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PACKAGE PRICING AT MISSION HOSPITAL

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Sriram T K, Shailaja Grover, Satyabala Hariharan and U Dinesh Kumar, Professor of Quantitative Methods and Information Systems, prepared this case for class discussion. This case is not intended to serve as an endorsement, source of primary data, or to show effective or inefficient handling of decision or business processes.

Package Pricing at Mission Hospital

Dr. Satyajit Bose was watching the fresh green paddy fields from his Toyota Innova while driving on National Highway 2 (NH 2) from Burdwan to Durgapur in West Bengal, a state in East India. He turned to Professor Dinesh Kumar and said:

> "Driving on this highway is like doing yoga: the greenery of this place relaxes your mind. The natural beauty of this stretch of land can rival any place in this world".

Prof. Dinesh nodded in acceptance; West Bengal was not new to him as he had spent a few years teaching at the Indian Institute of Management, Calcutta. However, his mind was preoccupied with the main reason for visiting Dr. Bose and Durgapur. Dr. Bose was the chairman of the Mission Hospital (a multispecialty hospital) at Durgapur. Although the hospital treated patients of all illnesses, their specialty was cardiology. Mission Hospital was a very popular not only amongst the locals, but even patients from many neighboring states as well as countries such as Bhutan and Sri Lanka visited it for different types of treatments. They conducted on average 150 heart surgeries every month and were in the process of increasing the monthly capacity to 200 heart surgeries. **Exhibit 1** depicts the major cardiac surgeries performed at the hospital.

Dr. Bose mentioned the problem he was facing as the chairman of the Mission Hospital. He said:

> "Professor, the business model in health care is changing fast. As a hospital, we publish the price list for many treatments. We also negotiate package prices with many state governments for specific ailments; these government schemes are created for the benefit of economically weaker sections of the society. The package pricing is also creating intense competition between the hospitals; there is a price war for each treatment. But we don't know whether this is the right strategy. Sometimes, I feel that we should charge like the olden days where the patient pays for all the costs associated with the treatment and the consultancy fee".

In India, many hospitals tend to charge flat rates (or package price) for several treatments. This has reduced the uncertainty associated with treatment costs for patients. India has also been one of the popular destinations of medical tourism, and customers of medical tourism expect a flat rate. Healthcare packages have been customized to suit various needs and preferences of these customers, including the choice of hospital, city, travel, hotel stay, and visit to nearby tourist attractions. **Exhibit 2** shows the package price for few cardiac surgeries from a leading medical tourism service provider. Apart from medical tourism, many hospitals quoted a flat fee for treatments such as heart surgery, knee joint replacement, etc. for local patients. Irrespective of the actual expenses and the duration of treatment, the patient would pay only the agreed flat price since it was a contract between the patient and the hospital. Many state governments in India insisted on such contracts as there was a perception in the public that hospitals insisted on unnecessary diagnostic tests whose profit margin was high.

Dr. Bose commented that there was a high risk involved with package pricing since the actual cost could far exceed the package price. He said:

> "It is like buffet pricing in restaurants, in which a customer pays a fixed price and can eat as much as he can. However, restaurants have control over the menu, but hospitals don't have any control over the number of days it will take to cure a person, because it depends heavily on an individual's body!"

There were some decisions Dr. Bose had to take: whether to use package pricing or traditional pricing; how should one come up with package pricing; and how to use package pricing as a competitive strategy in the market, since he was expecting many new hospitals to come up in Durgapur in the next couple of years.

ABOUT THE MISSION HOSPITAL

The Mission Hospital was set up in April 2008 with the objective of providing high-quality health-care services to all individuals at an affordable cost. It was a unit of Durgapur Medical Centre Private Limited. Located on three acres of land in Durgapur, Mission Hospital was a 350-bedded hospital known for providing state-of-the-art facilities to its patients. When asked about the ideology behind setting up this hospital, Dr. Bose said:

> "Our mission is to decentralize super-specialty healthcare, and deliver it to every doorstep in eastern India, beyond the metropolis, and heal patients with dedication, honesty and tender loving care".

Some of the ultramodern features available at the hospital included seven operation theatres with laminar airflow and high-efficiency particulate arrestance (HEPA) filters, mother and childcare units, a 24-hour accident and emergency department, blood bank, and a fully computerized pneumatic chute system. Mission hospital became the first super-specialty corporate hospital in eastern India outside Kolkata. It provided patients the flexibility of availing many government and non-government schemes for treatments, thereby attracting people from nearby areas as well. Many patients came from neighboring states and countries. Mission hospital paid special attention to understanding the needs of the patients and providing them with service that was responsive, efficient, courteous and helpful to improve the level of patient satisfaction. It has been investing a substantial amount in the training and development of its staff to maximize their potential. Mission hospital promoted a patient-centric approach that also ensured the safest possible environment.

PACKAGE PRICING FOR TREATMENTS

Under a fixed package pricing system, a patient was provided a quote on the treatment cost at the time of admission. The price for the treatment was tailored for each patient individually based on the surgery/treatment required, medical health, room charges, and other individual-specific factors such as age, weight, blood group, etc. The treatment charge was considered as "fixed" for a patient irrespective of the actual cost incurred by the hospital in treatment. In such a system, any variation in the planned treatment does not affect the price quoted by the hospital to the patient. The hospital receives the payment determined *ex ante* at the time of admission.

Mission Hospital was considering adoption of fixed package pricing to increase customer confidence and make its pricing policies more transparent while providing the best care available to its patients. This meant providing a quote for the total amount to be paid by the patient that included all costs associated with the treatment such as consultation fees, operation theatre charges, anesthetist fees, laboratory tests, medications, room rent, and taxes. There were to be no hidden costs and the patient paid no more or less than the quoted price.

PACKAGE PRICING: WHY, AND WHY NOT?

Both the hospital and the patient could benefit from this system. Patients are usually anxious that the hospital may recommend unnecessary tests and medicines to increase the bill. There is always an uncertainty as to how much one may end up paying to the hospital. This is important in the Indian context where only 30% of the population had some kind of financial tool to cover medical expenses (*Financial Express*, 2013).[1] Package pricing insured the patient against any risk of cost escalation during the course of the treatment. Even if the stay of the patient was extended for any reason such as a medical complication, it was taken care of by the hospital. Hence, such a system eliminates any price uncertainty. Another advantage of this system is that it helped patients in estimating the expenditure and planning their treatment. Since the price quotes could be provided before admission, patients compared the rates at different hospitals, thereby making a more informed choice.

Package pricing also reduced disputes on treatment costs between patients and hospitals. Many patients were covered under an insurance policy or a government scheme. At the time of payment, disagreements sometimes arose between these agencies and the hospital over treatment cost or the treatment itself. If hospitals did not receive the payment for the treatment administered, they might end up incurring a loss. **Exhibit 3** shows the package price for a few heart surgeries prescribed by the Central Government Health Scheme (CGHS). Mission Hospital has been accredited by the National Accreditation Board for Hospitals and Healthcare Providers (NABH) and empanelled under the CGHS scheme. Package pricing empowered hospitals to negotiate treatment charges with insurance companies and government agencies in a better way, making the hospitals better off financially. Also, this system promoted more cost efficiency than retrospective systems, where the payment was determined after the treatment.

However, the flat fee had drawbacks as well. Hospitals could incur losses owing to underestimation of the treatment cost. There was also a risk that hospitals, in order to reduce their costs, may seek to compromise with the treatment quality of the patients, who may not receive the required care or may be discharged sooner than the appropriate time harming the healing process of the patient. Another key challenge that a hospital faced was the accurate estimation of the treatment cost of the patient. If a patient stayed longer than expected, then it was left to the hospital to bear this as an additional cost. Hospitals usually accounted for possibility of cost escalation while quoting the flat fee to the patients. So, package pricing worked similar to insurance in reducing the risk for both parties.

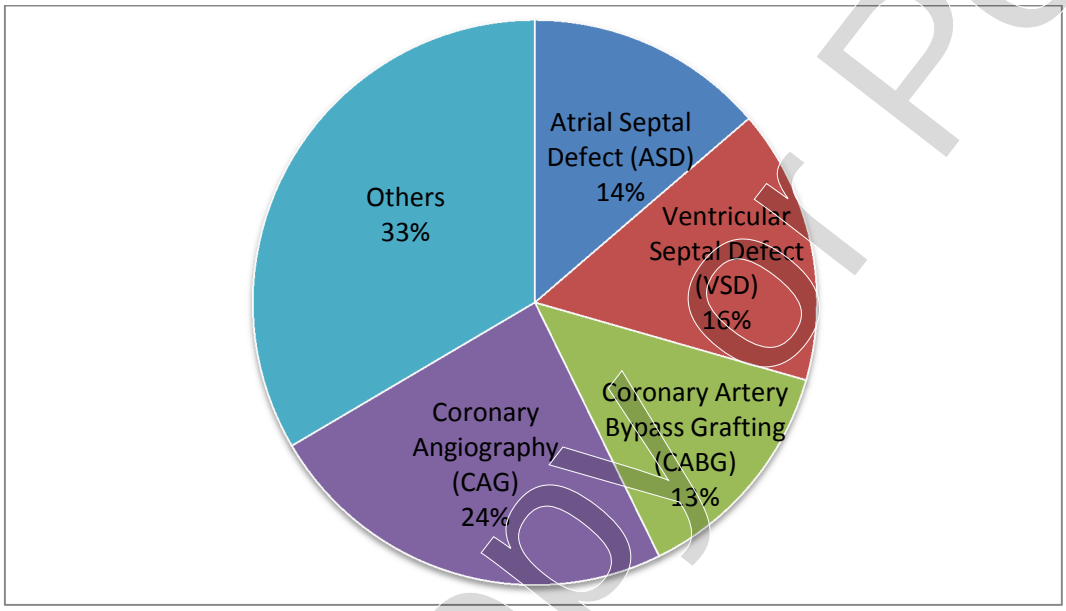
[1] *Source:* http://archive.financialexpress.com/news/4-factors-that-impacted-health-insurance-industry-in-2013/1212100

DECISION-MAKING FOR MISSION HOSPITAL

Dr. Bose had to design a system that could assist Mission Hospital to come up with an accurate approach for predicting the package price at the time of admission. The IT department of the Mission hospital had collected historical data on patients. **Exhibit 4** provides information on the variables that the hospital has collected. Few insights based on descriptive statistics are provided in **Exhibit 5**. Dr. Bose believed that the past data could help Mission Hospital to develop a predictive model for treatment costs.

Exhibit 1

Mission Hospital Surgery Statistics



Source: Mission Hospital

Exhibit 2

Cardiology Treatment Packages

Cardiac Care Surgery Packages	Days in Hospital	Procedure Cost (USD)	Procedure Cost (INR)
Angiography (Including Non-Ionic Contrast)	1	398	23880
Coronary Angioplasty (Including Two Stent)	Depends upon the treatment	11000	660000
Open Heart Surgery (CABG)	9	5500	330000
Pediatric Cardiac Surgery - ASD/VSD/AV Repair, MV Repair/Paediatric TOF	9	4267	256020
Aortic Valve Replacement AVR or Mitral Valve Replacement MVR (including one valve)	Depends upon the treatment	10000	600000
EPS	1	759	45540

Source: http://www.medicalindiatourism.com/treatment-packages/cardiology/ accessed on 22 July 2015

Exhibit 3

CGHS Kolkata 2010 Package Rates (in INR)

Name of treatment procedure	Rates for NABH accredited hospitals	Rates for Non-NABH hospitals	Rates for Super Specialty Hospitals
ASD closure	53000	45050	53000
VSD with graft	53000	45050	53000
CABG	130000	110500	130000
Coronary angiography	11500	10000	11500
DVR	130000	110500	130000
CATH	10350	9000	10350

Source: Office Memorandum, Department of Health and Family Welfare, Government of India

Exhibit 4

Variable Description of Data

Variable	Description
Age	Age of the patient in years
Body Weight	Weight of the patient in Kilograms
Body Height	Height of the patient in cm
HR Pulse	Pulse of patient at the time of admission
BP-High	High BP of patient (Systolic)
BP-Low	Low BP of patient (Diastolic)
RR	Respiratory rate of patient
HB	Hemoglobin count of patient
Urea	Urea levels of patient
Creatinine	Creatinine levels of patient
Marital Status	Marital status of the patient Married Unmarried Widow
Gender	Gender code for patient Male Female

Exhibit 4 (Contd.)

Past Medical History Code	**Code given to the past medical history of the patient** **Diabetes1 (Only Diabetes)** **Diabetes2 (Diabetes and Hypertension)** **Hypertension1 (Only Hypertension)** **hypertension2 (Hypertension, DM)** **hypertension3 (Hypertension, Anxiety, depression, chest pain)** **Other (cold, loose motions, jaundice, etc.)**
Mode of Arrival	Way in which the patient arrived the hospital Ambulance Transferred Walked in
State at the Time of Arrival	State in which the patient arrived Alert Confused
Type of Admission	Type of admission for the patient Elective Emergency
Key Complaints Code	Codes given to the key complaints faced by the patient ACHD CAD-DVD CAD-SVD CAD-TVD CAD-VSD OS-ASD other- heart other- respiratory other-general other - nervous other - tetralogy PM-VSD RHD
Total Cost to Hospital	Actual cost incurred by the hospital
Total Length of Stay	Number of days patient stayed in the hospital
Length of Stay - ICU	Number of days patient stayed in the ICU
Length of Stay - Ward	Number of days patient stayed in the ward
Implant used (Y/N)	Any implant done on the patient
Cost of Implant	Total cost of all the implants done on the patient, if any

Source: Mission Hospital

Exhibit 5

Data Insights

Parameter	Statistics	Inference
Age Group of Patients	≤10 years – 38.71% 11-25 years – 17.74% 26-50 years – 13.70% ≥50 years – 30.65%	Age groups (≤10 years) and (≥50 years) constitute more than 65% of patients. More males than females in all age groups.
Gender	Males – 67% Females – 33%	
Average Total Cost to Hospital	≤10 years – 1.5 L 11-25 years – 1.5 L 26-50 years – 2 L ≥50 years – 2.5 L	Maximum average cost incurred by the hospital is for age group more than 50 years
Implants	≤10 years – 4% 11-25 years – 23% 26-50 years – 47% ≥50 years – 26%	Most implants are made in the 26-50 years age group. Almost 20% of patients need implant.

Source: Mission Hospital