Summer Training at
Indraprastha Apollo Hospital,
New Delhi

- **Evaluation of Establishment and Operational Costs of New Rooms of Different Categories in Indraprastha Apollo Hospital, Delhi**
- **Cost Effectiveness Analysis of Environmental Cleaning Materials Used for House Keeping Practices**
- **Gap Evaluation and Possible Substitutions of Cleaning Agents and Disinfectants Used for Housekeeping Practices**
- **Up-Gradation of Housekeeping Departmental Sop's.**

By
Apurva Kashyap

Under the guidance of
Dr. Tanjul Saxena

MBA Hospital and Health Management
2015-2017

The IIHMR University, Jaipur
2016

INSTITUTE OF HEALTH
MANAGEMENT RESEARCH
(WHO Collaborating Centre for District Health System Based on Primary Health Care)

IIHMR UNIVERSITY

CERTIFICATE

TO WHOMSOEVER MAY CONCERN

This is to certify that **Dr. Apurva Kashyap**, student of MBA Hospital and Health Management (MBA-HM) from The IIHMR University, Jaipur has undergone summer training at **Indraprastha Apollo Hospital, Delhi** from **1st April 2016** to **31st May 2016.**

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

The summer training is in fulfillment of the course requirements.

I wish her all success in all her future endeavors.

Col (Dr) Ashok Kaushik
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Date: May 31, 2016

To Whom So Ever It May Concern

This is to certify that Dr. Apurva Kashyap, student of "Institute of Health Management Research, Jaipur" has successfully completed two months internship, (which is a part of her course curriculum, in MBA (Health & Hospital Management) program, from April 1, 2016 to May 31, 2016 at Indraprastha Apollo Hospitals, New Delhi.

During this period she was actively involved in the following studies:

- Assisted and coordinated in "Cost Effective Analysis of Environmental Cleaning Materials used for Housekeeping practices"
- **A study on** "Gap Evaluation and possible substitutions of Cleaning Agents and Disinfectants used for Housekeeping practices"
- Assisted and coordinated in "Evaluation of Establishment and Operational Costs of New Rooms of Different Categories"
- **Assisted and coordinated** in up-gradation of Housekeeping departmental SOP's

We wish success in all her future endeavor.

for Indraprastha Medical Corporation Limited
(Indraprastha Apollo Hospitals)

Anupam Srivastava
Manager - T & D

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I am thankful to all the respondents who cooperated with me and helped towards the completion of the projects. Last but not the least I would like to thank my friends and colleagues, who directly or indirectly helped in one way or the other and supported me at all the times.

Thank You,

Dr.ApurvaKashyap
(MBA-HM)
IIHMR UNIVERSITY
JAIPUR

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PART 1

HOSPITAL PROFILE

MISSION STATEMENT

"Our Mission is to bring healthcare of international standards within the reach of every individual. We are committed to the achievement and maintenance of excellence in education, research and healthcare for the benefit of humanity"

Dr. Prathap C Reddy
Founder Chairman
Apollo Hospitals Group - India

The Journey of Apollo Hospital

1980 to 1990

Apollo Hospitals inaugrated in 1983

Medical insurance scheme was introduced

Announced their first dividend within 3 years of operation

1991 to 2000

Apollo Hospitals rapidly scaled up

Hospitals opened in Delhi, Madurai, Vishakhapatnam

Apollo Chennai was awarded the ISO 9002 Certification

2000 to 2005

Apollo Delhi first in India to get JCI Accredited

Hospitals opened in Ahmedabad, Bengaluru, Kolkata

Launched the Nationwide Emergency Number 1066

2006 to 2008

Apollo Health City launched at Hyderabad

Prime Minister launched the Apollo Reach Initiative

Apollo Munich Insurance launched

2009 to 2010

6 Apollo Hospitals JCI Accredited

CyberKnife Radiosurgery launched at Chennai

Govt of India released Commemorative Stamp

2011 to 2012

Became the World's busiest Solid Organ Transplant Centre

Apollo Day Surgery Centre launched at Chennai

Apollo Specialty Hospital completed 1000 Aesthetic Surgeries

2013 to 2014

Pygopagus [Conjoined Twins] from Tanzania separated

Hosted 'The Cancer Conclave' at Chennai and 'The Future of Healthcare' conclave at New Delhi

2015 to 2016

Apollo Speciality Hospital launched at OMR

India's First Centre of Excellence in Hip Arthroscopy launched

South Asia's 1st Proton Therapy - Coming Soon

COMPANY OVERVIEW

Apollo Hospitals is widely recognized as the pioneer of private healthcare in India, and was the country's first corporate hospital. The Apollo Hospitals Group, which started as a 150-bed hospital and today, operates 9215 beds across 64 hospitals. A forerunner in integrated healthcare, Apollo has a robust presence across the healthcare spectrum. The Group has emerged as the foremost integrated healthcare provider in Asia, with mature group companies that specialize in insurance, pharmacy, consultancy, clinics and many such key touch points of the ecosystem. The Apollo Group has touched the lives of over 45 million patients, from 121 countries.

Genesis

The first Apollo Hospital opened in Chennai, in 1983. It was borne out of the determination to lead a complete transformation in Indian healthcare. Apollo's Founder Chairman, Dr.Prathap C Reddy was the driving force behind the inception. Credited as the architect of modern Indian healthcare, Dr.Prathap C Reddy started Apollo with the mission of bringing world-class healthcare to India, at a price point that Indians could afford! The backdrop to this development was the hopelessly inadequate healthcare infrastructure prevalent in India, at that time.

Game-Changer

Apollo's first innovation was its business model itself; before Apollo, only the very privileged had the access to quality treatment, as they could afford to travel abroad. Apollo introduced healthcare that matched best-in-class outcomes, but cost only a fraction of the global prices. This led to a revolution with democratized treatment in our nation. This cost consciousness continues to be a key building block in our healthcare strategy.

Clinical Excellence

This is not the only constant in the Apollo story. The Group is built on the bedrock of an enduring value system, and continues to drive unwavering focus on key touchstones like excellence, expertise, empathy and innovation.

Over the past three decades Apollo Hospitals' transformative journey has forged a legacy of excellence in Indian healthcare. The Group has continuously set the agenda and led by example in the blossoming private healthcare space. One of Apollo's significant contributions has been the adoption of clinical excellence as an industry standard. Apollo pioneered the concept - the group was the first to invest in the pre-requisites that led to international quality accreditation like JCI and also developed centres of excellence in Cardiac Sciences, Orthopaedics, Neurosciences, Emergency Care, Cancer and Organ Transplantation.

Apollo's prowess in excellence comes from the habit to rigorously re-evaluate and reinvent. Protocols are built, taken apart and built again to ensure that infection control are optimized to extreme levels; stringent internal scoring systems are constructed with the sole objective of ensuring the group matches up with the very best. Apollo's initiatives like ACE@25 and TASSC are indicators of the commitment to better global benchmarks in clinical excellence.

This focus on quality has become one of the group's strongest credentials. It is the one of the building blocks in the trust the Apollo brand name commands.

Strong value system

Along with excellence the Apollo philosophy rests on the pillars of technological superiority, a warm patient- centric approach, and an edge in forward-looking research. Apollo's spectacular success rests on sustained commitment and investments in each of these pillars.

Technology driven

At Apollo, healthcare systems leverage technology to build integrated healthcare delivery models, which facilitate seamless electronic medical records, Hospital Information systems and telemedicine-based health outreach initiatives, for enhanced access to medical care. Another critical manifestation of widespread technology has been the amazing advancement in medical equipment and Apollo has repeatedly pioneered the introduction of such innovations in India. The future promises with revolutionary new products like the Proton Beam Therapy. From leveraging new age mobility, to getting futuristic equipment Apollo has always been ahead of the curve. Currently, the group believes in the tremendous potential of robotics and is investing heavily in making it a real and robust option for all.

TLC

Apollo pioneered Tender Loving Care (TLC) and it continues to be the magic that inspires hope, warmth and a sense of ease in the patients. Processes are relentlessly improved upon to ensure maximum patient-centricity.

Road ahead

Apollo Hospitals has taken the spirit of leadership well beyond business metrics. It has embraced the onus of keeping India, healthy. Taking cognizance of the undeniable fact that India is reeling under the onslaught of Non Communicable Diseases (NCD), the Apollo Group has assumed the responsibility to educate, influence mindset. Increased focus on tactical initiatives like personalized preventive healthcare bears testimony to this new thrust. The Group has declared war on NCDs, and is leading the entire healthcare fraternity into this battle.

Socially Conscious

Apollo Hospitals has always strongly believed in social initiatives that help transcend barriers. In keeping with this, the group has started several impactful programmes in this area. One among these initiatives is SACHi (Save a Child’s Heart Initiative) - a community service initiative with the aim of providing quality paediatric cardiac care to children from underprivileged sections of society suffering from heart diseases. Apollo also runs the SAHI (Society to Aid the Hearing Impaired) initiative to help poor children with hearing impairment, and the CURE Foundation which is focused on cancer screening, cure and rehabilitation for those in need. In the area of Cancer care Apollo has also joined hands with Yuvraj Singh's YOUWECAN to organize large-scale cancer screenings. Apollo regularly conducts comprehensive health screening camps across the nation. The Group runs the incredible successful Billion Hearts Beating campaign – a nationwide programme that has awakened India to heart healthiness.

COMMITTEES AT APOLLO

The Committees that guide the smooth functioning of the hospital and help building the painstaking attitude in the employees:

- Quality Steering Committee
- Infection Control Committee
- Safety Committee
- Credentialing Committee
- Authorization Committee
- Appraisal Committee
- Medical Audit Committee
- Ethical Committee for Clinical Trials
- Ethics Committee
- Code Blue Committee
- Drug Committee
- Transfusion Committee
- Death Review Committee
- OT Committee

CODES

Blue:	Individual disaster	Call 66
Grey:	Internal disaster	Call 5555, 1926, 1983
Pink:	Baby disaster	Call 5555, 1926, 1983
Purple:	Fight likely	Call 5555, 1926, 1983
Black:	Bomb Threat	Call 5555, 1926, 1983
Red	External Disaster	CMO to Activate
Orange:	Indication of deterioration	
In patients condition	Call 66	

In case you cannot recall the above numbers, please call/dial “9” or ‘66’

FIRE SAFETY

Upon discovering a fire, Call out the code word - Code Grey

(This will alert nearby staff members to the emergency situation)

In case of fire, first inform 5555 and then remember the mnemonic:**RACE**

R **:** Rescue

A **:** Alarm

C **:** Confine the fire

E **:** Extinguish (if trained) and evacuate

Type of Extinguishers:

1. WATER CO_2 TYPE - Used for 'A' CLASS FIRE – Used for general fire by wood, Cloth &Paper

("A" written on fire extinguisher), Note: Do not use water co2 Type on electrical fire

2. CO_2 TYPE - Used for 'BCE' CLASS FIRE – Used for fire by Flammable Liquid, Burnable Gas, Metals &Electrical appliances

("BCE" written on extinguisher)

3. Dry Chemical Powder (DCP) Type – Used in any type of fire including gaseous / electrical / fire. (Multipurpose use)

("ABC" written on extinguisher)

UNIVERSAL PRECAUTION-Hand washing is the single most important factor to prevent and control infection.

SMOKING POLICY - Smoking in hospital premises is prohibited

OBSERVATIONAL LEARNINGS

CLINICAL SERVICES

OPD DEPARTMENT

Apollo has got 7 centralized OPD wings

Functions

Offers a complete facility of healthcare to the individual of all ages

Quality Indicators

- Patient's seen within scheduled appointment time
- Turnover time between two patients
- Patient's Satisfaction

Shortcoming'sobserved

- Poor maintenance of Flow of Patients
- High Waiting Time

EMERGENCY DEPARTMENT

The EMR department at Apollo is located on the Ground floor facing the main road and has a Separate Entrance. It has Waiting Lounge atits Entrance and EMR reception.
EMR is provided with its own Drugs and Stores. It is divided into two divisions:

- Observational: Minute and less severe cases are taken care of here. Such cases do not require admission and can be discharged after a few hours.
- Triage: Here severe cases are taken care of. This area is well equipped with all kinds of equipment to perform even a minor surgery.

Staffing-

- 1 HOD
- 5 CMO's
- Patient to Nurse ration- 1:1

OT DEPARTMENT

Apollo hospital has 16 OT's distributed in 3 locations namely OT complex 1 and OT complex 2 on the First floor and Ortho OT complex located on the Ground floor next to EMR

Functions

OT is committed to provide the highest standards of surgical care to the patients
Scope and Complexity of Services

- Cardiac
- Neuro
- Opthal
- ENT
- Gynae
- Plastic
- Ortho
- Micro disc
- Laparoscopies
- Transplant
- Oncological and other General surgeries

Days and hours of operations:

The OT department is functional from 8:00 to 20:00 hrs. six days a week and EMR cases are taken on Sunday.

Quality Indicators

- Cases Load/month
- Needle stick injuries
- Same day cancellation/100 surgeries
- Unplanned returns to OT/100 surgeries
- Number of recovery room delays/100 surgeries

INTENSIVE CARE UNIT

An intensive care unit is a specialty staffed and equipped, separate, and self-contained action of the hospital for the management of patients with life threatening or potentially life threatening clinical conditions.

Apollo has following ICU'S

- Surgical
- Medical
- Neuro
- Pediatric
- Stroke
- Coronary care unit
- Gastro care unit
- Organ transplant
- Neonatal ICU

SUPPORT SERVICES

RADIOLOGY DEPARTMENT

Functions:

- Provides complete diagnostic and imaging services of high quality and minimum error.
- Has developed standard operating procedures(SOP)

- Has established goals, objectives and standards of performance that are consistent with both the hospitals philosophy of patient care and practice of professional service delivery and match international standards.

Services provided:

1. Common X-rays
2. Fluoroscopy
3. Ultrasound
4. Color Doppler
5. Fatal Medicine Unit
6. CT Unit
7. CT single disc
8. CT 64 Slice
9. MRI 3 Tesla
10. Ultrasound and CT guided invasive procedures
11. Nuclear Medicine

BLOOD BANK

Goal-

- To have sufficient blood of all types to support an emergency, IPD, OPD, OT
- To maintain higher standards in all products and activities following GLP (Good Laboratory Practices) and GMP (Good Manufacturing Practices)
- To recreate ready accessible records of in-house eligible donors according to their blood group
- To upgrade Aphaeresis technology and maintain its continuous supply.

Days and hours of operation:

24 hours working 365 days a year

Quality Indicators

- Platelet count sent to Hematology lab for verification
- Fixed SOP for every procedure
- Equipment Calibration
- Chart maintained for temperature monitoring

MEDICAL RECORDS DEPARTMENT

It is to provide efficient storing, maintaining, coding and verification of medical records

Services Provided

- For storing of all medical records
- Verification of all records
- Issue of duplicate records
- Receipts and reply of mails
- Preparation and coordination in providing records for court cases and consumer cases
- Maintenance of MTP records
- Maintenance of MLC, Birth and Death registers
- Coordination with IT department for Backup of scanned records

UTILITY SERVICES

CENTRAL STERILE SUPPLY DEPARTMENT

It provides steady and effective supply of sterile linen and instruments of various departments in the hospital

Operations of the Department

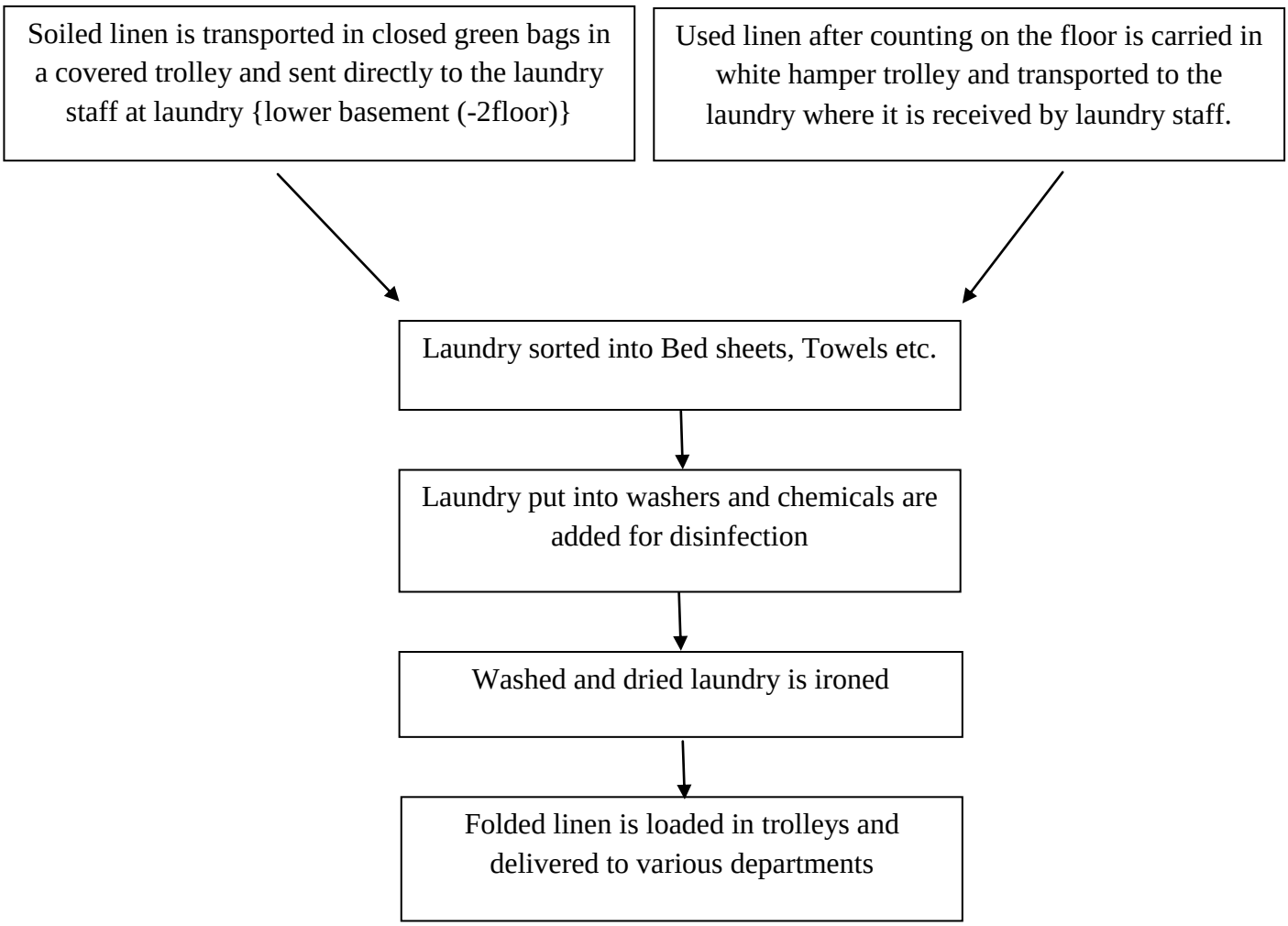
- Sterile supplies are dispatched to the wards as when required and Used instruments are collected for cleaning and autoclaving by CSSD staff

- Sterile Supply to OT and Emergency a day prior before 8:00 Pm and as when required.

LAUNDRY

It provides fresh linen to all hospital. It has a major role maintaining hygienic environment .and in infection control. The staff of laundry is a mix of Contract labor and IMCL workers.

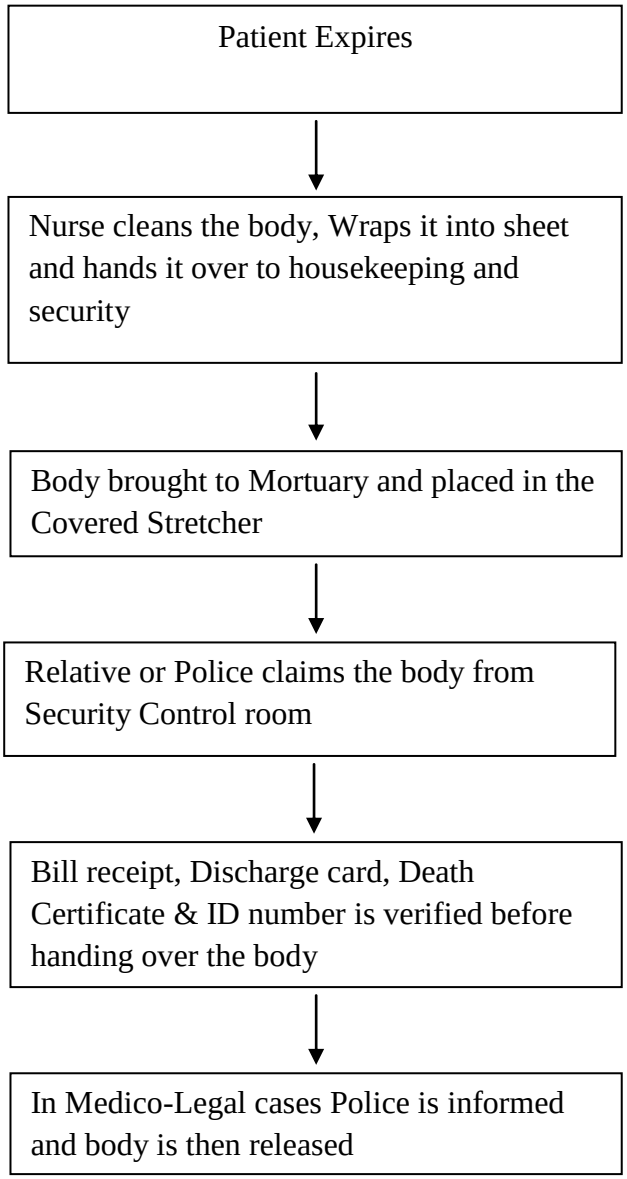
Work Flow



MORTUARY

It is a place where dead bodies are kept before they are claimed by the relative of the patients or added over to the police in Medico-Legal cases. It is located in the basement with a capacity of keeping 6 dead bodies at a given time. The security guards posted are responsible for releasing the body to the concerned person.

Work Flow



PART 2

Project Reports

PROJECT REPORT 1

Evaluation of Establishment and Operational Costs of New Rooms of Different Categories in Indraprastha Apollo Hospital, Delhi

Abstract:

India's health care sector witnesses close to 50 percent spend on in-patient beds for various diseases and surgeries, especially in urban and semi-urban pockets. [1] The healthcare industry requires huge capital for upgradation/maintenance/replacement of medical equipment and expansion. Availability of capital at a reasonable cost always remains a hurdle.[2] In India, furthermore utilisation of hospital services is driven both by rising incomes and by lucrative government and private insurance programmes that cover the cost of inpatient services; however, there is still a paucity of unit cost information of various services from Indian hospitals. In this study, establishment and operational cost of setting up of various kinds of rooms available in Indraprastha Apollo Hospital, Delhi was estimated. Various amenities provided in a Suite Room costs Rs.3,92,622. A deluxe and a single room cost Rs.2,43,146 and Rs.2,19,382 respectively. A Semi Private Room costs Rs.1,42,939. A single bed in a Multi Bed Unit Costs around Rs.56,361. Multi Bed Units' Cost includes the costs of amenities put in that Room/Ward. In Tower III, a Suite in a Platinum Ward costs around Rs.3,82,460. A Deluxe Room costs around 2,45,439. A Single Room in Platinum Ward costs approximately Rs.2,44,292.
Total variable costs are given in Table no. 2.

Introduction:

In today's healthcare industry providing patients only with excellent clinical service is not sufficient. Patient satisfaction also depends on the ambience, surroundings and services along with top rated therapeutic and diagnostic services. Various studies have concluded that a good environment and good comfortable stay helps in healing of the patient [3]. It is need of the hour to provide the patients with rooms which provides proper healing with comfort of home and cure of hospital.

The Apollo Hospitals Group, which started as a 150-bed hospital in Chennai today operates 9200 beds across 64 hospitals throughout India. The largest private hospitals chain is investing Rs.1,400 crore on construction of four new hospitals which are schedule to open in 2016 taking its bed strength over 10000 along with new clinics and Apollo Homecare, the new division of the group. [4]

Indraprastha Apollo Hospital Delhi was established in 1996 as a 695 bedded multi bedded multi-disciplinary super speciality tertiary care hospital with state-of-the-art facilities with a capacity to expand to 1000 beds. [5]

Table 1: Bed distribution assumptions FY14-FY16[6]

No. of beds	Sarita Vihar
Suite	5
Deluxe	10
ICU	154
Single room	174
Isolation room	10
Semi Private (2 beds)	100
Multi room (6 beds)	216
Total	669

Source: Centrum Research Estimates

In this study, an attempt has been made to determine the operating expenses that hospital has to invest in inpatient wards to cater for personal services. Costs were computed according to the category of room and the amenities which are being put up there or provided to the patients from time to time as per their needs. Both the fixed and variable costs were computed. The electrical, engineering and manpower costs were excluded from the study.

Research Question:

1) What is total cost incurred by Indraprastha Apollo Hospital, Delhi for providing various facilities and amenities in different categories of admission rooms?

Study Method:

Operating costs of various rooms of study hospital according to the unit costs of services and products from a provider (of services to patients) perspective was estimated. *Unit cost* refers to the cost of providing a single good or service.

It was calculated directly by taking the costs which hospital had to pay for every item. Calculation of the cost per unit per item placed inside the room by making a list of all the consumables and non-consumables was done. Segregation of the costs according to variable and fixed costs was done.

Variable cost accounts for the cost of various consumables which require replenishment every time a new patient comes in or sometimes also during the stay.

Data Collection:

Annual data was collected from April 2015 through March 2016 (Financial Year 2015–16). Average costs were quantised and added together to take care of the seasonal variations of prices. The main sources of data were the hospitals' activity and accounting reports. Although certain fixtures, furniture, etc. were already acquired in preceding years, therefore the costs at which they were purchased were taken into account.

Table 2: Estimated Cost of various amenities provided in different categories of rooms

Room Type	Cost (INR)	Variable Cost (INR)
Suite	392622	810
Deluxe	243146	392
Single	219382	342
Semi-Private	142939	515
AC Multi Bed Unit(Per Bed Cost)	56361	213
Platinum Ward - Suite	382460	718
Platinum Ward - Deluxe	245439	398
Platinum Ward - Single	244292	342

Results:

Among all the rooms, Indraprastha Apollo Hospital, Delhi has maximum bed occupancy of Single Rooms i.e. approximately 174 beds followed by Semi Private Rooms which are 2 bedded with 100 bed occupancy. Various amenities put in a Suite Room costs Rs.392622, out of which only Rs.810, i.e. just .21% of total cost is variable. A Deluxe room costs Rs.243146 containing Rs.392 as variable cost which is .16% of total cost.

Single room costs Rs.219382 out of which Rs.342, 0.16% of total cost is variable. A Semi Private Room costs Rs.142939 out of which Rs.515 is variable which is only 0.36% of total cost. A single bed in a Multi Bed Unit Costs around Rs.56361 out of which Rs.213 is the variable cost thus making it a mere 0.38% of total costs. Multi Bed Units' Cost includes the costs of amenities put in that Room/Ward.

A Suite in a Platinum Ward costs around Rs.382460 which has Rs.718 as variable costs making it 0.19% of total costs. A Deluxe Room costs around 245439 containing Rs.398 as variable costs making it 0.16% of total costs. A Single Room in Platinum Ward costs approximately Rs.244292. Rs.342 is variable which is only 0.14% of total cost. For Excel worksheet containing detailed costs of every item, refer to Annexure 1 at the end.

Conclusion:

This study tries to approximate costs of various rooms as close as possible. Time value of money and depreciation costs has not been taken into account for this study. It is also very much likely that current prices of same items may have changed in present time. This preliminary study has its own importance because no such relevant cost analysis has been documented for Indian hospitals till date. This study relates the inputs of hospital resources in monetary terms to the outputs of services in relation to patient admission.

This study can also prove to be a basic necessity of managers and policy makers to improve performance of hospital, optimum resource allocation and comparison of perforce of various hospitals of same group.

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PROJECT REPORT 2

Cost Effective Analysis of Environmental Cleaning Materials used for House Keeping Practices at Indraprastha Apollo Hospital, Delhi

Abstract:

A tertiary care hospital like Indraprastha Apollo Hospital has to face significant expenses for cleaning and maintaining cleanliness round the clock. A short time study of 5 weeks in the hospital to check for the money that hospital spent for cleaning agents was conducted. Calculation of the costs of cleaning chemicals used for the entire hospital which were bought by Housekeeping Department in past six months was done. For the month of October, it came out to be around Rs.3,24,474.89. For November month it was Rs.3,97,112.87. For the month of December, hospital gave away Rs.3,05,097.15. For January, the costs were Rs.4,60,925.19. For February and March the costs were around Rs.1,77,511.7 and Rs.5,30,163.56 respectively. The total spending for 6 months was Rs.3,67,5582.385

To investigate the costs more thoroughly, the hospital was mapped according to towers and floors to check for average weekly expenditure for cleaning. For this aspiration calculation of costs of not only the cleaning chemicals but also the costs of cleaning apparatus like mops, dusters, Scotch-Brite, gloves etc. was done. Detailed list is enclosed in the Result section. The hospital has ground plus six levels with 2 basements. Each floor consists of two towers which are connected by means of a corridor. Each tower houses wards and hospital beds in varying capacities and cohorts which include Suite rooms, Deluxe Rooms, Single Rooms, Semi- Private and Multi Bed Units. There is one more Tower, Tower III with ground plus four levels and two basements. Tower III is Platinum Ward of the hospital which encloses wards and rooms in a similar fashion as of earlier Towers. It was found that for cleaning 6^{th} floor tower I, the hospital spends Rs.2119.56 per week. Similarly for Tower II, cost comes out to be Rs.3997.44. Total cost for cleaning 6^{th} floor comes out to be Rs. 6117. For 5^{th} floor Tower I cost is Rs.3638. And for tower II it is Rs.4092.14. Total cost for cleaning 5^{th} floor, both the towers is Rs.7730.17. Cleaning cost of 4^{th} floor Tower I is Rs.3492.52. And for tower III, 3^{rd} and 4^{th} Floor, hospital spends Rs.2540 and Rs.2736 respectively. Costs for cleaning every room and even a single bed in general ward have also been calculated which are mentioned in the Result section.

Introduction:

Indraprastha Apollo hospital, Delhi has a build-up area of around 600,000 square feet. Indraprastha Apollo Hospital holds 695 Beds, plentiful ICU Beds, Sleep Lab, Endoscopy Lab, IVF Lab, Bronchoscopy Lab, Dialysis Unit, Bone Marrow Transplant Unit, Cancer Institute, Physiotherapy & Rehabilitation Centre, Holistic Medicine Department, Vaccination Room, and Wellness Centre for Health Check Ups, and Nuclear Medicine Department.

Cleaning and maintaining cleanliness is a perpetual process in hospital. The degree of cruciality of cleaning required depends on the type of condition of patients admitted.

This type of study is important because till now the focus had on payer and consumer payments to providers for delivering health care services. In this study attention was shifted to examination of the expenses of hospitals in providing cleaning services which are part of operating expenses. Aim was to do a Cost Effectiveness Analysis which can give a better insight of the money spent on cleaning products and materials. Further, this study compared monthly fluctuation of expenditure on cleaning materials.

Research Questions:

1) What are the expenses of cleaning different categories of inpatient rooms?
2) What is the difference of costs in cleaning different inpatient floors in Tower I and Tower II?
3) What is the difference of costs of cleaning 3rd and 4th floor of Tower III (where cleaning chemicals are outsourced) in comparison to Tower I and Tower II?
4) How much disparity in monetary terms exists in expenditure on cleaning material each month?
5) Out of all cleaning materials which cleaning material is used in highest percentage?

Method:

In an attempt to ascertain the cost of cleaning each room, prices of all the cleaning materials and equipment used in each inpatient areas during 5 weeks of study was calculated. Average cost for one week was approximated. Then the total area of entire floor was calculated. For calculating cost of cleaning of each room, the area of each room was measured. Cost of cleaning entire floor was divided by area of the floor to measure cost of cleaning per unit area. Cost for cleaning per unit area was multiplied by the area of room.

For comparison of costs incurred in past semi-annual period for entire hospital, complete record of housekeeping expenses from accounting reports was collected, separated out cleaning materials and summing up of the monthly expenses was done.

Results:

For distinctive analysis of cost of cleaning each room calculation of costs of cleaning the entire area and then approximation of cost of cleaning per square feet of area was done.The list of all the cleaning materials and their respective costs that were used on 6th floor Tower I and II, 5th floor tower I and II, 4th floor Tower I, 3rd and 4th floor Tower III are given Annexure No. 2.

Surprisingly there were significant differences in cleaning 1 square feet area at different floors of the same Towers. Another significant outcome of this study was the cost of cleaning Platinum Wards i.e. Tower III which costs almost double in comparison to 5th and 4th floor of Tower I and II where the cleaning agents are outsourced and cost of only non-consumables is calculated.

Following are the significant outcomes:

- 6th floor Tower I takes Rs.8.15 to clean 1 square feet area, per day whereas the same floor i.e. 6th floor on Tower II costs Rs.4.32 per square feet area each day which is approximately half.
- 5th floor on Tower I and II and 4th Floor on Tower I cost between Rs.4-5 to clean 1 square feet area per day.
- Tower III, Platinum Ward demands Rs.10-11 for cleaning per square feet of area per day.
- One more prodigious finding was the difference of costs in each passing month in the last 6 months. See Annexure No. 3.

Table 1: Difference of money spent in the past 6 months

MONTH	COST	DIFFERENCE
OCTOBER	324474.89	-
NOVEMBER	397112.87	+72637.98
DECEMBER	305097.15	-92015.72
JANUARY	460925.19	+155828.04
FEBRUARY	177511.7	-1314192.51
MARCH	530163.56	+1244954.14

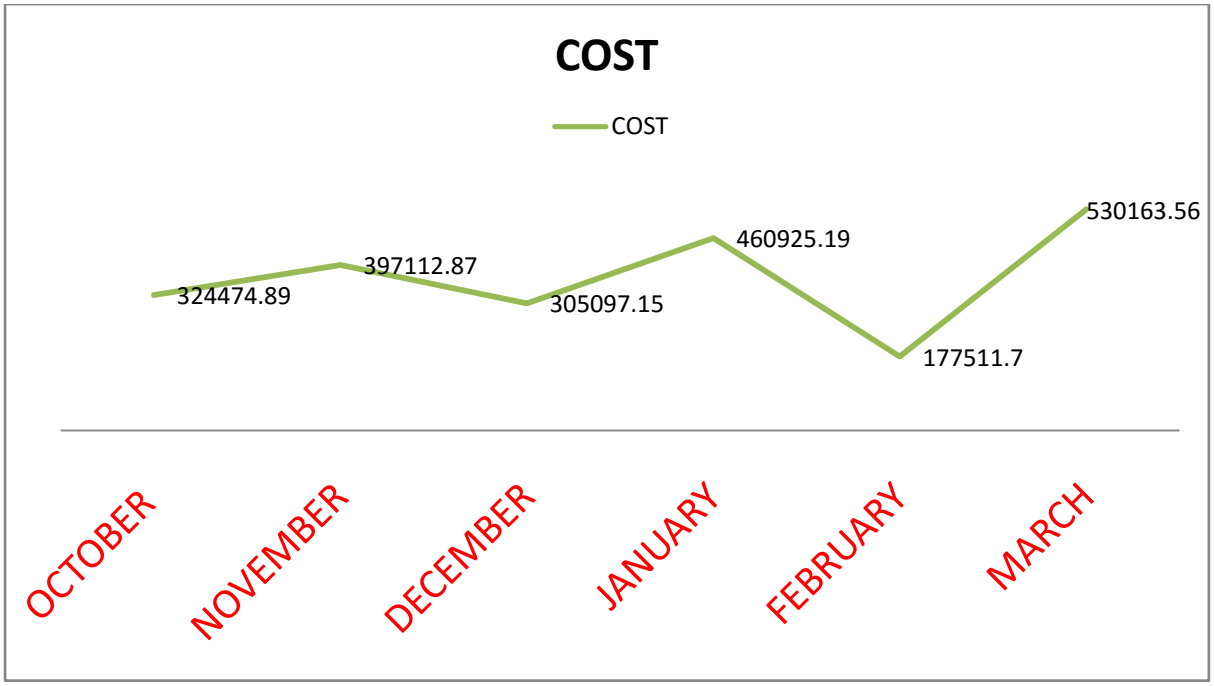
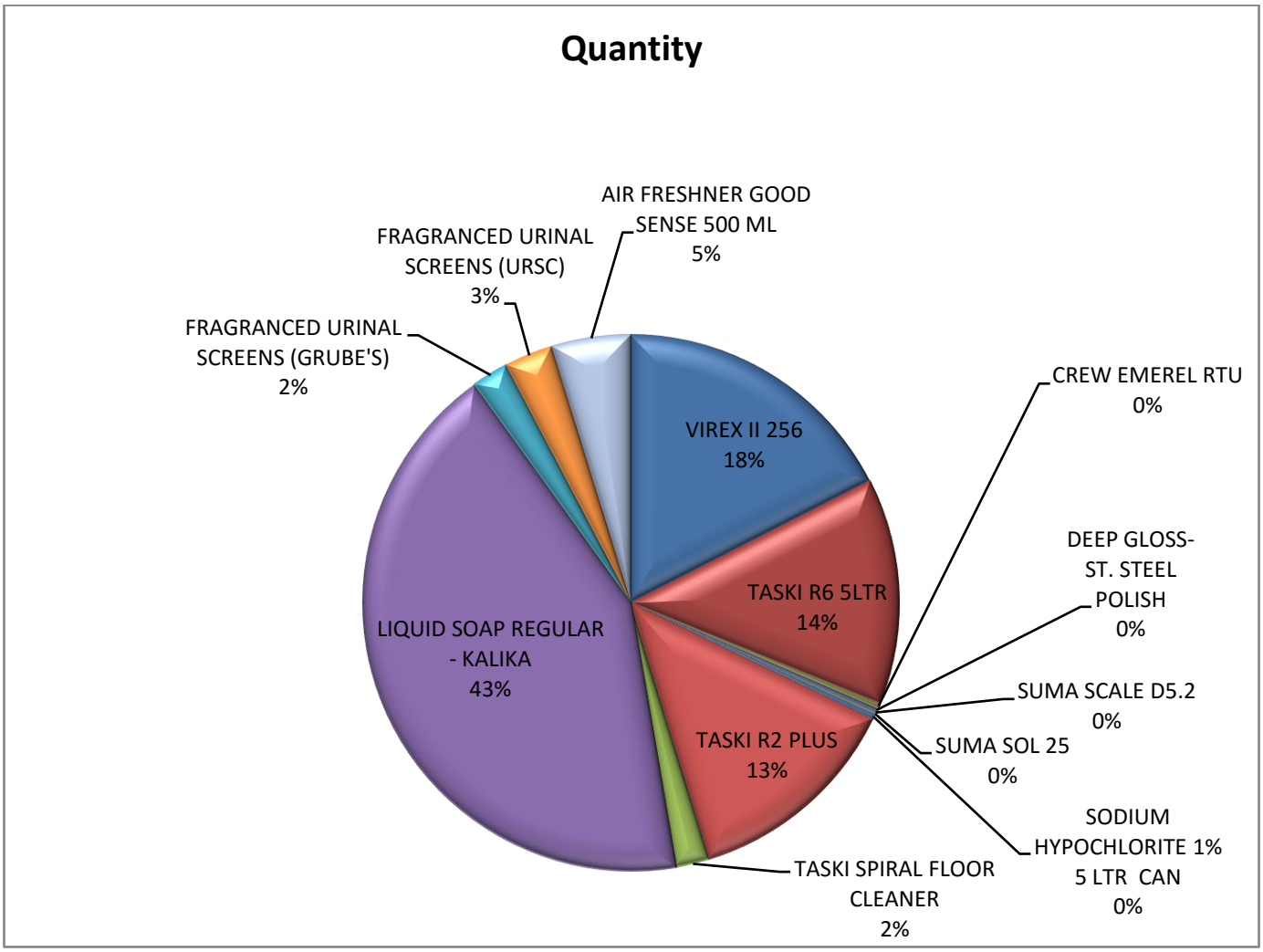


Table 2: The consumption of cleaners and chemicals in 6 months:

DISINFECTING AND CLEANING MATERIAL	QUANTITY USED IN LAST 6 MONTHS			TOTAL COST
	Quantity Used	Unit of Reference	Price per Unit	
VIREX II 256	2845.00	LTR	673.05	1914827.25
TASKI R6 5LTR	2220.00	LTR	52.59	116749.8
CREW EMEREL RTU	48.00	BOTTLE	287.94	13821.12
DEEP GLOSS- ST. STEEL POLISH	35.00	BOTTLE	467.49	16362.15
SUMA SCALE D5.2	20.00	LTR	106.25	2125
SUMA SOL 25	10	NOS	11.05	110.5
SODIUM HYPOCHLORITE 1% 5 LTR CAN	54.00	NOS	12.6	680.4
TASKI R2 PLUS	2137.50	NOS	532.31	1137812.625
TASKI SPIRAL FLOOR CLEANER	330.00	LTR	40.8	13464
LIQUID SOAP REGULAR - KALIKA	6960.00	LTR	36.2	251952
FRAGRANCED URINAL SCREENS (GRUBE'S)	364.00	NOS	100	36400
FRAGRANCED URINAL SCREENS (URSC)	476.00	NOS	181.01	86160.76
AIR FRESHNER GOOD SENSE 500 ML	774.00	NOS	109.97	85116.78
TOTAL				3675582.385


Quantity
AIR FRESHNER GOOD SENSE 500 ML 5%
FRAGRANCED URINAL SCREENS (URSC) 3%
FRAGRANCED URINAL SCREENS (GRUBE'S) 2%
CREW EMEREL RTU 0%
VIREX II 256 18%
DEEP GLOSS-ST. STEEL POLISH 0%
TASKI R6 5LTR 14%
LIQUID SOAP REGULAR - KALIKA 43%
SUMA SCALE D5.2 0%
TASKI R2 PLUS 13%
SUMA SOL 25 0%
SODIUM HYPOCHLORITE 1% 5 LTR CAN 0%
TASKI SPIRAL FLOOR CLEANER 2%

Individual Towers and respective floor cleaning cost calculations:

Tower I and Tower II Operational Cost of Cleaning

6TH FLOOR TOWER I

Covered area – 6th Floor ➡ 34587.32 Sqft. (Fire stair case and lift areas not included)

Tower I floor area: 17293.66 Sqft.

6th FLOOR TOWER I	
ROOM TYPE	NUMBER
SUITES	4
DELUXE ROOMS	4
SINGLE ROOMS	4

AREA COVERED BY ONE ROOM (Sqft)		TOTAL AREA COVERED(Sqft)
SUITE	936	936*4=3744
DELUXE	323	323*4=1292
SINGLE	259	259*4=1036

Average Operational Indented cost of cleaning, 6th Floor Tower I for 1 week: Rs. 2119.56.

For calculating the cleaning cost of per room, the area of each room was calculated and also the cost of cleaning per square feet was calculated.
The cost of cleaning every square feet was multiplied by the area covered by each room.

The following results were found:
17293.66/2119.56=8.15
Cleaning of 1 Sqft area costs Rs. 8.15

AREA COVERED BY ONE ROOM (Sqft)		WEEKLY COST OF CLEANING
SUITE	936	936*8.15=7628.4
DELUXE	323	323*8.15=2632.45
SINGLE	259	259*8.15=2110.85

AREA COVERED BY FOUR ROOMS (Sqft)		WEEKLY COST OF CLEANING
SUITE	3744	3744*8.15=30513.6
DELUXE	1292	1262*8.15=10529.8
SINGLE	1036	1036*8.15=8443.4

6TH FLOOR TOWER II

Tower II floor area: 17293.66 Sqft.

6th FLOOR TOWER II	
ROOM TYPE	NUMBER
SUITES	0
SEMI PRIVATE ROOMS	16
SEMI PRIVATE CORNER ROOMS	4
4 BEDDED GENERAL WARD	2

AREA COVERED BY ONE ROOM (Sqft)		**TOTAL AREA COVERED(Sqft)**
SEMI PRIVATE ROOM	259	259*16=4144
SEMI PRIVATE CORNER ROOM	323	323*4=1292
AREA OF ONE BED IN GENERAL WARD	75	75*8=600

Average Operational Indented cost of cleaning, 6th Floor Tower II for 1 week: Rs. 3997.44.

For calculating the cleaning cost of per room, the area of each room was calculated and also the cost of cleaning per square feet was calculated.
The cost of cleaning every square feet was multiplied by the area covered by each room.

The following results were found:
17293.66/3997.44=4.32
Cleaning of 1 Sqft area costs Rs. 4.32

AREA COVERED BY ONE ROOM (Sqft)		**WEEKLY COST OF CLEANING**
SEMI PRIVATE ROOM	259	259*4.32=1118.88
SEMI PRIVATE CORNER ROOM	323	323*4.32=1395.36
AREA OF ONE BED IN GENERAL WARD	75	75*4.32=324

TOTAL AREA COVERED BY ROOMS (Sqft)		**WEEKLY COST OF CLEANING**
SEMI PRIVATE ROOM	4144	4144*4.32=17902.08
SEMI PRIVATE CORNER ROOM	1292	1292*4.32=5581.44
AREA OF ONE BED IN GENERAL WARD	600	600*4.32=2592

5TH FLOOR TOWER I

Covered area – 5th Floor ➧ 36057.57 Sqft. (Fire stair case and lift areas not included)

Tower I floor area: 18028.785 Sqft.

5th FLOOR TOWER I	
ROOM TYPE	NUMBER
SUITES	0
DELUXE ROOMS	8
SINGLE ROOMS	16

AREA COVERED BY ONE ROOM (Sqft)		TOTAL AREA COVERED(Sqft)
DELUXE	323	323*8=2584
SINGLE	259	259*16=4144

Average Operational Indented cost of cleaning, 5th Floor Tower I for 1 week: Rs. 3638.04.

For calculating the cleaning cost of per room, the area of each room was calculated and also the cost of cleaning per square feet was calculated.
The cost of cleaning of every square feet was multiplied by the area covered by each room.

The following results were found:
18028.78/3638.04 = 4.95
Cleaning of 1 Sqft area costs Rs. 4.95

AREA COVERED BY ONE ROOM (Sqft)		WEEKLY COST OF CLEANING
DELUXE	323	323*4.95=1598.95
SINGLE	259	259*4.95=1282.05

AREA COVERED BY FOUR ROOMS (Sqft)		WEEKLY COST OF CLEANING
DELUXE	2584	2584*4.95=12790.8
SINGLE	4144	4144*4.95=20512.8

5TH FLOOR TOWER II

Tower II floor area: 18028.785 Sqft.

5th FLOOR TOWER II	
ROOM TYPE	NUMBER
DELUXE ROOMS	6
SINGLE ROOMS	6
SEMI PRIVATE ROOMS	6
4 BEDDED GENERAL WARD	2

AREA COVERED BY ONE ROOM (Sqft)		**TOTAL AREA COVERED(Sqft)**
DELUXE ROOMS	323	323*6=1938
SINGLE ROOMS	259	259*6=1554
SEMI PRIVATE ROOM	259	259*6=1554
AREA OF EIGHT BEDS IN GENERAL WARD	75	75*8=600

Average Operational Indented cost of cleaning, 5th Floor Tower II for 1 week: Rs. 4092.14

For calculating the cleaning cost of per room, the area of each room was calculated and also the cost of cleaning per square feet was calculated.
The cost of cleaning every square feet was multiplied by the area covered by each room.

The following results were found:
18028.785 /4092.14=4.40
Cleaning of 1 Sqft area costs Rs. 4.40

AREA COVERED BY ONE ROOM (Sqft)		**WEEKLY COST OF CLEANIN**
DELUXE ROOMS	323	323*4.40=1421.2
SINGLE ROOMS	259	259*4.40=1139.6
SEMI PRIVATE ROOM	259	259*4.40=1139.6
AREA OF ONE BED IN GENERAL WARD	75	75*4.40=330

TOTAL AREA COVERED BY ROOMS (Sqft)		**WEEKLY COST OF CLEANING**
DELUXE ROOMS	1938	1938*4.40=8527.2
SINGLE ROOMS	1554	1554*4.40=6837.6
SEMI PRIVATE ROOM	1554	1554*4.40=6837.6
AREA OF EIGHT BEDS IN GENERAL WARD	600	600*4.40=2640

4TH FLOOR TOWER I

Covered area – 4th Floor ➡ 35024.79 Sqft. (Fire stair case and lift areas not included)

Tower I floor area: 17512.395 Sqft.

4th FLOOR TOWER I	
ROOM TYPE	NUMBER
SINGLE ROOMS	16
SEMI PRIVATE CORNER ROOMS	8
4 BEDDED GENERAL WARDS	2

AREA COVERED BY ONE ROOM (Sqft)		**TOTAL AREA COVERED(Sqft)**
SINGLE ROOM	259	259*16=4144
SEMI PRIVATE CORNER ROOM	323	323*8=2584
AREA OF ONE BED IN GENERAL WARD	75	75*8=600

Average Operational Indented cost of cleaning, 4th Floor Tower I for 1 week: Rs. 3492.52.

For calculating the cleaning cost of per room, the area of each room was calculated and also the cost of cleaning per square feet was calculated.
The cost of cleaning every square feet was multiplied by the area covered by each room.

The following results were found:
17512.39/3492.52= 5.01
Cleaning of 1 Sqft area costs Rs. 5.01

AREA COVERED BY ONE ROOM (Sqft)		**WEEKLY COST OF CLEANIN**
SINGLE ROOM	259	259*5.01=1297.59
SEMI PRIVATE CORNER ROOM	323	323*5.01=1618.23
AREA OF ONE BED IN GENERAL WARD	75	75*5.01=375.75

TOTAL AREA COVERED BY ROOMS (Sqft)		**WEEKLY COST OF CLEANING**
SEMI PRIVATE ROOM	4144	4144*5.01=20761.44
SEMI PRIVATE CORNER ROOM	2584	2584*5.01=12945.84
AREA OF EIGHT BEDS IN GENERAL WARD	600	600*5.01=3006

Tower III Operational Cost of Cleaning

3rd FLOOR TOWER III

Tower III total floor area excluding shaft area: 27501.79 Sqft.

3rd FLOOR TOWER III	
ROOM TYPE	NUMBER
Suites	4
Deluxe rooms	31
Single Rooms	7

AREA COVERED BY ONE ROOM (Sqft)		TOTAL AREA COVERED(Sqft)
SUITE	782	782*4=3128
DELUXE	708	708*31=21948
SINGLE	708	708*7=4956

Average Operational Indented cost of cleaning, 3rd Floor Tower III for 1 week: Rs. 2539.90.

For calculating the cleaning cost of per room, the area of each room was calculated and also the cost of cleaning per square feet was calculated.
The cost of cleaning every square feet was multiplied by the area covered by each room.

The following results were found:
27501.79 /2539.90= 10.83
Cleaning of 1 Sqft area costs Rs. 10.83

AREA COVERED BY ONE ROOM (Sqft)		WEEKLY COST OF CLEANING
SUITE	782	782*10.83=8469.06
DELUXE	708	708*10.83=7667.64
SINGLE	708	708*10.83=7667.64

AREA COVERED BY FOUR ROOMS (Sqft)		WEEKLY COST OF CLEANING
SUITE	3128	3128*10.83=33876.24
DELUXE	21984	21984*10.83=238086.72
SINGLE	4956	4956*10.83=53673.48

4th FLOOR TOWER III

4th Floor Tower III total floor area excluding shaft area: 27501.79 Sqft.

4th FLOOR TOWER III	
ROOM TYPE	NUMBER
SUITES	3
DELUXE ROOMS	24
SINGLE ROOMS	4

AREA COVERED BY ONE ROOM (Sqft)		TOTAL AREA COVERED(Sqft)
SUITE	782	782*3=2346
DELUXE	708	708*24=16992
SINGLE	708	708*4=2382

Average Operational Indented cost of cleaning, 4th Floor Tower III for 1 week: Rs. 2735.964

For calculating the cleaning cost of per room, the area of each room was calculated and also the cost of cleaning per square feet was calculated.
The cost of cleaning every square feet was multiplied by the area covered by each room.

The following results were found:
27501.79 /2735.96= 10.05
Cleaning of 1 Sqft area costs Rs. 10.05

AREA COVERED BY ONE ROOM (Sqft)		WEEKLY COST OF CLEANING
SUITE	782	782*10.05=7859.1
DELUXE	708	708*10.05=7115.4
SINGLE	708	708*10.05=7115.4

AREA COVERED BY FOUR ROOMS (Sqft)		WEEKLY COST OF CLEANING
SUITE	3128	3128*10.05=31436.4
DELUXE	21984	21984*10.05=220939.2
SINGLE	4956	4956*10.05=49807.8

Recommendations:

- Any cost control initiatives must take into account this variability to ensure adequate targeting of costs per floor per bed type rather than across the broad consumption cuts.
- A further study of efficacy of cleaning vs patient satisfaction with hospital cleanliness vs consumption in that area is needed to understand causation if any.
- Monthly variations to be better analysed to understand causation, whether seasonal, occupancy linked or for other reasons.

Conclusion:

The cost information which was gathered from this study presents the approximate cost of cleaning from the service provider perspective, albeit man power costs were not included. Noteworthy finding of this study were the cost variations which existed as per room category and sub categorisation. Also, the consumption pattern differs for single, multi bed and other categories owing to more man power intensity. It is a very obvious fact that hospital policy planners invariably make efforts to provide the services in as minimal rates as possible. Following this idea, they generally try to cut off the costs as a whole. This study provided us with a different way of solving the same problem by checking varying consumption and prices at different areas of the hospital. This study is also important because till date no such relevant study has been documented which can tell the operational cost of cleaning of different categories of rooms.

It is always possible to do more detailed costing study but the challenges lie in collecting the data. In Indraprastha Apollo Hospital also, although accounts data could be accessed relatively easily, obtaining accurate activity statistics and price information was difficult. Improvements in the hospital recordkeeping could minimize contends of such cost studies in future, which in turn will help hospital to run their system more efficiently.

PROJECT REPORT 3

Gap Evaluation and Possible Substitutions of Cleaning Agents and Disinfectants used for Housekeeping Practices at Indraprastha Apollo Hospital, Delhi

Abstract:

Cleaning agents and disinfectants are indispensable requisites for attaining effectiveness in Housekeeping services in various health care institutions. A study was undertaken for a short period of 5 weeks in Indraprastha Apollo Hospital, Delhi to analyse the Housekeeping products and equipment used for environmental sanitation. The techniques adopted to disinfect various patient care areas along with the type of disinfectants; detergents and dilution-ratio were studied. Key informants were interviewed and keenly observed during cleaning and disinfection process of various maintenance areas. The primary intention of this study was to check the appropriate and efficient use of cleaning materials and disinfectants of not only the clinical departments and patient rooms but also the items which are in close vicinity of patients and likely to harbour the pathogenic microorganisms. This study also aimed to analyse the cost incurred by the hospital in relation to cleaning products in Housekeeping Department. Focused information of cleaning agents and disinfectants for Housekeeping activities in the hospital was taken into account. The present study suggests that scientific evaluation of Housekeeping detergent-germicides is a must for attaining cost effectiveness as well as quality assurance in health care institutions.

Keywords: Cleaning Agents, Disinfectants, Housekeeping.

Introduction:

In a tertiary care institute like Indraprastha Apollo, the cleaning of hard surfaces of hospital rooms and public areas becomes critical for reducing health care associated infections.

There are three towers in the hospital. Tower I and Tower II having six floors while Tower III has four floors. Microorganisms are ubiquitous, but their number increases many folds in a health care environment, owing to the presence of patients particularly if they are coughing, sneezing or having diarrhoea. Bacteria and viruses may survive for weeks or months on dry surfaces. [1][2][3] The designation of a patient's environment varies depending upon the nature of the health care organisation and the ambulation of the patient.

For example:

- In acute care, the patient environment is the area inside the curtain, including all items and equipment used in his/her care, as well as the bathroom that the patient uses.
- In intensive care units (ICUs), the patient environment is the room or bed space and items and equipment inside the room or bed space.

- In ambulatory care, the patient environment is the immediate vicinity of the examination or treatment table or chair, and waiting areas.
- In some care environments e.g. mental health, long-term care, paediatrics the patient environment may be shared space such as group rooms, dining areas, playrooms, central showers, washrooms etc.

Effective and periodic cleaning disrupts transmission of microorganisms from the contaminated environment to patients and health care providers. Improving cleaning practices in hospitals and other health care organisations will contribute towards controlling health care-associated infection and associated costs. [4]

Research Questions:

Functional Questions:

1) How does the housekeeper ensure the right kind of cleaner is being used for various floors?
2) Which cleaner, of what concentration or dilution, is to be used in different types of maintenance areas?
3) Are set policies for cleaning written for Housekeeping Department?

Equipment and Methods

1) What types of soaps or detergents are used on various surfaces?
2) What are the equipments in use in the Housekeeping Department?

Materials and Methods:

Consumption and utilisation of cleaning agents and disinfectants at Indraprastha Apollo Hospital Delhi was conducted for 5 weeks. Following this a market survey was conducted to know the availability of detergents and disinfectants of similar composition.

Moderate Risk Areas	High Risk Areas
a. Suites b. Deluxe Rooms c. Single Rooms d. Semi Private Rooms e. AC Multi bedded Units	a. ICU b. Isolation Rooms c. HDU

For studying the consumption and utilisation, a representative sample of different wards in the hospital catering to different specialities and acuteness of illness, were selected for the study:

Table 1: Characteristics, monthly consumption of cleaning agents and disinfectants in inpatient wards during 5 weeks of study

Items	Characteristic	Composition	Preparation	Area Utilized	Weekly Consumption	Cost (INR)
Taski R2 Plus	Hygienic hard surface cleaner	Didecyl Dimethyl Ammonium Chloride	6ml in 1 L fresh water, 4ml in 1 L fresh water	Floors, Toilets, Dusting	14.63 Litre	2600
Taski R6	Toilet Bowl Cleaner	Hydrochloric acid (OES) Quaternary ammonium compounds, Trimethyltallow alkyl, chlorides	Direct use	Toilet Bowl	17.5 Litre	925
Virex II 256	Broad Spectrum Environmental Cleaner and Disinfectant	Didecyl Dimethyl Ammonium Chloride:8.7%, n-alkyl dimethyl benzyl ammonuium chloride:8.19%, Lauryl dimethyl amine oxide, Ethylene diamine tetra acetic acidsodium salt, Sodium Bicarbonate	4 ml in 1 L of cold water	Floor, Critical Areas (ICU, HDU)	46 Litre	30960
Taski R9	Floor cleaner (oil and grease remover)	Acid detergent	Direct Use	Floor	12 Litre	580
					Total	35065

Costs were calculated according to the consumption per unit of each cleaning material intended by housekeeping and nursing staff on every tower and floor over a period of 5 weeks. Average cost for cleaning per week was calculated which included cleaning materials along with the cost of cleaning accessories replaced.

Observations:

The various cleaning materials for housekeeping activities used at the hospital are Taski R2, Taski R6, Taski D5, Taski R9, Virex II 256 cleaner cum disinfectant, Air Freshener (Good Sense), Liquid soap etc.

For Non consumables list see Annexure No. 2

Table 2: Average Weekly Cost of Cleaning of Different Areas of Hospital

Area	**Weekly Cost of Cleaning**
6th Floor Tower I	2119.56
6th Floor Tower II	3997.44
5th Floor Tower I	3638.04
5th Floor Tower II	4092.14
4th Floor Tower I	3492.52
3rd Floor Tower III	2539.90
4th Floor Tower III	2735.96
Total	**22615.55**

Gap analysis involves the comparison of actual performance with potential or desired performance. The cleaning practices are compared according to the instructions given on label and actual practices.

General recommendations for cleaning as given by Govt. of India for cleaning practices in any tertiary care hospital are given in the table that follows.

Table 3: Cleaning frequency, level of cleaning/disinfection according to the type of functional area risk category [5]

Functional Area Risk Category	*Frequency of cleaning*	*Level of cleaning/disinfection*	*Method of cleaning/Disinfection[6]*	*Cleaning Practices Performed in Indraprastha Apollo Hospital*
High risk areas	*Once in two hours and spot cleaning as required*	*Cleaning and Intermediate level disinfection*	*Cleaning with soap & detergent plus disinfection with alcohol compound, aldehyde compounds (Formaldehyde, glutardehyde) hydrogen peroxide and phenolics.*	*As per the protocols*
Moderate risk areas	*Once in four hours and spot cleaning as required*	*Cleaning and low level disinfection*	*Cleaning with soap & detergent plus disinfection with aldehyde compounds (Formaldehyde, glutardehyde) hydrogen peroxide phenolics*	*As per the protocols*

GAP ANALYSIS OF MOPPING IN INPATIENT AREAS:

RECOMMENDED ACTIONS	ACTIONS PERFORMED
BEFORE CLEANING	
Check for precaution signs and follow.	√
Use proper dilution of chemical as per manufacturer's instruction.	√
Gather materials required for cleaning before entering the room.	√
Clean hands before entering the room.	**X**

Note: Housekeeping staff did not clean hands every time they entered a new room.

RECOMMENDED ACTIONS	ACTIONS PERFORMED
DURING CLEANING	
Clean hands and wear gloves	√
Do not swipe out infectious solid waste across the room. Collect it and dispose it in colour coded bag according to hospital policy.	**X**
Progress from clean to dirty areas	**X**
Wash the mop under running water before doing wet mopping	**X**
Do not double dip mop in same cleaning solution.	√
Change mop after cleaning 3 rooms.	**X**
Remove gloves and clean hands before leaving room.	**X**

Note:

- Hand hygiene practices were not universally followed in room cleaning.
- Infected waste was not removed and discarded on the spot.
- Garbage bin and bags should have been emptied and changed at the end of the cleaning and gloves should have been changed. But Housekeeping staff replaced garbage bin bags in between and touched themselves and other objects with infected hands.
- Two bucket cleaning system was followed where ideally one of the buckets should contain diluted solution with R2 while the other bucket should have clean water. But it was observed that slight amount of R2 was in the clean bucket making it a lightly diluted solution. Mops were dipped in clean water (faintly diluted with chemical) and not in the concentrated actual cleaning solution.

- Mop was not washed under running water after every room.
- Protocols ask to change mops after cleaning every 3 rooms. But mops are not changed till visibly soiled or after one complete shift.

RECOMMENDED ACTIONS	ACTIONS PERFORMED
AFTER CLEANING	
Tools used for cleaning and disinfection must be cleaned and dried between uses.	**X**
Launder mop heads daily	√
All washed mop heads should be dried thoroughly before re-use	√
Clean sanitation cart and carts used to transport bio medical waste daily.	√

Notes:

- Housekeeping staff left the room without changing gloves and cleaning hands.
- Mops are dipped into the same clean water again and again and then wringed manually before cleaning each room thus causing splash of dirty water.
- There is no separate place in sanitation cart to keep used WC brush and dripping brush is placed along with clean white duster thus escalating chances of spread of infection.

GAP ANALYSIS OF TOILET CLEANING:

RECOMMENDED ACTIONS	ACTIONS PERFORMED
DURING CLEANING	
Remove any soiled linen and wipe up any spills.	√
Clean all the fixtures in bathrooms.	√
Ensure sufficient time of contact of disinfectant with water closet.	**X**
Clean sink and slab.*	√
Do not double dip mop in same cleaning solution.	**√**
Change mop after cleaning 3 rooms.	**X**
Remove gloves and clean hands before leaving room.	**X**

Notes:

- Wash basin sinks and outer slabs were cleaned with the same mopping cloth which was used in every room without washing or cleaning*.
- Same WC Brush was used in each room.
- WC brush was not cleaned after each use.

- Dirty WC brush was kept at the same place in sanitation cart after cleaning rooms thus making it a potential surface to harbour micro-organisms spreading infection.
- The outer rims of commodes of every room were cleaned with the same mopping cloth.

Suggestions:

- Housekeeping staff should be told about importance of hand hygiene in detail and strict instructions to practice hand hygiene practices between cleaning of two rooms and also while cleaning the room.
- Emphasis should be administered on making Housekeeping staff understand the basics behind spread of infection and how pathogenic micro-organisms can be a threat.
- The staff should be aware of the fact that even mops and dusters used for cleaning can redistribute and help in propagation of infectious agents.

Gap Analysis according to type of Cleaner:

Taski R 2 Plus	Standard Protocols	Actions	Gaps
Dilution	6ml in 1 Litre water	6ml in 1 Litre water	No Gap
Application	**Small Areas**: 1) Spray a small quantity on damp cloth and clean the surface. 2) Let the solution stay for at least 5 minutes. 3) Rinse with fresh water or wipe with a clean damp cloth.	1) Disinfectant is directly sprayed on the surface. 2) It is not left for any amount of time. 3) Surface is not cleaned with a clean cloth.	1) Disinfectant should not be directly sprayed upon objects. 2) It should be left for at least 5 minutes. 3) After cleaning with disinfectant the area should be wiped by a clean cloth.
	Large Surfaces: 1) Use a sponge, cloth or wet mop to apply the solution and to clean the surface. 2) Let the solution stay for 10 minutes. 3) Rinse with fresh water or damp cloth or wet mop	1) While washing the large surfaces the dilution of 6ml into 1 Litre water is spread on the floor and wiped with flat mop. 2) This is followed by moping the floor with wet mop rinsed and cleaned in diluted R2 solution.	1) Disinfectant solution is not left for the required period of time prior to wet mopping of the area.

Taski R6	Standard Protocols	Actions	Gaps
Dilution	Direct Use	Directly Used	No gaps
Application	-Flush the Toilet or Urinal	Toilet was flushed	No Gaps
	-Squirt R6 under the rim, around the bowl and water outlets.	Same action performed	No Gaps
	-Leave for 5-10 minutes	Not left for the required period of time.	R6 should be left for at least 5 minutes for activation.
	-Scrub the inside of the toilet bowl with brush to remove difficult stains. Then flush to rinse the toilet.	-Same action performed	No Gaps

Suggestions:

- Housekeeping staff should be imparted training on activation time of various cleaning agents. They should understand importance of contact time for achieving proper level of disinfection.
- Following cleaning, it is equally important that no residues of the harmful cleaner are left behind.

Major Findings of Importance:

- Mop head is being changed in every shift in Tower I and Tower II but not in between the rooms. In Tower III, different mop heads are used for different rooms.
- Contaminated swab and bandages which lie near the bed are swept across the room instead of being collected and disposed of then and there.
- Sanitary attendant does not change gloves in each room. They touch various articles and themselves with gloved hands even after cleaning the toilets.
- Cleaning is not done from dirty to clean areas. It happens randomly in Tower I and Tower II. Tower III follows the recommendations up to some extent.
- Dusting and mopping used the same concentration of R2.
- Many persons responsible for cleaning were not aware of the dilutions.
- Toilet brushes are not cleaned and kept in cleaning cart with other cleaning materials. Cart is also not cleaned thus making it a reservoir of spreading infection from one room to another.
- The specific types of the materials were being used in different areas of hospital. Like ICU and OT use Virex II 256 for cleaning rooms.
- It was also observed that though the cleaning was being carried out frequently, use of cleaning agents and disinfectants was based more on traditional ways.

Possible Substitutes:

Table: Available cleaning agents and detergent disinfectants

ɹgent	**Manufacturer**
Teepol – 300	Reckitt-Benckiser
Spiral	Hindustan Unilever
Ajax	Colgate Palmolive
Fresca Dust Guard Sanitizer	Metropol
Wizard	Quartz Home Care
Spic and Span	Prestige Brands
Polysan - D	Polypharm Pvt. Ltd

Detergent Disinfectant	
Germinol	TruClean Solutions
Lamp phenyl	Bengal Chemicals
Trishul phenyl	Ambey Group
Phoenix	Metropol
Dettol	Reckitt-Benckiser

Recommendations:

- Different colour mops should be used for cleaning different areas. For example, the inside of the sink can be cleaned by red coloured duster whereas the outer slab can be cleaned by white duster.
- Different mops should be used for different rooms especially when the patient is infected.
- Reusable Microfiber Mop can be used. Steps for cleaning involves soaking into the chemical, wringing, attaching to the mop head with the help of Velcro Strips, removed and set aside for laundering after cleaning each room.[5]
- An automatic combine machine is recommended which performs the four processes of laying the detergent/ cleaning/germicidal agent, scrubbing, rinsing the floor and vacuuming back the water.
- Supervisor should do spot checking.
- Use of audio/visual training aids.
- Appraisal of cleaning staff should be based on his/her knowledge about cleaning agents and discipline in following standard cleaning practices.
- Bactericidal action of detergents and disinfectants in use should be evaluated from time to time.

Discussion:

This ourstudy aimed to get answers of very important and crucial questions. It was found that most of the Housekeeping Floor in-charge were aware of proper use of right type of cleaner in right dilution but poor compliance to standard procedures was observed amongst down in the line staff undertaking cleaning task. Staff knew that critical and medium risk areas required different type of cleaning but they did not know about the rationale. There was not much deviation in quantity of cleaners to be used but gaps were found in methodology to accomplish the goal. There were set guidelines about using correct quantity of chemicals but no written instructions on proper usage were found. Also no written policy was laid on steps and methods to use cleaning agents. All the cleaning aids used were of high quality and were replaced from time to time as and when required. Staff had adequate knowledge about using the right type of cleaner on right surface. Various surfaces like wooden floor, tiles and steel surfaces have proper cleaners. Platinum III staff took due care of the temperature of water to clean the floor.

Conclusion:

Avoidance and restriction of hospital acquired infection is one of the most integral objectives of hospital Housekeeping Department. Housekeeping services involve actions analogous to maintenance and preservation of hospital habitat, cleanliness, sanitation and purity of hospital premises and its surrounding. For optimum and adequate utilization of resources it is a must that materials are used in right quality and quantity, efficiently and effectively. Providing the services within specified protocols also ensures the best use of available resources. One possible reason for the gaps identified in the Housekeeping practices is the absence of fixed standard procedures for using cleaning materials. The usage of a specific type of material at specific areas and techniques of using them should be strictly adhered. Studies have shown that patient satisfaction is also related to cleanliness of the hospital.[7] While the work of the environmental services staff is vital in helping prevent the spread of disease, how that work is performed can also make a difference in how the hospital is viewed by patients and visitors.[8] Calculation of the cost of cleaning materials, which hospital spends on weekly basis was also done. The calculations were made in two forms. One calculation is for just the cleaning chemicals while another calculation also included the cost of cleaning agents like mops and mopping rods etc. Now the question here is, can there be any difference in money spent or to be more precise, can any amount of money be saved on cleaning chemicals if the staff involved follows all the protocols. This question can be answered by another sequential study after making some definite changes. It is self-evident that eliminating the gaps can increase the efficiency many folds. In a hospital like Indraprastha Apollo, aim is not to just cut the costs blindly, but to achieve maximum cost efficiency. Although a list of possible substitutes of the cleaning materials suitable to be used in a hospital at various surfaces has also been made, the final decision should be only be made after conducting standard bacteriological tests.

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Room wise amenities list of Indraprastha Apollo Hospital, Delhi

Amenities	ROOM TYPE																							
	Suite	Cost Per Unit	Cost Per room	Deluxe Room	Cost Per Unit	Cost Per Room	Single Room	Cost Per Unit	Cost Per Room	Semi Private room	Cost per unit	Cost per room	AC Multi Bed Unit	Cost per Unit	Cost per Bed	Platinum Ward- Suite room	Cost per Unit	Cost per Bed	Platinum Ward- Deluxe room	Cost per Unit	Cost per Bed	Platinum Ward- Single room	Cost per Unit	Cost per Bed
1 Electronic Bed	1	133000	133000	1	133000	133000	1	133000	133000							1	133000	133000	1	133000	133000	1	133000	133000
2 Manual Bed	0	0	0	0	0	0	0	0	0	2	10000	20000	1	10000	10000	0	0	0	0	0	0	0	0	0
3 Cardiac Table	1	9000	9000	1	9000	9000	1	9000	9000	2	9000	18000	1	4000	4000	1	9000	9000	1	9000	9000	1	9000	9000
4 Mattress	1	4000	4000	1	4000	4000	1	4000	4000	2	4000	8000	1	4000	4000	1	4000	4000	1	4000	4000	1	4000	4000
5 Mattress sticker	4	8	32	4	8	32	4	8	32	8	8	64	4	8	32	4	8	32	4	8	32	4	8	32
6 Patient's bed sheet	1	200	200	1	200	200	1	200	200	2	200	400	1	200	200	1	200	200	1	200	200	1	200	200
7 Patient's blanket	1	483	483	1	483	483	1	483	483	2	483	966	1	483	483	1	483	483	1	483	483	1	483	483
8 Patient Pillow	1	320	320	1	320	320	1	320	320	2	320	640	1	320	320	1	320	320	1	320	320	1	320	320
9 Patient Pillow Cover Cloth	1	92	92	1	92	92	1	92	92	2	92	184	1	92	92	1	92	92	1	92	92	1	92	92
10 Patient Pillow Cover Rexin	1	79	79	1	79	79	1	79	79	2	79	158	1	79	79	1	79	79	1	79	79	1	79	79
11 Patient dress	1	480	480	1	480	480	1	480	480	2	480	960	1	480	480	1	480	480	1	480	480	1	480	480
12 Medicine Cupboard	2	7000	14000	2	7000	14000	2	7000	14000	2	7000	14000	1	5000	5000	2	8000	16000	2	8000	16000	2	8000	16000
13 Large 4 Drawer Medicine Cupboard	0	0	0	0	0	0	0			1	2000	2000				0	0	0	0	0	0	0		
14 Patient Side Tray	2	50	100	2	50	100	1	50	50	1	50	50	0		0	2	50	100	1	50	50	1	50	50
15 Water Bottles	6	15	90	2	15	30	2	15	30	2	15	30	0		0	6	15	90	2	15	30	2	15	30
16 Water Bottles Complimentary Neck Labels	6	0	0	2		0	1		0	4	0	0	2	0	0	6	0	0	2			1		0
17 Godrej Safe	1	6000	6000	1	6000	6000	1	6000	6000	0	0	0	0	0	0	1	6000	6000	1	6000	6000	1	6000	6000
18 Coaster	2	12	24	2	12	24	2	12	24	4	12	48	2	12	24	2	12	24	2	12	24	2	12	24
19 Glass	2	53	106	2	53	106	2	53	106	4	53	212	2	20	40	2	53	106	2	53	106	2	53	106
20 Plastic Cover for Glass	2	2	4	2	2	4	2	2	4	2	2	4	2	4	8	2	2	4	2	2	4	2	2	4
21 Water Flask	2	690	1380	1	690	690	1	690	690	2	690	1380	1	350	350	2	690	1380	1	690	690	1	690	690
22 Partition Curtains	2	1000	2000	2	1000	2000	2	1000	2000	4	1000	4000	2	1000	2000	2	1000	2000	2	1000	2000	2	1000	2000
23 Heavy Curtains	4	750	3000	1	750	750	1	750	750	1	750	750	0	0	0	4	750	3000	2	750	1500	1	750	1500
24 Shower Curtains	2	575	1150	1	575	575	1	575	575	1	575	575	0	0	0	2	575	1150	1	575	575	1	575	575
25 Curtain Hooks	100	3	300	50	3	150	50	3	150	100	3	300	30	3	90	100	3	300	50	3	150	50	3	150
26 Telephone	1	525	525	1	525	525	1	525	525	2	525	1050	1	525	525	1	525	525	1	525	525	1	525	525
27 Telephone Card	2	10	20	1	10	10	1	10	10	1	10	10	1	10	10	2	10	20	1	10	10	1	10	10
28 Television, Remote and Setup Box	2	23000	46000	1	23000	23000	1	23000	23000	2	23000	46000	1	23000	23000	2	35000	70000	1	35000	35000	1	35000	35000
29 Hangers	8	105	840	4	105	420	4	105	420	0	0	0	0	0	0	8	105	840	4	105	420	4	105	420
30 S.S. Garbage bin large	0	1308	0	0	0	0	0	0	0	0	0	0	1	1308	1308	0	1308	0	0	0	0	0	0	0
31 S.S. Garbage bin small	5	500	2500	2	500	1000	0	0	0	0	0	0	0	0	0	4	500	2000	2	500	1000	2	500	1000
32 Garbage bin bags	5	92	460	2	92	184	2	92	184	3	92	276	2	92	184	4	92	368	2	92	184	2	92	184
33 Plastic Garbage Bins	0	200	0	0	0	0	1	200	200	3	200	600	1	200	200	0	200	0	0	0	0	0	200	0
34 Tissue Box	4	14	56	2	14	28	2	14	28	2	14	28	1	14	14	4	14	56	2	14	28	2	14	28
35 Picture Frames	2	175	350	1	175	175	1	175	175	1	175	175	0	0	0	3	175	525	1	175	175	1	175	175
36 Clock	2	100	200	1	100	100	1	100	100	1	100	100	1	100	100	2	100	200	1	100	100	1	100	100
37 Clock Batteries	4	7	28	2	7	14	2	7	14	2	7	14	2	7	14	4	7	28	2	7	14	2	7	14
38 Attendant Pillow	1	320	320	1	320	320	1	320	320	1	320	320	1	320	320	1	320	320	1	320	320	1	320	320
39 Attendant Pillow Cover Cloth	1	92	92	1	92	92	1	92	92	1	92	92	1	92	92	1	92	92	1	92	92	1	92	92
40 Attendant Pillow Cover Rexin	1	79	79	1	79	79	1	79	79	1	79	79	1	79	79	1	79	79	1	79	79	1	79	79
41 Attendant Bedsheet	1	200	200	1	200	200	1	200	200	1	200	200	1	200	200	1	200	200	1	200	200	1	200	200
42 Attendant Blanket	2	483	966	1	483	483	1	483	483	1	483	483		483	0	2	483	966	1	483	483	1	483	483
43 Bathroom Door Mat	2	20	40	1	20	20	1	20	20	1	20	20	1	20	20	1	20	20	1	20	20	1	20	20
44 Bathroom Linen Door Mat	2	85	170	1	85	85	1	85	85	1	85	85	0		0	1	85	85	1	85	85	1	85	85
45 Hand Towel	2	73	146	1	73	73	1	73	73	2	146	292	0		0	2	73	146	1	73	73	1	73	73
46 Bath Towel	2	189	378	1	189	189	1	189	189	1	189	189	0		0	2	189	378	1	189	189	1	189	189
47 Bathroom Tray	4	50	200	1	50	50	1	50	50	1	50	50	0		0	2	50	100	1	50	50	1	50	50
48 Bathroom Glass	4	15	60	2	15	30	2	15	30	2	15	30	0		0	4	20	80	2	20	40	2	20	40
49 Bathroom Glass Cover	2	2	4	2	4	8	2	4	8	2	4	8	0		0	2	2	4	2	4	8	2	4	8
50 Shampoo	2	4	8	1	9	9	1	9	9	2	9	18	0		0	2	4	8	1	9	9	1	9	9
51 Body Gel	2	9	18	1	9	9	1	9	9	2	9	18	0		0	2	9	18	1	9	9	1	9	9
52 Body Lotion	2	4	8	1	4	4	1	4	4	2	4	8	0		0	2	4	8	1	4	4	1	4	4
53 Talcum	2	4	8	1	4	4	1	4	4	2	4	8	0		0	2	4	8	1	4	4	1	4	4
54 Tooth Brush + tooth paste	2	11	22	1	11	11	1	11	11	2	11	22	0		0	2	11	22	1	11	11	1	11	11
55 Comb	2	4	8	1	4	4	1	4	4	2	4	8	0		0	2	4	8	1	4	4	1	4	4
56 Soap Dish	2	13	26	1	13	13	1	13	13	2	13	26	0		0	2	13	26	1	20	20	1	13	13
57 Toilet Soap	0	0	0	0	0	0	0	0	0	2	3	6	1	3	3	0	0	0	0	0	0	0	0	0
58 Biotique Soap	2	14	28	1	14	14	1	14	14	2	14	28	0		0	2	14	28	1	14	14	1	14	14
59 Liquid Soap Dispenser	2	250	500	1	250	250	1	250	250	1	250	250	0		0	2	275	550	1	300	300	1	250	250
60 Napkin	1	26	26	1	26	26	1	26	26	2	26	52	0		0	1	26	26	1	26	26	1	26	26
61 Towel Tissue Dispenser	0		0	1	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0
62 Bucket	2	250	500	1	250	250	1	250	250	1	250	250	1	250	250	2	250	500	1	250	250	1	250	250
63 Mug	2	22	44	1	22	22	1	22	22	1	22	22	1	22	22	2	22	44	1	22	22	1	22	22
64 Toilet Roll	2	7	14	1	7	7	1	7	7	1	7	7	1	7	7	2	7	14	1	7	7	1	7	7
65 Microwave	1	5920	5920	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0
66 Tea Tray	1	40	40	1	40	40	0	0	0	0	0	0	0		0	1	40	40	1	40	40	0	0	0
67 Tea Kettle	1	529	529	1	529	529	0	0	0	0	0	0	0		0	1	529	529	1	529	529	1	570	570
68 Tea Mug	2	40	80	2	40	80	0	0	0	0	0	0	0		0	2	45	90	2	40	80	0	40	0
69 Saucer Plate	2	15	30	2	15	30	0	0	0	0	0	0	0		0	2	15	30	2	15	30	0	15	0
70 Stirring Spoon	1	5	5	1	5	5	0	0	0	0	0	0	0		0	1	5	5	1	5	5	0	5	0
71 Sachet Tray	1	55	55	1	55	55	0	0	0	0	0	0	0		0	1	55	55	1	55	55	0	55	0
72 Tea Bags	4	2	8	4	2	8	0	0	0	0	0	0	0		0	4	2	8	4	2	8	0	2	0
73 Milk Powder	4	4	16	4	4	16	0	0	0	0	0	0	0		0	4	4	16	4	4	16	0	4	0
74 Coffee Pouch	4	4	16	4	4	16	0	0	0	0	0	0	0		0	4	4	16	4	4	16	0	4	0
75 Sugar Sachets	4	4	16	4	4	16	0	0	0	0	0	0	0		0	4	4	16	4	4	16	0	4	0
76 Mini Bar	1	8000	8000	1	8000	8000	1	8000	8000	0	0	0	0		0	1	8000	8000	1	8000	8000	1	8000	8000
77 Foot Step	1	1370	1370	1	1370	1370	1	0	0	1	1370	1370	0	1370	0	1	1370	1370	1	1370	1370	1	1370	1370
78 Corner Table	1	2000	2000	0	2000	0										2000	1	2000	1	2000	2000	1	2000	2000
79 Coffee Table	1	5500	5500	1	5500	5500										6000	1	6000	0	0	0	0	0	0
80 Dining Table and Chairs	1	35000	35000	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0
81 Sofa Cum bed	0	0	0	1	9000	9000	1	9000	9000	2	9000	18000	0		0	0	0	0	0	0	0	0	9000	0
82 Chairs	0	0	0	1	3400	3400	1	3400	3400	0	0	0	0		0	2	3400	6800	1	3500	3500	1	3400	3400
83 Fixed Sofa	1	15000	15000	1	15000	15000	0	0	0	0	15000	0	0		0	1	16000	16000	1	15000	15000	1	15000	15000
84 Folding Recliner Chair	0	0	0	0	0	0	0	0	0	0	0	0	1	2800	2800	0	0	0	0	0	0	0	0	0
85 Recliner Sofa	1	40000	40000	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0
86 3- Seater Sofa with cushions	1	18000	18000	0	0	0	0	0	0	0	0	0	0		0	1	35000	35000	0	0	0	0	0	0
87 5- seater sofa with Cushions	1	30000	30000	0	0	0	0	0	0	0	0	0	0		0	1	50000	50000	0	0	0	0	0	0
89 Cushion Cover Rexin	4	80	320	3	80	240	0	0	0	0	0	0			0	4	80	320	2	80	160	2	80	160
90 Plastic Wall mounting Hooks	3	5	15	3	5	15	0	5	0	3	5	15	3	5	15	3	5	15	3	5	15	0	5	0
91 Liquid Soap	2	9	18	1	9	9	1	9	9	1	9	9	1	9	9	2	9	18	1	9	9	1	9	9
Total			392622			243152			219382			142939			56361			382460			245439			244292
Variable Costs			810			398			342			515			213			718			398			342
Variable Cost as Fraction of Total Cost			0.21			0.16			0.16			0.36			0.38			0.19			0.16			0.14

Room Type	Cost
Suite	392620
Deluxe	243146
Single	219382
Semi-Private	142939
AC Multi Bed Unit(Per Bed Cost)	56361
Platinum Ward - Suite	382460
Platinum Ward - Deluxe	245439
Platinum Ward - Single	244292

Annexure 2

6TH FLOOR INDENTED OPERATIONAL COST: ROOM CLEANING

	6TH FLOOR TOWER I	5/1/2016	cost	requirement		issued	total cost
1	AIR FRESHNER GOOD SENSE 500 ML(01570200000082437)		109.97	1		1	109.97
2	WHITE DUSTER(01554800000069693)		7.50	10			0.00
3	GARBAGE BAG BLACK 17"X22" SMALL BIODEGRDABLE(01510900000082367)		92.40	5	kg	5	462.00
4	GARBAGE BAG BLACK 31"X 42" BIG BIODEGRDABLE(01510900000082368)		92.40	10	kg	10	924.00
5	LIQUID SOAP REGULAR - KALIKA(01570200000082379)		36.20	5	L	0	0.00
6	WET MOP REFIL(01570200000083822)		62.49	1		0	0.00
7	TASKI R-9		192.33	1.5		1.5	288.50
8	TASKI R6 5LTR JD(01510000000070207)		52.59	5		5	262.97
		4/23/2016					
1	WHITE DUSTER(01554800000069693)		7.50	10		10	75.00
2	WET MOP REFIL(01570200000083822)		62.49	10		10	624.90
3	MOP ROD		51.13	2		2	102.26
4	SCOTCH-BRITE GENERAL PURPOSE"3M"(01507700000023818)		19.13	1		1	19.13
5	GLOVES SURGICAL BLUE		3.49	50	PAIR	50	174.50
6	TASKI R2 PLUS [1.5LIT 1-BOX-3LTR]CODE:5721093(015100000000218630)		177.44	1.5		1.5	266.15
		4/17/2016					
1	AIR FRESHNER GOOD SENSE 500 ML(01570200000082437)		109.97	2		1	109.97
2	GARBAGE BAG BLACK 17"X22" SMALL BIODEGRDABLE(01510900000082367)		92.40	5	kg	5	462.00
3	GARBAGE BAG BLACK 31"X 42" BIG BIODEGRDABLE(01510900000082368)		92.40	10	kg	10	924.00
4	GLOVES SURGICAL BLUE		3.49	100	PAIR	50	174.50
5	WET MOP REFIL(01570200000083822)		62.49	10		10	624.90
		4/11/2016					
1	AIR FRESHNER GOOD SENSE 500 ML(01570200000082437)		109.97	1		1	109.97
2	BRUSH FEATHER(01570200000082447)		31.50	1		1	31.50
3	WHITE DUSTER(01554800000069693)		7.50	10		10	75.00
4	GARBAGE BAG BLACK 17"X22" SMALL BIODEGRDABLE(01510900000082367)		92.40	5	kg	5	462.00
5	GARBAGE BAG BLACK 31"X 42" BIG BIODEGRDABLE(01510900000082368)		92.40	10	kg	10	924.00
6	GLOVES SURGICAL BLUE		3.49	50	PAIR	50	174.50
7	HAND MOP(01570200000082377)		10.00	6		6	60.00
8	WET MOP CLAMP(01507700000051142)		56.25	2.00		2	112.50
9	WET MOP REFIL(01570200000083822)		61.88	10		10	618.75
10	MOP ROD		51.13	1		1	51.13
11	NYLON BRUSH / SCRUBBER(01510000000010762)		1.91	2		2	3.83
12	SCOTCH-BRITE GENERAL PURPOSE"3M"(01507700000023818)		19.13	1		1	19.13
13	TASKI R-9		192.33	3	LTR	3	577.00
14	TASKI R6 5LTR JD(01510000000070207)		52.59	5		5	262.97

			4/4/2016					
1	AIR FRESHNER GOOD SENSE 500 ML(01570200000082437)			109.97	2		2	219.94
2	BRUSH FEATHER(01570200000082447)			31.50	1		1	31.50
3	WHITE DUSTER(01554800000069693)			7.50	10		10	75.00
4	GLOVES SURGICAL BLUE			3.49	50	PAIR	50	174.50
5	LIQUID SOAP REGULAR - KALIKA(01570200000082379)			36.20	10	L	10	361.98
6	WET MOP REFIL(01570200000083822)			62.49	10		10	624.90
7	NYLON BRUSH / SCRUBBER(01510000000010762)			1.91	2		2	3.83
8	SCOTCH-BRITE GENERAL PURPOSE"3M"(01507700000023818)			19.13	1		1	19.13
	COST FOR 5 WEEKS							10597.78
	COST FOR 1 WEEK							2119.56
	6TH FLOOR TOWER II							
			5/1/2016					
1	AIR FRESHNER GOOD SENSE 500 ML(01570200000082437)			109.97	2		1	109.97
2	WHITE DUSTER(01554800000069693)			7.50	12		12	90.00
3	GARBAGE BAG BLACK 17"X22" SMALL BIODEGRDABLE(01510900000082367)			92.40	10	kg	10	924.00
4	GARBAGE BAG BLACK 31"X 42" BIG BIODEGRDABLE(01510900000082368)			92.40	10	kg	10	924.00
5	GLOVES SURGICAL BLUE			3.49	100	PAIR	100	349.00
6	HAND MOP(01570200000082377)			10.00	12		12	120.00
7	LIQUID SOAP REGULAR - KALIKA(01570200000082379)			36.20	20	L	20	723.97
8	WET MOP REFIL(01570200000083822)			62.49	20		15	937.35
9	SCOTCH-BRITE GENERAL PURPOSE"3M"(01507700000023818)			19.13	2		2	38.25
10	TASKI R6 5LTR JD(01510000000070207)			52.59	5		5	262.97
11	TASKI R2 PLUS [1.5LIT 1-BOX-3LTR]CODE:5721093(015100000000218630)			177.44	3		3	532.32
			4/23/2016					
1	AIR FRESHNER GOOD SENSE 500 ML(01570200000082437)			109.97	2		2	219.94
2	WHITE DUSTER(01554800000069693)			7.50	10		10	75.00
3	GLOVES SURGICAL BLUE			3.49	50		50	174.50
4	WET MOP REFIL(01570200000083822)			62.49	10		10	624.90
5	MOP ROD			51.13	2		2	102.26
6	SCOTCH-BRITE GENERAL PURPOSE"3M"(01507700000023818)			19.13	1		1	19.13
7	TASKI R2 PLUS [1.5LIT 1-BOX-3LTR]CODE:5721093(015100000000218630)			177.44	3		3	532.32
			4/17/2016					
1	AIR FRESHNER GOOD SENSE 500 ML(01570200000082437)			109.97	2		1	109.97
2	WHITE DUSTER(01554800000069693)			7.50	12		12	90.00
3	GARBAGE BAG BLACK 17"X22" SMALL BIODEGRDABLE(01510900000082367)			92.40	10	kg	10	924.00
4	GARBAGE BAG BLACK 31"X 42" BIG BIODEGRDABLE(01510900000082368)			92.40	10	kg	10	924.00
5	HAND MOP(01570200000082377)			10.00	12		8	80.00
6	LIQUID SOAP REGULAR - KALIKA(01570200000082379)			36.20	20	L	10	361.98

7	WET MOP REFIL(01570200000083822)		62.49	20		20	1249.80
8	TASKI R2 PLUS [1.5LIT 1-BOX-3LTR]CODE:5721093(015100000000218630)		177.44	3		3	532.32
9	TASKI R6 5LTR JD(01510000000070207)		52.59	5		5	262.97
		4/10/2016					
1	AIR FRESHNER GOOD SENSE 500 ML(01570200000082437)		109.97	2		1	109.97
2	BRUSH FEATHER(01570200000082447)		31.50	2		2	63.00
3	WHITE DUSTER(01554800000069693)		7.50	24		12	90.00
4	GARBAGE BAG BLACK 17"X22" SMALL BIODEGRDABLE(01510900000082367)		92.40	10	kg	10	924.00
5	GARBAGE BAG BLACK 31"X 42" BIG BIODEGRDABLE(01510900000082368)		92.40	10	kg	10	924.00
6	GLOVES SURGICAL BLUE		3.49	150	PAIRS	150	523.50
7	HAND MOP(01570200000082377)		10.00	10		10	100.00
8	GLOVES HEAVY DUTY KIWI NO.10 --(01570200000084188)		50.63	5.00		2	101.25
9	WET MOP CLAMP(01507700000051142)		56.81	4.00		4	227.24
10	WET MOP REFIL(01570200000083822)		62.49	20		15	937.35
11	TASKI R2 PLUS [1.5LIT 1-BOX-3LTR]CODE:5721093(015100000000218630)		177.44	3		3	532.32
12	TASKI R6 5LTR JD(01510000000070207)		52.59	5		5	262.97
13	BRUSH W C(01570200000083824)		33.75	2.00		2	67.50
		03/04/2016					
1	AIR FRESHNER GOOD SENSE 500 ML(01570200000082437)		109.97	2		2	219.94
2	WHITE DUSTER(01554800000069693)		7.50	12		12	90.00
3	GARBAGE BAG BLACK 31"X 42" BIG BIODEGRDABLE(01510900000082368)		92.40	10	kg	10	924.00
4	GLOVES SURGICAL BLUE		3.49	100	PAIRS	100	349.00
5	HAND MOP(01570200000082377)		10.00	12		12	120.00
6	GLOVES HEAVY DUTY KIWI NO.10 --(01570200000084188)		50.63	2.00		2	101.25
7	WET MOP CLAMP(01507700000051142)		56.81	2.00		2	113.62
8	WET MOP REFIL(01570200000083822)		62.49	20		15	937.35
9	MOP ROD		51.13	3		2	102.26
10	SCOTCH-BRITE GENERAL PURPOSE"3M"(01507700000023818)		19.13	4		4	76.50
11	TASKI R2 PLUS [1.5LIT 1-BOX-3LTR]CODE:5721093(015100000000218630)		177.44	3		3	532.32
12	TASKI R6 5LTR JD(01510000000070207)		52.59	5		5	262.97
	COST FOR 5 WEEKS						19987.21
	COST FOR 1 WEEK						3997.44
	WEEKLY COST FOR 6TH FLOOR						6117.00

S. no.	Disinfecting and Cleaning Material	1-OCT-2015 to 31-OCT-2015				1-Nov-2015 to 30-Nov-2015				1-Dec-2015 to 31-Dec-2015				1-Jan-2016 to 31- Jan-2016				1-Feb-2016 to 28-Feb-2016				1-Mar-2016 to 31-March-2016				QUANTITY USED IN LAST 6 MONTHS			
		Quantity		Price per Un	Total Price	Quantity		Price per U	Total Price	Quantity		Price per U	Total Price	Quantity		Price per U	Total Price	Quantity		Price per U	Total Price	Quantity		Price per U	Total Price			Price per U	Total Cost
1	VIREX II 256 CLEANER CUM DISINFECTANT(01507700000064469)	90.00	LTR	721.13	64901.25	78.00	LTR	721.13	56247.75	52.00	LTR	721.13	37498.50	175.00	LTR	673.05	117783.75	NA	NA	NA	NA	230.00	LTR	673.05	154801.50	2845.00	LTR	673.05	1914827
2	TASKI R6 5LTR JD(01510000000070207)	360.00	LTR	52.59	18933.77	450.00	LTR	52.59	23667.21	330.00	LTR	52.59	17355.95	490.00	LTR	52.59	25770.95	240.00	LTR	52.59	12622.51	350.00	LTR	52.59	18407.83	2220.00	LTR	52.59	116749.8
3	CREW EMEREL RTU 32 OZ - JD(01570200000082353)	12.00	BOTTLE	287.94	3455.24	31.00	BOTTLE	287.94	8926.03	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5.00	BOTTLE	287.94	1439.68	48.00	BOTTLE	287.94	13821.12
4	DEEP GLOSS- ST. STEEL POLISH (170Z) - JD(01570200000082354)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	24.00	BOTTLE	467.49	11219.79	NA	NA	NA	NA	11.00	BOTTLE	467.49	5142.41	35.00	BOTTLE	467.49	16362.15
5	SUMA SCALE D5.2 JOHNSON DIVERSEY(01507700000023829)	NA	NA	NA	NA	10.00	LTR	106.25	1062.49	NA	NA	NA	NA	NA	NA	NA	NA	10.00	LTR	106.25	1062.49	NA	NA	NA	NA	20.00	LTR	106.25	2125
6	SUMA SOL 25 GM - JD(01570200000083429)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10.00	NOS	11.05	110.54	NA	NA	NA	NA	10	NOS	11.05	110.5
7	SODIUM HYPOCHLORITE 1% 5 LTR CAN	NA	NA	NA	NA	NA	NA	NA	NA	4.00	LTR	12.60	50.40	NA	NA	NA	NA	50.00	NOS	12.60	630.00	NA	NA	NA	NA	54.00	NOS	12.6	680.4
8	TASKI R2 PLUS [1.5LIT 1-BOX-3LTR]CODE:5721093(01510000000218630)	340.50	NOS	532.31	181250.23	420.00	NOS	532.31	223568.56	346.50	NOS	532.31	184444.08	364.00	NOS	532.31	193759.43	215.00	NOS	532.31	114445.82	451.50	NOS	532.31	240336.20	2137.50	NOS	532.31	1137813
9	TASKI SPIRAL FLOOR CLEANER - JD(01510000000010360)	50.00	LTR	40.80	2040.16	60.00	LTR	40.80	2448.20	35.00	LTR	40.80	1428.11	130.00	LTR	40.80	5304.42	50.00	LTR	40.80	2040.16	55.00	LTR	40.8	2244.18	330.00	LTR	40.8	13464
10	LIQUID SOAP REGULAR - KALIKA(01570200000082379)	1100.00	LTR	36.20	39818.24	1160.00	LTR	36.73	42607.90	1160.00	LTR	36.76	42641.60	1240.00	LTR	36.20	44886.02	860.00	LTR	36.20	31130.62	1440.00	LTR	36.20	52125.70	6960.00	LTR	36.2	251952
11	FRAGRANCED URINAL SCREENS (GRUBE'S)(01507700000246681)	NA	NA	NA	NA	200.00	NOS	100.00	20000.00	164.00	NOS	100.00	16400.00	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	364.00	NOS	100	36400
12	FRAGRANCED URINAL SCREENS (URSC)(01570200000140762)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	244.00	NOS	181.01	44165.95	32.00	NOS	181.01	5792.26	200.00	NOS	181.01	36201.60	476.00	NOS	181.01	86160.76
13	AIR FRESHNER GOOD SENSE 500 ML(01570200000082437)	128.00	NOS	109.97	14076.01	169.00	NOS	109.97	18584.73	48.00	NOS	109.97	5278.50	164.00	NOS	109.97	18034.89	88.00	NOS	109.97	9677.26	177.00	NOS	109.97	19464.47	774.00	NOS	109.97	85116.78
					324474.89				397112.87				305097.15				460925.19				177511.6595				530163.56				3675582