

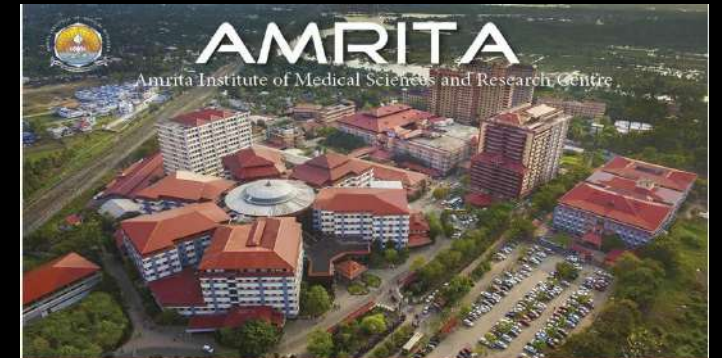
Accredonomics



Dr Sanjeev Singh
Medical Director
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Agenda

- Accreditation : level of performance
- Primary goal of the accreditation
- Importance to access, affordability, efficiency, quality and effectiveness of healthcare
- Case Studies of Cost Benefit, Effective and Utility



Accreditation, Quality, and Making Hospital Care Better

Ashish K. Jha, MD, MPH

Ensuring quality is a critical component of high-performing health systems. Having access to health care is not enough: patients who enter the health care system—whether a clinic, a hospital, or another venue—need to be confident that they will receive care that is safe, effective, and consistent with the latest clinical evidence. This is particularly important for hospitals, where patients are acutely and often severely ill, but all the data suggest that the quality of care is far from optimal. There are large variations in complications and mortality rates across hospitals.

The concerns about level and variations in hospital quality are not new. We have known for decades that hospitals differ in their ability to provide high-quality care for patients—and our national strategy for ensuring and improving care has been accreditation. The notion is simple: using an external, independent body that applies objective criteria to ensure that hospitals are implementing evidence-based practices to maximize patient outcomes. Although the logic may be sound, it has not been clear whether this approach works.

Despite a national strategy in which our government, through the Centers for Medicare & Medicaid Services (CMS) essentially pushes most hospitals to get accredited, patient outcomes often lag. A 2017 news story in the *Wall Street Journal* reported that hospitals accredited with

newspaper reported that 350 hospitals cited in inspection reports in 2014 as being in violation of Medicare requirements had accreditation from The Joint Commission at the time, and that more than a third with accreditation had additional violations later in 2014, 2015, and 2016. There appears to be a disconnect between what accreditation is meant to do vs what it might be doing.



Does Accreditation Work?

Does accreditation ensure high quality care? Policy makers certainly think so. CMS requires that hospitals either be accredited or pass state inspection to receive Medicare reimbursement. If pursuing accreditation, hospitals may choose to work with one of several accrediting bodies, to whom they

evaluation and certification from a state survey agency on behalf of CMS. Although this option may be appealing to hospitals that want to avoid the high costs and administrative burdens associated with accreditation, the vast majority of acute care hospitals opt to become accredited.

The major accreditor in the United States is The Joint Commission, which is used by 4477 hospitals, or about 88% of accredited US hospitals. It is one of the more expensive accrediting organizations, with annual fees that can run into the tens of thousands of dollars, with additional costs of surveys. Yet the direct fees are only a small portion of the investment required; staff time, consultation services, and other aspects of preparing for the surveys can rack up large indirect costs. One case study found that direct survey fees were only 7% of the total costs associated with the accreditation of a hospital. And preparing for an accreditation survey feels like a chore, requiring focus on minute administrative details where the link to patient outcomes is not immediately clear.

Examining the Link: Accreditation and Quality

Given the high costs and extra workload associated with accreditation, systematic evaluations of the value of accreditation would be extremely helpful. And there is some evidence available. Much of the data suggest that hospitals that are accredited are

RESEARCH ARTICLE

Open Access



Analysis of costs and benefits of a re-accreditation of a Swiss acute care hospital

Nicola Thurneysen^{1,2*}, Tima Plank¹ and Stefan Boes²

Abstract

Background: Accreditation of hospitals and other institutions is a widely used instrument for the quality assurance in health care. However, relevant literature regarding the economic evaluation of hospital accreditation is still missing. To date no formal Cost-Benefit Analysis (CBA) or Cost-Utility Analysis (CUA) has been carried out.

Methods: This study uses an existing framework specifically developed for the economic evaluation of hospital accreditation. Based on this framework, we identify and quantify the costs and selected benefits of the re-accreditation of a Swiss acute care hospital. Costs are identified and quantified by conducting key informant and expert interviews. Benefits are identified by hospital experts and rated using a newly developed validation tool.

Results: Costs of the re-accreditation amount to about CHF 870'000 (internal and external costs). Benefits in quality management (QM) and in the critical incident reporting system (CIRS) are quantified and rated by the hospital experts in the following order: (1) development or promotion of a quality or safety culture, (2) implementation of a hospital-wide complaint management, (3) fulfillment of the hospital vision, (4) improved image upon stakeholders (patients, suppliers etc.), (5) improved image in policy, (6) quality dashboard, (7) preparation of centralized quality documents, and (8) avoidance of liability cases.

Conclusion: This study provides detailed information about costs and selected benefits associated with the re-accreditation of a Swiss acute care hospital. As opposed to the costs, benefits could not be monetized but were quantified using an expert rating to illustrate the impacts of the re-accreditation. Overall, our study confirms the difficulties in the economic evaluation of hospital accreditation, but it makes a step towards a formal CUA.

Keywords: Hospital accreditation, Economic evaluation, Costs, Benefits, Validation tool

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**WHAT WOULD IT TAKE FOR ACCREDITATION
TO BE COST-EFFECTIVE? A THRESHOLD
ANALYSIS CASE STUDY**

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Conclusion: The lack of clear outcomes and causal relationship between accreditation and patient safety and quality outcomes creates a challenge in determining whether accreditation is cost effective. However only a small reduction in bed days would be required for a positive return on the investment made in an accreditation program. The approach illustrated in this study demonstrates the complex nature of the analysis required to assess accreditation costs and benefits.

A Cost/Benefit Analysis of TJC Accreditation

As more and more healthcare providers hop on board with accreditation, you might be wondering which one is right for your organization.

Today, we'll take a look at one accreditation in specific: The Joint Commission (TJC). We'll look at the costs and benefits so you know what to expect before jumping in with both feet.



Overview of TJC

An independent, not-for-profit organization, The Joint Commission accredits and certifies more than 20,000 health care organizations and programs in the United States. Joint Commission accreditation and certification is recognized nationwide as a symbol of quality that reflects an organization's commitment to meeting certain performance standards.

Costs

TJC accreditation typically makes up 10-15% of the annual fees a hospital pays for a financial audit, and the surveying process can cost somewhere in the ballpark of \$10,000-\$45,000. These costs are offset, however, by the benefits that are associated with accreditation (and we'll get to that in a minute.)

According to the TJC website, costs are calculated as follows:

Fees are divided across a three year period using an annual fee. The survey fee in the first year makes up about 60% of the total cost, and you'll pay that in the first year with the additional 40% paid over the following two years. There are no extra charges for surveyor travel, etc. Actual cost will depend on several factors (such as the number of locations you have and the volume of individuals you serve.) Estimates are available by calling (630) 792-5115.

Quality Improvement and Accreditation: What Might It Look Like?

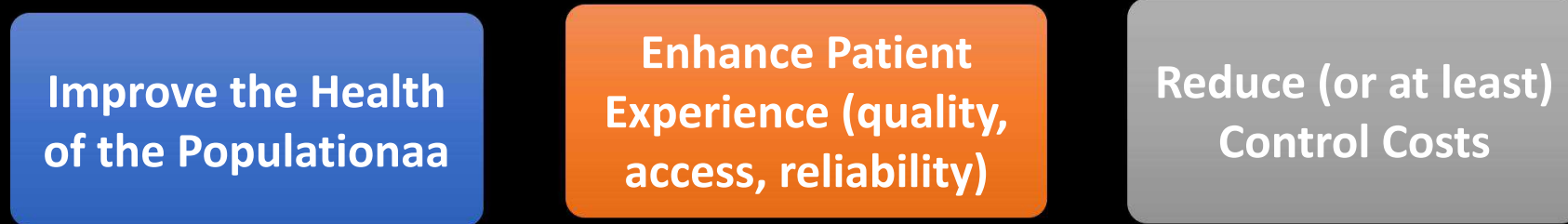
Kaye Bender and Paul K. Halverson

“Achievement of accreditation will provide a mechanism for recognizing high-performing health departments that, despite the demands of their normal daily work, take a step back and seek ways to incorporate the concepts of QI to perform more efficiently and effectively”

IHI: Triple Aim

CMS: “Better Health, Better Care, Lower Cost”

a



NABH: Guiding Standards

NABH Accreditation Standards for Hospitals



Achievement	d. The organisation adapts evidence-based clinical practice guidelines and/or clinical protocols to guide uniform patient care.
Excellence	e. Clinical care pathways are developed, consistently followed across all settings of care, and reviewed periodically.
Commitment	f. Care delivery is uniform for a given clinical condition when similar care is provided in more than one setting. *
Excellence	g. Multi-disciplinary and multi-speciality care, where applicable, is based on best clinical practices/clinical practice guidelines manner across the organisation.

Standard

COP.6.

Nursing care is provided to patients in the organisation in consonance with clinical protocols.

Objective Elements

Commitment	a. Nursing care is provided to patients in accordance with written guidance. *
Achievement	b. The organisation develops and implements nursing clinical practice guidelines reflecting current standards of practice. *
Commitment	c. Assignment of patient care is done as per current good clinical/ nursing practice guidelines.

Amrita Experience: Case Studies

Medication Error

VTE Prophylaxis

Healthcare Associated Infections

Antimicrobial Stewardship

Application of new technology

MOM4; MOM7; MOM8 – Medication Management

Types	Frequency		Percentage	
	Retrospective	Prospective	Retrospective	Prospective
Medication Errors				
Near Miss	77	21	40.5	32.3
Administration Error	4	7	2.1	10.8
Transcription Error	16	0	8.4	0
Prescription Error	35	14	18.4	21.5
Dilution Error	2	1	1.1	1.5
Dispensing Error	18	1	9.5	1.5
Dosage Error	29	15	15.3	23.1
Duration Error	18	3	9.5	4.6
Labelling Error	1	2	.5	3.1

CAHOCON @ Kochi

Diagnosis			N	Mean	Std. Deviation	P-Value
Ca.Stomach	LOS	Pre Pharmacist Involvement	13	11.23	4.22	0.115
		Post Pharmacist Involvement	9	8.33	3.77	
	Direct	Pre Pharmacist Involvement	13	419604.84	267461.67	0.042
		Post Pharmacist Involvement	9	233676.56	90550.44	
	Indirect	Pre Pharmacist Involvement	13	4393.84	2472.56	0.670
		Post Pharmacist Involvement	9	4908.88	3106.39	

Economics of Medication Error

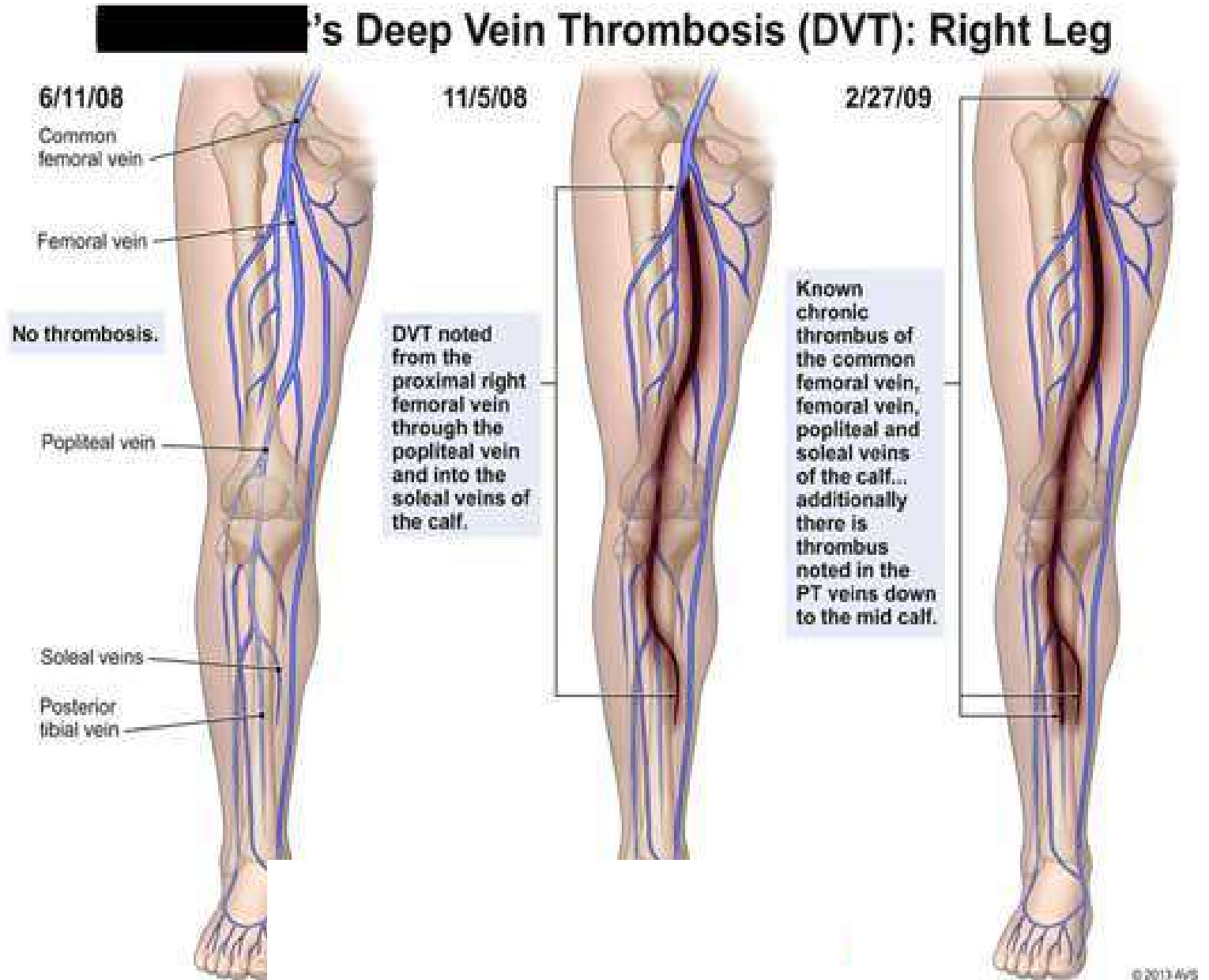
		Base case (Range)
1.	Cost avoidance	246682 (562420-315738)
2.	Cost of Service -Pharmacist Wages	40000
3.	Net Cost Benefit	206682 (246682-40000)
4.	Cost Benefit Ratio = $\frac{\text{Net Cost Benefit}}{\text{Cost of Service}}$	5.18

Post pharmacist involvement

- No. of Medication errors : 64
- Net cost Benefit : 206682
- Cost Avoidance : 246682
- Types of Medication Error : 9
- Cost Benefit per Error :
 $206682/9 = \text{Rs. } 22,964$

COP 16e;PSQ
6a; ROM 5

Venous Thrombo- embolic (VTE) Prophylaxis



VTE Prophylaxis: Cost Benefit Analysis

COST	AMOUNT	NO.OF TIMES	TOTAL AMOUNT	PERCENTAGE
ECG	100	3	300	1%
CTANGIO	13550	1	13550	30%
2D ECHO	900	1	900	2%
TROP I	610	3	1830	4%
D-DIMER	710	1	710	2%
DT-INR	180	15	2700	6%
OXPRIN(CLEXANE)60mg	615.58	24	14773.92	33%
STREPTOKINASE	2355	1	2355	5%
T.WARFARIN	531.075	6MONTHS	531.075	1%
ICU CHARGE	950	5DAYS	4750	11%
WARD CHARGE	465	5DAYS	2325	5%
TOTALCOST			44724.995	100%

Indirect Cost

COST	AMOUNT	PERCENTAGE
JOB DAYS LOST	4000	58%
TRAVELLING COST	700	10%
ACCOMADATION COST	1750	25%
FOODCOST	500	7%
TOTAL COST	6950	100%

Direct Cost

Cost Benefit for Preventing VTE

Total cost of prophylaxis = 1914

Total cost if prophylaxis is not given = direct cost + indirect cost
= 44724.995 + 6950 = Rs. 51674.995

Cost benefit = 51674.995 - 1914 = **Rs. 49,760**

Normal persons utility value = 0.82

PE persons utility value = 0.63

Normal person's QALY = $0.82 * 20 = 16.4$

PE persons QALY = $0.63 * 20$
= 12.6

QALY gained = $16.4 - 12.6 = 3.84$

If prophylaxis is not given to 180 patients the probability of developing PE is 3.
If prophylaxis is given to 180 patients, the probability of developing PE is 1.*

Total PE gained = $3 - 1 = 2$

Cost of prophylaxis = Rs. 1914

Cost of prophylaxis given to 180 patients = $180 \times 1914 = \text{INR } 3,44,520$

QALY gained while giving prophylaxis to 180 patients = $3.84 \times 2 = 7.68$

Amount to be spent in 1QALY = $344520 / 7.68 = \text{INR } 44,859$

* [Zhongguo Wei Zhong Bing Ji Jiu Yi Xue](#). 2011 Nov;23(11):661-4. [Enoxaparin for the prevention of post surgical pulmonary embolism].

** [Xia XY¹, Tan YL, Sun YW, Yan GD, Rong YX, Ren QH, Liu JY, Xu XZ, Shan GP, Jin L.](#)

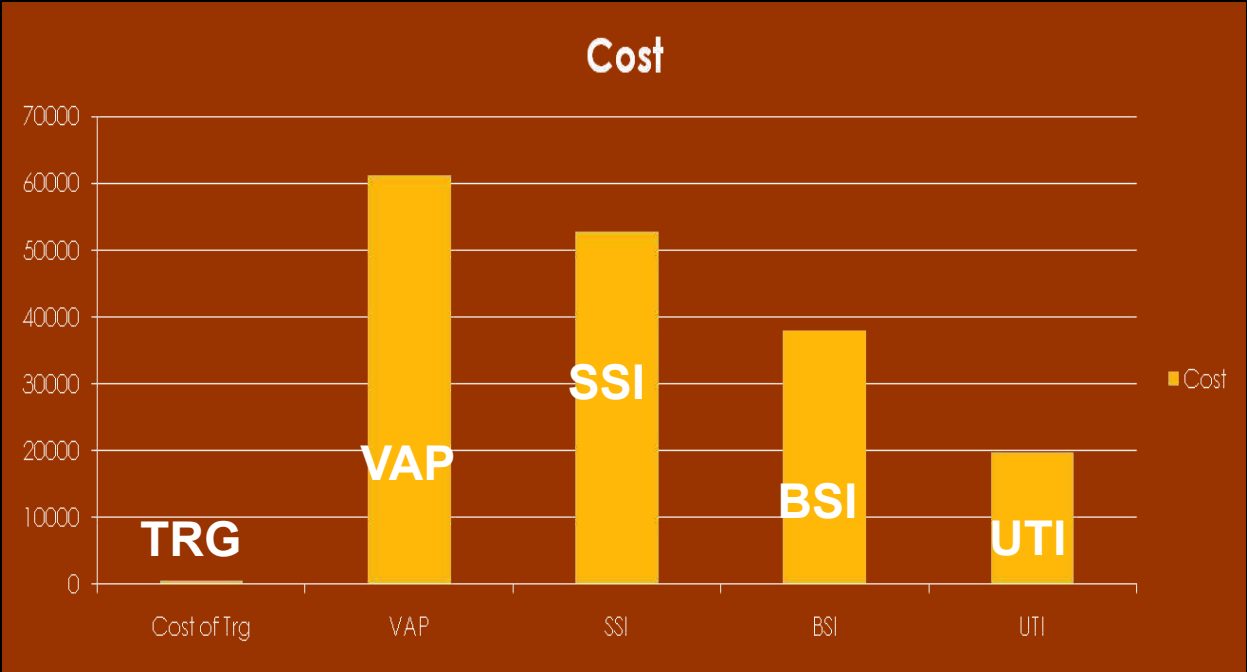
Healthcare Associated Infections

Cost of Training

Manpower		
Staff	Salary	Pro Rata Cost
Inf Control Nurse		44
Inf Control Technician		38
Microbiologist		111
Doctor		200
		393
Facilities		
Room Rent	1500 Sft @ Rs. 700 Rs. 3388 per day Rs. 1500 for half a day	1200
Electricity		
Fan	$0.18 \times 4 = 0.72$	3.6
Light	$0.12 \times 4 = 0.48$	2.4
LCD & PC		10
		16
Refreshment		
Tea	50*5	250
Others		
Stationary		10
TOTAL		1869
Total Expenditure on 30 trgs for 4 mnth	1869 X 30	56070
Surveillance Cost	Rs. 5000 avg mthly salary; Rs. 200 per day; Rs. 25 per hr; Rs. 6500 per yr; For 4 staff	26000
Recruitment Cost		

HIC 5:Cost Effectiveness of Infection Prevention

Standard	
HIC.5.	The organisation takes actions to prevent healthcare associated infections (HAI) in patients.
Objective Elements	
Commitment	a. The organisation takes action to prevent catheter-associated urinary tract Infections.
Commitment	b. The organisation takes action to prevent infection-related ventilator associated complication/ventilator-associated pneumonia.
Commitment	c. The organisation takes action to prevent catheter linked blood stream infections.
Commitment	d. The organisation takes action to prevent surgical site infections.



Cost Comparision: Infection Expenditure	
Event	Rs
Cost of Training	669
SSI	52808
BSI	37942
UTI	19686
VAP	61140

CAHOCCN @ Kochi

Cost Parameters

No.	Cost Variables	Costing Parameters
1.	Direct Cost	a) Surgical procedure cost b) Operating room cost c) Anesthesia cost d) ICU and Ward charges e) Medicines f) Lab Investigations g) Radiology Investigation h) Blood Transfusion i) Cross Consultations (if any) j) Any other procedure charges (like dialysis)
2.	Indirect Cost	a) Loss of job days of patient b) Loss of job days of attendants c) Boarding & Lodging cost of attendants d) Miscellaneous charges (like transportation)
3.	Cost of additional LOS	a) Cost involved for extra stay of HAI patients
4.	Opportunity Cost	a) Cost of lost opportunity of admitting additional patients because of occupied beds by HAI patients b) Cost of lost opportunity of doing more surgical procedures because of beds been occupied by HAI patients

Estimated Cost Avoidance - SSI

Before Intervention

- No of Surg: 1434
- No of pts infected: 86
- SSI: 6.72
- ALOS: 22 days
- Avg cost: Rs. 52802

After Intervention

- No of Surg: 1404
- No of pts infected: 46
- SSI: 3.27
- ALOS: 10.7days
- Avg cost: 52802
- No of SSI avoided: 40
- **Cost saved: INR 21,12,080**

Comprehensive Costing

Overview of Cost of avoidance	Amount	No of Infections	Total
Cost of Avoidance of SSI	52,802	46	24,28,892
Cost of Avoidance of BSI	37942	18	6,82,956
Cost of Avoidance of VAP	63,645	11	7,00,095
Cost of Avoidance of UTI	17,686	12	2,12,232
Total			40,24,175
Indirect Cost			
Indirect Cost of SSI	21,270	46	9,78,420
Indirect Cost of BSI	19,450	18	3,50,100
Indirect Cost of VAP	23,150	11	2,54,650
Indirect Cost of UTI	17,740	12	2,12,880
Total		87	17,96,050
Additional Cost because of Extra LOS - SSI	46 X 12.2 days	561	
Additional Cost because of Extra LOS - BSI	18 X 9.9 days	178.2	
Additional Cost because of Extra LOS - VAP	11 X 16.5 days	181.5	
Additional Cost because of Extra LOS - UTI	12 X 3.4 days	40.8	
		961.50 days	
	Rs.6000 per bed per day revenue		
			57,69,000
Opportunity Cost	961.5 days / 12 days (ALOS) = 80.12		
80 extra patients could have been admitted	80.12 X 1,05,000 (Package Cost)		
			84,12,600

Cost of Avoidance
Indirect Cost
Cost of Additional Stay
Opportunity Cost

INR: 84,12,600

Global Savings in IPC by practicing HH

Total Cost of avoidance	40,24,175
Total Indirect Cost	17,96,050
Additional Cost on LOS saving	57,69,000
Opportunity Cost	84,12,600
Total Savings	2,00,01,825

**With 1 \$ of investment;
Return of Investment is 236 \$**

Cost of Bad Will & Litigation

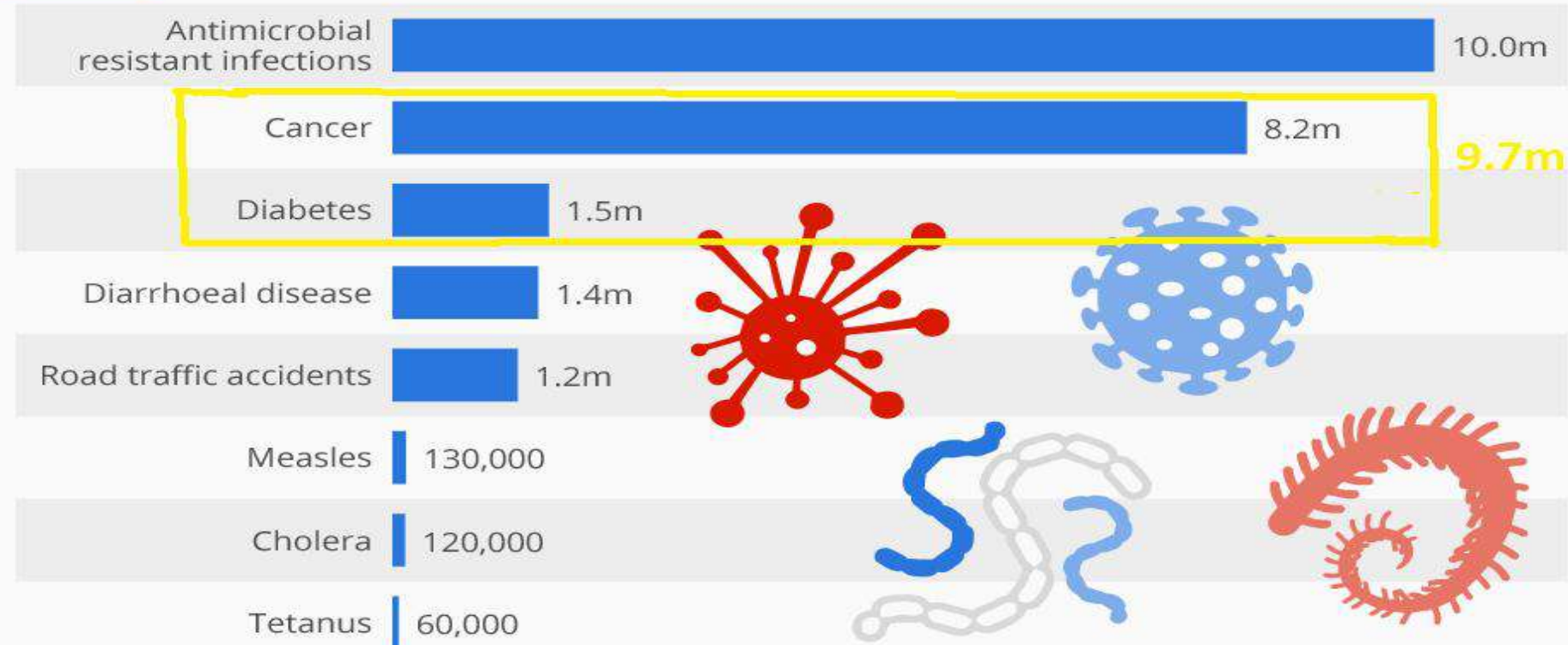
Variables	Statement	@	Total Amount
Cost of Bad Will	Positive Impact @ 1:9	50,000/-	20,50,000
	Negative Impact @ 1:41		
Cost of Litigation	1 case / yr	50,000/-	1,00,000
Total (Image cost)			21,50,000

Cost of Avoidance of HAI in a year in 1 department	2,00,01,825
Cost of Image on settlement if HAI occurs	21,50,000
Total Cost Saving to work on IPC	2,21,51,825/-

Antimicrobial Resistance: Global threat

Deaths From Drug-Resistant Infections Set To Skyrocket

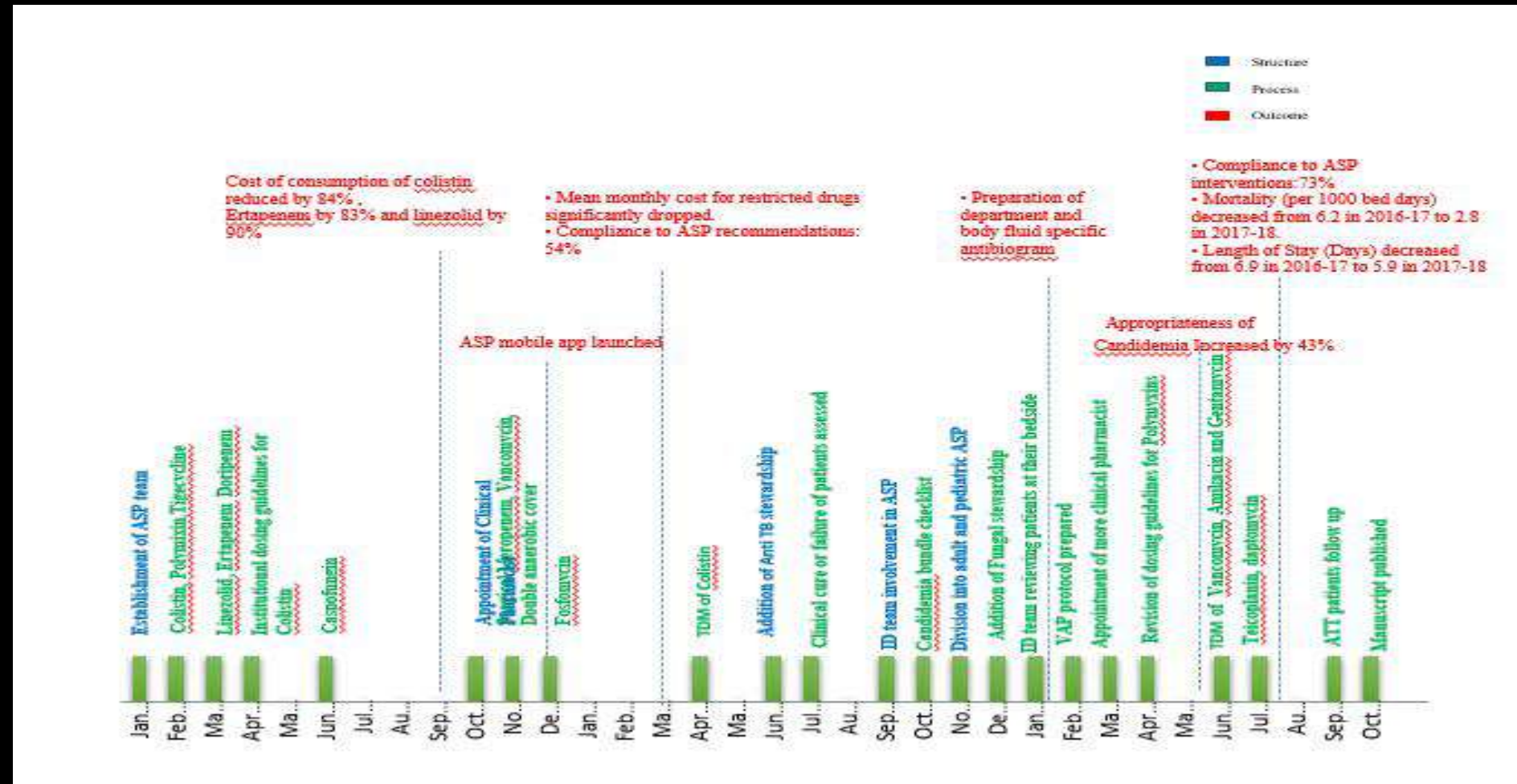
Deaths from antimicrobial resistant infections and other causes in 2050



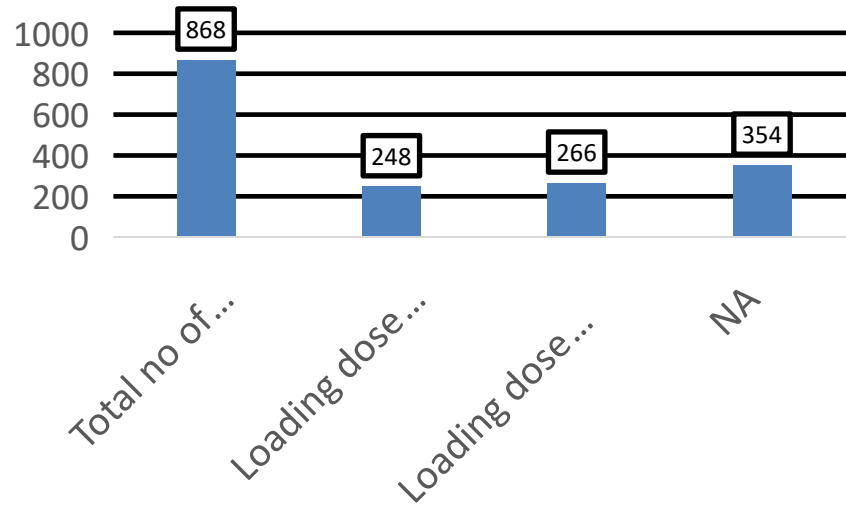
Call for Action 2018: Accra, Ghana

Donabedian Model of Antibiotic Stewardship

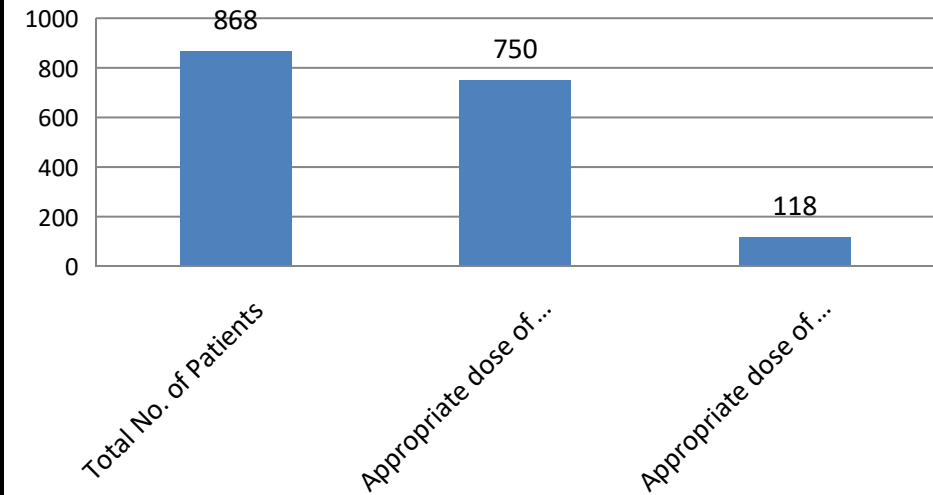
HIC 4e,f & g: Rational policy and Stewardship



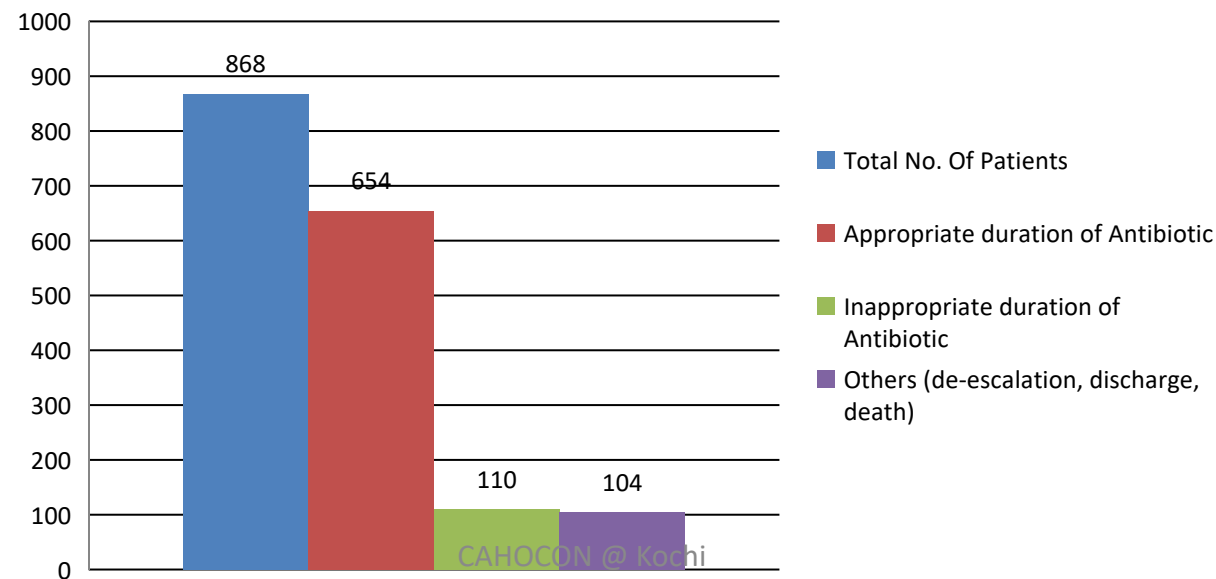
Practice of Loading Doses



Antibiotic Dosing

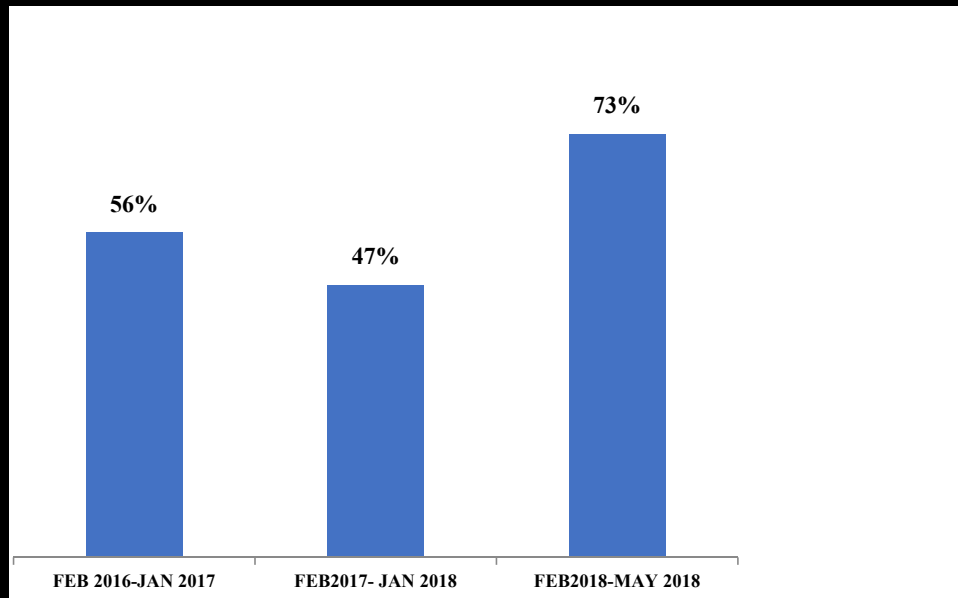


Duration of Antibiotics

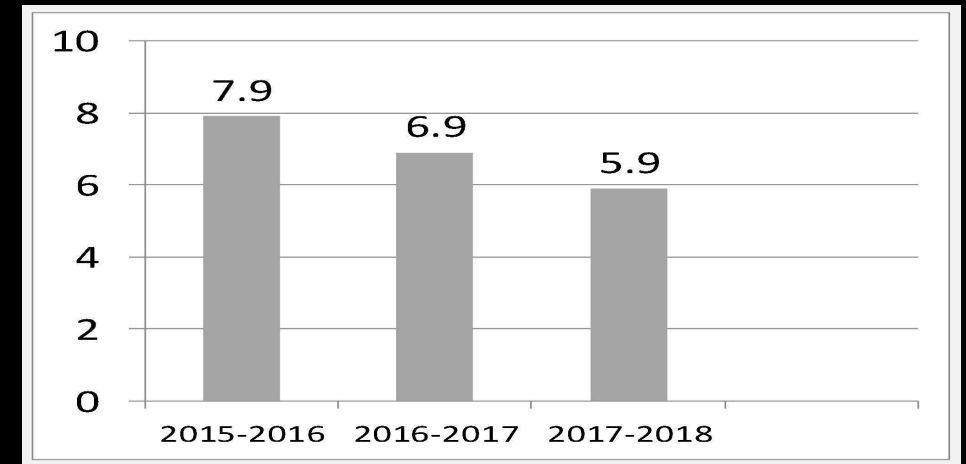


Tangible Outcomes of Antibiotic Stewardship

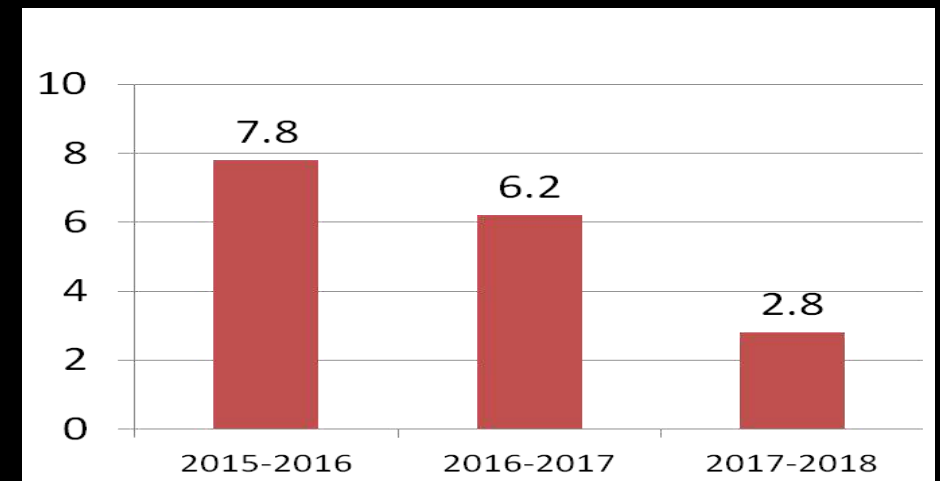
Total Appropriateness of Antimicrobial Prescribing



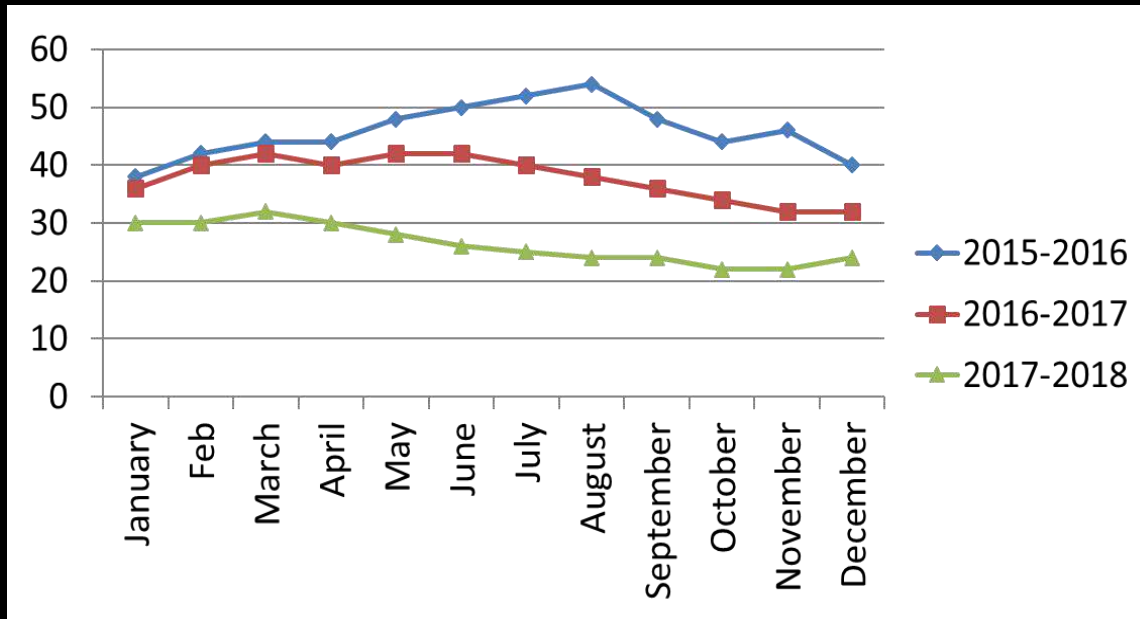
Length of Stay (Days)



Mortality (per 1000 bed days)



Cost Benefit, Effective & Utility of AMSP



Direct Cost:
Antibiotic Consumption &
Reduced HAIs

Indirect Cost:
Bystanders stay, food,
loss of job

Opportunity Cost:
Reduced LOS, more
admissions

Year	Amount
2015-2016	55000000
2016-2017	45400000
2017-2018	31500000
Total (YTD)	INR 2,35,00,000

Systematic Review: Antibiotic Prophylaxis

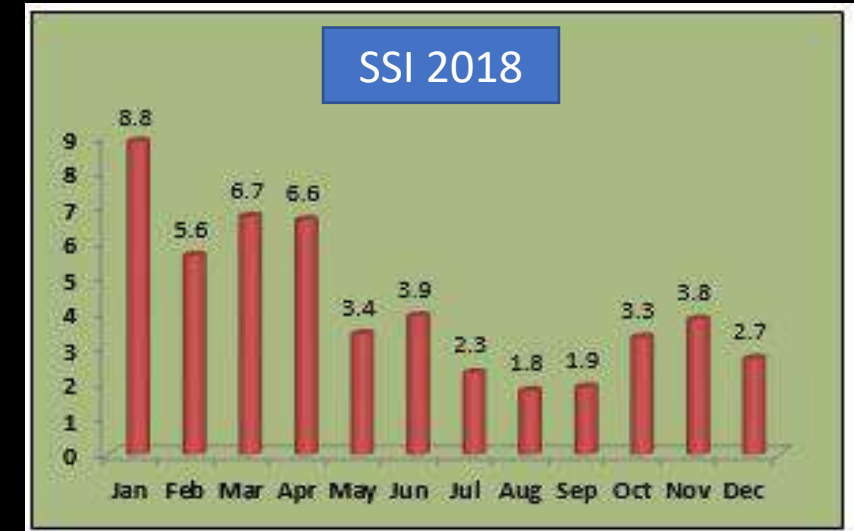
Table 20.1.1. Meta-analyses examining antibiotic prophylaxis*

Study	Trials Included	Surgical Procedures, Antibiotics	Results: Odds Ratio or Relative Risk of Infection (95% CI)
Kreter, 1992 ³⁵	28	Cardiothoracic surgery; cephalosporins	▪ Cefazolin vs. placebo: OR 0.2 (0.10-0.48). ▪ Cefazolin vs. cefuroxime or cefamandole: OR 1.6 (1.03-2.45) • Single dose vs. multiple dose regimen: no significant difference
McDonald, 1998 ³⁰	28	Multiple types of surgery; multiple antibiotics	▪ Single dose vs. multiple dose antibiotics (all studies): OR 1.06 (0.89-1.25) ▪ Duration of multiple dose regimen <24 hours: OR 1.02 (0.79-1.32) • Duration of multiple dose regimen >24 hours: OR 1.08 (0.86-1.36)
Meijer, 1990 ²⁹	42	Biliary surgery; cephalosporins	▪ Antibiotic vs. placebo: OR 0.30 (0.23-0.38) ▪ Cephalosporin I vs. cephalosporin II or III: OR 1.18 (0.69-2)[†] • Single dose vs. multiple dose regimen: OR 0.80 (0.4-1.6)

PSQ 3b: Antibiotic Prophylaxis (Business Case)

2018

- No of CABGs: 1434
- Prophylaxis used: Meropenum, Amika & Linezolid
- Cost incurred: Rs.2,85,58,964 (\$ 4,19,984)



2019

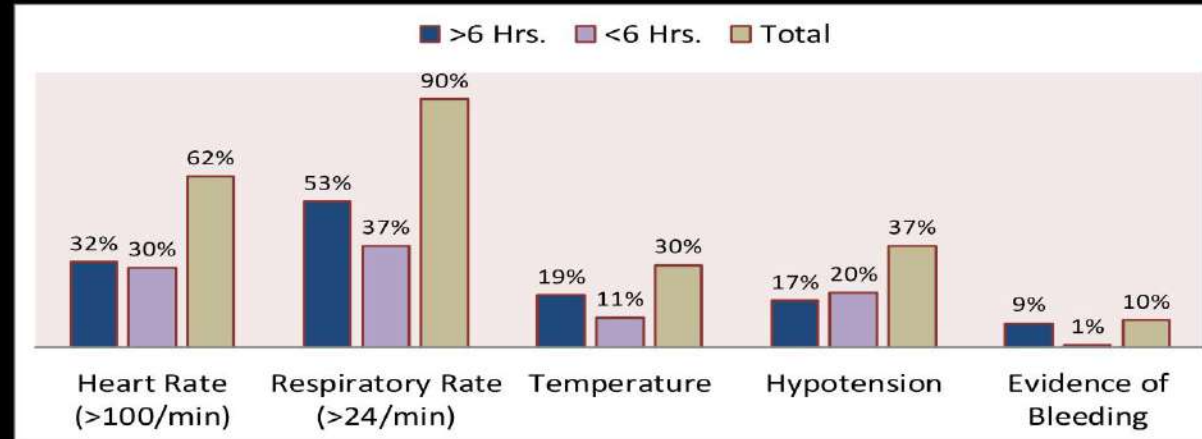
- No of CABGs: 1404
- Prophylaxis used: Cefuroxime
- Cost incurred: Rs.3,91,716 (\$5760)



ROI: \$ 4,14,224

AAC 5a: Early Warning Sign

COP 5: Cardio Pulmonary Resuscitation



Based on the above findings
“AMRITA MET CRITERIA” was
designed and nurses were
empowered to activate “CODE
MET”.



MET CALL NO : CALL CRITERIA

1. Airway: Choking

2. Breathing:

- Acute change in respiratory rate
- RR < 8 or > 28 per min.
- New/ acute change in saturation
- SpO₂ < 88% for more than 5mins.
- Increased oxygen demand to
maintain baseline saturation.

3. Circulation:

- Acute change in HR < 40 or >
140 per min

- Systolic BP < 90 mmHg or > 180mm
of Hg

- New onset Diastolic BP > 120 mmHg

- Chest pain – new or unrelenting
chest pain

4. Temperature:

- Temp > 102° F with change in
mental status.

5. Neurological Changes:

- Acute change in mental status
- Seizure
- Unexplained lethargy

- New focal Neurological deficit.

6. Blood sugar:

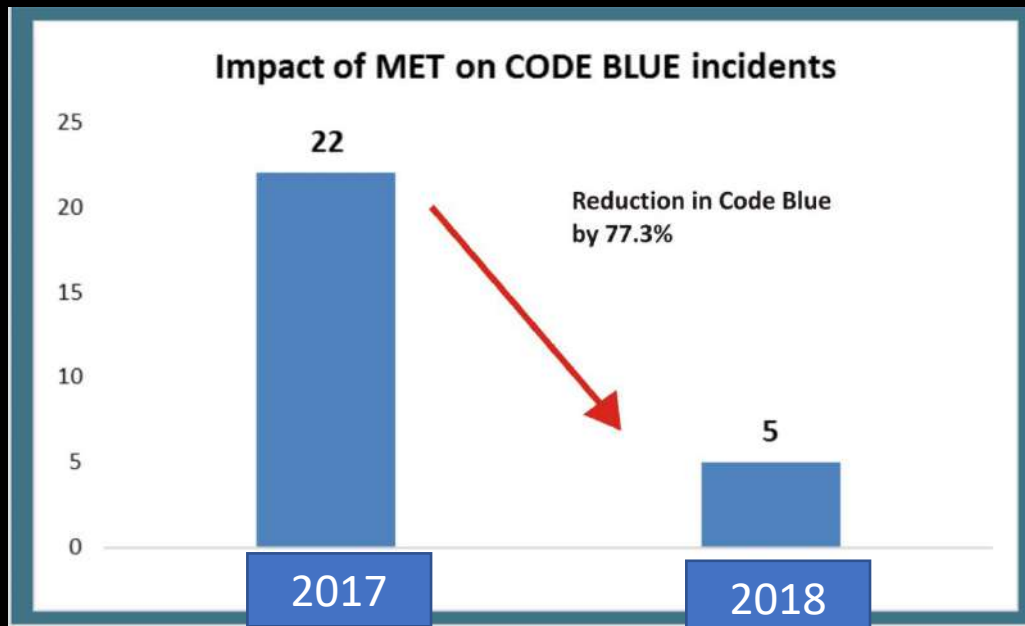
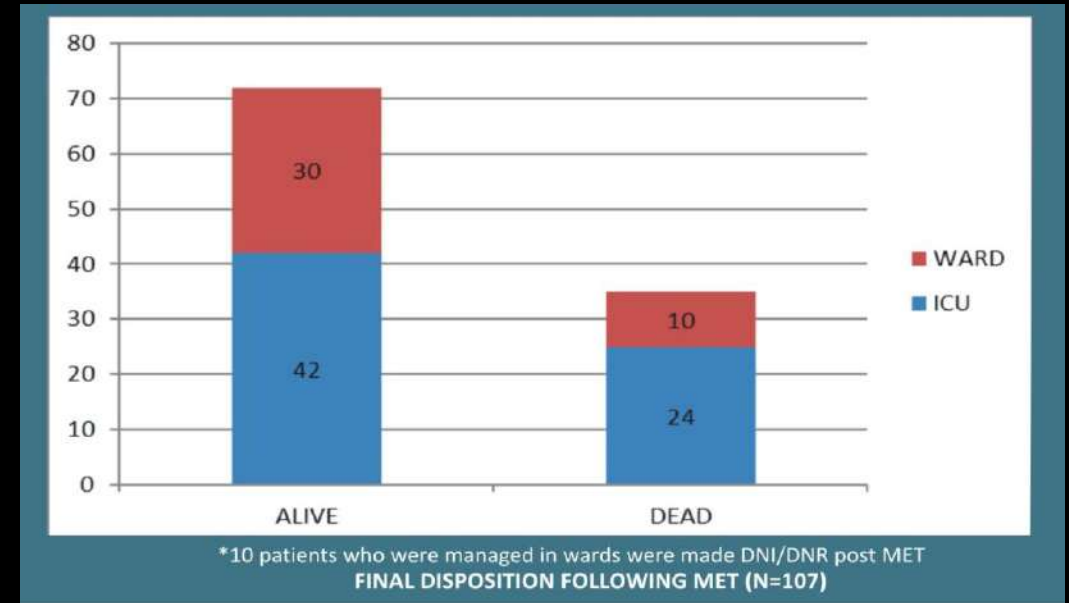
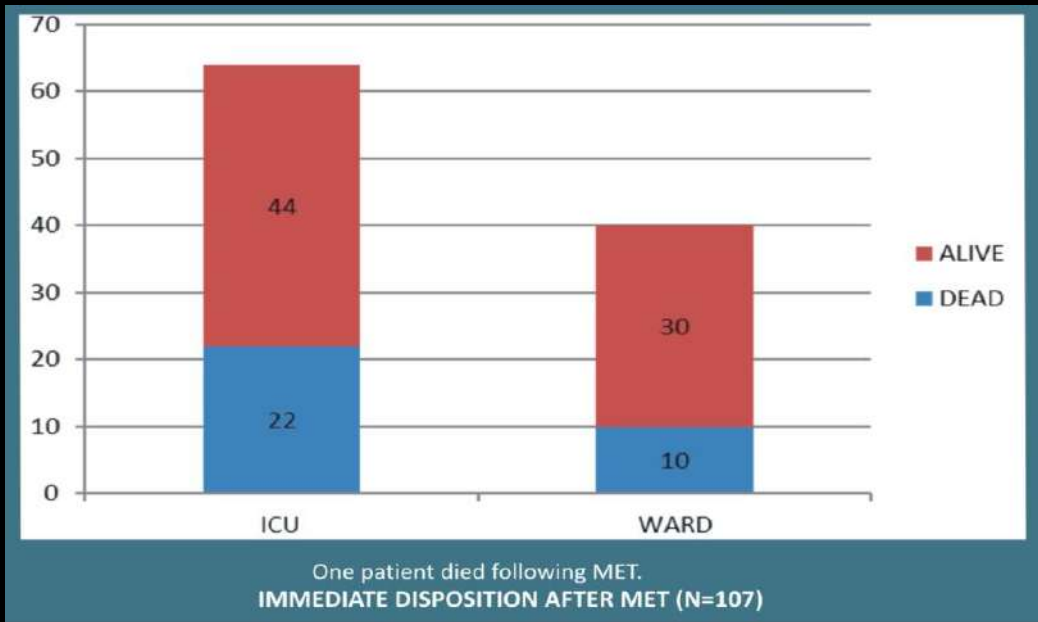
- Blood Sugar level < 60 or > 400 mg /
dl (New onset)

7. Bleeding:

- New Onset, Significant (> 100ml fresh
blood), Increased frequency Bleeding
related to procedure

8. Urine Output:

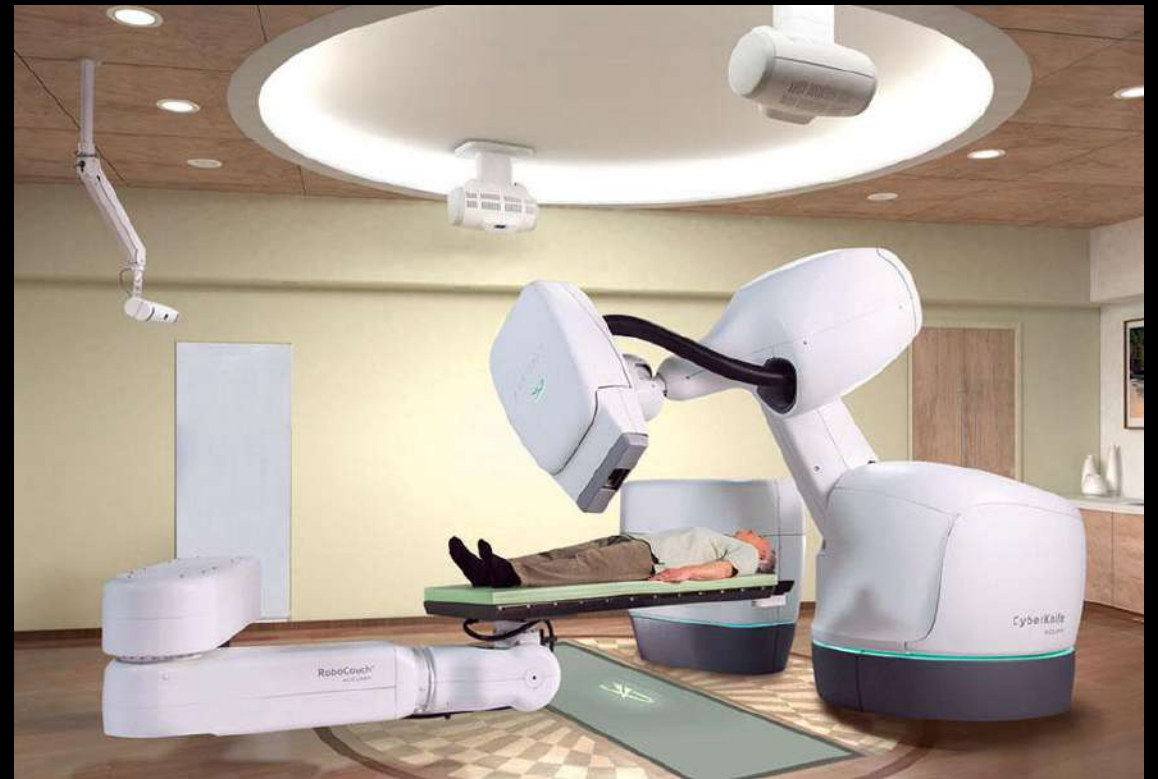
- New onset of decrease in urine output
(< 250 ml/ shift or < 500 ml in 24hrs
except patients with chronic kidney
disease)



EFFECTS OF CHANGE

- Nurses' general awareness of triggers improved, evidenced by frequent calls to MET.
- Improvements in hospital utilization vis-a-vis avoiding code blue, unnecessary ICU admissions by prompt response to MET calls

COP 1d: Application of Technology in Precision Medicine



Findings- CEA

- Cost effectiveness Analysis – CK
- **Cost quoted for CK =30 Crore/ 300 Million**
- **Maintenance and Human Resources Cost = 200 Million**
- Assuming **70% LC** i.e. Complete cure with no relapse ,
 - No . Of patients as target population = 19441
 - No. of patients cured = $19441 \times 70\% = 13,608$
 - Hospital Revenue = $19441 \times 84000 = 1143$ Million
 - Hospital investment = 300 Million
 - Additional Investment = 200 Million
- **Cost per case cured : 500 Million/ 13608 = 36743 INR**

FINDINGS –CEA (cont'd...)

- ❖ Assumption – LINAC could be applicable in treatment procedure of all type of cancer!!!
- Cost Quoted for LINAC = 10 Cr/ 100 Million
- Total human resource and Maintenance cost = 200 Million
- LC in case of LINAC = 90% (Approx).
- Thus total patients could be cured = $19441 \times 0.9 = 17,496$
- Cost per case cured = $200 \text{ Million} / 17496 = 6287 \text{ INR} = 11,431 \text{ Rs.}$

Summary

- Accreditation brings standardization of care delivery
- Accreditation bring public recognition
- Accreditation is equivalent to highest Quality care
- Accreditation comes with a cost
- With rational implementation, each Quality improvement initiatives would play Cost benefit, Cost Effective and Cost Utility role
- QI can / should also be aimed at linking Business Processes



Thank you

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