with the sudden and intense second wave of COVID-19 pandemic. With the virus spreading fast across the country, hospitals ran out of oxygen supply, ventilators, beds, and key drugs.<sup>6</sup> The Government encouraged civil society and private sector companies to come forward in the fight against COVID, by including all COVID support activities under the category of 'Eligible CSR Activities'.<sup>7</sup>

Aligned to government priorities, to help India tackle the second wave and be prepared for an anticipated third wave, HDFC CSR funded ventilators, Pressure Swing Adsorption (PSA) oxygen generating plants, para monitors, and ambulances across the country. This equipment aided treatment of moderately to severely ill patients affected by coronavirus, largely from socio-economically backward sections of society.

# 3.1.2 The hospital and equipment selection process were aligned to beneficiary and stakeholder needs.

High burden states during the pandemic like Maharashtra, Karnataka, Uttar Pradesh, Tamil Nadu, and Andhra Pradesh<sup>8</sup> were prioritized for improving the healthcare services. Government and charitable hospitals primarily providing free of cost services to underprivileged patients were shortlisted. Consultations with implementation partners and local government helped in identification of high demand centers (hospitals with high patient load) facing shortage of key supplies.

The equipment model selection process took into consideration existing capacities of hospitals. This enhanced the ease of operation during critical times. It also resulted in cost and time saving as no additional training, resource, and systems were required by the hospital to start operations.

The need of the intervention and hospital and equipment selection process, for each type of equipment, has been detailed in table 4.2 below:



<sup>&</sup>lt;sup>6</sup> 'Why couldn't India's health system cope during the second wave? Years of bad health policies', published by 'The Conversation,', written by Rama V Baaru, Professor, Centre of Social Medicine and Community Health, Jawaharlal Nehru University, 2021

<sup>&</sup>lt;sup>7</sup> <u>General Circular No. 10/2020, No. 05/01/2019 – CSR, Ministry of Corporate Affairs, Government of India. 23rd March</u> 2020

<sup>&</sup>lt;sup>8</sup> <u>'COVID-19 second wave in India: 10 worst affected states with highest number of coronavirus infections', published in</u> <u>Business today magazine on 17th April 2021</u>

Equipment	Need	Hospital Selection	Equipment Selection
Ventilators	Serious respiratory problems during COVID	Govt./ Charitable hospitals catering predominantly to marginalized population	Expert from Breach Candy Hospital finalized the specification and model (Model: Wipro-GE). Staff were capacitated during COVID first wave.
PSA Plants	Increased need for oxygen during COVID	Selected by implementation partner, based on ground realities, in high burden locations	Technical evaluation of 5 quotations by experts. Reputation & experience of the agency along with inclusion of training of staff was considered.
Ambulance	Safe transportation of COVID patients to tertiary care	Location of the hospital and their existing inadequacies in terms of number of ambulances	'Advanced Life Support' ambulance was selected in consultation with the hospital.
Para Monitors	Need for large number of ICU beds during second wave of COVID	High burden locations catering predominantly to marginalized population	Selection was based on familiarity with the model, capacity of staff to operate the model & cost considerations (Model: PAMTRONS)

Table 3.2. Relevance of various equipment under general healthcare – emergency support category

"During the second wave of COVID, hospital received critically ill patients more than double the Intensive Care Unit (ICU) bed capacity. The Para Monitors funded by HDFC CSR allowed us to create an ICU like set up in wards. They proved extremely important for monitoring vital signs of the moderate and severely ill patients."

> - Ms. Sunita Jayant, Dr M L Dhawale Memorial Trust Hospital, Maharashtra





**Figure 3.1:** Para Monitors funded by HDFC CSR at Dr M L Dhawale Memorial Trust Hospital at IC Unit (top left), at dialysis center (bottom left).

Sassoon General Hospital is large state-run hospital in Maharashtra with ~1,500 beds. During the COVID-19 pandemic the hospital was dealing with resource crunch and excessive patient load. It was during this time; the hospital received an additional ventilator with the support of HDFC CSR. Since the ventilator model procured was familiar to the hospital staff, it was quickly deployed for serving patients, thereby maximizing its utilization.

"The hospital was already using GE ventilators. Having the maintenance systems and expertise to operate already in place made it easier for doctors to use them optimally during critical times."

- Dr. Harish Tatiya, B. J. Medical College, Sassoon General Hospital, Maharashtra



#### Need for Ambulance at District Hospital Churachandpur (DHC)

With whole of India witnessing spike in COVID-19 cases, Manipur was no exception. May 2021 sparked a sudden surge in Manipur cases with ~600 active cases being recorded per day (Source: COVID-19 common control room, Government of Manipur, Press Release).

Churachandpur is the second biggest district in Manipur with a population of ~ 2.7 lakhs. The District Hospital (DHC) is the only tertiary care hospital in the district, with 236 beds and 108 hospital staff. During the COVID-19 pandemic, the hospital provided free health care support to patients through 30 dedicated COVID-19 ICU beds and 80 beds with oxygen support. Transportation of critical COVID-19 patient was a serious challenge taking into consideration the difficult terrain and shortage of ambulances. DHC, at that time, had only one Basic Life Support (BLS) ambulance to cater to increasing patient load.

In June 2021, HDFC CSR funded an ALS ambulance equipped with an electrocardiograph, defibrillator, sphygmomanometer, suction machine, sink, oxygen cylinder, monitor, and first aid kit. This benefitted around 123 severely ill COVID patients during the second wave of the pandemic. Post the pandemic, the ambulance is being used to transfer special cases to higher hospitals in Imphal. The ambulance has covered approximately **22,000 kms in 16 months** and has **benefitted more than 180 patients**.

#### 3.2 Efficiency

#### 3.2.1 All equipment are being operated and maintained by trained staff.

Operation and maintenance by well trained staff is inevitable to ensure reliable and safe technologies for improved healthcare services. It ensures efficient use of equipment thereby maximizing benefits to the patients. All equipment evaluated under the study was reported to be operated and maintained by trained staff.

The ventilators, PSA plants, and para-monitors were reported to be operated by trained doctors, respiratory care therapists, nursing staff, engineers, and technicians daily. Special training was provided by the equipment vendors during the time of installation. A vendor's accessibility and availability for regular service was a key parameter for vendor selection.

In-house bio-medical engineers were stated to be responsible for quality of output and regular maintenance of equipment. Regular quality checks, calibrations, and preventive maintenance of equipment are being undertaken.



The ALS ambulance at District Churachandpur hospital was being run by experienced drivers. The advanced equipment inside the ambulance needs a paramedic on board to be able to serve the critically ill patients. While a full-time paramedic was not reported by the hospital, critical patients were reported to be accompanied by nurses whenever required.

# 3.2.2 All interventions were found to be cost effective and timely (except for 2 PSA plants)

External experts from leading hospitals like Breach Candy and Tata Memorial Center were consulted before finalizing the equipment technology (model and make). Quotations were taken from more than one vendor and a detailed technical assessment was undertaken by experts followed by a commercial evaluation. The vendor with the best technical specifications (T1) and lowest cost (L1) was finalized and awarded the contract.

As this category of equipment were aimed at treating COVID-19 patients and preparing hospitals for an anticipated third wave, all equipment (except the PSA plants at Yeneyopa Medical college hospital and Pulwama District hospital) were timely installed during the second wave of the pandemic.

Two PSA plants, at Yeneyopa Medical college hospital and Pulwama District hospital, were installed during the third wave of COVID-19. The reason for the delay was reported to be the unavailability of equipment and a delay in the installation process.

#### 3.3 Effectiveness

3.3.1 The interventions were able to achieve its objective of benefitting large number of underprivileged patients, both during and post COVID times.

The new equipment helped hospitals in expanding free of cost services to the neediest, which was the key objective during the pandemic. The equipment benefited COVID patients during the pandemic and now continues to benefit patients suffering from other ailments as well.

The key factors responsible for achieving this outcome, which emerged from the study, are:

- Alignment of equipment's make and model with existing capacity of hospital.
- Timeliness of intervention

Approximately **44,000 patients** from socio economically weaker sections of society (COVID and Non-COVID) received quality healthcare services at zero (or subsidized) cost, between May 2021 to October 2022, from the 25-equipment evaluated.



- Selecting hospitals with high patient footfall, predominantly from socio economically backward sections
- Ensuring that vendors shortlisted are accessible through the year for handholding and servicing.
- Well-trained staff operating and maintaining the equipment on a daily basis.

"Pune was the COVID hotspot, and we needed multiple ICU beds. Being the largest govt hospital in Pune district, all below poverty line and socio-economically weaker patients were referred here. In fact, it was the apex center for all other tertiary centers. The ventilators have added to existing healthcare capacity. They proved extremely useful during COVID and now serve the patients in respiratory ICU."

> - Dr. Harish Tatiya, B. J. Medical College, Sassoon General Hospital, Maharashtra

"Since the hospital has its own PSA plant it doesn't have to rely on external factors. The plants serve on an average 40 to 50 patients daily, most of which are senior citizens."

> - Dr. Chefreish. R. B, Yenepoya Medical College Hospital, Karnataka

"Our hospital was a high-volume (COVID) center. The patients were never denied, so even if there was no space in ICU the patients were admitted and put on ventilators in case of extreme breathlessness. Ventilators from HDFC CSR have come in handy and has helped providing best possible service to our patients."

> - Dr. Divya Patil, Jayadeva Hospital, Karnataka

### 3.4 Sustainability

3.4.1 All equipment were found to be in use post COVID. Long term operational efficiency was ensured by coverage under hospital's annual/ comprehensive maintenance contracts.

Post reduction in COVID cases, all equipment were reported to be installed at alternative departments and thus continue to benefit under privileged patients.



### 3.4.1.1 Ventilators

All units evaluated are being utilized in respiratory ICUs serving moderately to severely ill patients (including any COVID patients). The authorities assured optimum use even post reduction in COVID cases.

"Around 71 patients suffering from tuberculosis or severe lung infections have been treated using these ventilators in past 2-3 months. All the equipment are still being used optimally."

Dr. Harish Tatiya,

B. J. Medical College, Sassoon General Hospital, Maharashtra

#### 3.4.1.2 PSA Oxygen Plants

Of the three PSA plants evaluated during the study, two plants at Dr Borooah Cancer Institute and Yeneyopa Medical college hospital were found to be in regular use post COVID. The plant at Pulwama District hospital was reported to be used only during emergencies and not daily. However, under development the super specialty wing of the hospital would ensure efficient use of the plant once commissioned.

The Yeneyopa Medical College Hospital, Karnataka: This is a 1,250 bedded multi-specialty hospital located in Mangalore city. It provides comprehensive clinical care at affordable prices. It has multiple operation theatres, IC units, and transplant and dialysis units. Most people served belong to economically weaker sections of society (90% of the patients being treated at its cancer center are from below the poverty line). It can be concluded that the large capacity of the hospital, and availability of affordable facilities and services has enabled optimum use of PSA plants post COVID.

"Post COVID the PSA plant helps in supporting quality of healthcare at our hospital. Since we have our own plant, we do not have to rely on external factors for providing emergency support to needy patients. It provides oxygen support to 40-50 patients on daily basis."

Dr. Chefriesh R.B.,

Yeneyopa Medical College Hospital, Karnataka

**Dr. Bhubaneswar Borooah Cancer Institute, Assam:** This is a 272 bedded hospital providing affordable cancer care comparable to premier cancer centers across the country. About 12,000 new and 80,000 old cancer patients visit the institute every year. With high incidence of cancer and limited cancer treatment facilities in the NE region, this hospital caters to the needs of the entire Northeastern (NE) states. It has 6 operating theatres and an IC unit. It can be concluded that high footfall from all NE



states and availability of affordable cancer diagnostic and treatment has enabled optimum use of PSA plants post COVID.

"Our hospital caters to almost entire N-E India region. Post COVID, the PSA plant helps to treat cancer patients at our hospital. We never had our own plant but now our demand for commercial oxygen has reduced. The plant provides oxygen support to 50-60 patients on daily basis."

Dr. Bibhuti Borthakur,

Dr. B. Booroah Cancer Institute, Assam



Figure 3.2: PSA Oxygen Plant funded by HDFC CSR at Dr. B. Booroah Cancer Institute

**District Hospital Pulwama, Jammu & Kashmir:** This is a 200 bedded hospital catering to population not only from Pulwama district but also neighboring districts of Shopian and Budgam. The PSA plant was constructed at the dedicated COVID ward constructed near the women's hostel. The



plant is connected to three blocks of the district hospital: (1) Dedicated COVID building (b) Building offering OPD services (c) Super specialty wing which is expected to commence services in 2023. Currently, the PSA plant was reported to be used on needs basis for the covid ward and the OPD patients. Reduction in COVID cases and limited need of oxygen support at OPD, result in reduced usage of plant. However, the commencement of the super specialty ward would ensure long term efficient usage of the plant.



Figure 3.3: PSA Oxygen Plant funded by HDFC CSR at Pulwama District Hospital



#### 3.4.1.3 Para Monitors

The 10 para monitors evaluated at the Dr ML Dhawale Memorial Trust hospital were reported to be extremely useful post COVID. They are being used in IC units and special care units to continuously monitor the vital parameters of patients. Around 670 non-COVID patients (5 times more than the COVID patients) have benefitted using these para monitors since May

#### 3.4.1.4 Ambulance

Post reduction in COVID cases, the ALS ambulance is being used for transporting patients from DCH to higher hospitals in Imphal. While the hospital did not report having any paramedics, critically ill patients were reported to be accompanied by nurses who could use the equipment.

"The ambulance has been very useful in transporting severely ill patients, that cannot be managed at our hospital, to a higher hospital in Imphal."

Dr T Vanlalakungi,

District Churachandpur hospital, Manipur



# 4 EQUIPMENT CATEGORY 2: CANCER DIAGNOSIS AND TREATMENT

This category of equipment were installed to improve affordable and quality healthcare services for cancer diagnosis and treatment across the country. A total of 7 pieces of equipment were funded by HDFC CSR of which 5 have been evaluated.



#### Table 4.1. Equipment wise name and location of hospitals covered equipment category 2

Equipment	Hospital	State	Quantity
<b>CT Scanner</b> The Cachar Cancer Hospital Society		Assam	I
Mammography machineThe Cachar Cancer Hospital Society		Assam	I
<b>PET scanner</b> Sri Shankara Cancer Foundation		Karnataka	I
ELISA     Tata Memorial Centre       Analyzer     Tata Memorial Centre		Maharashtra	I
CT Simulator	Saroj Gupta Cancer Centre and Research Institute	West Bengal	I



#### 4.1 Relevance

# 4.1.1 Aligned to emerging needs and government priorities, the equipment were funded to enhance cancer care for the underprivileged across the country.

Cancer is emerging as a major public health concern in India. One in nine people are likely to develop cancer in his/her lifetime in India. The incidence of cancer cases is estimated to increase by 12.8 per cent in 2025 as compared to 2020<sup>9</sup>. A national survey indicates that out-of-pocket expenditure on cancer treatment is among the highest for any ailment. Furthermore, treatment for about 40% of cancer hospitalization cases is financed mainly through borrowings, sale of assets and contributions from friends and relatives<sup>10</sup>.

Realizing this, the Government has taken a range of steps in recent years to address the challenge of cancer more effectively. These range from population level initiatives for prevention, control and screening for common types of cancer, to strengthening cancer care infrastructure<sup>11</sup>. Central Government is implementing Strengthening of Tertiary Care for Cancer Scheme aimed at improving healthcare infrastructure for cancer treatment<sup>12</sup>. Aligned to emerging needs and government priorities, HDFC CSR worked towards improving cancer treatment infrastructure and funded 7 cancer diagnostic and treatment equipment across the country.

# 4.1.2 Hospital and equipment selection was aimed at providing top quality technology to the underprivileged and needy.

All the hospitals selected were not-for-profit institutes providing free of cost cancer care to the under privileged in various states of India. High footfall, pro-poor facilities, and urgency of equipment were some of the factors considered for hospital selection. The equipment selection was done based on the needs of hospital and expert advice. New equipment with advanced technologies helped hospitals to enhance both quality and reach of services. Price, warranty, durability, were amongst the key factors that influenced the purchase decision.

Details on need and selection process for each equipment is provided below:

#### 4.1.2.1 CT Simulators

21



<sup>&</sup>lt;sup>9</sup> <u>Cancer incidence estimates for 2022 & projection for 2025: Result from National Cancer Registry Program, India</u>, by Krishnan Sathishkumar, published in Dec 2022

<sup>&</sup>lt;sup>10</sup> 'Economic burden of cancer in India: Evidence from cross-sectional nationally representative household survey, 2014', by Sunil Rajpal, Institute of Economic Growth, Delhi University and William Joe, Universita degli Studi di Firenze, ITALY, published in Feb 2018

<sup>&</sup>lt;sup>11</sup> <u>'Steps taken to reduce Non-Communicable Diseases</u>', posted by Press Information Bureau, Ministry of Health and Family Welfare, Government of India, in Dec 2022

<sup>&</sup>lt;sup>12</sup> '<u>Setting up of New Cancer Hospitals</u>', posted by Press Information Bureau, Ministry of Health and Family Welfare, Government of India, in Feb 2021

The Saroj Gupta Cancer Centre and Research Institute at Kolkata, West Bengal, is one of the comprehensive tertiary care cancer hospitals of Eastern India. It is a not-for-profit organization dedicated to providing cancer treatment at an affordable cost. Special concessions and subsidized rates are provided to patients who cannot afford nominal expenses.

The radiotherapy department, to cater to large number of patients, required a CT simulator to enhance the quality and logistics of treatment. With the CT simulator the department aimed to deliver state of the art diagnosing and treatment to patients at zero cost. The key factors for shortlisting the equipment make and model were:

- Big bore of machine to accommodate patients with all equipment.
- Ensuring moment restriction for optimum diagnosis and treatment.
- Minimum price, maximum warranty, and good service back up.

Based on suggestions received from the hospitals and techno-commercial evaluation, Soatom Confidence RT, radiotherapy CT simulator by Siemens was shortlisted.

#### 4.1.2.2 CT Scanner/ PET Scanner

A CT scan machine and a PET Scan machine were funded by HDFC CSR, at Cacher Cancer hospital society and Sri Shankara Cancer hospital respectively.

The Cachar Cancer Hospital and Research Centre Assam is a non-profit organization. It is a 90 bedded hospital providing comprehensive cancer care to the underprivileged from poverty-stricken regions of North-Eastern Indian states. It is a pro poor hospital providing low-cost/ free of cost treatment to its patients. A CT scan machine is of paramount importance for cancer diagnosis and treatment. The only CT scan machine at the hospital, installed in 2008, had broken down and a new one was required on an urgent basis. Thus, HDFC CSR funded the new CT scan machine and enabled continued cancer detection and treatment to the under privileged at this hospital.

The Sri Shankara Cancer hospital, Karnataka, is a not-for-profit cancer treatment hospital providing free of cost or subsidized treatment to its patients. It has 480 beds and serves thousands of patients every year. The hospital already had a PET CT scan machine, but an additional machine was required to cater to the growing demand and increasing patient load. HDFC CSR thus funded a new PET CT scan machine thereby helping enhance cancer care for the under privileged at this hospital.

To address the urgency of machines, the latest model of the same make as the existing or previously used machines by the hospital was shortlisted. The familiarity with the make and model helped to fast track the adoption and deployment of the equipment.



Figure 4.1: PET Scanner funded by HDFC CSR at Sri Shankara Cancer Hospital



### 4.1.2.3 Mammography machine

Cachar Cancer Hospital and Research Centre, Assam, offers comprehensive cancer care for various types of cancer including breast cancer. With highest incidence of cancer in North-eastern India, 45% of them being in females<sup>13</sup>, breast cancer has become a growing concern in these states.

A mammography machine is essential for breast cancer diagnosis, early detection, prevention, and treatment. The only mammography machine at the hospital was defunct for the past 3 years, severely affecting breast cancer care at the hospital. Hence, a new one was funded by HDFC CSR.

The hospital also supported a cancer awareness camp in Assam's Dima Hasao district which urged women to be aware of breast cancer and undertake regular cancer screening. The mammogram machine funded by HDFC CSR, helped in screening of women who visited the hospital post the awareness camp.

Based on expert's feedback received from Tata Memorial Centre, CCHS and Hinduja hospital, a digital mammography machine with 3D tomosynthesis capability, 2D stereotactic biopsy and, necessary accessories were finalized. Post techno-commercial evaluation of various vendors, Wipro-GE Mammography machine was finalized.

#### 4.1.2.4 Elisa Analyzer

Tata Memorial Centre, Maharashtra, is a 560 bedded renowned specialist cancer treatment and research center. It provides treatment procedures and diagnosis tests at very low costs and offers free cancer treatment to almost 70% of its patients every year.

While the hospital provides comprehensive cancer care, it lacked the equipment to perform a very rare test for determination and quantification of tumor markers. Patients had to go outside the hospital to undertake this test, which was very expensive. HDFC CSR thus funded a new fully automated ELISA analyzer. It is a compact laboratory liquid handling system enabling the hospital to perform rare tests at subsidized cost for needy patients. The hospital now monitors and identifies recurrence and asymptomatic dissemination of tumor markers.

The hospital team undertook a techno-commercial evaluation of various makes and models. The final equipment selected served a dual purpose - along with being an ELISA analyzer, it also acts as a liquid handling system for other molecular tests. Its versatility, scalability and ease of use were the key factors for selection. A fully automated ELISA, freedom EVO-75 by Tecan company, was shortlisted.



<sup>&</sup>lt;sup>13</sup> National Cancer Registry Program Report (NCRP), 2020 published by ICMR



Figure 4.2: ELISA analyzer funded by HDFC CSR at Tata Memorial Hospital

### 4.2 Efficiency

4.2.1 All equipment were implemented in a cost-effective and timely manner and is being operated, maintained, and calibrated by trained staff.

### 4.2.1.1 CT Simulator

Radiation technologists are trained to exclusively operate these stimulators. In-house medical physicists and oncologists supervise the technologists daily. These technologists are trained and certified by the Atomic Energy Regulatory Board (AERB) to operate this high-tech equipment.

A third-party quality assurance had been undertaken to obtain the operational license from AERB. Thereafter, an in-house Radiation Safety officer performs regular quality tests on the machine. SIEMENS Healthineers have provided a 27-`month warranty, post which the equipment will be covered under the hospital's comprehensive maintenance contract.



## 4.2.1.2 CT Scanner and PET Scanner

Nuclear medicine technologists and radiologists exclusively operate the machine daily. Doctors specialized in nuclear medicine and oncologists supervise the working. Quality assurance (QA) is carried out by the technologists under supervision of Radiation Safety officer. He is responsible for uploading all the data on AERB portal once a year. The machines are covered under long-term comprehensive maintenance contracts of the hospital post the standard warranty period.

#### 4.2.1.3 Mammography machine

Technologists and radiologists operate the machine daily. The Radiation Safety officer takes care of the quality assurance. The machine is covered under long term comprehensive maintenance contracts of the hospital post the standard warranty period.

#### 4.2.1.4 ELISA Analyzer

Scientific assistants and professors, trained by vendors at the time of installation, operate and maintain the equipment on a daily basis. The quality assurance is undertaken by observing real time graphs produced when the assay is going on. The operators are trained for conducting the QA during each assay. The hospital takes care of maintenance post the standard warranty period.

#### 4.3 Effectiveness

# 4.3.1 The equipment funded by HDFC CSR has enhanced the number of beneficiaries, improved accuracy and helped in time saving.

The key factors responsible for achieving this, which emerged from the study, are:

- Selection of advanced and latest technology
- Timely intervention, especially where urgent deployment was required.
- Well-trained staff operating and maintaining the equipment daily.

Approximately 6,300 patients from socio economically weaker backgrounds received quality cancer diagnosis and treatment at zero cost, between April 2021 and October 2022, from the 5equipment evaluated.

#### 4.3.1.1 CT Simulator

The equipment has **benefited approximately 624 patients in 4 months** (July to October). It is further expected to benefit around 1,200 patients annually in future.



"Modern day radiation requires simulation. The CT stimulator has enhanced quality and logistics of treatment thereby reducing time and providing more accurate results."

Dr. Gautam Bhattarcharjee, Saroj Gupta Cancer Institute



Figure 4.3: CT Simulator funded by HDFC CSR at Saroj Gupta Cancer Institute

### 4.3.1.2 CT Scanner

The equipment has **benefited approximately 3,357 patients in 11 months** (Dec 21 to Oct 22). The machine helped the hospital to continue the basic diagnosis and treatment services with optimum quality and faster delivery.



"We are a charitable hospital providing services to the poor and lower strata of society. A CT scan machine is the lifeline of a cancer hospital. With the breakdown of the older machine, timely intervention by HDFC CSR helped us in resuming smooth functions."

Dr Ravi Kannan, Cachar Cancer Hospital Society Institute



#### Figure 4.4: CT Scanner funded by HDFC CSR at Cacher Cancer Institute

#### 4.3.1.3 PET Scanner

The equipment has **benefited approximately 1,976 patients in 4 months (July to October)**. It has been benefiting averagely 18-20 patients per day, 6 days a week. The machine has helped in handling the increased patient load and has resulted in significant time savings.

#### 4.3.1.4 Mammography machine

The equipment has screened **around 105 beneficiaries in 4 months (July to October)** of which **approximately 50-60 cases of breast cancer were detected**. With thousands of patients being served by the hospital annually, the machine is sure to benefit many more in future.

The hospital reported that the new mammography machine helped the hospital to resume its breast cancer screening services after 3 years. The machine was also reported to be helping cancer prevention and early detection social program supported by the hospital in rural Assam.

As the equipment is an advanced one, tomosynthesis i.e., viewing of breast cancer through multiple angles has made the detection of even the smallest of the lumps possible, which was not the case with the earlier machine.



"Women are the key beneficiaries with this diagnostic equipment. If they have any lump in the breast area, the equipment helps in early detection thus preventing spread of cancer."

> Dr Ravi Kannan, Cachar Cancer Institute, Assam

#### 4.3.1.5 ELISA Analyzer

The equipment has **benefited approximately 300 patients in 11 months (Dec 21 to Oct 22)**. This equipment has expanded the scope of performing rare tests, which were not available in other fully automated analyzer e.g., Cytokine analysis, Inhibin tumor marker test, and CD25 test. It has also accelerated the process by increasing the speed and accuracy of the results. Apart from this, the equipment is also being put to alternative use of acting as a liquid handling system for molecular test and results. The machine was reported to be not in use during the COVID period.

#### 4.4 Sustainability

All equipment were linked with AMC/CMC post expiry of standard warranty thereby ensuring its durability and sustainability. Data was well managed and reported. National trends of increasing number of cancer cases and burden of treatment, indicate likelihood of intervention remaining relevant in the long run.

#### Social program enhancing benefits of intervention.

Dima Hasao is a hilly district in Assam. The Cacher Cancer Hospital is the nearest cancer care hospital to this district. As a social initiative, the hospital conducted a study to profile cancer diagnosis and treatment in this district. Under diagnosis emerged as a key concern during the study. The hospital thus carried out a cancer prevention and early detection program in this district to enhance cancer awareness, diagnosis, and treatment in the district. Breast cancer awareness amongst women was a key component of this program. This program leads to lot of women availing the free of cost diagnosis and treatment facilities at Cacher Cancer Institute. The mammogram machine funded by HDFC CSR is proving extremely beneficial in this initiative. The social initiative by the hospital is helping enhance the benefits of the equipment and widening impact numbers. Thousands of patients, largely women from socio economically weaker sections of society, are expected to benefit each year by the machine.

Note: Population Based Cancer Registries (PBCR) systematically collect data on all new cases of cancer occurring in a well-defined population from multiple sources such as Government Hospitals, Private Hospitals, Nursing Homes, Clinics, Diagnostic Labs, Imaging centers, Hospices and Registrars of Births & Deaths. It is an authentic source providing data on incidence and mortality of cancer in various parts of the nation.





Figure 4.5: Mammogram machine funded by HDFC at Cacher Cancer Hospital and Research Center



# 5 EQUIPMENT CATEGORY 3: GENERAL HEALTHCARE – OTHER

This category of equipment were installed for helping economically weaker sections of society to fight diseases other than cancer. A total of 108 dialysis machines and 1 pediatric endoscopy machine were funded, all of which were evaluated under the study.



#### Table 5.1. Equipment wise name and location of hospitals covered under equipment category 3

Equipment Hospital		State	Equipment evaluated
DialysisVarious state-run hospitals acrossmachinesOdisha through Fairfax IndiaCharitable Foundation		Odisha	108
Endoscopy machine	Lokmanya Tilak Municipal General Hospital's Pediatric department	Maharashtra	Ι

#### 5.1 Relevance

5.1.1 Aligned to emerging needs and government priorities, the equipment were funded to enhance general healthcare in Odisha and Maharashtra.

#### 5.1.1.1 Dialysis Machines

Dialysis treats patients suffering from advanced stages of chronic kidney diseases (CKD). The reported prevalence of CKD in different regions of India ranges from <1% to 13%<sup>14</sup>. Odisha has been identified in various research as a high burden state for CKD with Cuttack being tagged as a 'hotspot' by many.



<sup>&</sup>lt;sup>14</sup> Chronic Kidney Disease in India – Journal published by Christian Medical College, Vellore, Tamil Nadu, India.

One of the studies has reported<sup>15</sup> 14.3% prevalence, equal in both sexes, in rural parts of Odisha, with 70% belonging to lower socioeconomic groups.

Odisha had been facing a shortage of facilities to provide accessible and affordable dialysis to its population. Under National Health Mission, the government of Odisha launched 'SAHAYA' scheme, which promised free dialysis at government run hospitals to enhance affordability and accessibility of treatment. To support this initiative, Fairfax India Charitable Trust has signed an MoU with Govt of Odisha committing to help them with infrastructure development. The aim was to ensure adequate machines in at least one hospital per district. To support this initiative, I08 machines were funded by HDFC under its CSR between 2018 and 2020 covering 21 districts of Odisha.

State run hospitals providing free of cost services to economically weaker sections of society were selected by implementation partner, in consultation with State Government, based on urgency and demand analysis. Equipment model and technical specifications were aligned to Government of Odisha's needs. Expert nephrologist opinions, market research, local conditions, post-sale service availability, equipment cost, etc. were key factors influencing decision. Haemo-dialysis machines from Fresenius Medical Care, a global leader in equipment manufacturing, were procured.

<sup>66</sup> Local conditions play an important role in shortlisting equipment. We preferred mechanical dialysis machines over electric ones due to frequent power cut-downs in Odisha. This helped in ensuring uninterrupted services throughout the year. <sup>99</sup>

-Mr. Himanshu Dave, Fairfax India Charitable Trust

### 5.1.1.2 Pediatric Endoscopy Machine

India has been ranked 107<sup>th</sup> amongst 121 countries in Global Hunger Index, which is determined by factors like child stunting, wasting, and death.<sup>16</sup> Child development has remained a key focus of Government with multiple schemes focusing on child health and nutrition. The child health program under the National Health Mission (NHM) comprehensively integrates interventions that improve child nutrition and care.

Endoscopy machines are used to view and operate on the internal organs and vessels of your body. Pediatric endoscopy equipment is an advanced, high-definition video system which allows a non-surgical procedure to examine the child's digestive system. Endoscopy plays an important role in diagnosis and treatment of digestive issues in young children.



<sup>&</sup>lt;sup>15</sup> <u>Chronic Kidney Disease of Unknown Etiology in India</u> – public article published by International Society of Nephrology.

<sup>&</sup>lt;sup>16</sup> <u>'Malnutrition in India: A comprehensive strategy to combat for better future</u>', article published in 'The Economic Times' edition, on 26<sup>th</sup> December 2022

Lokmanya Tilak Municipal General Hospital (LTMGH) is one of oldest India's public sector hospitals. The Department of Pediatrics and Nutrition Resource Centre has been striving to serve poor and malnourished children for more than 50 years. It provides free of cost treatment to patients from socio economically weaker sections of society. It has set up pediatric endoscopy services since 2016 and has been receiving ~500 children every year for an endoscopy requirement.

The endoscopy machines acquired in the year 2016 were old and needed upgradation. HDFC, under its CSR, thus funded a new advanced model of endoscopy machine to the hospital in March 2022. A few upgraded accessories like lens and video processor were also provided to upgrade the older machines. A team of experts finalized the technical specifications of the equipment. These included in house experts (pediatricians and gastroenterologists) from LTMGH, external experts from leading hospitals of India - Narayana Health's SRCC children's hospital and Jaslok Hospital. Post financial negotiations and assuring the technical needs identified, the vendor and make was shortlisted. 190 series endoscopy video system was procured from Olympus Medical Systems India Pvt Ltd.

<sup>44</sup> With old machines, we could provide only diagnostic treatments and not therapeutic treatments. The new and advanced machine funded by HDFC CSR filled this gap. <sup>37</sup>

Dr Prachi Karnik, Lokmanya Tilak Municipal General Hospital

#### 5.2 Efficiency

# 5.2.1 All equipment are being operated, maintained, and calibrated by trained staff. All were implemented in a cost effective and timely manner.

#### 5.2.1.1 Dialysis Machines

Fairfax India Charitable Trust, through a tender process, had appointed RahiCare, a Chandigarh based private operator, to operate machines provided by Fairfax across India. Their team consists of physicians and trained technologists. The service providers ensure regular preventive maintenance and quality checks. Furthermore, minimum calibrations as directed by the manufacturer are carried out daily by them. A 4-year comprehensive on-site warranty has been provided by the manufacturer, post which the state government takes care of the maintenance and servicing.

#### 5.2.1.2 Endoscopy machines

The endoscopy machine at LTMGH was reported to be operated by trained medical fellows under supervision of doctors. Annually, 3 fellows are trained by the hospital to exclusively operate the equipment under supervision and guidance of senior faculties and doctors.



The fiber optic technology of the equipment requires regular maintenance and quality checks for ensuring optimum results. A biomedical engineer performs these checks on the machines every quarter. The equipment is covered under 5-year comprehensive maintenance contract post the completion of standard one year warranty by manufacturer.

All interventions were timely as reported during the evaluation. All equipment was selected post a techno commercial evaluation of various vendors and hence was cost effective. Low cost was one of the key criteria for equipment selection.

#### 5.3 Effectiveness

# 5.3.1 The equipment has greatly enhanced the reach and quality of treatment to the needy patients from economically weaker sections of society, at zero cost.

The key factors responsible for achieving this, which emerged from the study, are:

- Alignment to government priorities
- Selection of hospitals serving most needy sections of society.
- Selection of most advanced technologies enabling wider scope of services
- Regular preventive maintenance and servicing of equipment,
- Availability of trained staff operating and maintaining the equipment on daily basis

#### 5.3.1.1 Dialysis Machines

108 haemo-dialysis machines funded by HDFC CSR have **performed 3,21,000 dialysis procedures**, **cumulatively, between April 2018 to October 2022.** Most of these were provided to patients suffering from chronic kidney disorders or to victims of snake bites and belonged to economically weaker sections of society.

The equipment enabled around 2.7 crore people<sup>17</sup> (65% of Odisha's population across 21 districts) to access free of cost dialysis within their district. Most of them could access the hospitals within a 20 km radius of their village.

#### 5.3.1.2 Endoscopy Machine

The equipment was installed in March 2022 and has **benefited 160 children in 8 months (March to October).135 for upper GI endoscopy and 25 for lower GI endoscopy or colonoscopy.** 

<sup>&</sup>lt;sup>17</sup> If a district had at least one government hospital providing free dialysis through HTPF funded machines, that district's population was considered covered under this estimation.

Based on past data of patients being treated by the previous endoscopy machine, **approximately 500** to 600 children are estimated to be benefitted by this machine annually.

#### Appreciation by women beneficiaries

As reported by the NGO partner, lot of women beneficiaries were observed to be appreciating the free of cost dialysis procedures made available in their districtintervention.

Though India is modernizing, the inequlaity between men and women remain prominent in several parts. Most families, especially in rural India, prioritize men's health over women's. In case of economically weaker sections, the limited pool of funds available for healthacre, is mostly utilized towards managing male member's health.

The equipment funded by HDFC CSR enabled free of cost dialysis for all. This enabled families to focus on women's health too. Such women reported high gratitude to the hospitals for providing free dialysis services.

Additionally, with few centers in Odisha offering affordable dialysis, long distances had to be travelled for treatment. This implied loss of several working days for the family member accompanying the patient. This often led families to neglect dialysis for female family members. Centers within districts and shorter travel time, resolved this problem for families and helped them prioritze womn's helath.

#### 5.4 Sustainability

All equipment were supplied to government hospitals. Post the long-term maintenance contract with manufacturer/ service provider, the government was responsible for its maintenance. Furthermore, in house biomedical engineers were present in all hospitals to regularly maintain the equipment thereby ensuring durability and sustainability.

Looking at the growing concern of chronic kidney disease, and high demand of pediatric endoscopy, the likelihood of intervention results to stay for a long time is high.



## 6 CONCLUSION AND RECCOMENDATIONS

The healthcare infrastructure funded by HDFC CSR has achieved its objectives of providing quality and affordable healthcare services to thousands of beneficiaries from socio-economically poor backgrounds.

Key findings are summarized below:

- All equipment stood **relevant** to the national context as well as hospital needs.
- All equipment were **efficiently** procured, operated, and maintained.
- All equipment were found to be **effective** in achieving its outcomes.

The study identified a few best practices which led to the success of the program. These include:

- Alignment to national needs and government priorities.
- Selection of hospitals with high footfall, largely serving socio-economically backward sections of the community
- Alignment to existing capacity of hospital, i.e., know-how and familiarity with equipment make and model.
- Selection of advanced technologies enabling a wider scope of services.
- Thorough techno-commercial evaluation in consultation with sector experts.
- Timely intervention, especially during the pandemic and for hospitals with urgent needs of replacement machines.
- Well-trained staff operating and maintaining the equipment.

While the interventions were successful, a few recommendations to maximize the outcomes are listed below:

- MIS system needs to be strengthened to get more meaningful data (complying with data privacy and confidentiality requirement) on aspects like range and volume of services delivered, health outcomes achieved, etc. from all hospitals. An M&E framework should be made part of the agreement with the beneficiary, i.e., the hospital.
- Social awareness programs, in communities surrounding the hospital receiving the support, will help in maximizing the impact of the intervention. Such programs should be initiated under CSR in partnership with the hospitals to enhance reach and spread awareness.
- A programmatic approach, instead of point interventions, towards a single identified problem and focusing on one geography could result in larger impacts over a period of time.



## **ANNEXURE A**

## List of equipment funded by HDFC CSR

S. N.	Equipment	Equipment Type	Hospital Name	Location (State)	Quantity of equipment
I	Cancer	CT Scan & Mammography	The Cachar Cancer Hospital Society	Assam	2
2	Cancer	PET CT scan machine	Sri Shankara Cancer Foundation	Karnataka	I
3	Cancer	Cancer Treatment	Tata Memorial Centre	Maharashtra	1
4	Cancer	Bone marrow transplant ward	Dr B Borooah Cancer Institute	Assam	I
5	Cancer	CT Scan machine	Saroj Gupta Cancer Centre and Research Institute	West Bengal	I
6	Cancer	Linear Accelerator equipment	Cancare Trust (Head and Neck Cancer Institute of India)	Maharashtra	I
7	General	Endoscopy machine	Lokmanya Tilak Municipal General Hospital, Paediatric Department (LTMGH)	Maharashtra	1
8	General	Dialysis machine	Fairfax India Charitable Foundation	Odisha	108
9	General	Ventilator	B J Govt. Medical College, Pune	Maharashtra	4
10	General	Ventilator	Bhagwan Mahaveer Jain Hospital	Karnataka	5
Ш	General	Ventilator	CMC Vellore	Tamil Nadu	5
12	General	Ventilator	Dr Hegde Institute of Medical Science	Andhra Pradesh	2
13	General	Ventilator	Govt. Rajaji Hospital	Tamil Nadu	3
14	General	Ventilator	Gujarat Cancer & Research Institute	Gujarat	5
15	General	Ventilator	Haffkine Institute- Govt Medical College, Chandrapur	Maharashtra	5
16	General	Ventilator	Haffkine Institute- Govt Medical College, Gondia	Maharashtra	5
17	General	Ventilator	Haffkine Institute- Civil Hospital, Thane	Maharashtra	4
18	General	Ventilator	Haffkine Institute- Civil Hospital, Nashik	Maharashtra	3
19	General	Ventilator	Haffkine Institute- Civil Hospital, Ahmednagar	Maharashtra	3
20	General	Ventilator	Jayadeva Hospital	Karnataka	5



S. N.	Equipment	Equipment Type	Hospital Name	Location (State)	Quantity of equipment
21	General	Ventilator	KEM Hospital	Maharashtra	3
22	General	Ventilator	Madras Medical Mission	Tamil Nadu	2
23	General	Ventilator	Mahatma Gandhi Institute of Medical Sciences	Madhya Pradesh	2
24	General	Ventilator	MCGM- Dr R N Cooper Hospital, Juhu	Maharashtra	5
25	General	Ventilator	MCGM- KEM Hospital, Parel	Maharashtra	5
26	General	Ventilator	MCGM- LTMG Hospital, Sion	Maharashtra	5
27	General	Ventilator	MCGM-Nair Hospital, Mumbai Central	Maharashtra	5
28	General	Ventilator	St Joseph Hospital	Maharashtra	2
29	General	Ventilator	Swamy Vivekanada Medical Mission	Maharashtra	2
30	General	Ambulance	District Churachandpur Hospital	Manipur	I
31	General	Ambulance	District Tamenglong Hospital	Manipur	1
32	General	Ambulance	Christian Institute of Health Sciences and Research	Nagaland	I
33	General	PSA Plants	St Catherine's Hospital	Uttar Pradesh	I
34	General	PSA Plants	Sub-divisional Hospital, East (Purvi)	Bihar	I
35	General	PSA Plants	Pedeppalli Government Hospital	Telangana	I
36	General	PSA Plants	Yenepoya Medical College	Karnataka	I
37	General	PSA Plants	Doddaballapur Government Hospital	Karnataka	I
38	General	PSA Plants	District Hospital	Kashmir	I
39	General	PSA Plants	Dr B Borooah Cancer Institute	Assam	1
40	General	PSA Plants	Homi Bhabha Cancer Hospital	Andhra Pradesh	1
41	General	PSA Plants	Yamuna Sports Complex	Delhi	2
42	General	Multi para monitors	Dr M L Dhawale Memorial Trust Hospital	Maharashtra	10
				Total	219



## List of equipment covered under the impact evaluation study

S. N.	Equipment	Equipment Type	Hospital Name	Location (State)	Quantity of equipment
I	General	Endoscopy machine	Lokmanya Tilak Municipal General Hospital, Paediatric Department (LTMGH)	Maharashtra	I
2	General	Dialysis machine	Fairfax India Charitable Foundation	Odisha	108
3	Cancer	CT Scan & Mammograph y	The Cachar Cancer Hospital Society	Assam	2
4	Cancer	PET CT scan machine	Sri Shankara Cancer Foundation	Karnataka	I
5	Cancer	Elisa Analyzer	Tata Memorial Centre	Maharashtra	I
6	Cancer	CT Simulator	Saroj Gupta Cancer Centre and Research Institute	West Bengal	I
7	General	Ventilator	B J Govt. Medical College, Pune	Maharashtra	4
8	General	Ventilator	Jayadeva Hospital	Karnataka	5
9	General	Ventilator	Mahatma Gandhi Institute of Medical Sciences	Madhya Pradesh	2
10	General	Ambulance	District Churachandpur Hospital	Manipur	I
11	General	PSA Plants	Yenepoya Medical College	Karnataka	I
12	General	PSA Plants	District Hospital	Kashmir	I
13	General	PSA Plants	Dr B Borooah Cancer Institute	Assam	1
14	General	Multi para monitors	Dr M L Dhawale Memorial Trust Hospital	Maharashtra	10
				Total	139





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## **CONTACT US**

Research Triangle Institute Global India Pvt. Ltd. 6th Floor, Commercial Tower, Pullman – Novotel Hotel, Aerocity, New Delhi – 110037 Tel: +91 11 4128 7150