Demystifying Healthcare Costs: A Scientific Approach

India's first scientific study on costing of medical procedures across public and private hospitals

FICCI HEAL
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Healthcare at Crossroads

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Foreword

The announcement of the flagship Ayushman Bharat- Pradhan Mantri Jan Arogya Yojana (AB-PMJAY), to cover over 10 crore poor and vulnerable families with a coverage up to INR 5 lakhs per family per annum for secondary and tertiary care hospitalization is certainly a timely and much needed trigger to reform healthcare delivery in India and to achieve the country's growth aspirations.

As we move towards achieving Universal Health Coverage for India, we would need to tackle various challenges including substantial expansion of our healthcare infrastructure to cover the 50 crore expected beneficiaries. The private sector, that has been providing nearly 60% of in-patient care and has contributed to 70% of bed capacity expansion in the last decade, will be a crucial partner in attaining this.

However, there are rising concerns amongst the private providers in terms of inadequate package rates for the procedures covered for hospitalization. Conventionally, the major weaknesses of public health insurance schemes, whether RSBY or CGHS, have been non-viable reimbursement rates and delays in payments to the hospitals, affecting the financial sustainability of such schemes with the empanelled hospitals.

For the government's aspirational mission to succeed in providing access to healthcare for its most vulnerable population, it is imperative to devise a **reimbursement mechanism based on a scientifically developed costing framework.** It is time to recognise costing from the point of view of both - affordability as well as viability and make concerted efforts to understand the actual cost associated with a medical procedure including direct material (drugs and consumables) as well as indirect cost of manpower and infrastructure.

Federation of Indian Chambers of Commerce and Industry (FICCI), as a change agent, has been working towards developing a rational costing template since 2013, under the aegis of Ministry of Health and Family Welfare, GoI, and was the nodal agency for the development of National Costing Guidelines. FICCI also initiated a study on costing of procedures in 2017 with three corporate hospitals to understand the cost parameters.

This year, in consultation with AIIMS and NITI Aayog, FICCI has developed *India's first scientific study on cost of healthcare in private and public hospitals*. The Study titled **'Demystifying Healthcare Costs: A Scientific Approach'**, will be released during the 12th annual healthcare conference, FICCI HEAL 2018, "Healthcare at Crossroads" scheduled on August 30 & 31, 2018 at FICCI,

New Delhi. This study can lay the foundation of determining actual costs incurred within the delivery system and can provide fundamental competence to devise appropriate package rates for AB-PMJAY as well as any other healthcare program in the country, to ensure that sustainability of all partners engaged in such programs is safeguarded. The study and its methodology can also help public and private hospitals to analyze and optimize their costs, leading to overall reduction in cost of delivery of care.

We are grateful to **NITI Aayog, Government of India** for supporting our endeavors and specifically **FICCI HEAL 2018.** We hope that the deliberations in the conference will help us in coming up with concrete recommendations for the healthcare sector that will be submitted to the Government at the highest level for consideration.



Dr Alok Roy
Co-Chair,
FICCI Health Services Committee
& Chairman,
Medica Group of Hospitals



(Hony) Brig Dr Arvind Lal
Chair,
FICCI Health Services Committee
& Chairman and Managing
Director,
Dr Lal PathLabs Ltd



Mr Varun Khanna
Co-Chair,
FICCI Health Services Committee
& Executive VP,
Fortis Healthcare



Dr Shakti Gupta
Chair,
FICCI Task Force on
Pricing of Healthcare &
Medical Superintendent,
Dr R P Centre for
Ophthalmic Sciences, AIIMS
New Delhi



Dr Narottam Puri
Advisor,
FICCI Health Services Committee;
Board Member and
Former Chairman, NABH
& Advisor- Medical,
Fortis Healthcare



Ms Shobha Mishra Ghosh
Assistant Secretary General
FICCI

Executive Summary

Providing healthcare to 1.35 billion people regardless of their economic status is a challenging proposition for any government. India, with its ever-growing healthcare demands and other demographic challenges, is still struggling with the three prerequisites of a Universal Healthcare Program - Accessibility, Affordability and Quality.

While developments in technology have made healthcare more accessible, affordability still remains unrequited, with more than six crore people being pushed to poverty every year due to burgeoning healthcare costs.

Against this background, the Government of India's National Health Policy 2017 (NHP-2017) has its goal fully aligned with the concept of Universal Health Coverage (UHC). The Ayushman Bharat Mission, announced in the Union budget 2018-19 of the Government of India, aims to carry NHP-2017 proposals forward. The Mission has two components – Health and Wellness Centers and Pradhan Mantri Jan Arogya Yojana – aiming for increased accessibility, availability and affordability of primary, secondary and tertiary care health services in India.

With private sector contributing to 70% of in-patient and 60% of out-patient care services in the country, the government has rightly sought to include the private sector in provisioning care for the beneficiaries under this Mission. However, for successful implementation of the AB-PMJAY it is imperative that a suitable and sustainable reimbursement model is offered to the private hospitals, considering the viability of their establishment. This calls for an understanding of cost incurred in providing healthcare services.

Costing in healthcare is complex due to the nature of delivery of services. There are several practical issues in capturing utilization of resources by the activities within the delivery system. The healthcare services require resources at multiple points of delivery within the system, with varying intensity of consumption of resources.

The traditional methods of costing are unable to capture the consumption of resources by various activities and lead to either over or under recovery. Hence, there is an urgent need for a scientific study to demystify the costs associated with delivery of healthcare.

FICCI has conducted a pilot study by employing Time Driven Activity Based Costing (TDABC). TDABC, a simple and a powerful tool, is able to capture the cost per unit of every resource based on the standard capacity and actual utilization of the capacity. This method maps the resources to activities to arrive at the cost. It has been adopted internationally and is endorsed by renowned publications including Harvard Business Review.

The FICCI study has selected a cross-section of procedures and hospitals from different locations and of different sizes. The study has brought out several important aspects of healthcare costs.

The impact of costs due to location and size is different on various components of cost like manpower, machinery, materials and expenses/overheads.

The computation of costs of different hospitals of varying sizes in different locations is measured by a statistical tool - Standard Deviation. The standard deviation of cost of each surgery from its mean value reflects heterogeneous nature of cost structures across hospitals.

The study has rolled out recommendations for a sustainable cost model in healthcare. The scientific basis of this study provides a foundation on which the government and service providers can work together to derive an appropriate reimbursement model that is not only viable but also accounts for enhanced quality and clinical outcomes.

Chapter 1
Background

Though India's population is 16% of the world's population, it has a disproportionately high share of global disease burden of approximately 21%. The burden of communicable diseases is coupled with one of the fastest growing incidences of non-communicable disease, mental illness and trauma. Contrary to its population size and disease burden, India has one of the lowest public healthcare spends in the world, which has just marginally increased from 1.2% of the GDP in 2013-14 to 1.4% in 2017-2018.

Public provisions for healthcare remain largely inadequate and India's healthcare model is shaped mostly by private healthcare. Globally, India has been recognized for availability of high quality secondary and tertiary care at a fraction of prices as compared to developed countries. But it fails to provide even basic healthcare beyond the urban limits, putting about 70% of its population dwelling in the rural areas at risk of suffering from preventable and curable diseases and conditions. The constantly increasing demand for healthcare services across the country bring to the fore the challenges of accessibility, affordability and quality. Private healthcare sector, though largely unorganized, caters to about 70% of all healthcare service demands in the country. Burgeoning healthcare prices, out-of-pocket health expenditure at 62% and very limited social security, pushes about six crores of our countrymen below the poverty line, every year.

The Business of Healthcare in India

In order to address the current challenges and improve health outcomes in the country, substantial investment in healthcare infrastructure needs to be made by both public funding and private investment. Private sector has been actively investing in the sector with 70% of bed capacity expansion over last 10 years and by providing 60% of the country's in-patient care. It is estimated that the Indian healthcare industry is likely to grow at a CAGR of 16% to reach USD 372 billion (INR 26 trillion) by 2022. However, at the ground level, small and large hospitals, which form the backbone of the healthcare delivery system, either operate with low profit margins or are running in losses.

It is an undeniable fact that investors in private healthcare sector expect a fair return on their investment, as in case of any other business investment. Given the longer gestation of healthcare projects, investors expect a project Internal Rate of Return (IRR) of 15% to 18%. For a typical hospital project to have an IRR of 18%, cash flow has to be positive before the third year of operation and EBITDA in the range of 23% to 25% in the fourth to fifth year of operation. However, in reality, very few assets are able to achieve and sustain the desired financial performance. An assessment by Ernst & Young of a pan India sample of 76 private providers (standalone and chains) based on publicly available data for FY 15-16 revealed that the Return on Capital for a cross section of private players is in the range of -2% (25th percentile) to 11% (75th percentile), that is way below cost of capital at 14%.

Developing and maintaining hospitals is a capital-intensive affair and therefore, managing costs, achieving profitability and justifiable growth are very important for any hospital venture to be successful. Hospitals face number of challenges as they are exposed to greater risk as compared to other industries, owing to complexity of operations, ensuring appropriate quality of care and humanitarian and ethical issues in providing healthcare.

The operational and financial risks in hospital sector and various challenges faced in this sector also emanate from the growing competition, which puts hospitals under pressure to provide cost effective services along with ensuring good quality of care. Two critical aspects being:

- Appropriate pricing of services
- Optimal capacity utilization

Further, due to continuous technological advancement in diagnosis and treatment, hospitals need to invest heavily on acquiring the most appropriate technology to deliver quality care to the patients. Hospital pricing policy has to ensure the recovery of the capital costs of these equipment and technologies. Apart from physical resources, hospitals also face the challenge of ensuring that they retain qualified professionals. A FICCI-Kantar IMRB pan India patient satisfaction survey of 5,000 healthcare consumers conducted in 2017, revealed that reputed doctors associated with a hospital was the third most compelling reason for people to choose a particular hospital for treatment.

Key financial challenges for Indian Hospitals:

- Cash flow and working capital management
- Achieving operating profitability on a sustainable basis
- Optimizing resources and processes and thereby reducing overall cost
- Improving overall margin
- Deriving financial performance indicators for different departments or service lines
- Managing employee cost without affecting the staff turnover ratio
- Analyzing and optimizing workforce and benefits
- Managing receivables below 90 days
- Improving and maintaining credit rating of the hospital by ensuring healthy financial ratios
- Generating and retaining funds for future capitalization, modernization and expansion
- Cash embezzlement, wastage, fraud and leakages

Ayushman Bharat: Leapfrogging towards Universal Health Coverage

With the announcement of the 'world's largest public funded healthcare program'- Ayushman Bharat- Pradhan Mantri Jan Arogya Yojana (AB-PMJAY) which was earmarked in Union Budget 2018, the Government of India envisions to provide access to secondary and tertiary care to more than 10 crore vulnerable families (approximately 50 crore beneficiaries). The scheme will provide a cover of INR 5 lakh per family for hospitalization for 1,350 plus medical procedures. Given the significant infrastructure deficit in the public health system, majority of care to the AB-PMJAY beneficiaries will be delivered by private healthcare providers, which would require strong commitment from the private sector and a viable collaboration between the government and the private sector.

In the recent years, the government has engaged with the private sector for implementation of several health protection initiatives where the private sector is providing affordable healthcare services to a large number of beneficiaries, like RSBY and CGHS. However, there have been fundamental challenges related to reimbursement rates, inordinate delays in reimbursement, low emphasis on performance or quality-based incentives and lack of consideration for sustainability of the private healthcare providers; which have affected the viability of such collaborations for the private sector.

Cost of Delivering Care

For successful implementation of AB-PMJAY, it will be critical to ensure that package rates for procedures covered under the mission are adequate to provide quality services to the beneficiaries and do not hamper the sustainability of the healthcare providers. To derive rational and sustainable package rates, there is a strong need to **understand costs from the perspective of all relevant stakeholders** - the government, the providers and the consumer. While the price controllers view the cost of care mainly as cost of consumables, patients see cost as what they pay out of pocket and hospitals work cost around departments. Because of this disconnect, the efforts of deriving rational reimbursement rates for healthcare service providers have been ineffective in the past. The only way to bring a fundamental reform is to consider the **cost within the delivery system - the cost incurred by the provider.**

The goal of Universal Health Coverage can be accomplished only with clear criteria for costing as well as adequate and timely reimbursement. Therefore, it is imperative to develop a proper costing approach to derive reimbursement rates that are aligned with service delivery costs at different levels of care, locations and volumes. International studies suggest the cost crisis in healthcare can be fundamentally solved with accurate measurement of costs and their fair comparison with outcomes.

While volume-based costs may appear to be a reasonable method of costing in several industries, it cannot provide accurate costs in the healthcare industry. Delivery of healthcare being very complex in nature, accurate measurement of costs is difficult. Not all costs in healthcare are proportionate to changes in volume, except the cost of machinery and materials. Better patient outcomes and quality of care, which are powerful drivers of value in healthcare, also have implications on cost.

Ascertaining types and units of resources consumed and apportioning cost of such resources for each service delivered in a hospital have been challenging for providers. Therefore, it is important to move away from the conventional method of measuring costs to a scientifically designed method, which is able to capture the utilization of resources for various processes within a hospital.

Time Driven Activity Based Costing (TDABC), a revised and simplified Activity Based Costing (ABC), has been internationally recognized as an effective methodology for estimating costs of processes used in patient care. TDABC assigns resource costs to patients based on the amount of time resources are used in patient encounters, while other costing approaches rely on arbitrary allocations to some extent. TDABC directly measures the clinical and non-clinical resources for every activity involved in delivery of a service. This helps in not only understanding the actual cost but also the utilization of resources according to their available capacity.

TDABC has been recognized internationally as a scientific methodology for costing in Healthcare:

"Time Driven Activity Based Costing in Healthcare: A systematic review of the literature by George Keel, Carl Savage, Muhammad Rafiq & Pamelo Mazzocato - Medical Management Centre, Department of Learning, Informatics, Management and Ethics, Karolinska Institutet, Stockholm, Sweden & by Kaplan RS, Anderson SR. Time-driven activity-based costing. Harvard Business Review 2004;82(50):131–8."

Chapter 2
About the Study

Over the recent years, a rising trust deficit has been witnessed between the private healthcare providers and the government as well as between the provider and the patient, based on the perception that private healthcare providers are profiteering. Policy announcements have been made by the government for capping prices of commonly used consumables in hospitals, while the hospitals are grappling with issues of cash flow, low returns and reimbursement rates as well as delayed payments. Recognising that a rational derivation of package rates, profit margins or price caps should come from a scientific costing exercise, FICCI Health Services Committee carried out the **FICCI Study on Costing of select Medical Procedures in Hospitals** *(hereafter referred to as 'the study')*, under it's **Task Force on Pricing of Healthcare.**

Scope of the Study

The study aims to provide a reasonable, quantifiable measure of costs of healthcare services in a hospital setting that can provide competence to develop appropriate package rates for defined healthcare services.

Scope of this study is to arrive at the actual costs associated with delivery of select medical procedure across select public and private hospitals in India.

The cost structure varies among the service providers in terms of:

- Level of Care: Difference in costs incurred due to the levels of care provided in a hospital - whether it is a secondary care level or tertiary care level hospital
- Types of Hospital: Cost structure varies depending on whether a hospital caters predominantly to outpatients (medical center) or to inpatients (surgical center)
- Location of Operation: Depending on where a hospital is located, several cost components like real estate costs, utilities, salaries and benefits for manpower, etc. vary

To ensure all cost elements are accurately captured and to better understand the variation in different cost components in different hospitals, it is imperative to carry out a scientific study using a **standardized costing tool**, which captures costs of services of different hospitals on a common platform.

Four categories of hospitals that have been covered under this study include:

- **Category A**: Less than 100 bedded private hospitals
- **Category B**: 100-300 bedded private hospitals
- **Category C**: More than 300 bedded private hospitals
- **Category D**: Public hospitals

Methodology

Time Driven Activity Based Costing (TDABC) has been adopted as the methodology of the study.

Providers and policy makers in the current competitive reimbursement environment are looking for cost-accounting solutions capable of notifying process improvement and meeting the expectations of cost-control policies. Hence, the healthcare organizations around the world are investing heavily in value-based healthcare (VBHC). Further, TDABC, a bottom-up costing approach, is being widely used as the cost-component of VBHC due to its capacity for addressing costing challenges.

Conventional methods of costing are resource intensive and difficult to maintain, especially for a large organization. A major drawback is that they do not map the resources to procedures according to their consumption in the activities involved. Further, the capacity utilization of resources is not considered in arriving at per unit cost of the resources. This has an impact of treating procedures of different clinical outcomes with same costs.

TDABC is simple, transparent and a powerful tool since it requires only two key parameters: The **Capacity Cost Rate (CCR)** and the **Time** required to perform activities in service delivery. It is aptly applicable in healthcare as it can help to efficiently cost the processes involved, thereby overcome risks associated with current cost-accounting methods.

The TDABC method involves the following key steps:

Step 1	Select the medical procedure/condition
Step 2	List all key activities (both clinical and non-clinical) performed to deliver care for the selected medical procedure/condition
Step 3	Map each activity and identify all direct and indirect resources consumed for the activity, including the average time, the personnel type and equipment required to complete each activity
Step 4	Ascertain time estimates for each activity involved and the resources deployed
Step 5	Ascertain cost estimate for all direct and indirect resources involved in care delivery
Step 6	Estimate the capacity of each resource and calculate the Capacity Cost Rate (CCR), which is equal to total expenditure of the resource divided by the available capacity of the resource
Step 7	Arrive at the total cost of patient care

The expenses attributable to a particular resource, requires the calculation of the total cost incurred, to make it available for patient care. For personnel, this includes salary, fringe benefits, administrative support, information technology and office expenses. For physical space, this includes annual depreciation, maintenance, operating and housekeeping costs, real estate costs, and the cost value of all equipment in that space.

While calculating the available capacity, only effective capacity is considered. For example, in case of nursing resource, though the duty shift could be of 8 hours, the hours for break for refreshments, fatigue and handing over & taking over are not included. The remaining hours are considered as the denominator.

An illustration of working cost of a Nursing Resource under TDABC		
	Number of days in a year	365
Less	Sundays	50
	Saturdays	24
	Casual Leave	12
	Earned Leave	12
	Training	5
	Sick Leave	10
	Number of days available	252
	Number of working hours per nurse	8
Less	Break	1
	Fatigue and handing over	1
		6
	Nursing cost	20,000
	Add benefits (15%)	3,000
	Training costs (10%)	2,000
	Supervision cost (10% of supervision cost)	4,000
	Amenities and space (2%)	400
	Total Cost	29,400
	Per annum cost	352,800
	Per day cost	1,400
	Per hour cost	233

This method fixes per unit effective cost of the resource, where the unit of cost is fixed based on the type of the resource. In the OT, all resources have per hour as unit of cost whereas in ICU or Wards it is per patient bed day.

Procedures Selected for Costing

With the intent to understand costs for commonly carried out procedures and to cover different medical specialities, the following 10 procedures were selected for this Costing Study:

1. Laparoscopic Cholecystectomy– Minimal Invasive Procedure
2. Inguinal Hernia Repair
3. Upper Gastrointestinal Endoscopy
4. Lower Segment Caesarean Section (LSCS)
5. Cataract Surgery
6. Hysterectomy
7. Percutaneous Transluminal Coronary Angioplasty (PTCA)
8. Coronary Artery Bypass Grafting (CABG)
9. Total Knee Replacement (TKR)
10. Transurethral Resection of the Prostate (TURP)

The above procedures are typically elective/planned procedures with relatively more standard clinical pathways.

Participating Hospitals

Nine hospitals from metro and non-metro cities from across the country participated in the study. All private hospitals included in the study are NABH accredited.

Cities covered: Agra, Chennai, Delhi, Kolkata, Mathura and Patna

Category	Hospital Number	Location of Operation
A (Less than 100 beds)	Hospital 1	Non-metro
	Hospital 2	Metro
B (100 - 300 beds)	Hospital 3	Non-metro
	Hospital 4	Metro
	Hospital 5	Metro
C (More than 300 beds)	Hospital 6	Non-metro
	Hospital 7	Metro
D (Public Hospitals)	Hospital 8	Metro
	Hospital 9	Metro

Collection of Data

Data for the study has been collected in a standardised template that captures all direct and indirect costs incurred during delivery of a medical procedure. The template broadly captures all costs under five heads:

1. Manpower
2. Material
3. Machinery
4. Expenses
5. Utilities

A 10 membered team of finance professionals and cost accountants led by a healthcare costing expert, engaged in data collection with the hospitals and guided them on deriving cost of all components of the procedures and populate it in the corresponding section of the template. Medical Directors, Operational Heads, Medical Superintendents, Members from the finance team and Head of Departments from the hospitals were involved in the study, as required.

Basis of Allocation

The basis of allocation for all cost heads for all departments involved in delivery of care has been pre-defined to ensure uniform standard for data collection across hospitals (Detailed basis of allocation has been provided in **Annexure 2**).

Sample Top Sheet for Costing of CABG

COSTING FOR CABG ON-PUMP SURGERY

	MANPOWER	MATERIAL	MACHINERY	EXPENSES	UTILITIES	TOTAL
MEDICAL SUPPORT DEPARTMENTS						
OT	58,909	60,210	11,671	3,389	8,279	142,458
ICU	6,450	4,341	1,937	3,087	1,956	17,772
Lab	11,869	1,295	132	7	71	3,374
Radiology	-	-	-	3,000	-	3,000
Physiotherapy	9,091	-	-	2,639	452	12,182
Blood Bank	993	-	131	23	92	1,238
Pharmacy	767	-	-	24	16	807
Ward	6,340	3,511	-	78	1,106	11,035
SERVICE DEPARTMENTS						
CSSD	5,133	31	7,035	17	2,618	14,834
IT	481	18	549	23	20	1,091
CCTV	522	-	10	0.32	38	570
Fire Safety	65	-	59	2	-	126
OPERATIONS & Administration	2,335	4	-	26	405	2,770
Finance & Accounts	512	2	-	4	4	523
Purchase & Stores	427	2	1	1	122	553
HR	394	6	-	1	33	433
Maintenance	643	493	-	0.19	-	1,136
Medical Records Department	105	-	-	0.19	22	127
Admissions	130.	-	-	-	-	130
Security	1,142	-	-	-	-	1,142
Dietetics	3,494	-	-	-		3,4934
Housekeeping	39	7	4	0.19	33	82
Laundry & Linen	-	1,348	-	-	-	1,3478
OTHER COSTS						
Building Cost	-	-	-	4,056.	-	4,056.
Communication	-	-	17	434	-	451
Genset Power Back Up	-	-	348	-	-	348
Biomedical Waste (Outsourced)	-	-	-	56.00	-	56.00
Non-medical Furniture (Indirect)	-	-	-	1,038	-	1,038
Bio-metric	-	-	1	-	-	1
Solar Heating	-	-	-	-	-	-
UPS	-	-	44	-	-	44
Water Facilities	-	45	25	-	-	70
Total Cost	**99,840**	**71,311**	**21,965**	**17,907**	**15,269**	**226,292**

Chapter 3
Findings and Recommendations

Summary of Cost Comparisons- Computed for hospitals of different sizes and locations

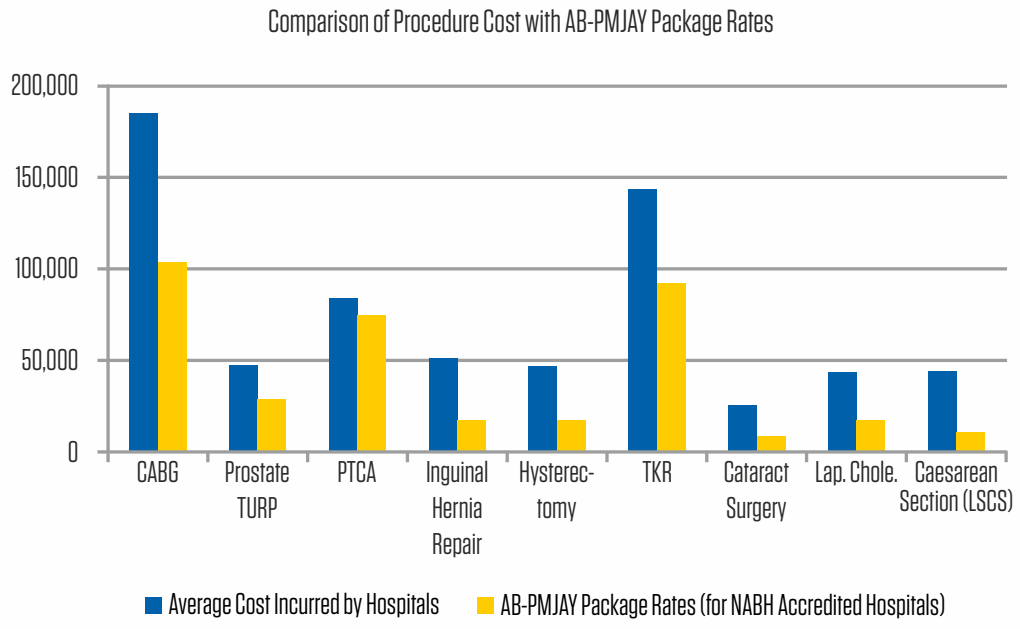
Category	Hospital	CABG	Prostate TURP	PTCA	Inguinal Hernia	Hysterectomy	TKR	Cataract Surgery	Laparoscopic Cholecystectomy	Upper GI Endoscopy	Caesarean Section (LSCS)
A	Hospital 1	NA	61,199	90,313	54,086	56,839	1,71,655	NA	48,892	NA	50,999
A	Hospital 2	NA	53,970	NA	63,148	67,098	1,85,140	40,542	54,689	NA	56,762
B	Hospital 3	184,000	52,511	88,780	55,758	64,907	185,830	23,778	33,091	NA	NA
B	Hospital 4	2,02,725	47,548	1,09,017	60,767	43,563	2,05,658	18,681	40,346	3,738	54,140
B	Hospital 5	1,98,005	54,158	88,826	50,668	51,683	1,59,655	NA	54,641	NA	49,220
C	Hospital 6	226,292	61,199	90,313	54,086	56,839	1,71,655	NA	48,892	NA	50,999
C	Hospital 7	1,60,980	67,456	1,33,458	65,925	66,828	1,81,819	20,628	57,965	3,005	61,087
D	Hospital 8	1,36,882	46,775	81,701	62,543	41,019	1,01,039	18,629	53,425	1,930	35,905
D	Hospital 9	NA	NA	NA	NA	NA	NA	NA	46,779	3,003	NA
Average Cost		**184,813**	**49,423**	**88,343**	**51,886**	**49,863**	**151,383**	**20,376**	**43,871**	**2,335**	**44,889**
Standard Deviation (%)		**17**	**13**	**19**	**9**	**18**	**18**	**38**	**16**	**26**	**15**
AB-PMJAY Package Rates (for NABH Accredited Hospitals)		**103,500**	**28,750**	**74,750**	**17,250**	**23,000**	**92,000**	**8,625**	**17,250**		**10,350**
% of Cost Covered in AB-PMJAY Package Rates		**56**	**58**	**85**	**33**	**46**	**61**	**42**	**39**		**23**

Notes on Computation of costs:

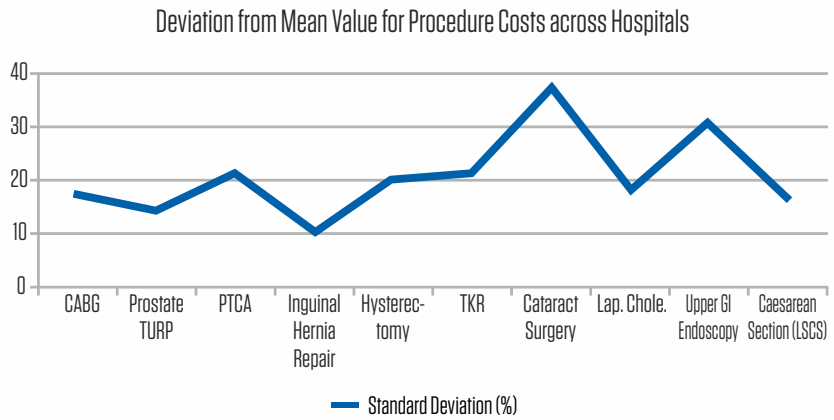
1. Land cost, corporate overheads, cost of finance and Return on Investment have not been included
2. Cost of implants, wherever applicable, have been included for the computation of cost

Key Findings

- Across the selected medical procedures it was observed that the clinical manpower cost accounted for almost one-third of the total cost of the procedure
- Variation in overall cost for a procedure is not significant when compared between public and private hospitals included in the study. It was also observed, for some procedures public hospitals incur higher costs than some of the private hospitals
- In some cases, the package rates are even less than the cost of manpower and materials required to deliver care. Proposed package rates of the selected procedures under AB-PMJAY vary between 23-85% from the average cost incurred by hospitals to carry out these medical procedures.



- Costs of procedures were found to be closer to the GIPSA rates fixed by the PSU insurance companies, though the cost derived for a procedure in this study does not include cost of interest paid by the hospital or any expected Return on Investment. GIPSA rates have been negotiated with large number of service providers of different sizes across the country
- Standard deviation of cost for the selected medical procedures across hospitals range between 9% to 38%, which highlights the heterogeneous cost structures amongst hospitals



- Lower volumes led to higher costs, as the cost of delivery of care in case of less than 100 bedded small hospitals was found to be higher than that of the cost incurred by more than 100 bedded hospitals
    - This observation is irrespective of whether the hospital was located in a metro or a non-metro city
    - Small hospitals face challenges in investment in manpower and equipment, and hence engage with clinical teams on fee-for-services basis (as consultants) and in some cases small hospitals rent equipment even for the routine surgeries
- Volumes impact different components of cost in different manner. Higher volumes do lead to savings in machinery and materials (consumables). However, increase in volumes does not always lead to lower costs, as the utilization of infrastructure is constrained by capacity utilization of the clinical manpower. Any significant rise in volume can lead to new break-even points/levels, as **additional investment will be required for:**
    - engaging additional clinical manpower
    - adding capacity, in case major volume of general ward patients is added as this capacity is usually full in established hospitals
- Large public hospitals like AIIMS command price advantage in procurement of machinery and materials (consumables)
- Balancing between cost and accessibility is complex. While real estate cost continues to be a challenge for the hospitals in metro cities, hospitals in non-metros have higher cost of clinical manpower in terms of their remuneration and fringe benefits. Due to limited public infrastructure beyond metro cities, hospitals also invest in creating a support system for the doctors and their families

Recommendations: The Way Forward for Sustainable Pricing in Healthcare

With the launch of AB-PMJAY, India is witnessing an increasing role of government as a payer of healthcare services. Given that 70% of healthcare is delivered in private health establishments in India, public purchase of healthcare services from private providers will be an important feature of operationalizing Universal Health Coverage. Therefore, it is critical that the government offers reimbursement rates that are sustainable and help in growth of the sector which would attract investments to improve access to quality care in the country.

- In India, reimbursement rates for procedures under various public health insurance schemes vary vastly and there is lack of national level guidelines on package definition and reimbursement tariff determination. The government needs a **framework for standard package definition** (with unique nomenclature for each package) and reimbursement tariff determination that has the ability to evolve in response to changing contexts, revised priorities and experiences gained over years
- Although the government has developed package rates for AB-PMJAY taking into consideration package rates for social health insurance schemes like various State Social Health Insurance Schemes, CGHS and RSBY, it is recommended that these should be revised in light of a **scientific costing study**. Given the number of AB-PMJAY beneficiaries, hospitals will not be able to sustain the package rates if they are not viable. This is applicable to both- small hospitals and large hospitals across the country
    - At the given AB-PMJAY package rates, even the provision for 10% higher package rates each for having entry level of NABH certification, being located in the rural areas or backward districts and running PG/DNB course and15% higher package rates for hospitals with full NABH accreditation, will be not be sufficient to cover costs in majority cases
- The government should formulate a rationalized reimbursement tariff that defines **differential rates for stratified provider groups.** This should be coupled with optimal payment models that orient away from fee-for-service (FFS) to reimbursement mechanisms that incentivize quality, efficiency and clinical outcomes
    - Globally, there is a gradual shift with decreasing usage of Fee-for-service model and increasing adoption of the **capitation model for out-patient care and diagnose-related-groups (DRG) model for in-patient care.** Most countries are moving towards a **hybrid model (fixed + variable incentive)**, which incentivizes efficiency of resources/inputs and achievement of clinical outcomes by moving away from indicators linked directly to revenue generation via fee-for-service arrangements
    - The model for **differential pricing** should also be considered based on the qualification and experience of manpower, deployment of cutting edge technology as well as the provision of best-in-class service by the provider. As in the case of Railways wherein user charges vary according to the preference of facilities, the hospitals may be allowed to recover the difference between the reimbursable by the government and cost of facilities preferred by the patients.
- Package rates should be fixed for a period of one year and at the end of each year, the rates should be adjusted in consideration of inflation and any other significant change in input costs, due to factors like change in tax regime or minimum wages or allowances.

- Since introduction of GST, tax on inputs for hospitals like disposables, drugs, reagents and medical equipment have augmented. Healthcare services being exempt from GST, providers cannot claim any input tax credit, which adds to cost of delivery of care. The government needs to consider **'Zero GST Rating'** for healthcare services or an **output tax of 5% on the composite bill** for healthcare services, which will ensure that the credit chain is intact.

- Though land cost has not been included in computation of cost in this study, it must be considered for devising package rates, as it forms part of a major share of the project cost with an impact on cash flow. As an asset, cost of land does not depreciate, the gains are notional as an enterprise under "going concern" concept needs land for its business continuity

Computation of Land Cost	
Land allotted to service provider at an annual rental value over a long period of time	This rental value should be absorbedby the service provider as a cost and should be amortized over the procedures
Land allotted on payment of a lump sum together with a minimal rent per annum for a specified period	The capitalized value of all the payments should be amortized over the life of the agreement with 11% ROI
Land purchased by service provider at Market Value	The value at which land is purchased must be recovered over a period of 29 years with a ROI of 11%. Accordingto many international investors business continuity is assumed for about 30 years only
Land provided free/at concessional cost with an obligation of commitment of free beds	Per bed revenue foregone should be capitalized over the life of the agreement and amortized with an ROI of 11%

- Actual turnaround time for reimbursement to service providers should be strictly within the specified period. This is very crucial given the past experience of service providers with various public funded schemes. Sizeable outstanding payments, often running into crores of rupees, impact financial health of the providers. The provision for penalties for delays in reimbursement need to be adequate to compensate for any losses due to delayed reimbursements

- Further, the current bed capacity status in the country is not enough to cater to the expected beneficiaries of AB-PMJAY. We need to substantially increase our number of beds by approximately 0.64 million with an investment of INR 3 trillion (USD 44 billion) over next 10 years. With limited public funds, government needs to provide appropriate financing options along with incentives and tax benefits to the private sector to expand their service capacities. This can be done through:

  - Provide **long term financing** to the healthcare sector - Healthcare is included in harmonized master list of Infrastructure sub sectors by the Reserve Bank of India (RBI). While hospitals have been provided infrastructure status and are eligible for long-term loans (12 years) and a longer moratorium period, many promoters fail to get the projects appropriately financed because of lack of

knowledge on their and the banker's part. The government needs to take initiative to create awareness about the benefits of the infrastructure status and engage different stakeholders (the RBI, Ministry of Finance and commercial banks) to make favorable financing available to the industry

- Healthy cash flow is as important to achieving a successful medical practice as offering excellent patient care. As a business borrower, the healthcare organizations need to carefully select the right financial resource for each need and hence it is important to know how much working capital is enough. However, in India, we do not have a **structured working capital financing for the healthcare sector.** RBI has proposed a minimum 40% loan component for working capital funding of INR 150 crore and above to bring in greater credit discipline and improve monetary transmission. However, there is no clarity on the availability of the same for healthcare service providers and working capital financing remains a challenge for small and medium hospital as well as large standalone hospitals
- **Deduction under section 35AD of the IT Act** should be extended to hospitals incurring substantial investment in digitization, implementation of EHR, providing NCD care in remote areas, telemedicine, remote radiology etc

Annexure 1: Sample Template

COSTING FOR CABG ON-PUMP SURGERY							
		Manpower	Material	Machinery	Expenses	Utilities	Total
Medical Support Departments	OT	58,909	60,210	11,671	3,389	8,279	142,458
	ICU	6,450	4,341	1,937	3,087	1,956	17,772
	Lab	1,869	1,295	132	7	71	3,374
	Radiology	-	-	-	3,000	-	3,000
	Physiotherapy	9,091	-	-	2,639	452	12,182
	Blood Bank	993	-	131	23	92	1,238
	Pharmacy	767	-	-	24	16	807
	Ward	6,340	3,511	-	78	1,106	11,035
Service Departments	CSSD	5,133	31	7,035	17	2,618	14,834
	IT	481	18	549	23	20	1,091
	CCTV	522	-	10	0.32	38	570
	Fire Safety	65	-	59	2	-	126
	Operations & Administration	2,335	4	-	26	405	2,770
	Finance & Accounts	512	2	-	4	4	523
	Purchase & Stores	427	2	1	1	122	553
	HR	394	6	-	1	33	433
	Maintenance	643	493	-	0.19	-	1,136
	Medical Records Department	105	-	-	0.19	22	127
	Admissions	130	-	-	-	-	130
	Security	1,142	-	-	-	-	1,142
	Dietetics	3,494	-	-	-	-	3,494
	Housekeeping	39	7	4	0.19	33	82
	Laundry & Linen	-	1,348	-	-	-	1,348
Other Costs	Building Cost	-	-	-	4,056	-	4,056
	Communication	-	-	17	434	-	451
	Genset Power Back Up	-	-	348	-	-	348
	Biomedical Waste (Outsourced)	-	-	-	56	-	56
	Non-medical Furniture (Indirect)	-	-	-	1,038	-	1,038
	Bio-metric	-	-	1	-	-	1
	Solar Heating	-	-	-	-	-	-
	UPS	-	-	44	-	-	44
	Water Facilities	-	45	25	-	-	70
	Total Cost	**99,840**	**71,311**	**21,965**	**17,907**	**15,269**	**226,292**

1. Operation Theatre (OT)

Operation Theatre		
Particulars	CABG On-pump	Total
Manpower		
Experts	45000	58909
Employees	13909	
Materials		
OT Consumables		60210
Machinery		
Depreciation	6446	11671
Maintenance	5225	
Expenses & Utilities		
Expenses		
Non-medical Furniture	38	3389
AC	3250	
Fumigation	100	
Utilities		
Building	7350	8279
Power consumption	929	
Total Cost		142458

OT Manpower

Experts cost per Surgery

S. No.	Particulars	CABG on-pump
1.	Surgeon fee	28000
2.	Anesthetist fee	8500
3.	Asst. Surgeon fee	8500
	Total per surgery	**45000**

OT Manpower- Other Employees

S. No.	Designation	No. of persons	Category	Gross Salary per staff/month	Gross Salary per month	No. of days	Actual number of days	Total salary for OT Manpower (only for CABG surgeries)	Manpower cost per day	Standard working hours (CABG surgeries)	per hour cost	Manpower cost per hr CABG on-pump (6 hr duration)
1	Scrub Nurse	1	Staff	50000	50000	30	22	68182	2273	7	325	1948
2	Asst. Scrub Nurse	2	Staff	25000	50000	30	22	68182	2273	7	325	1948
3	Floor Nurse	1	Staff	18000	18000	30	22	24545	818	7	117	701
4	Anesthesia Nurse & Tech.	2	OT Asst. & Staff	20000	40000	30	22	54545	1818	7	260	1558
5	Perfusionist	1	Perfusionist	80000	80000	30	22	109091	3636	7	519	3117
6	Asst. Perfusionist	1	OT Tech.	65000	65000	30	22	88636	2955	7	422	2532
7	Nurse Junior	1	ANM	18000	18000	30	22	24545	818	7	117	701
8	Security	2		18000	36000	30	22	49091	1636	7	234	1403
	Total	11		294000				486818	16227		2318	13909

OT Materials

Consumables in OT

S. No.	Name of the material	Cost price per unit (in Rs.)	Qty per Patient	Cost of OT Consumables (in Rs.)
1	San-Fent 50mcg/Ml 10ml Injection	81	2	162
	.....			
138	Xynova 2% 30ml Inj	24	1	24
Grand Total				60210

OT Machinery Equipment

S. No.	Name of the equipment	Cost price	Date of Purchase	Avg. life-time of the equipment- (in yr)	Scrap value @5% on cost price	Cost of machine per year	No. of Equipment	Annual cost of all machines	Cost per day 300 days	Annual Insurance charges @1% on cost	Cost of Spares & Maintenance @10% on cost	Total cost of Maintenance	Total cost of Maintenance for all Machines	Cost per day Maintenance 300 days	Total cost including maintenance
1	Heart-Lung Machine with HCU	6500000	21/Mar/16	7	325000	882143	1	882143	2940	65000	650000	715000	715000	2383	5324
	....														
24	IABP machine	2200000	1/Apr/16	7	110000	298571	1	298571	995	22000	220000	242000	242000	807	1802
	Total	28500000			1425000			3867857	12893					10450	23343

Cost per surgery	Cost per day	Capacity hours	Number of hours per Surgery	Cost per surgery
OT Machinery Depreciation	12,893	12	6	6446
OT Machinery Maintenance	10,450	12	6	5225
Total				11671

OT Expenses and Utilities

Computation of Non-Medical Assets cost

Furniture/ Equipment

S. No.	Name of the equipment / Furniture	No. of Equipment	Cost price	Avg. life-time of the equipment	Scrap value @5%	Cost Per year = (CP-Scrap value)/ Avg. life time	Total Cost Per year = [(CP-Scrap value)/ Avg. life time] x No of equipment	Cost per day	Standard Hours Per Day	Cost Per Hour
1	Hand Trolley Small	2	2500	5	125	475	950	3	12	0
	-									
13	Fogger Machine	1	25500	5	1275	4845	4845	16	12	1
	TOTAL	23	77600	65	3880	14744	22905	76		6

Particulars	No. of Hours per surgery	CABG On-Pump
Non-Medical Asset cost per surgery	6	38

Air Conditioning Utilization Cost

S. No.	Floor	Area	CFM	IDU Details	ODU details-TR	Capital Cost	Avg. life-time of the equipment	Scrap value @5%	Cost Per year = (CP-Scrap value)/ Avg. life time	Annual Insurance charges @1% on cost	Cost of Spares & Maintenance @5% on cost	Total Annual cost (in Rs.)	Cost per day (Rs.)	Cost per hour (Rs.)	Power in KW (unit/hour)	Power cost per hour @Rs. 10.45/-
1	2 Floor	Corridor	3400	Ductable Unit	9	868872	7	43444	117918	8689	43444	170051	567	71	11	110
2	2 Floor	OT 1	2400	AHU	9	868872	7	43444	117918	8689	43444	170051	567	71	11	110
3	2 Floor	OT 2	2400	AHU	9	868872	7	43444	117918	8689	43444	170051	567	71	11	110
Total						2606617		130331	353755	26066	130331	510152	1701	213		329

Particulars	Surgery duration (in hr)	Cost per Surgery
AC Cost	6	3250

Fumigation

Consumable Cost	**6000**
Usage (Days)	45
Consumable cost per Day	**133**
Per Hour Cost	**17**

Particulars	Surgery duration (in hr)	Cost per Surgery
Fumigation Cost	6	**100**

Building

Total cost of the building (in Rs.)	1,610,807,000
Total Area square feet	220,575
Specific areas	15,943
Area for OT	**15,943**
Cost per square feet (in Rs.)	7,303
Cost of OT	116,424,507
Total OT Building Cost	116,424,507
Life of the asset (in years)	30
Cost per year	3,880,817
Cost per month	323,401
Number of days in the month	**22**
Cost Per day	**14,700**
Standard Hours per day	**12**
Cost per hour	**1,225**

	Hours per Surgery	Cost per Hour	Cost Per Surgery
O.T Building cost	6	1225	**7350**

Power Consumption for OT Equipment

S. No	Name of the equipment	Power consumption units per hour (in KV)	Total consumption charges @ Rs. 10.50/-
1	Heart-Lung Machine	4	42
	-		
17	Blood Warmer	0.5	5
Total Electricity charges per hour			155

Particulars	Surgery duration (in hr)	Cost per Surgery
OT Equipment power consumption	6	929

2. Intensive Care Unit (ICU)

ICU cost- per bed day		
Particulars	CABG On-pump	Total
Manpower		
Employees		6450
Materials		
Consumables		4341
Machinery		
Depreciation	1343	1937
Maintenance	594	
Expenses & Utilities		
Expenses		
Non-Medical Assets	496	3088
AC	2591	
Utilities		
Building Cost	1884	1956
Power Consumption	72	
Total Cost		17772

ICU Manpower

S. No.	Designation	No of persons	Gross Salary per staff/month	Gross Salary per month	Manpower cost per day	No of beds	Manpower cost per day/bed
1	Staff Nurse	8	31261	250091	11368	7	1624
2	In-charge	1	45000	45000	2045		292
3	Security	2	18000	36000	1636		234
	Total	11		331091	15050		2150

Particulars	No of days stay in ICU	Cost per Patient
ICU Manpower Cost	3	6,450

ICU Materials
Consumables

S. No.	Name of the material	Cost price per unit (in Rs.)	Quantity used	Cost of consumables (in Rs.)
1	Urine Pot	34	1	34
	....			
106	Gloves Surgical Sterile With P, Truskin, No 7.0, Sutures India	11	4	44
	Total value of consumables in ICU			4341

ICU Machinery
Equipment in common usage

S. No.	Name of the equipment	Cost price	Date of Purchase	Avg. life-time of the equipment	Scrap value @5% on cost	Cost of Machine Per year = (CP-Scrap value)/ Avg. life time	No. of Equipment	Annual cost of all machines	Annual Cost per day	Cost of Spares & Maintenance @5% on cost	Annual Insurance charges @1% on Cost	Total Maintenance cost of machine per annum	Maintenance cost per day
1	Multipara Monitor	350,000	1/May/16	7	17500	47500	1	47500	130	17500	3500	21000	58

26	ECG Machine	100,000	1/May/16	7	5000	13571	1	13571	37	5000	1000	6000	16
	Total								3134	421500	84300	505800	1386

S. No.	Particulars	Cost per day	No of Beds	Cost per day/Bed
1	Equipment-Depreciation cost	3134	7	448
2	Equipment-Maintenance cost	1386		198

S. No.	Particulars	No of days stay in ICU	Depreciation cost per Patient	Maintenance cost per Patient
1	ICU Machinery Cost	3	1343	594

ICU Expenses and Utilities

Computation of Non-Medical Asset cost

Furniture/ Equipment

S. No.	Name of the equipment / Furniture	No. of Equipment	Cost Price	Avg. life-time of the equipment	Scrap value @5% on Cost	Cost per year = (CP-Scrap value)/ Avg. life time	Total Cost Per year = [(CP-Scrap value)/ Avg. life time]xNo. of equip	Cost per day (Total Cost per year)/365)
1	Attender Cot	1	3000	5	150	2970	2970	8
	....							
19	Ambu Bag	3	2830	5	142	2802	8405	23
	Total	56	131080		6554	129769	422770	1158

Particulars	No of beds in ICU	cost per day	cost per day/Bed	Cost per surgery (for 3 days)
ICU Non-medical Assets Cost	7	1158	165	496

Air Conditioning Utilization Cost

S. No	Floor	Area	CFM	IDU Details	ODU details-TR	Capital Cost	Avg. life-time of the equipment	Scrap value @5%	Cost Per year = (CP-Scrap value)/ Avg. life time	Annual Insurance charges @1% on cost	Cost of Spares & Maintenance @5% on cost	Total Annual cost (in Rs.)	Cost per day (Rs.)	No of Beds	Cost per day/ Bed (Rs.)	Power in KW (unit/hour)	Power in KW (unit/ Day)	Power cost per day @Rs. 10.50/-	Power cost per day/ bed
1	2 Floor	PRE POST OPERATIVE WARD	6800	AHU	17	1688095	7	84405	229099	16881	84405	330384	905	7	129	20	490	5141	734
		Total				1688095		84405	229099	16881	84405	330384	905		129				734

Cost per Day / Bed:	
A/C cost and Maintenance cost per day/bed	129
A/C Power consumption cost per day/bed	734
Total AC utilization cost per day	864

Particulars	No. of days stay in ICU	Cost per Surgery
Total AC utilization Cost	3	2591

Building

Total cost of the building (in Rs.)	1,610,807,000
Total Area square feet	220,575
Specific areas	6,502
Area for ICU	6,502
Cost per square feet (in Rs.)	7,303
Cost of ICU (in Rs.)	47,484,928
Other specific cost	-
Total ICU Building Cost (in Rs.)	47,484,928
Life of the asset (in Years)	30
Cost per year	1,582,831
Cost per month	131,903
Cost per day	4,397

Particulars	No of days stay in ICU	No of Beds in ICU	Cost Per Surgery
ICU Building cost	3	7	1884

Power Consumption Cost for ICU Equipment

S. No.	Name of the equipment	No. of Equipment	Electricity consumption per day (in KV)	Conversion to Watts	No of Units per day = Power consumption in Watts/ 1000	Electricity Charges per day (No. of Units X Rs. 10.50)
1	Multi-Para Monitor	1	0.5	500	0.5	5
2	Spot Light	1	0.5	500	0.5	5
Total						168

S. No.	Particulars	No of days stay in ICU	No of Beds in ICU	Cost per Surgery
1	Power consumption Cost	3	7	72

3. Laboratory

Laboratory		
Particulars	CABG On-pump	Total
Manpower		
Employees		1869
Materials		
Consumables		1295
Machinery		
Depreciation	92	133
Maintenance	40	
Expenses & Utilities		
Expenses		
Non-Medical Assets	3	7
AC	4	
Utilities		
Building Cost	45	71
Power Consumption	27	
Total Cost		**3374**

Laboratory Manpower

S. No.	Designation	No of persons	Gross Salary per staff/month	Gross Salary per month	Monthly Test done (Avg. 6 Month)	Manpower cost Per Test
1	Manpower	42	73285	3077951	46115	67
	Total	**42**		**3077951**		

S. No.	Particulars	No. of Test in CABG	Cost per Surgery
1	Laboratory Manpower Cost	28	1,869

Lab Investigations done for CABG patients

S. No.	Name of the investigation	No. of times
Pre-Operative Lab Investigations		
1	HB	1
2	TC/DC	1
3	ESR	1
4	Sugar	2
5	Urea	2
6	Creatine	2
7	Electrolytes	1
8	HBsAg	1
9	BT/CT	1
10	PT /PTT	1
11	INR	1
12	LFT	1
13	Lipid Profile	1
14	Group Rh	1
15	Arterial Blood Gas With NA+&K+	3
16	Sodium and Pottasium	1
Post-Operative Lab Investigations		
17	HB	1
18	HB	1
19	HB	1
20	HB	1
21	HB	2
22	HB	1
Total Lab Revenue		28

Laboratory Materials Consumables:

S. No.	Name of the material	Cost of consumables (in Rs.)
1	Reagents	19,514,344
2	Quality Controls	1,634,773
3	Calibrators	1,389,001
4	Other Consumables	3,052,413
Total value of consumables in Lab in 1 year * Consumption of Last one year		25,590,531

Avg. Material Consumption per Month	2,132,544
Avg. Monthly Test done	46,115
Material Consumption Per Test	46
Total Test done in CABG	28
Total Material consumption	1,295

Laboratory Machinery

Equipment

S. No.	Name of the equipment	Cost Price	Date of Purchase	Avg. life-time of the equipment	Scrap value @5% on cost	Cost of Machine Per year = (CP-Scrap value)/ Avg. life time	No. of Equipment	Annual cost of all machines	Annual Cost per Month	Cost of Spares & Maintenance @5% on cost	Annual Insurance charges @1% on Cost	Total Maintenance cost of machine per annum	Maintenance cost per Month
1	Centrifuge	41,305	20/May/16	7	2065	5606	1	5606	467	2065	413	2478	207
2	Laminar Air Flow	80,000	26/Oct/17	7	4000	10857	1	10857	905	4000	800	4800	400
	Total	13317717		294000				1820264	151689	665886	133177	799063	66589

Particulars	Cost per Month	Monthly Test Done	Total Cost/test	Total Test done in CABG	Total Cost
Laboratory Equipment-Depreciation cost	151689	46115	3	28	92
Laboratory Equipment-Maintenance cost	66589		1	28	40

Laboratory Expenses and Utilities
Computation of Non-Medical Asset cost
Furniture/ Equipment

S. No.	Name of the equipment / Furniture	No. of Equipment	Cost price	Avg. life-time of the equipment	Scrap value @5% on Cost	Cost per year = (CP-Scrap value)/ Avg. life time	Total Cost Per year = [(CP-Scrap value)/ Avg. life time]xNo. of equip	Cost per Month
1	Non-Medical Assets	1	300000	5	15000	57000	57000	4750
	Total	1	300000		15000	57000	57000	4750

No. of test done Monthly	46115
Non-Medical Asset cost per day	4750
Non-Medical Asset cost per Test	0
Total Test done in CABG	28
Total Cost	3

Air Conditioning Utilization Cost

S. No.	Floor	Area	CFM	IDU Details	ODU details-TR	Capital Cost	Avg. life-time of the equipment	Scrap value @5%	Cost Per year = (CP-Scrap value)/ Avg. life time	Annual Insurance charges @1% on cost	Cost of Spares & Maintenance @5% on cost	Total Annual cost (in Rs.)	Cost per Month (Rs.)	Monthly Test done	Cost per Test	Total No. of Test Done in CABG	Total Cost
1	Ground Floor	Radiology	6800	AHU	9	385000	7	19250	52250	3850	19250	75350	6279	46115	0	28	4
Total						385000		19250	52250	3850	19250	75350	6279	46115			

Building

Total cost of the building (in Rs.)	1,610,807,000
Total Area square feet	220,575
Specific areas	3,617
Area for Laboratory	3,617
Cost per square feet (in Rs.)	7,303
Cost of Laboratory (in Rs.)	26,412,568
Other specific cost	-
Total Laboratory Building Cost (in Rs.)	26,412,568
Life of the asset (in Years)	30
Cost per year	880,419
Cost per month	73,368

	No. of Test done Monthly	Cost Per Test	Total No. of Test Done in CABG	Cost per surgery
Laboratory Building Cost	46,115	2	28	45

Power Consumption cost for Laboratory Equipment

S. No.	Name of the equipment	No. of Equipment	Electricity consumption Load (in KV)	Conversion to Watts	No of Units per day = Power consumption in Watts/ 1000	No. of days per month	No. of Units per Month	Electricity Charges per Month (No. of Units X Rs. 10.50)	No. of Test done Monthly	Cost Per Test	Total No. of Test Done in CABG	Total Cost for Tests done in CABG
1	Pathology Consumption				190	22	4180	43890.00	46115.37	1	28	27
Total								43890.00				27

Abbreviations used in the Sample Template Sheets:

- **AHU** Air Handling Unit
- **ANM** Auxiliary Nursing Midwifery
- **CP** Cost Price
- **CFM** Cubic Feet per Minute
- **IDU** Indoor Unit
- **KV** Kilo Volt
- **ODU** Outdoor Unit
- **TR** Ton of Refrigeration

**Figures have been rounded off*

Annexure 2: Basis of Allocation

Classification of Department	Department	Cost Component	Basis of Allocation
MEDICAL SUPPORT	OT	Manpower	Hours of surgery
		Consumables	Cost per surgery
		Equipment	Hours of surgery/Number of surgery
		Non-medical furniture	Hours of Surgery/Number of surgery
		Power consumption	Hours of surgery
		AC	Hours of surgery
		Building	Hours of surgery
	ICU/ Post-Operative Ward	Manpower	Number of days stay
		Consumables	Cost per surgery
		Equipment	Number of days stay
		Non-medical furniture	Number of days stay
		Power consumption	Number of days stay
		AC	Number of days stay
		Building	Number of days stay
	Lab	Manpower	Number of investigation in each department within the lab. Wherever technicians are dedicated, cost is allocated to that department
		Consumables	Number of investigation in each department within the lab. Wherever kits are used, based on number of tests per kit, Pre-analytics, variable consumable, fixed consumable & printing and stationery to be per patient
		Equipment	Number of investigations done
		Non-medical furniture	Specifically identified & number of investigations done
		Power consumption	Specific output calculation and number of hours for which the equipment are used
		AC	Number of hours for which AC is working & number of investigations
		Building	Proportionate area and calculation of common area
	Radiology *Refer to table at the end	Manpower	Number of procedures in each department within radiology. Wherever technicians are dedicated, cost is allocated to that department
		Consumables	Number of procedures in each department within radiology. Wherever materials are particular to a machine, cost allocated to procedures from such machine.

Classification of Department	Department	Cost Component	Basis of Allocation
SERVICES INHOUSE		Equipment	Number of procedures done/time taken for each type of activity
		Non-medical furniture	Specifically identified & number of investigations done
		Power consumption	specific output calculation and number of hours for which the Equipment are used
		AC	Number of hours for which AC is working & number of investigations
		Building	Proportionate area and calculation of common area
	Physiotherapy	Manpower	Number of sessions per patient
		Consumables	Generally does not arise
		Equipment	As applicable for the surgery
		Non-medical furniture	Specifically identified & number of investigations done
		Power consumption	Specific output calculation and number of hours for which the Equipment are used. Only normal electrical fittings and appliances are considered for this surgery
		AC	Number of hours for which AC is working & number of sessions
		Building	Proportionate area and calculation of common area
	Blood Bank	Manpower	Number of bags
		Consumables	Number of bags
		Equipment	Cost allocated by number of bags
		Non-medical furniture	Specifically identified & number of bags
		Power consumption	Specific output calculation and number of bags
		AC	Number of hours for which AC is working and number of bags
		Building	Proportionate area and calculation of common area
	Pharmacy (IP and OT)	Manpower	Cost per day per bed
		Non-medical furniture	Cost per day per bed
		AC	Cost per day per bed
		Building	Cost per day per bed
	Ward	Manpower	Cost per day per bed
		Consumables	Cost per day per bed
		Non-medical furniture	Cost per day per bed
		Building	Cost per day per bed

Classification of Department	Department	Cost Component	Basis of Allocation
	Admission	Manpower	Cost per admission
	CSSD	Manpower	Cost per hour/Standard Tray Unit (STU)
		Material	Cost per hour/STU
		Equipment	Cost per hour/STU
		Power consumption	Cost per hour/STU
		Non-medical furniture	Cost per hour/STU
		Building	Cost per hour/STU
	CCTV	Manpower	Cost per day per bed
		Equipment	Cost per day per bed
		Non-medical furniture	Cost per day per bed
		Power consumption	Cost per day per bed
	IT	Manpower	Cost per day per bed
		Materials	Cost per day per bed
		Equipment	Cost per day per bed
		Power consumption	Cost per day per bed
		Non-medical furniture	Cost per day per bed
		Building	Cost per day per bed
		Ac	Cost per day per bed
	Fire Safety	Manpower	Cost per day per bed
		Machinery	Cost per day per bed
		Non-medical furniture	Cost per day per bed
	Finance & Accounts	Manpower	Cost per day per bed
		Material	Cost per day per bed
		Non-medical furniture	Cost per day per bed
		Building	Cost per day per bed
	Operations & Administration	Manpower	Cost per day per bed
		Material	Cost per day per bed
		Machinery	Cost per day per bed
		Expenses	Cost per day per bed
		Non-medical furniture	Cost per day per bed
		AC	Cost per day per bed
		Building	Cost per day per bed
	Maintenance	Manpower	Cost per day per bed
		Material	Cost per day per bed
		Machinery	Cost per day per bed
		Expenses	Cost per day per bed
		Non-medical furniture	Cost per day per bed
	Purchase & Stores	Manpower	Cost per day per bed/Number of requisitions

Classification of Department	Department	Cost Component	Basis of Allocation
SERVICES OUTSOURCED		Material	Cost per day per bed/Number of requisitions
		Machinery	Cost per day per bed/Number of requisitions
		Expenses	Cost per day per bed/Number of requisitions
		Non-medical furniture	Cost per day per bed/Number of requisitions
	Human Resource	Building	Cost per day per bed/Number of requisitions
		Manpower	Cost per day per bed/Number of employees per cost center
		Material	Cost per day per bed/number of employees per cost center
		Non-medical furniture	Cost per day per bed/number of employees per cost center
	Medical Records Department (MRD)	Manpower	Cost per day per bed
		Non-medical furniture	Cost per day per bed
		Building	Cost per day per bed
	Housekeeping for IP Block	Manpower	Cost per day per bed
		Materials	Cost per day per bed
		Machinery	Cost per day per bed
		Expenses	Cost per day per bed
		Non-medical furniture	Cost per day per bed
		Building	Cost per day per bed
	Housekeeping for OT Block	Materials	Cost per hour
		Machinery	Cost per hour
		Expenses	Cost per hour
		Non-medical furniture	Cost per hour
		Building if applicable	Cost per hour
	Housekeeping for other areas	Materials	Cost per sq. ft. or per day per bed
		Machinery	Cost per sq. ft. or per day per bed
		Expenses	Cost per sq. ft. or per day per bed
		Non-medical furniture	Cost per sq. ft. or per day per bed
		Building if applicable	Cost per sq. ft. or per day per bed
	Communication Expenses	Communication Exp	Cost per day per bed
		Equipment	Cost per day per bed
	Dietetics	Manpower, materials, equipment, expenses	Cost per day per bed or cost per patient
	Laundry	Manpower, materials, equipment, expenses	Cost per day per Bed
	Security	Manpower, materials, equipment, expenses	Cost per unit of time or Cost per day per bed

Classification of Department	Department	Cost Component	Basis of Allocation
INDIRECT COST	UPS	Manpower, materials, equipment, expenses	Cost per day per bed
	Genset Power Backup	Manpower, materials, equipment, expenses	Cost per day per bed
	Solar Heating	Manpower, materials, equipment, expenses	Cost per day per bed
	Bio-medical Waste	Manpower, materials, equipment, expenses	Cost per day per bed
	Water Utilization	Manpower, materials, equipment, expenses	Cost per day per bed
	Bio-metrics	Manpower, materials, equipment, expenses	Cost per day per bed
	Building Cost	Manpower, materials, equipment, expenses	Cost per day per bed
	Non-medical Furniture	Manpower, materials, equipment, expenses	Cost per day per bed

*Basis of Allocation for Radiology

CT	Number of scans Capacity - number of effective hours and 4 scans per hour
MRI	Time per scan, number of hours per day @ 12 and effective hours to be decided, cost per hour
Ultrasound	Time per scan, effective number of hours and cost per hour
X-Ray	Number of X-Rays and effective number of hours per day, standard time per x-ray
Endoscopy	Per procedure, number of procedure to be decided by taking effective hours of work as 10 hours out of 12 hours
Laparoscopy	Per Hour and number of hours per procedure

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List of Abbreviations

ABC	Activity Based Costing
AB-PMJAY	Ayushman Bharat-Ayushman Bharat- Pradhan Mantri Jan Arogya Yojana
AC	Air Conditioning
AIIMS	All India Institute of Medical Sciences
CABG	Coronary Artery Bypass Grafting
CAGR	Compound Annual Growth Rate
CCR	Capacity Cost Rate
CCSD	Central Sterile Services Department
CCTV	Closed-Circuit Television
CGHS	Central Government Health Scheme
DNB	Diplomate of National Board
DRG	Diagnose-Related-Groups
EBITDA	Earnings Before Interest, Taxes, Depreciation, and Amortization
EHR	Electronic Health Records
FFS	Fee-For-Service
FY	Financial Year
GDP	Gross Domestic Product
GIPSA	General Insurance Public Sector Association
GST	Goods and Services Tax
HR	Human Resources
ICU	Intensive Care Unit
INR	Indian National Rupee
IP	In-patient
IRR	Internal Rate Of Return
LSCS	Lower Segment Caesarean Section
MRD	Medical Records Department
NABH	National Accreditation Board for Hospitals
NCD	Non Communicable Diseases
NHP	National Health Policy
OT	Operation Theatre
PSU	Public Sector Undertaking
PTCA	Percutaneous Transluminal Coronary Angioplasty
RBI	Reserve Bank of India
ROI	Return on Investment
RSBY	Rashtriya Swasthya Bima Yojana
STU	Standard Tray Unit
TDABC	Time Driven Activity Based Costing
TKR	Total Knee Replacement
TURP	Transurethral Resection of the Prostate
USD	United States Dollar
VBHC	Value Based Healthcare

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Business Analyst and Strategist- Healthcare Management

FICCI Team:

- **Ms Shobha Mishra Ghosh**, Assistant Secretary General, FICCI
- **Ms Sarita Chandra**, Deputy Director- Health Services, FICCI
- **Ms Tansi Nayak**, Assistant Director- Health Services, FICCI
- **Ms Shilpa Sharma**, Consultant- Health Services, FICCI

Notes



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Contact us:
FICCI, Federation House
Tansen Marg, New Delhi - 110 001
Tel: 011 2373 8760 - 70 (Ext. 513/438)
Fax: 011 2332 0714, 011 2372 1504
Email: healthservices@ficci.com
Website: www.ficci.in