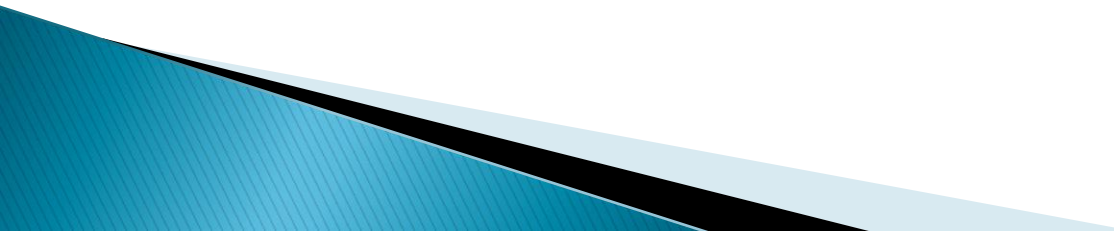


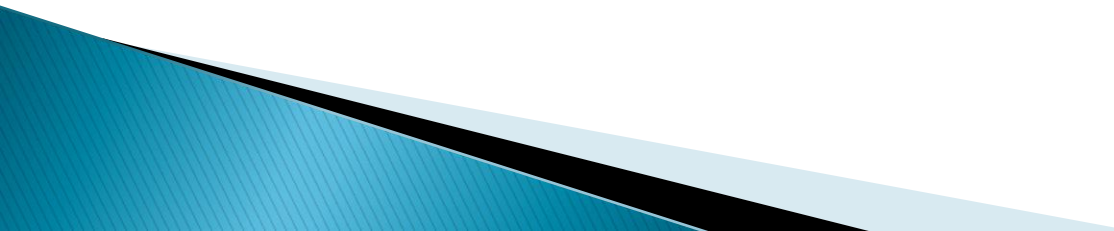
# **Hospital Acquired Infection: Measuring its impact on Increase Average Length of Stay and Cost of Care.**

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- ▶ **Introduction:** Healthcare-acquired infections (HAIs) are social and economic burden to both the patients and the healthcare industry.
  - ▶ Patients in health care institutions across the country as well as globally acquire healthcare associated infection that results in increase average length of stays as well as economic burden.
  - ▶ Such infection can cause patients great discomfort and adversely impact the overall quality and cost of health care.
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# Definition of HAI

- ▶ An infection occurring in a patient in a hospital or other health care facility in whom infection was not present or incubating at the time of admission. This include infection acquired in the hospital but appearing after discharge, and also the occupational infections among staff of the facility.  
( WHO definition)
  - ▶ Infections which occur more then 48 hours after admission are also considered as nosocomial.
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## Aim:

- ▶ Aim of this study was to provide baseline information of incidence rate of HAI and sensitize the administration about its economic impact on hospital's finance as well as on patients so as to guide priority setting in the development of strategy and policy.

## Objectives:

- ▶ To calculate the HAI incidence rate among patients admitted in hospital.
  - ▶ To ascertain additional out of pocket (OOP) expenditure by patients due to HAI compare with the patients without HAI.
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- ▶ **Study design:**

In this study, analytical approach of measuring of cost of HAI is comparing the group of patients affected with specific type of micro-organism with the group of the patients unaffected with HAI.

- ▶ **Study type:** Retrospective analytical, prospective observational

- ▶ **Study area:** ICU, Wards

- ▶ **Sample size:** 96 cases of HAI in 2015

- ▶ **Inclusion criteria:** All patients above 16 years of age admitted in ICU and wards with different complains and presentations and developed clinical evidence of infection which does not originate from the patients original admitting diagnosis were included in this study.

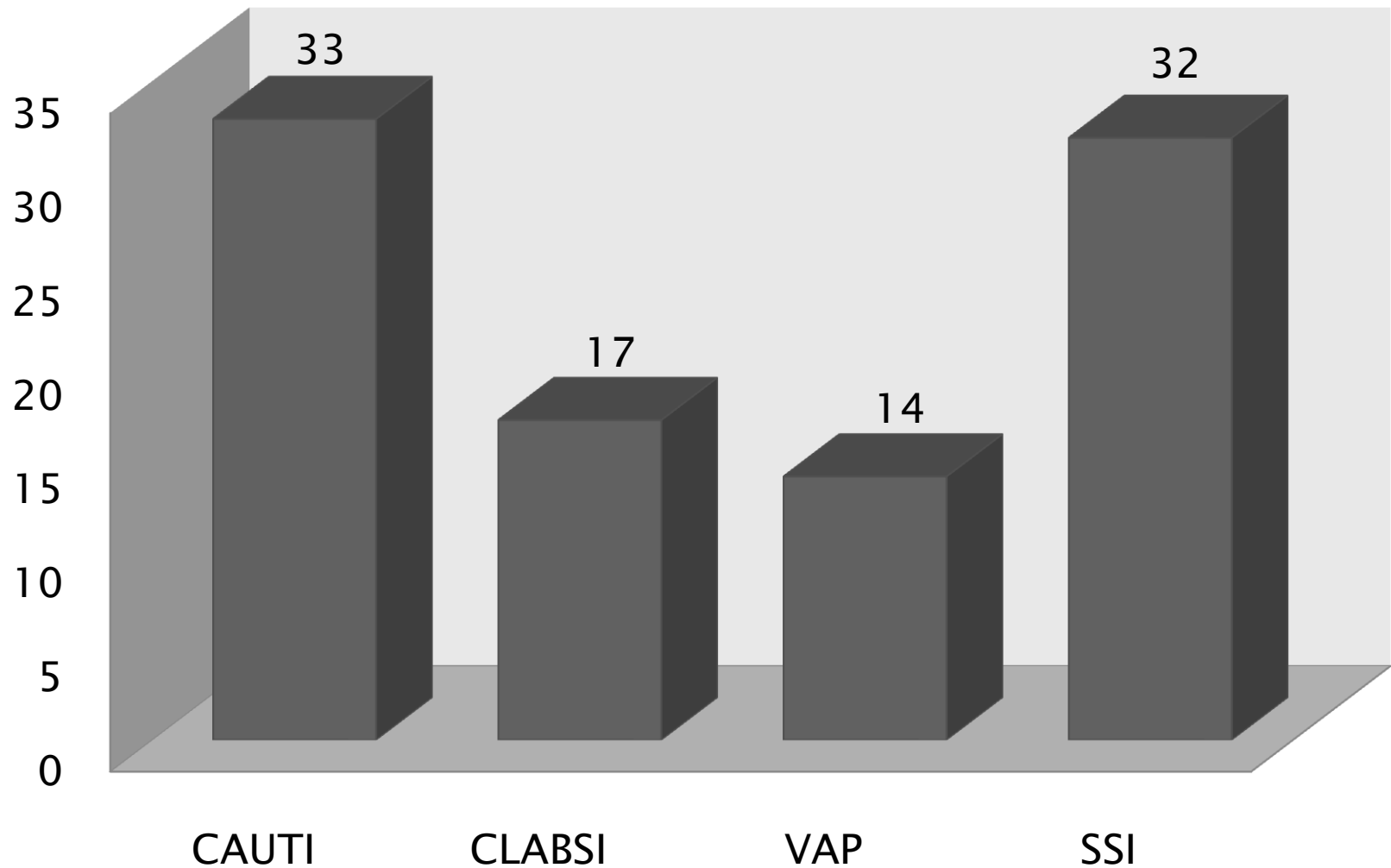
- ▶ **Exclusion criteria:** According to the definition of HAI, patients admitted before 48 hrs excluded from the study.

- ▶ **Data collection tool:** Retrospective from records maintained by infection control department, prospectively by observation, interviewed with experts and care takers. (Nurses, ICN, Intensivist, Doctors

- ▶ **Data analysis method:** MS Excel

# Data Analysis

# Cases of HAI 2015



# Multiple infection

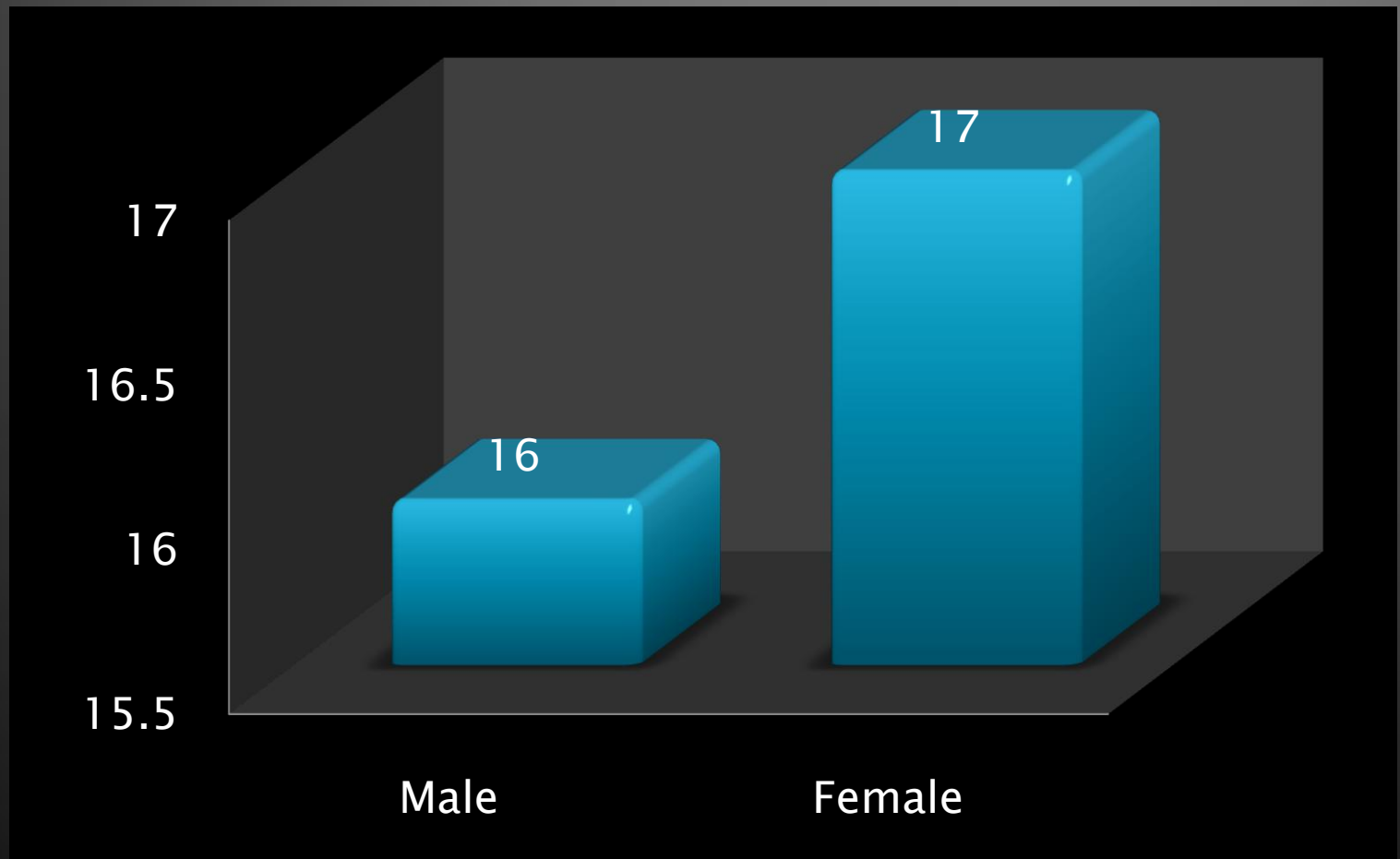
| No of multiple infection cases | 17 |
|--------------------------------|----|
| UTI+BSI                        | 6  |
| UTI+VAP                        | 4  |
| BSI+VAP                        | 4  |
| BSI+UTI+VAP                    | 1  |
| VAP+SSI                        | 1  |
| BSI+SSI                        | 1  |



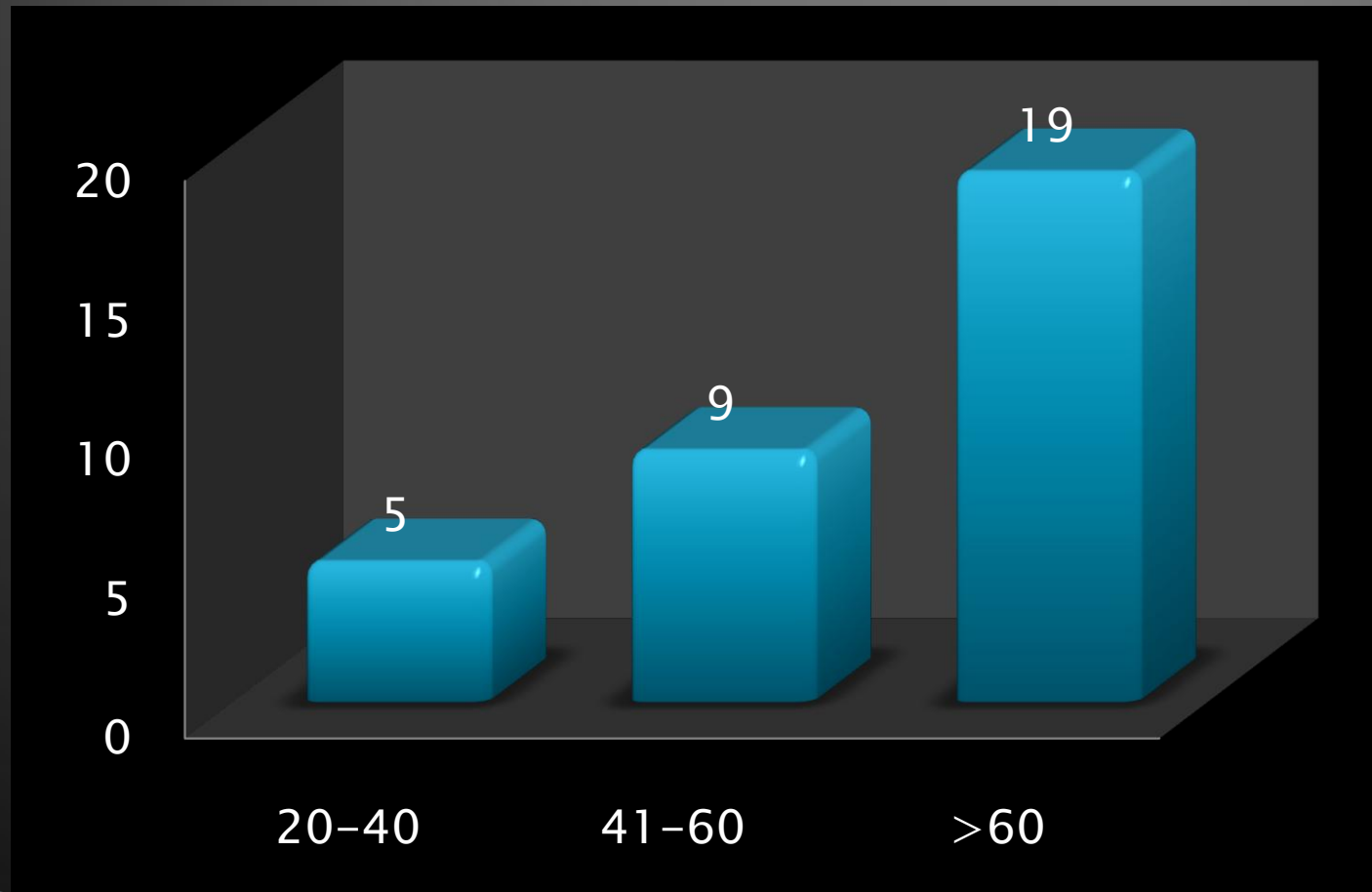
# Annual Infection rate

| HAI    | Annual infection rate |
|--------|-----------------------|
| VAP    | 2.5                   |
| CAUTI  | 1.97                  |
| CLABSI | 2.7                   |
| SSI    | 6.3                   |

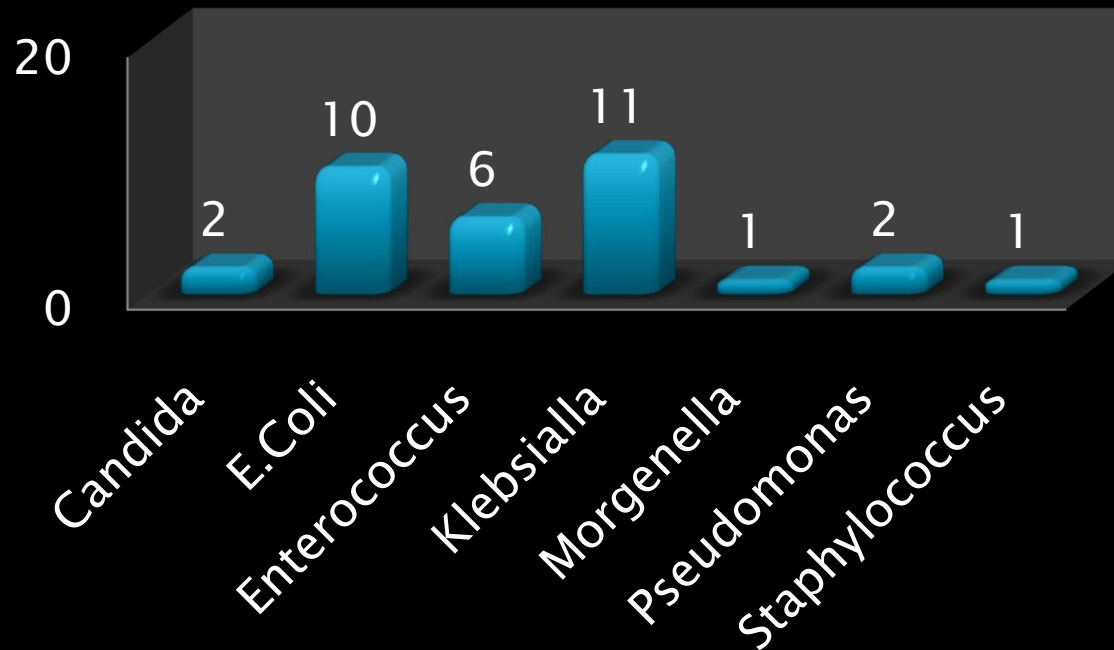
# UTI Gender Specific



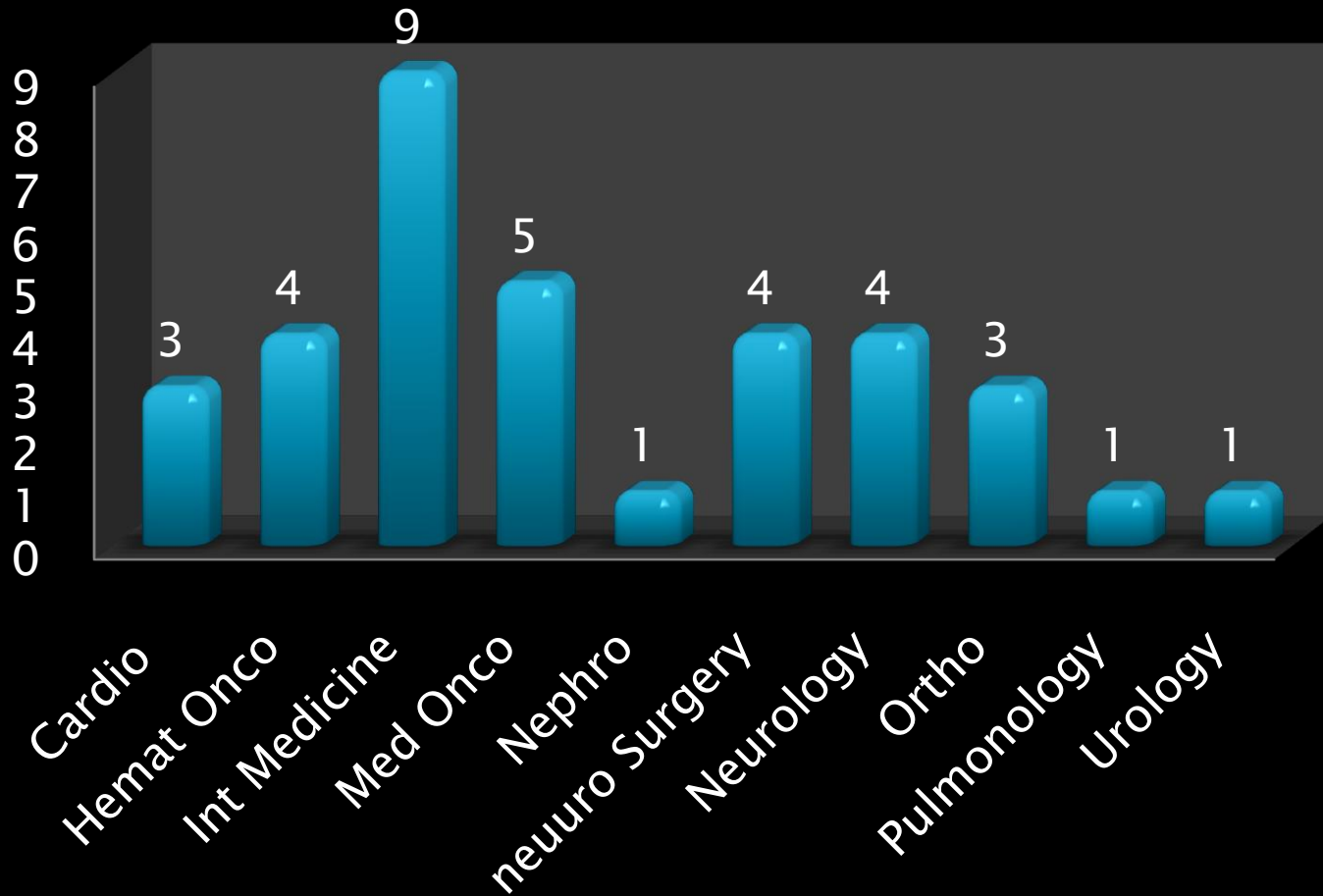
# UTI Age Specific



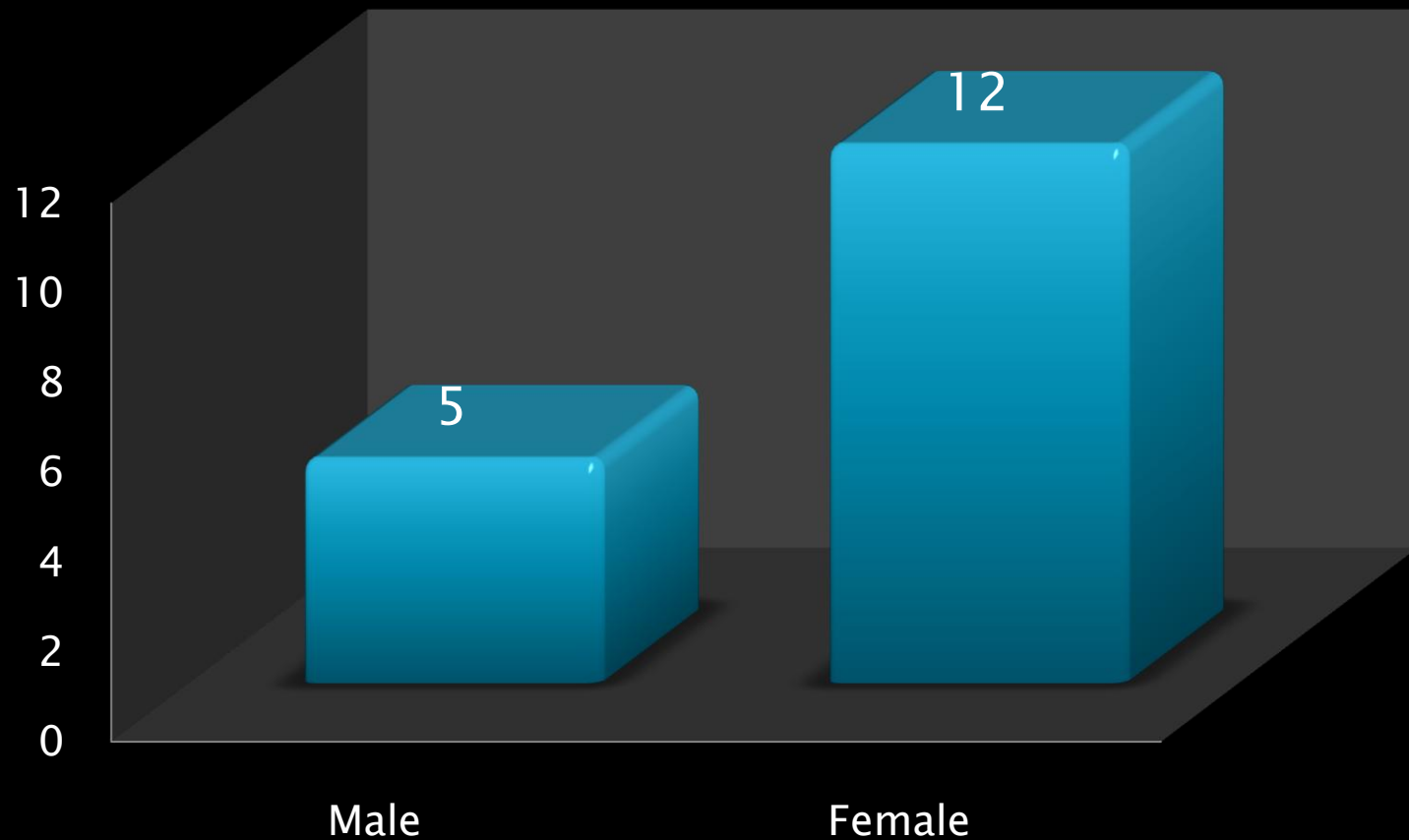
# UTI Micro-organism Specific



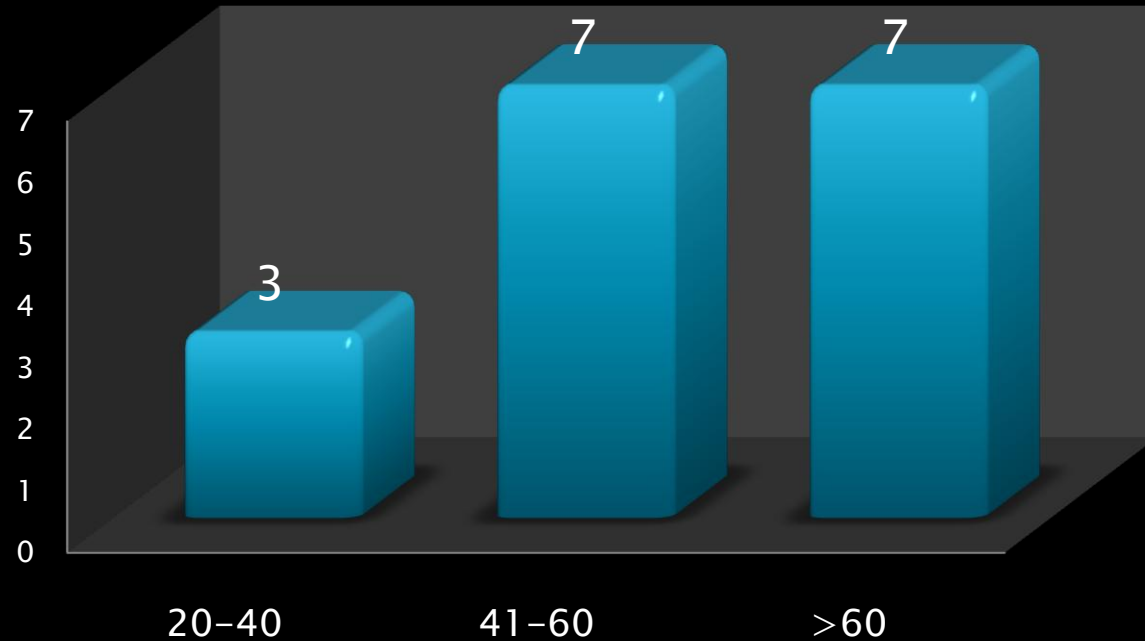
# UTI Specialty wise



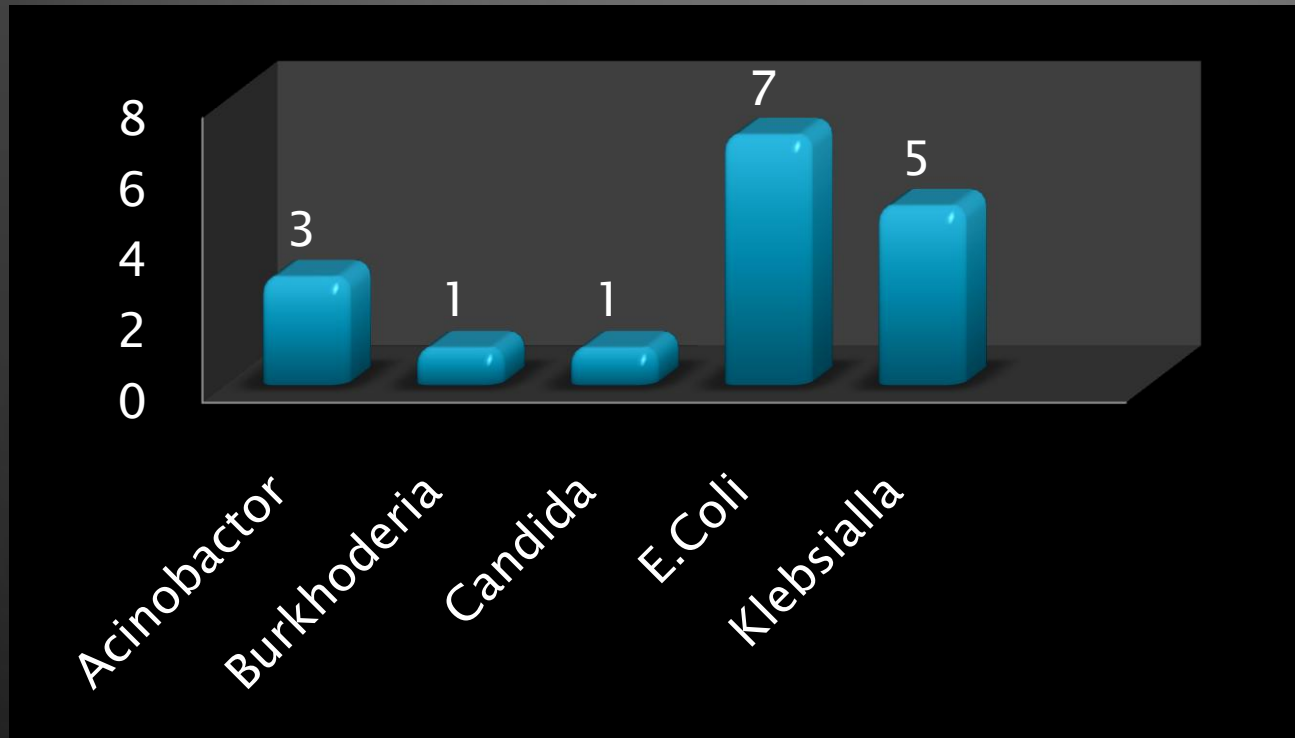
# CLABBSI Gender Specific



# CLABSI Age Specific

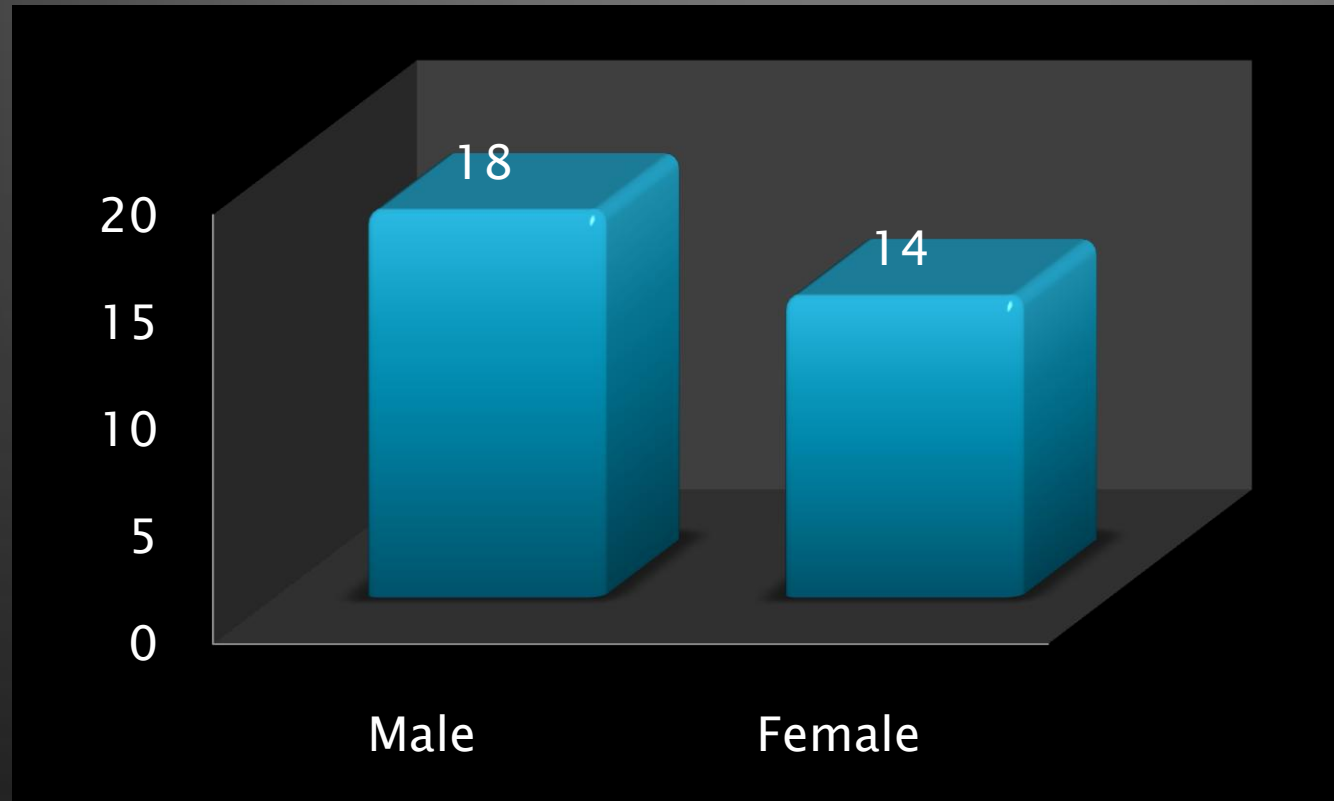


# CLABSI Micro-organism specific

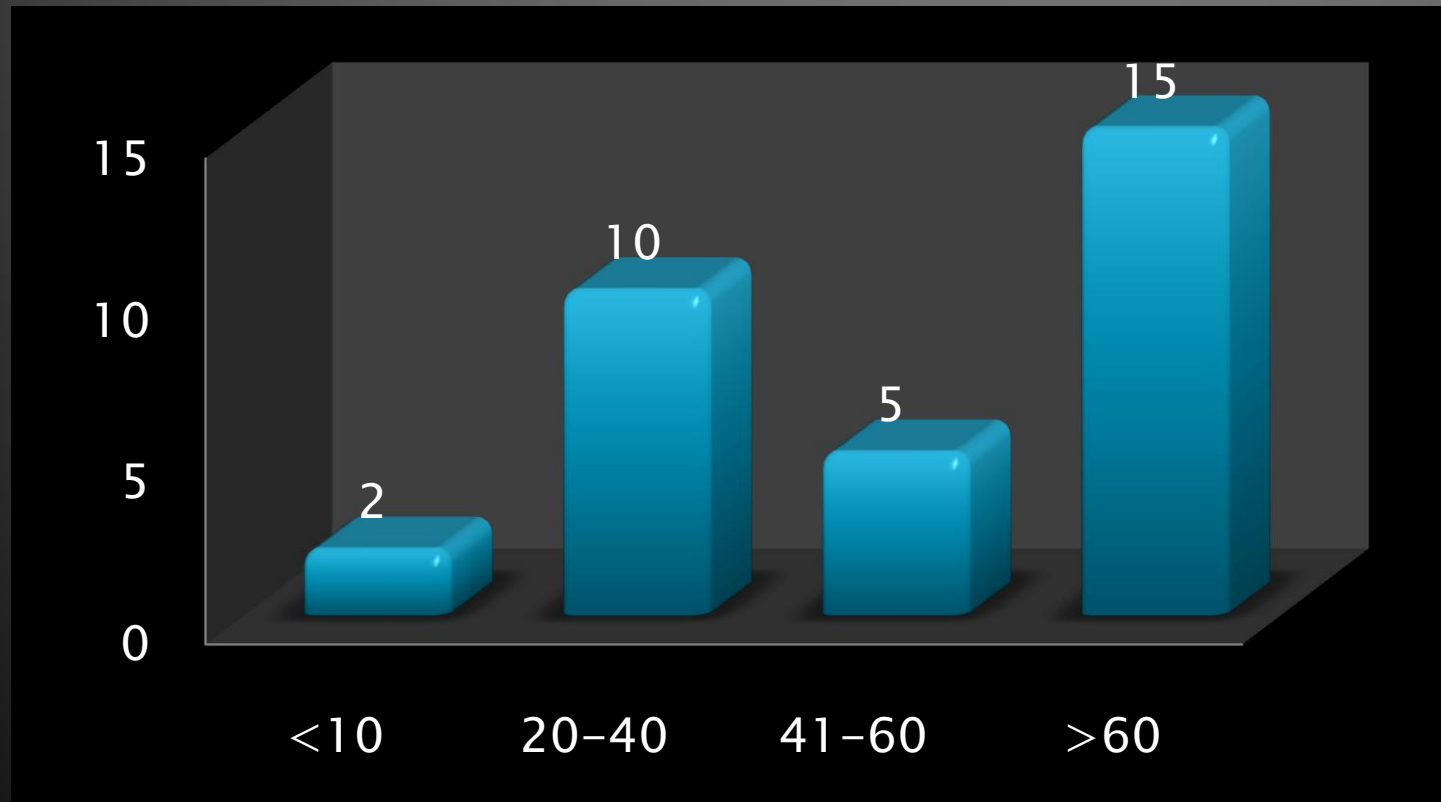




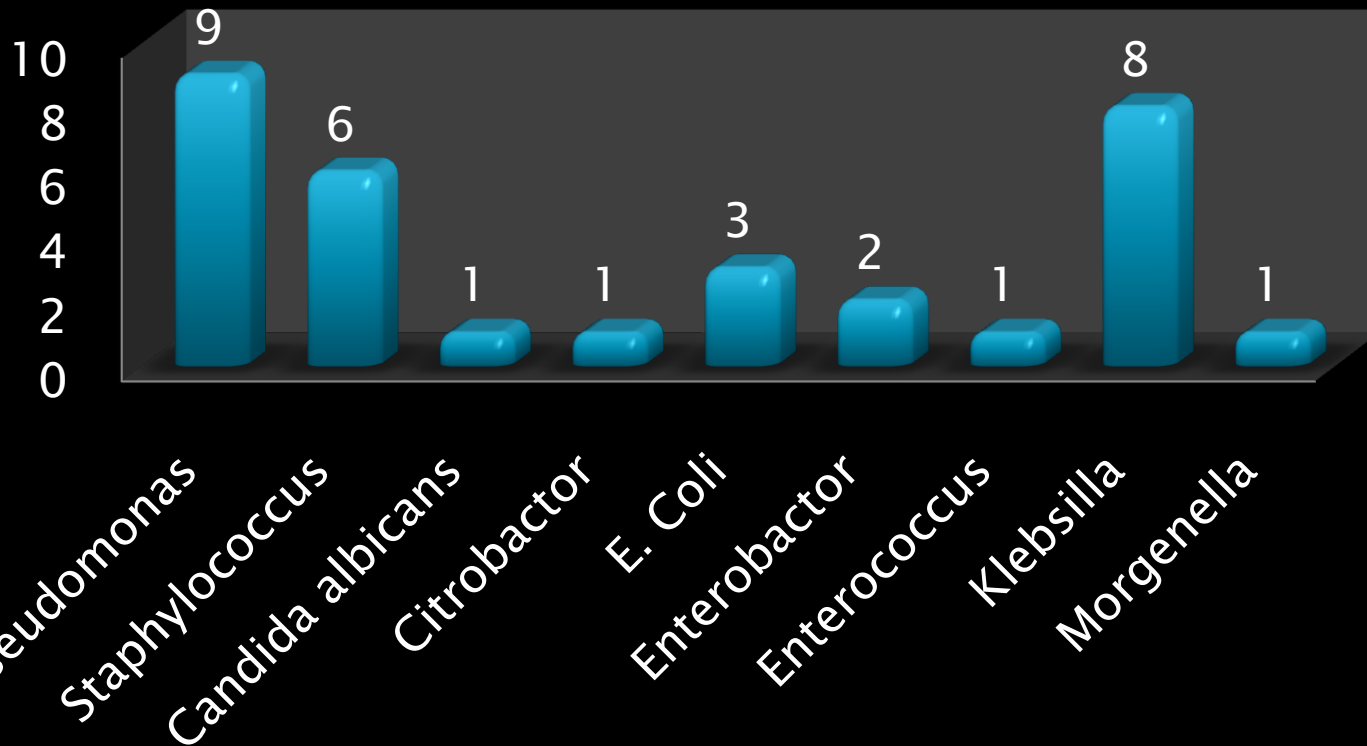
# SSI Gender specific



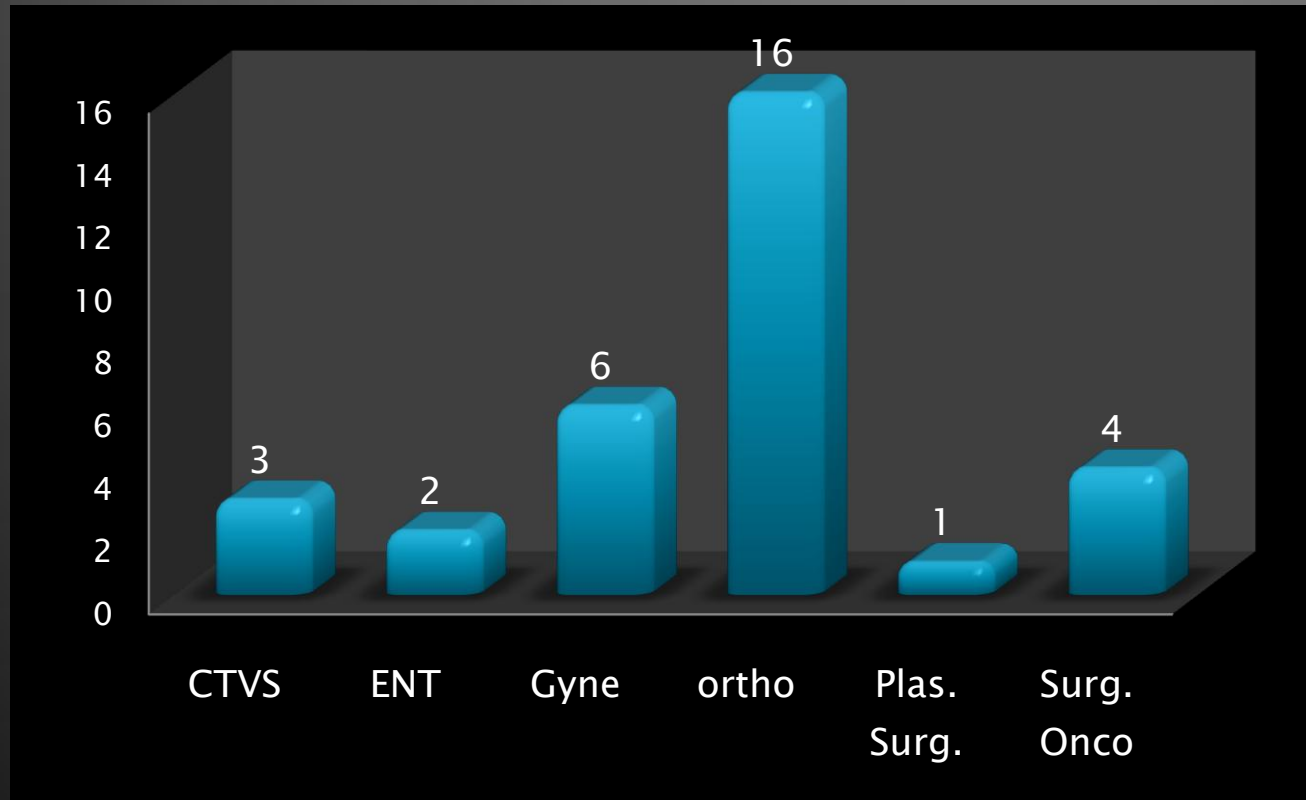
# SSI Age Specific



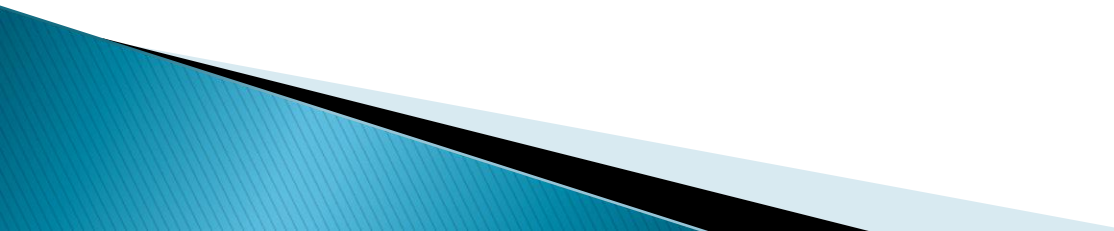
# SSI Micro-organism Specific



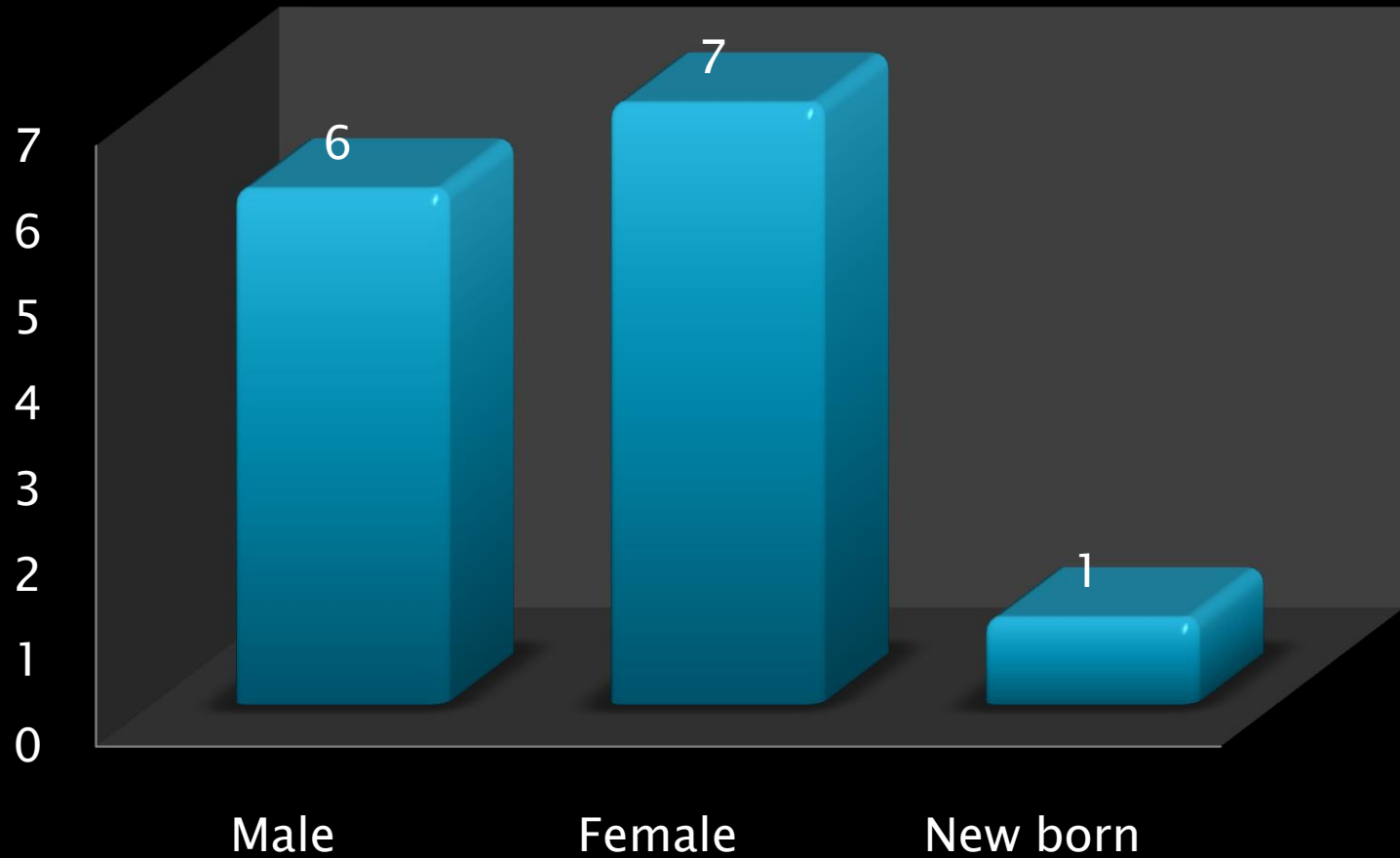
# SSI Specialty wise



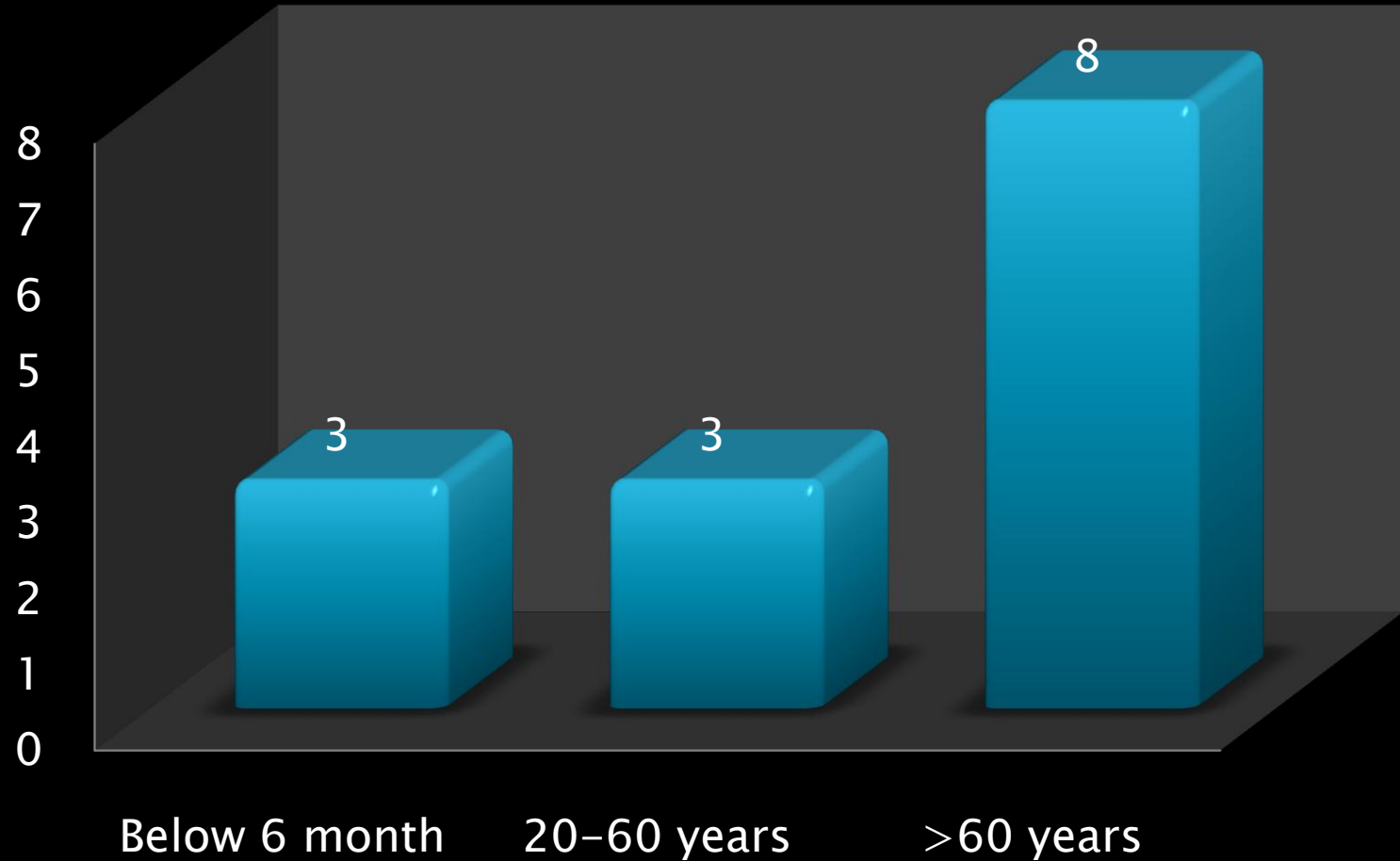
# SSI readmission/re-exploration rate

- ▶ In SSI cases readmission or re-exploration cases
  - ▶ Out of 32 cases 10 cases readmitted or re-explore due to Surgical site infection in which 9 cases from orthopedic department 1 case from gynecology department.
  - ▶ In ortho most of cases are implant cases, SSI result in either failure of implant or readjustment of the implant.
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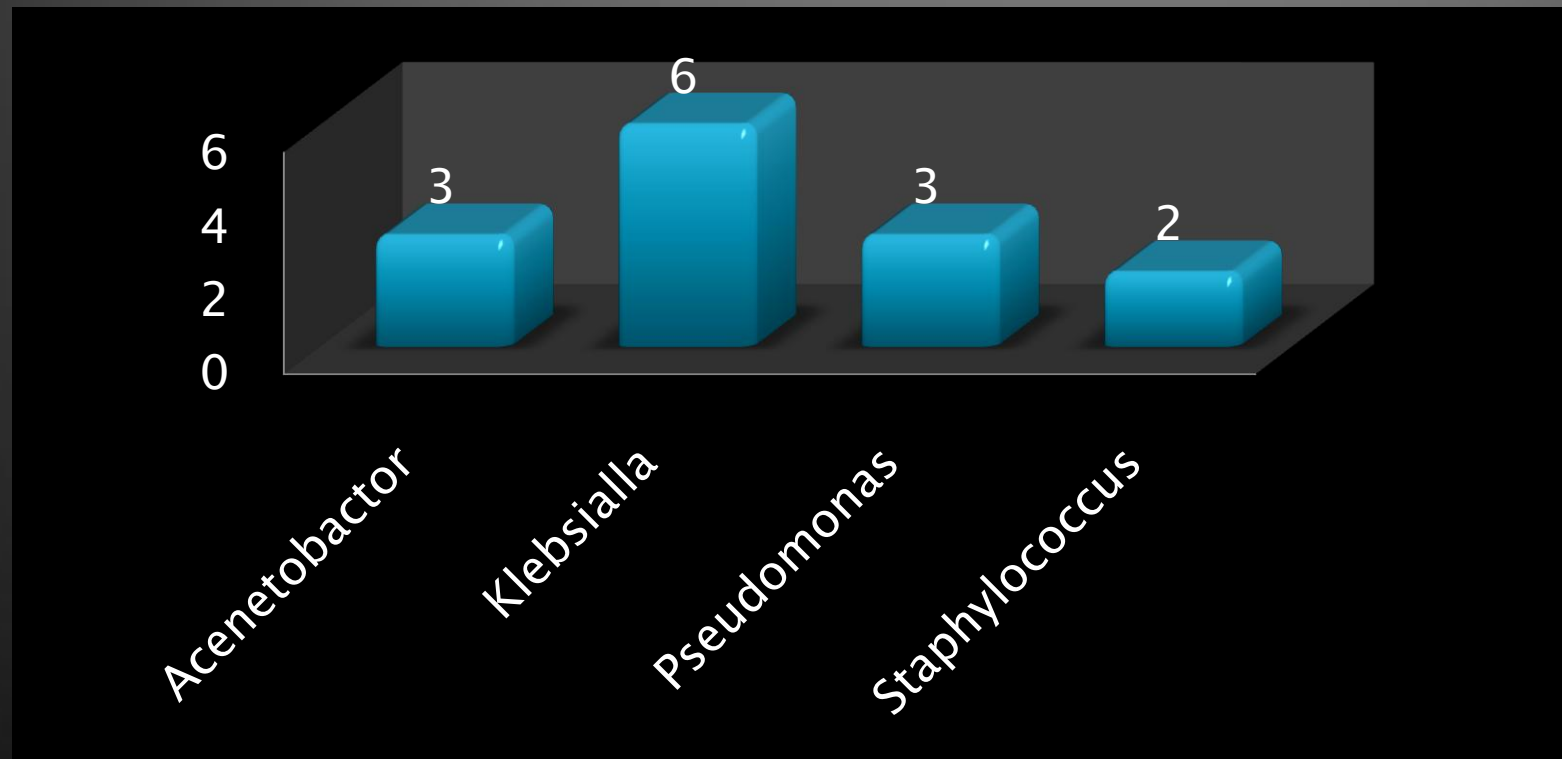
# VAP Gender Specific



# VAP Age Specific

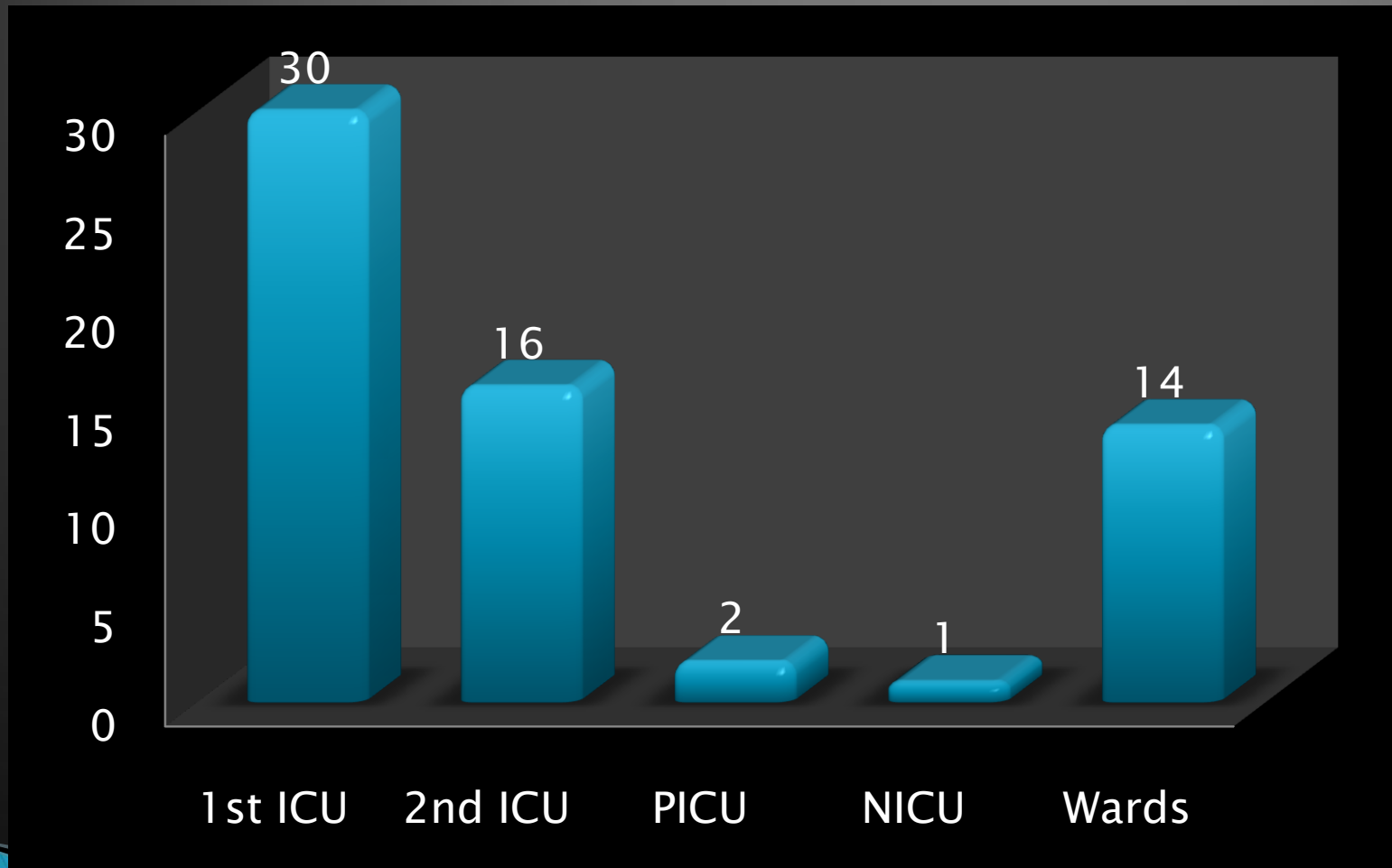


# VAP Micro-organism Specific





# Area wise HAI distribution(SSI not included)



# Average length of Stay

| HAI                | Total ALOS | Total ALOS after infection |
|--------------------|------------|----------------------------|
| CAUTI              | 17.4       | 6.8                        |
| CLABSI             | 19.3       | 14.7                       |
| VAP                | 44.17      | 29.7                       |
| Multiple infection | 30.4       | 17.9                       |

In SSI there is average days of 15.8 after surgery when infection become positive

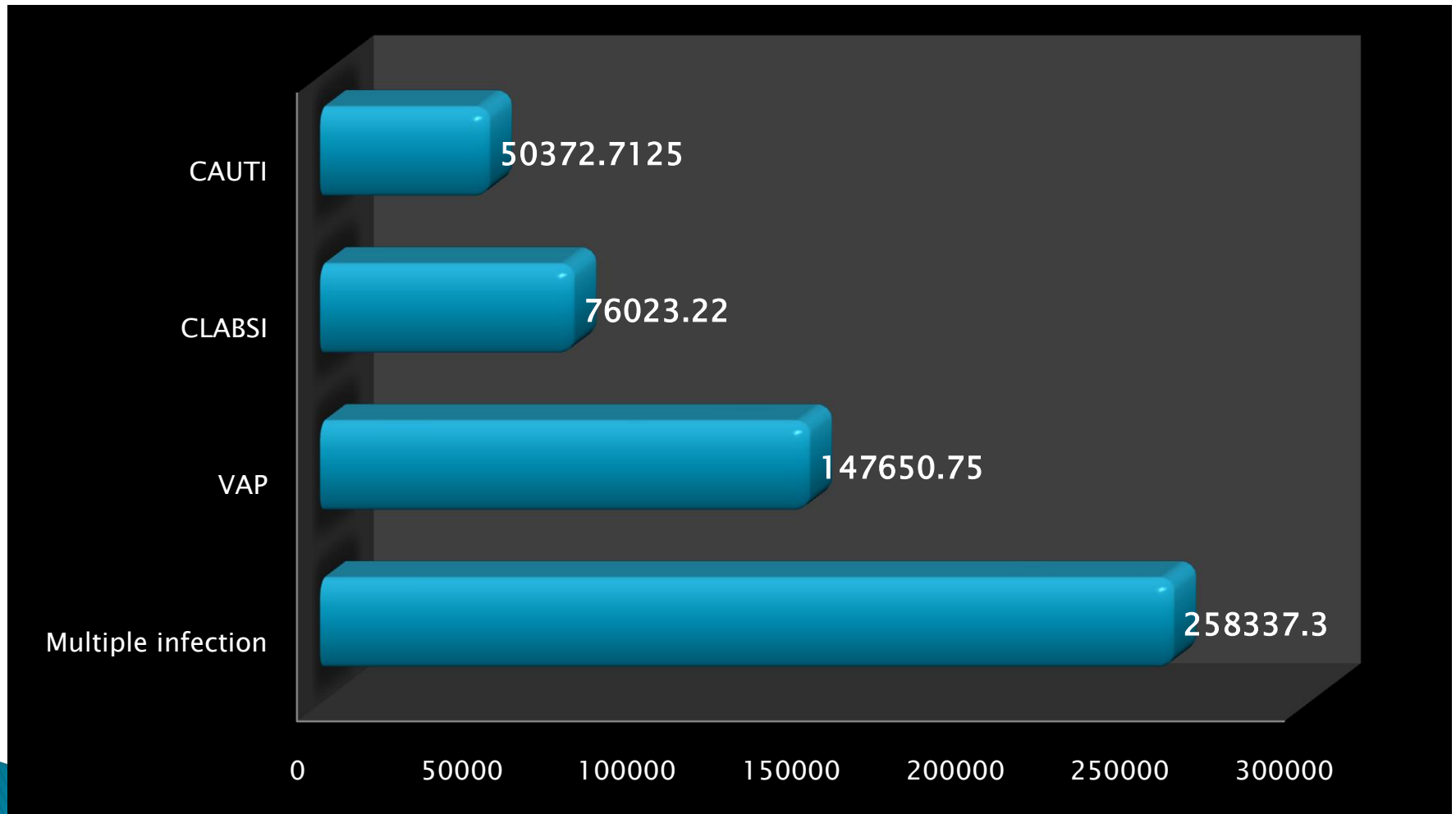
# HAI Mortality rate

- ▶ There were 8 death out of 92 cases of HAI detected in 2015, where cause of death is either septic shock or sepsis was the contributing factor.
- ▶ Number of death/ total number of HAI in a year\*100
- ▶  $8/96*100 = 8.33\%$

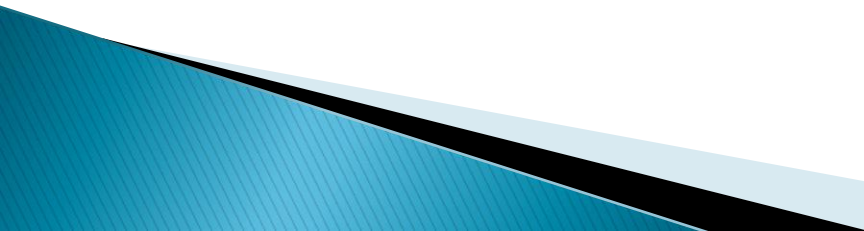
# Economic impact of HAI

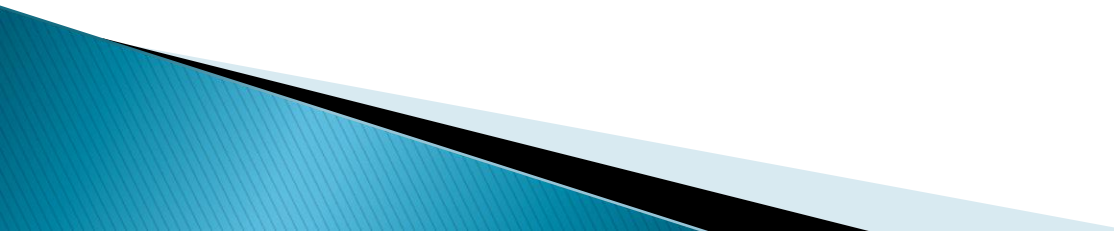
- ▶ Although it is very difficult to decide that which cost is contributed because of HAI because patients were admitted in critical condition.
- ▶ Still we categorized the cost on the basis that if patient is admitted only 1 day because of HAI what financial impact will be on patient.
- ▶ We have taken time period after infection in which we took
  - a) cost of antibiotic administered to the patient,
  - b) Room rent,
  - c) Nursing charges,
  - d) Consultancy of doctor,
  - e) Investigation charges and
  - f) some consumables.
- ▶ We identified average cost incurred by patient CAUTI, CLABSI, VAP and Multiple infections.

# Extra cost incurred due to HAI



# Economic effect of HAI on Hospital

- ▶ Economic impact of HAI on hospital mainly seen in TPA patients or package patients, where charges to the patients remain constant but cost to the hospital increases.
  - ▶ The extra charges mean the patient with HAI consume more hospital resources.
  - ▶ To estimate the cost impact, a hospital can convert charges into cost by multiplying by an appropriate ratio of cost to the charges(RCC).
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- ▶ In SSI cases there is multiple visit of OPD for daily dressing after surgery and re-admission or re-exploration costs a huge amount which is really difficult to calculate.
  - ▶ It also bear a huge opportunity cost because of multiple visit in hospital to the patient and their attendant.
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# Recommendations

- ▶ Sensitize the issue and increase education and awareness among health care worker as well as adhere to the standard guidelines for prevention of hospital acquired infection and reduce the burden of economic impact because of HAI.



# Conclusion

- ▶ The economic burden is increased by 2–4 times due to increase ALOS to both the hospital and patient, further compounded by the social burden of one attendant having to stay with the patient, resulting in notional loss of income.
  - ▶ Considering the low per capita income and high out of pocket expenditures in India HAI lead to functional disability and emotional stress to the patient that reduce the quality of life.
  - ▶ HAI add to the imbalance the recourse allocation between primary and secondary health care by diverting scarce fund to the management of potentially preventable condition
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