

# HOSPITAL ACQUIRED INFECTION:

## A Study to Measure Its Impact on Increase Average Length of Stay and Cost of Care in Multi-Specialty Hospital.

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# INTRODUCTION

- HAI's 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.

The background is a dark navy blue. It features several large, overlapping, semi-transparent geometric shapes in various colors: bright green, cyan, magenta, orange, and light blue. These shapes are arranged in a way that creates a sense of depth and movement, with some appearing to recede into the background and others coming forward.

# **HOSPITAL** **ACQUIRED** **INFECTION** **(HAI)**

A series of overlapping, semi-transparent geometric shapes in shades of purple, blue, and teal, arranged in a diagonal pattern in the top right corner of the slide.

➤ An infection occurring in a patient in the 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.

A series of overlapping, semi-transparent geometric shapes in shades of green, yellow, and orange, arranged in a diagonal pattern in the bottom left corner of the slide.

❖ ( WHO definition)

Infections which occur more then 48 hours after admission are also considered as nosocomial.

# 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 prior 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 as compared with the patients without HAI.

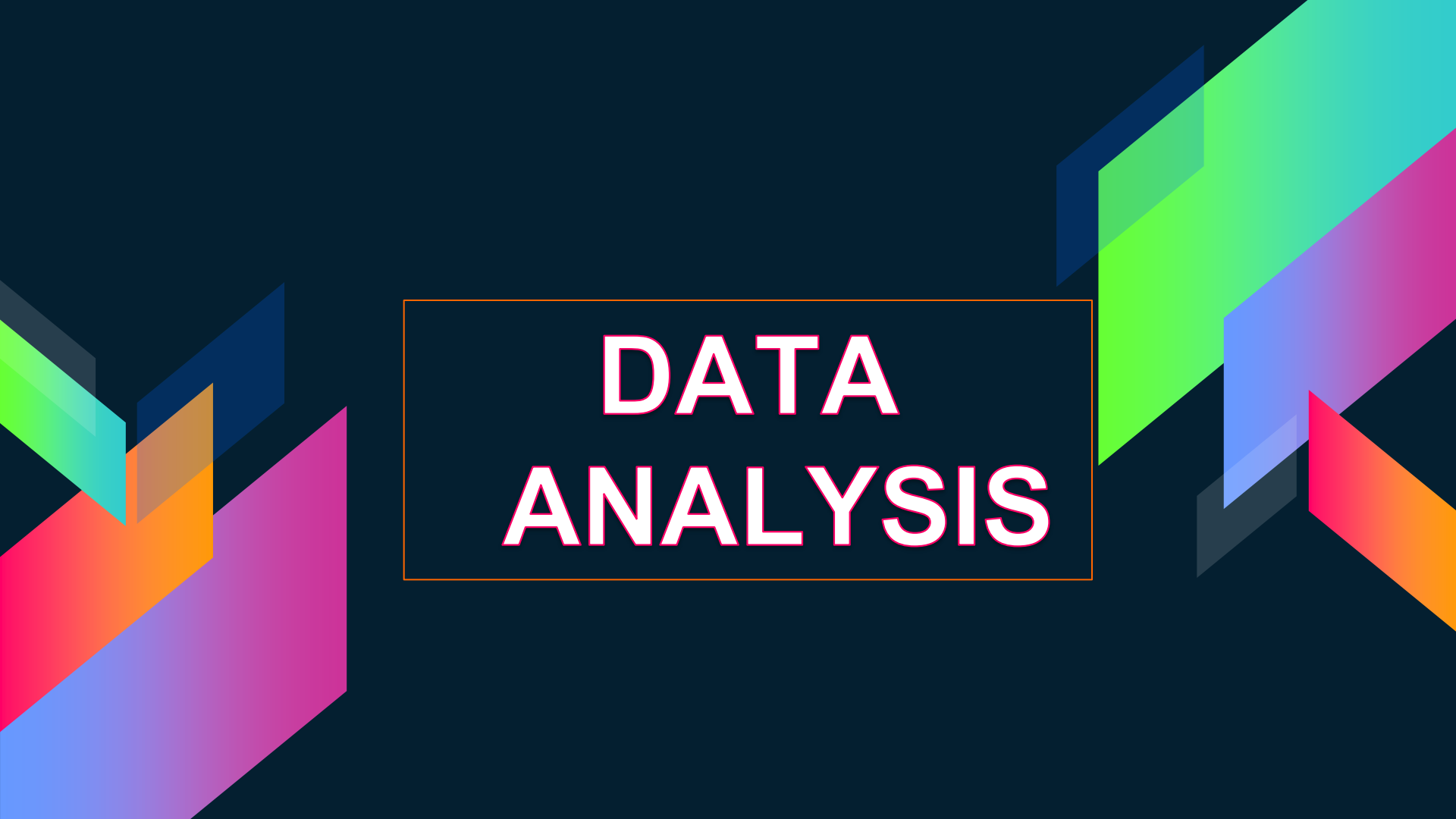
# STUDY DESIGN

- ❖ In this study, analytical approach of measuring the cost of HAI by 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 and Wards
- ❖ Sample size: 90 cases of HAI in 2025

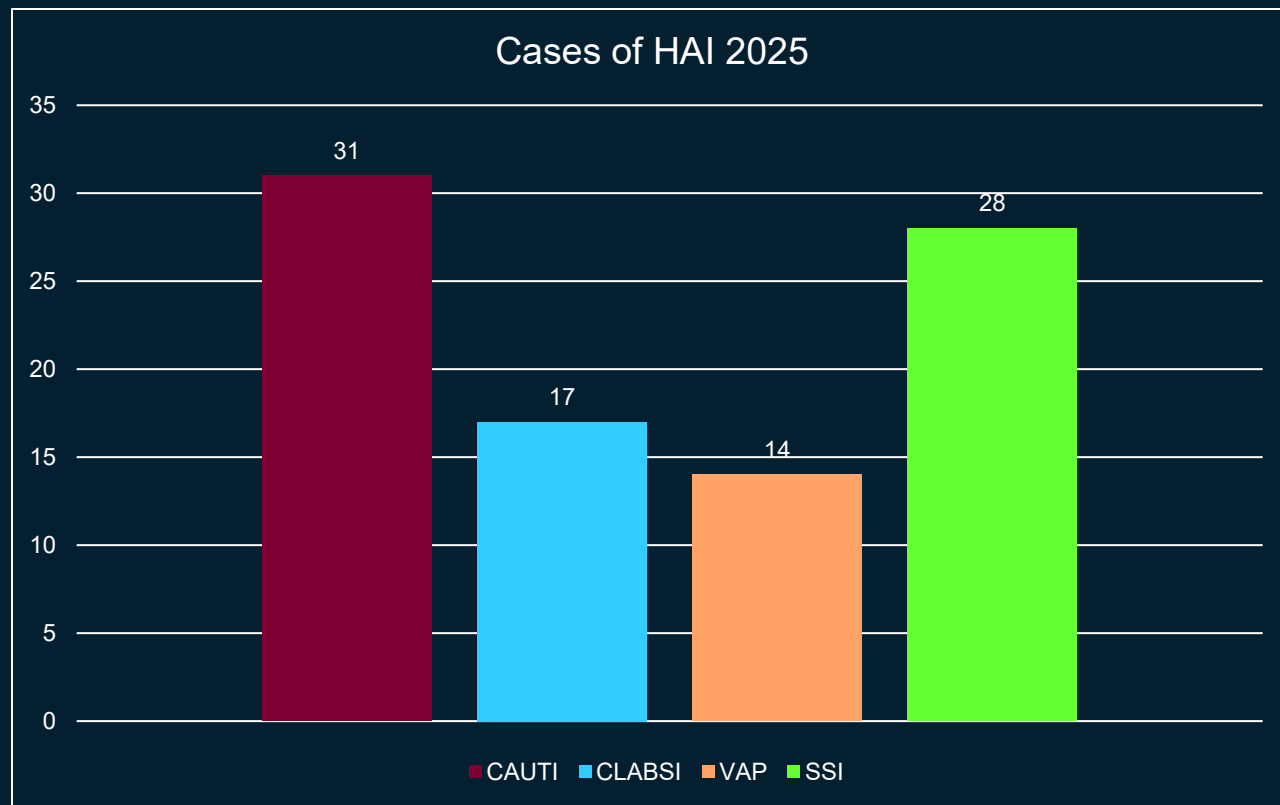
**INCLUSION CRITERIA:** All patients admitted in the ICU and wards with different complains and developed clinical evidence of infection which does not originate from the patients original admitting diagnosis were included in this study.

**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, Intensivists, Doctors etc)

The background features a dark navy blue field with several large, overlapping, semi-transparent geometric shapes. On the left, there are shapes in shades of green, blue, orange, and pink. On the right, there are shapes in shades of green, blue, pink, and orange. These shapes create a sense of depth and movement.

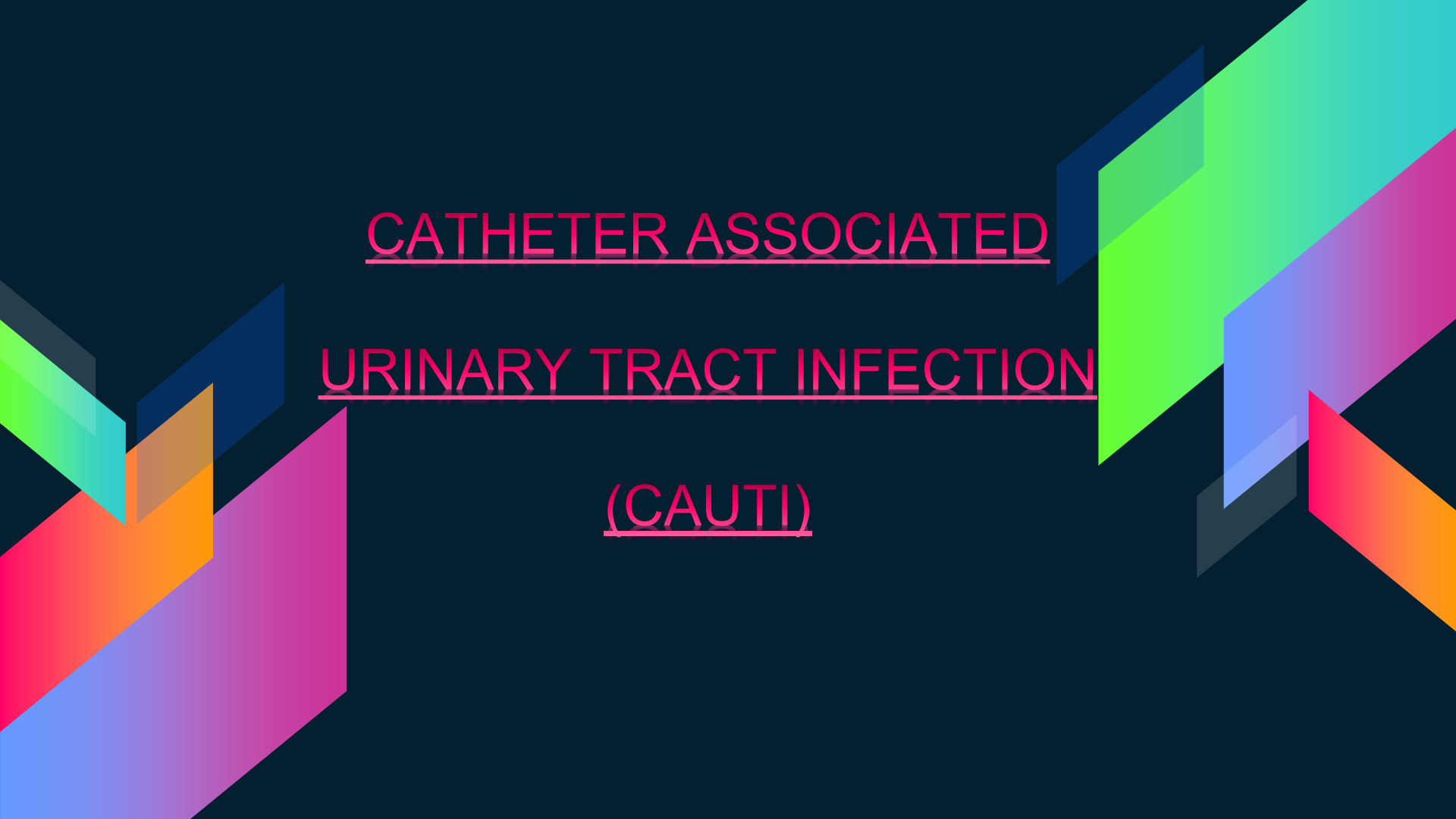
# DATA ANALYSIS



Total HAI cases taken in this study= 90

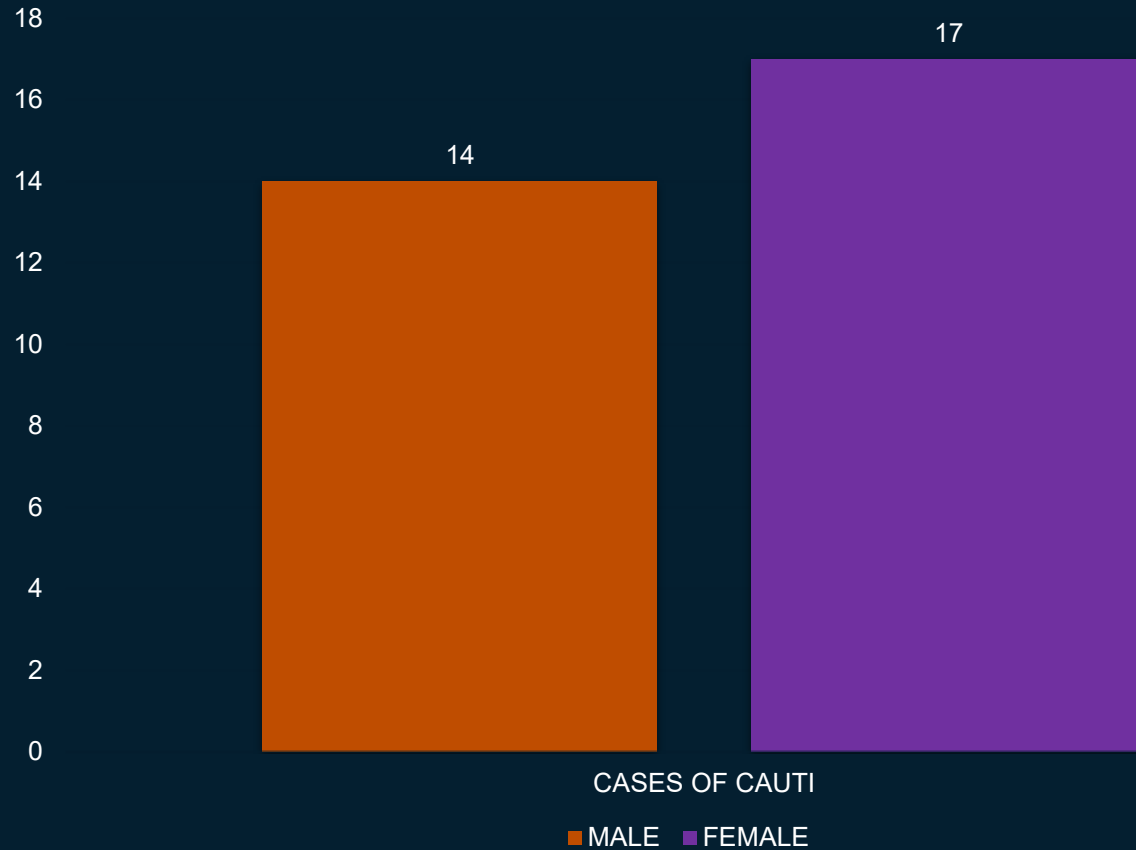
# ANNUAL INFECTION RATE OF HAI

| HAI    | Annual Infection Rate |
|--------|-----------------------|
| CAUTI  | 1.83                  |
| CLABSI | 2.03                  |
| VAP    | 2.65                  |
| SSI    | 5.47                  |

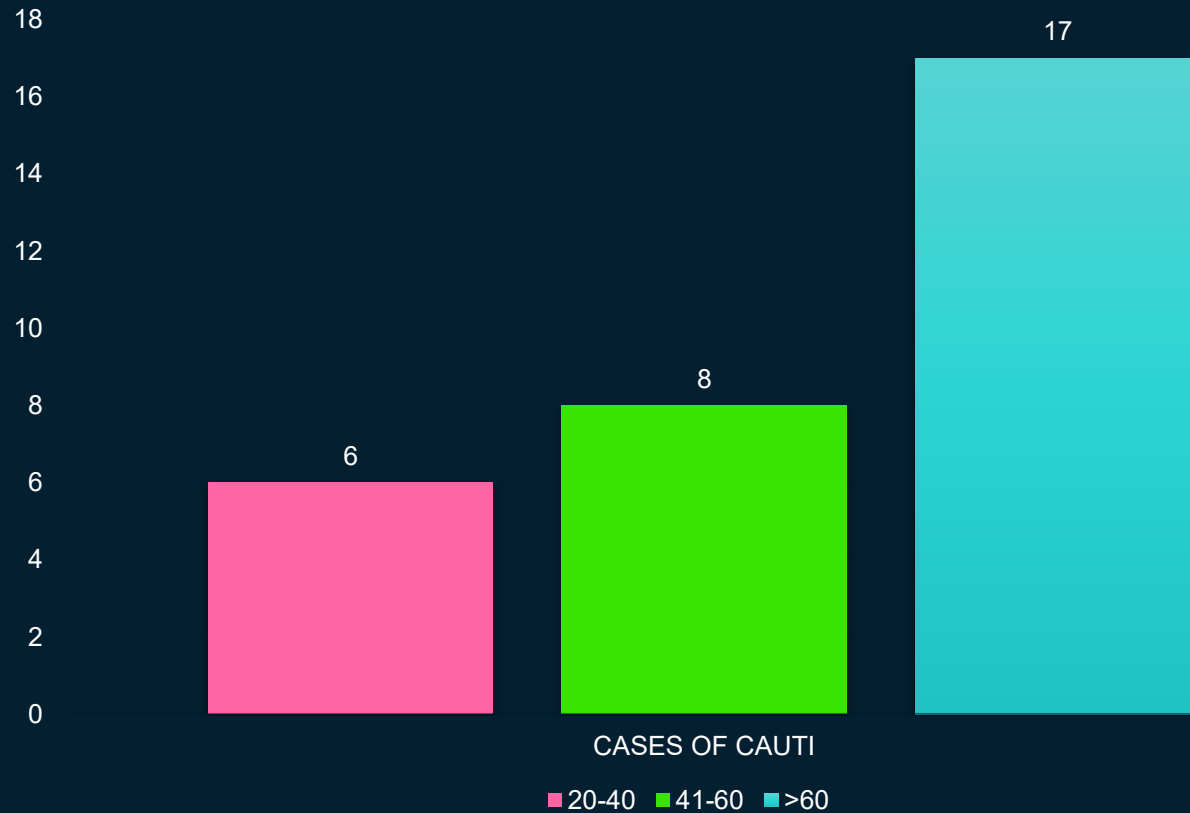
The background is a dark navy blue. It is decorated with several large, overlapping, semi-transparent geometric shapes in various colors: bright green, cyan, magenta, orange, and light blue. These shapes are arranged in a way that creates a sense of depth and movement, with some appearing to be layered on top of others.

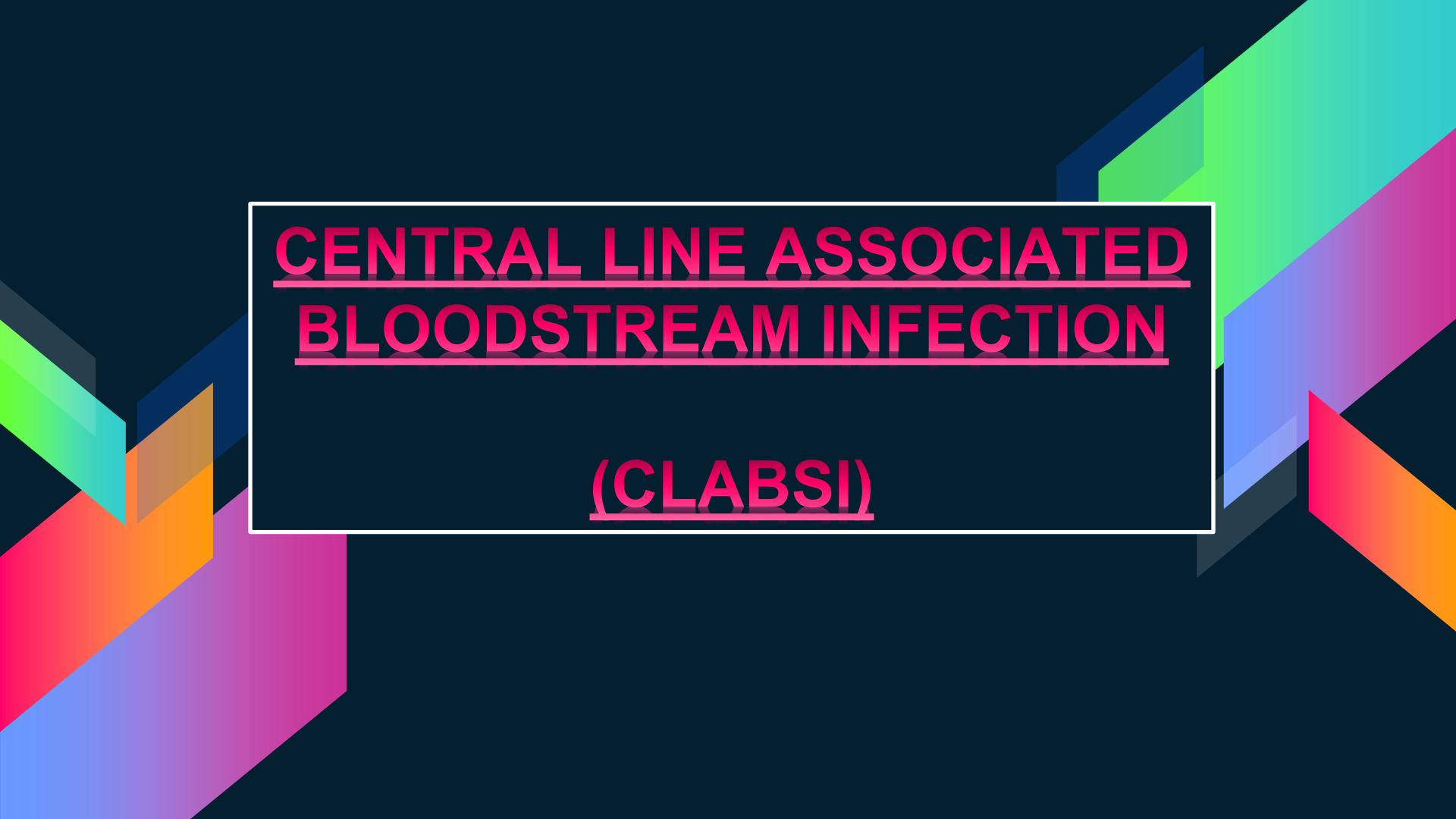
# CATHETER ASSOCIATED URINARY TRACT INFECTION (CAUTI)

## GENDER WISE CAUTI CASES



## AGE WISE CAUTI CASES

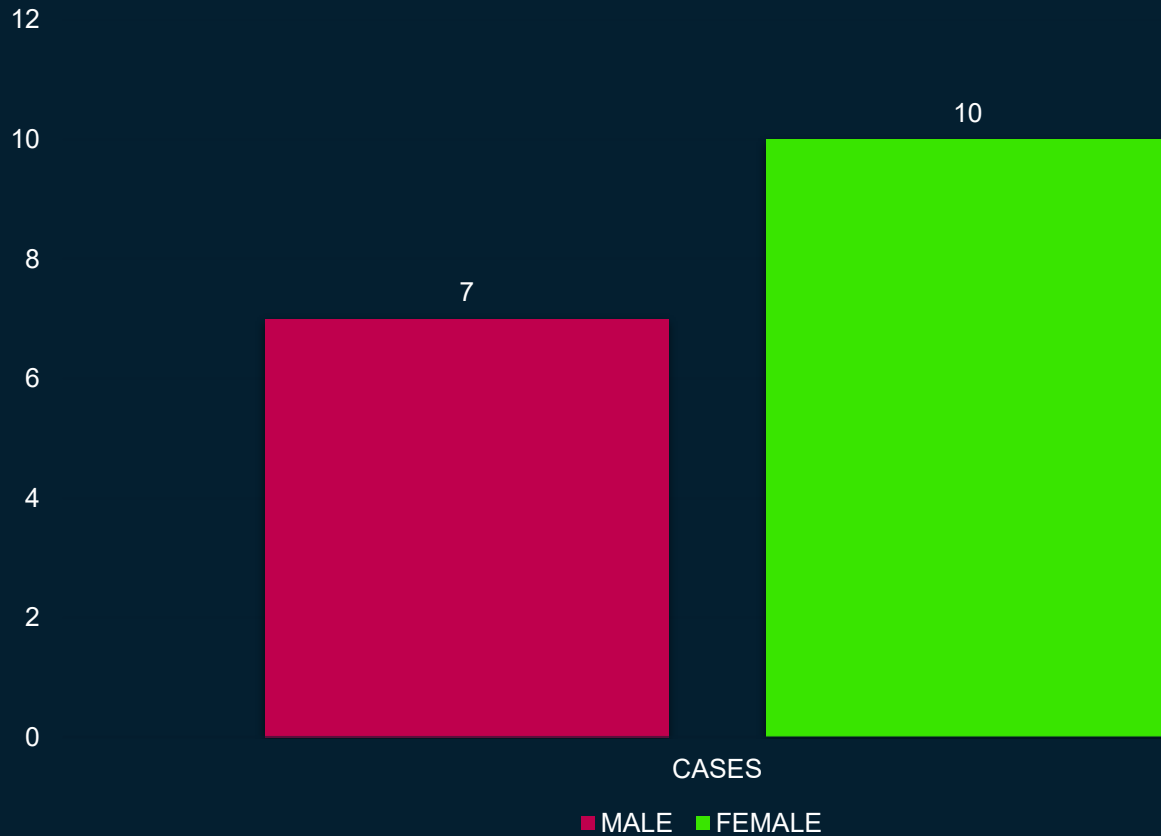




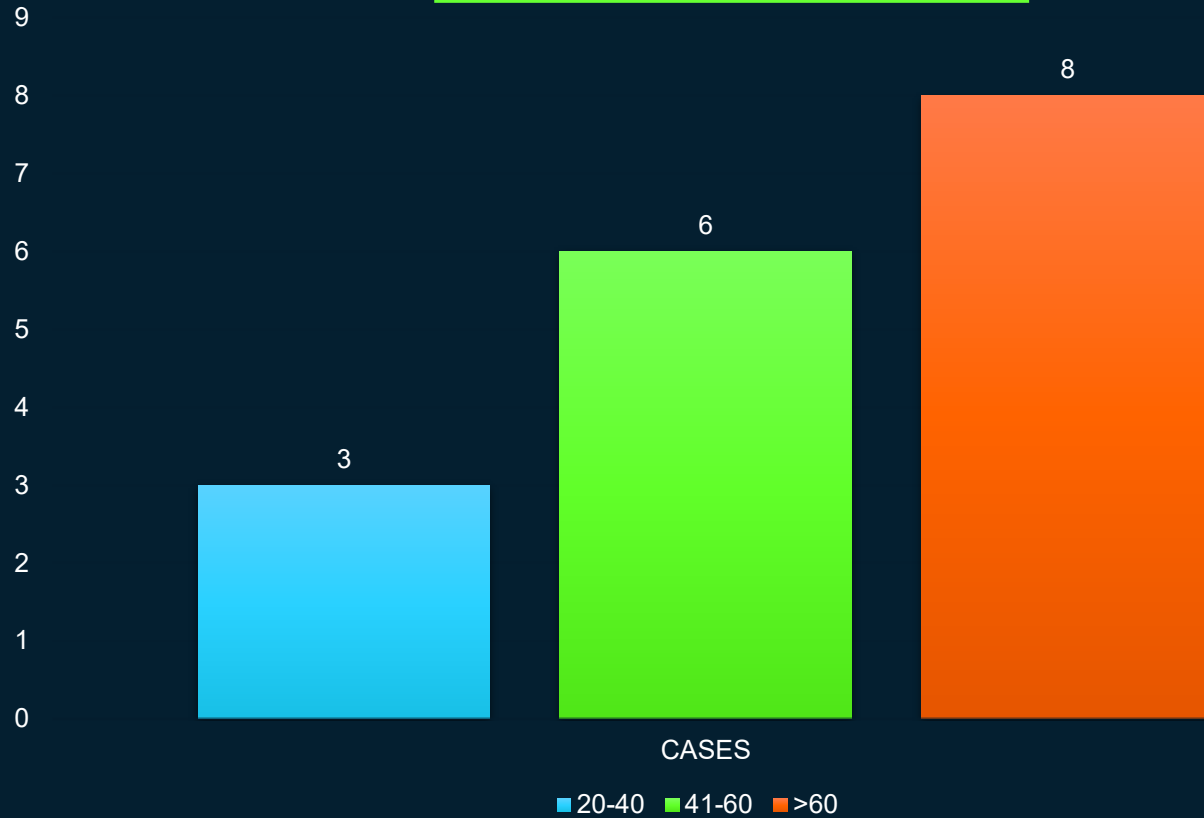
# CENTRAL LINE ASSOCIATED BLOODSTREAM INFECTION

(CLABSI)

## GENDER WISE DISTIBUTION



## AGE WISE DISTRIBUTION

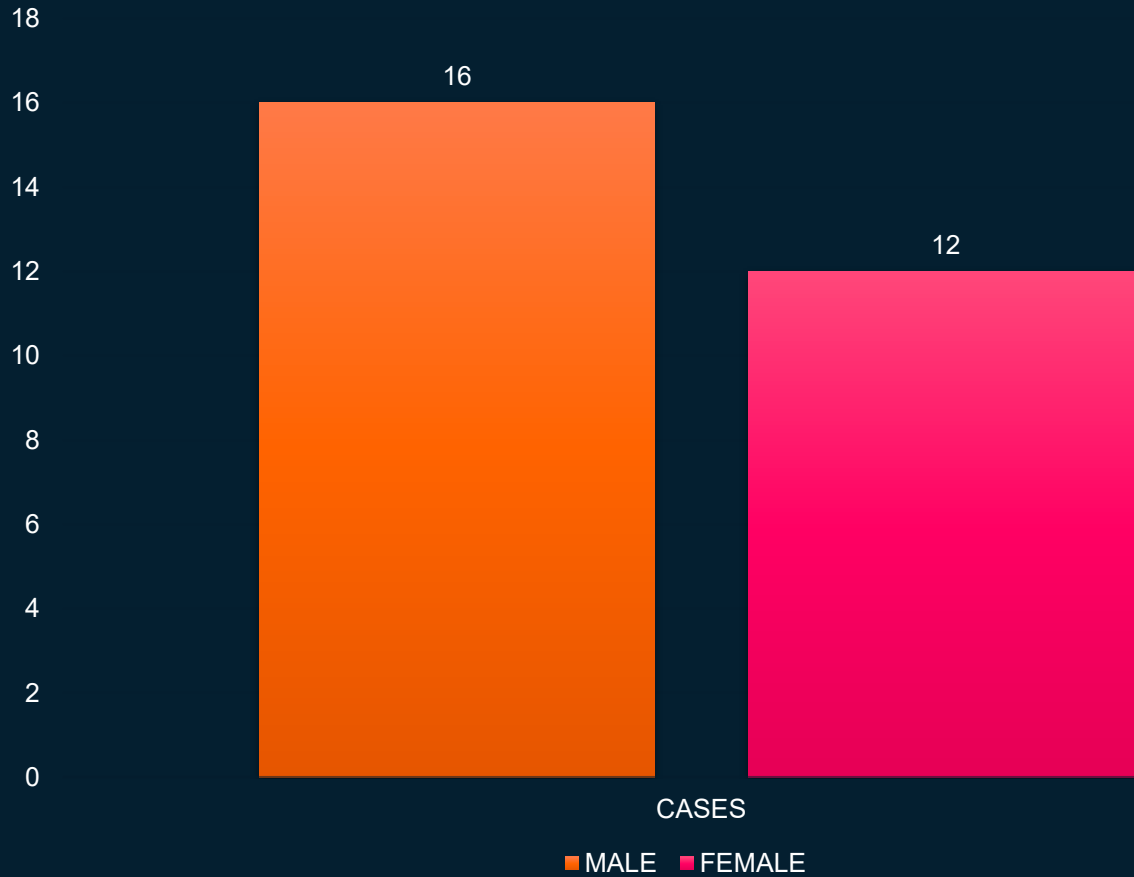




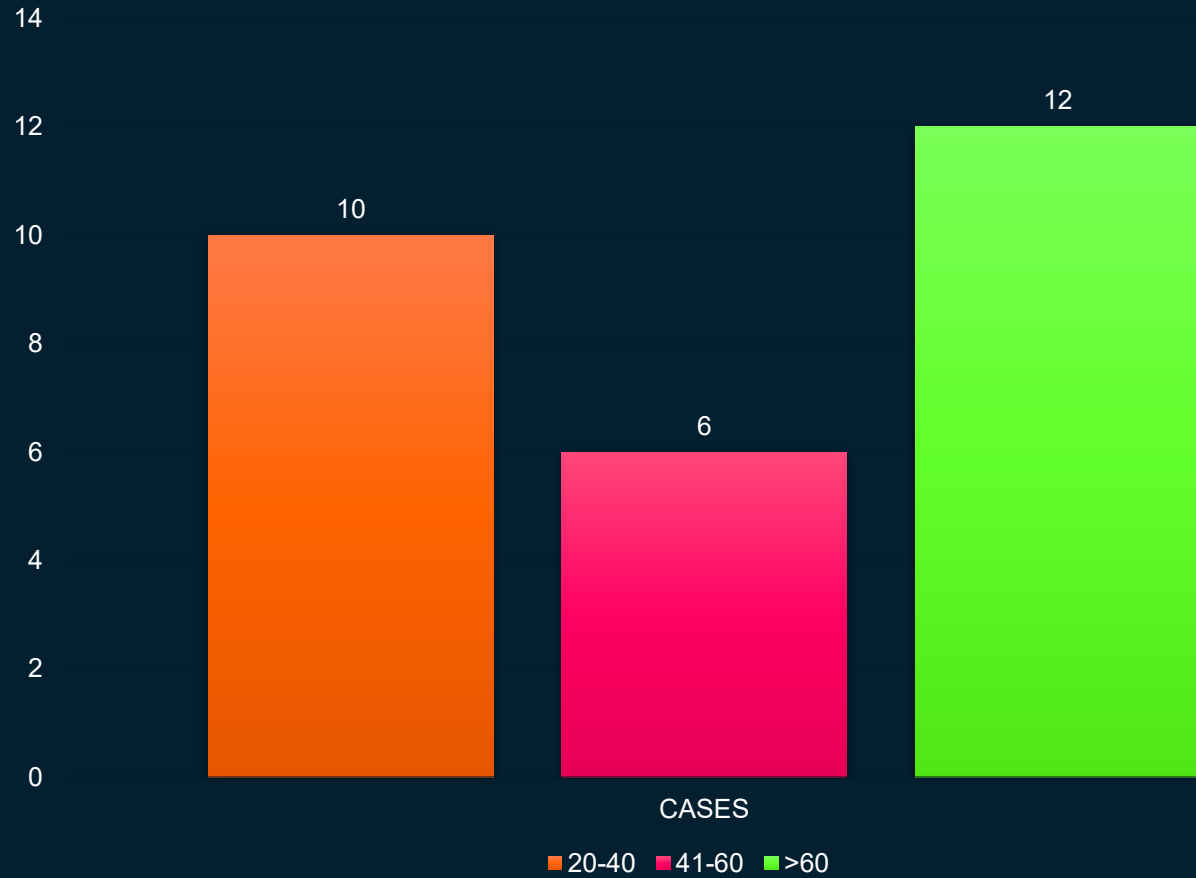
# SURGICAL SITE INFECTION

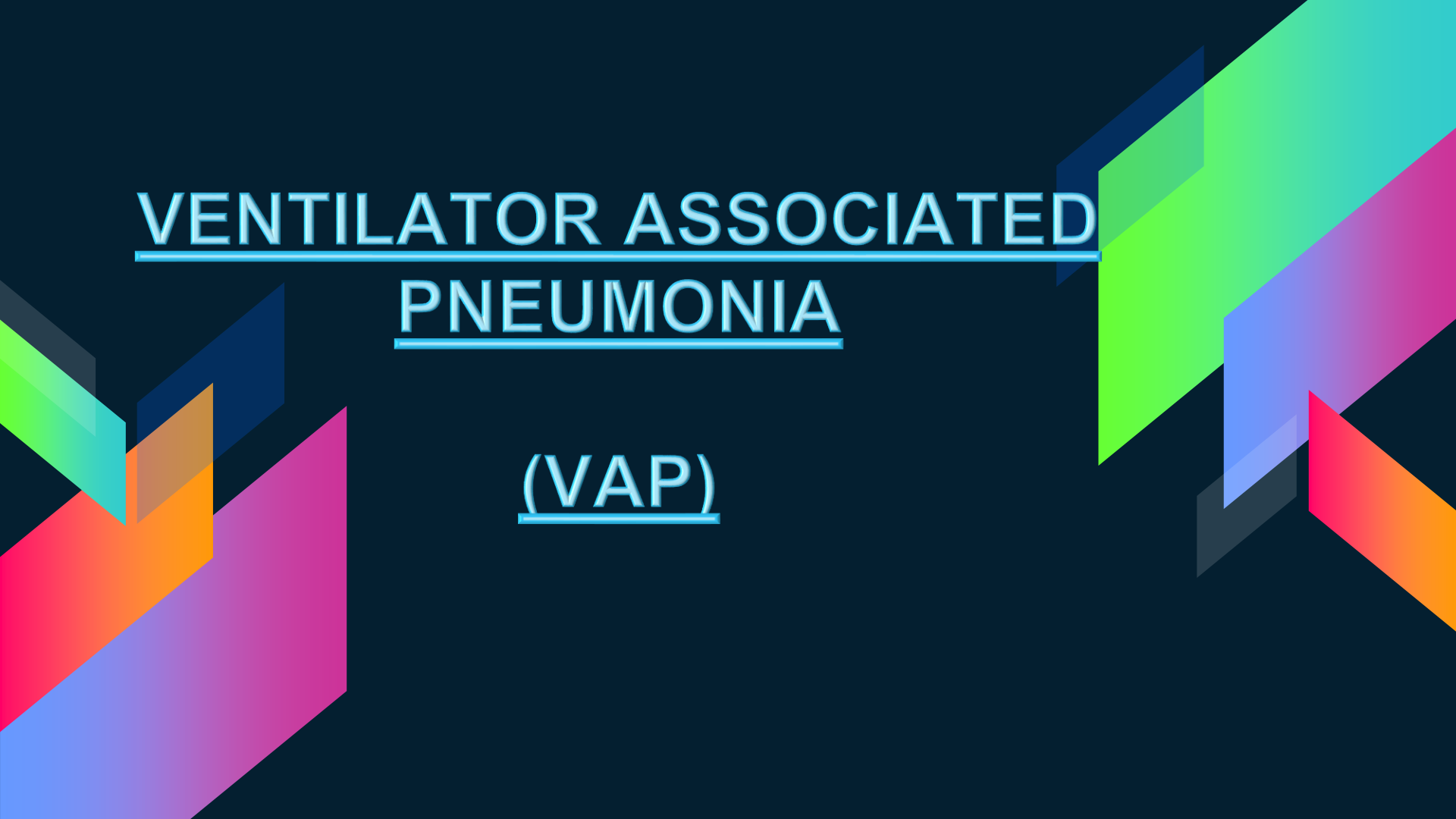
(SSI)

## GENDER WISE DISTRIBUTION



## AGE WISE DISTRIBUTION

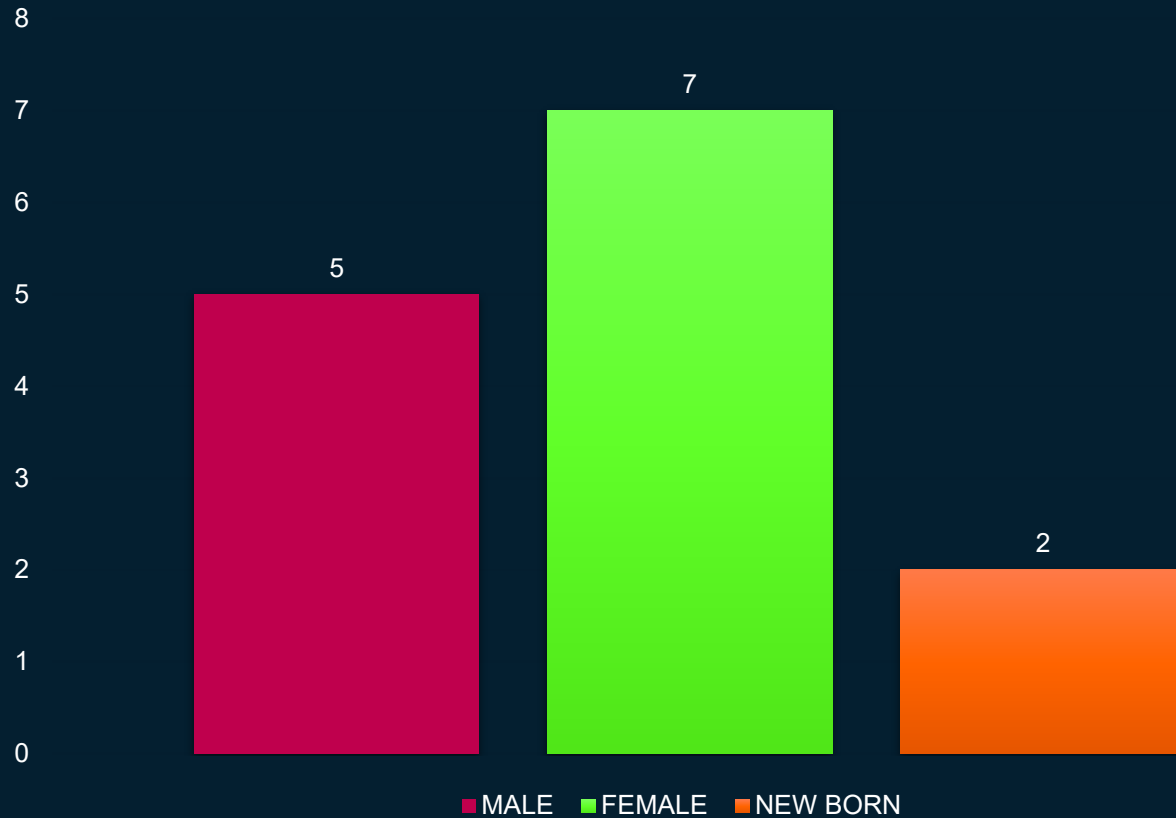


The background is a dark navy blue. It features several large, overlapping, semi-transparent geometric shapes in various colors: bright green, cyan, magenta, orange, and light blue. These shapes are arranged in a way that creates a sense of depth and movement, with some appearing to be layered on top of others. The overall aesthetic is modern and graphic.

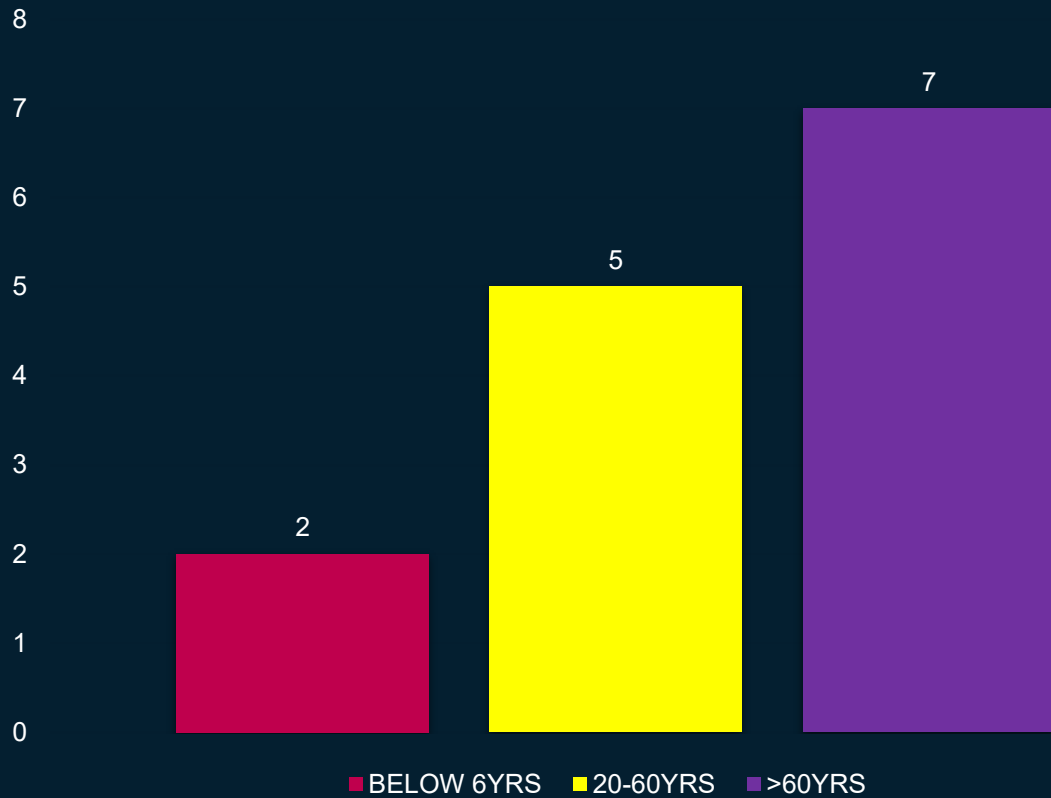
# VENTILATOR ASSOCIATED PNEUMONIA

(VAP)

## GENDER WISE VAP

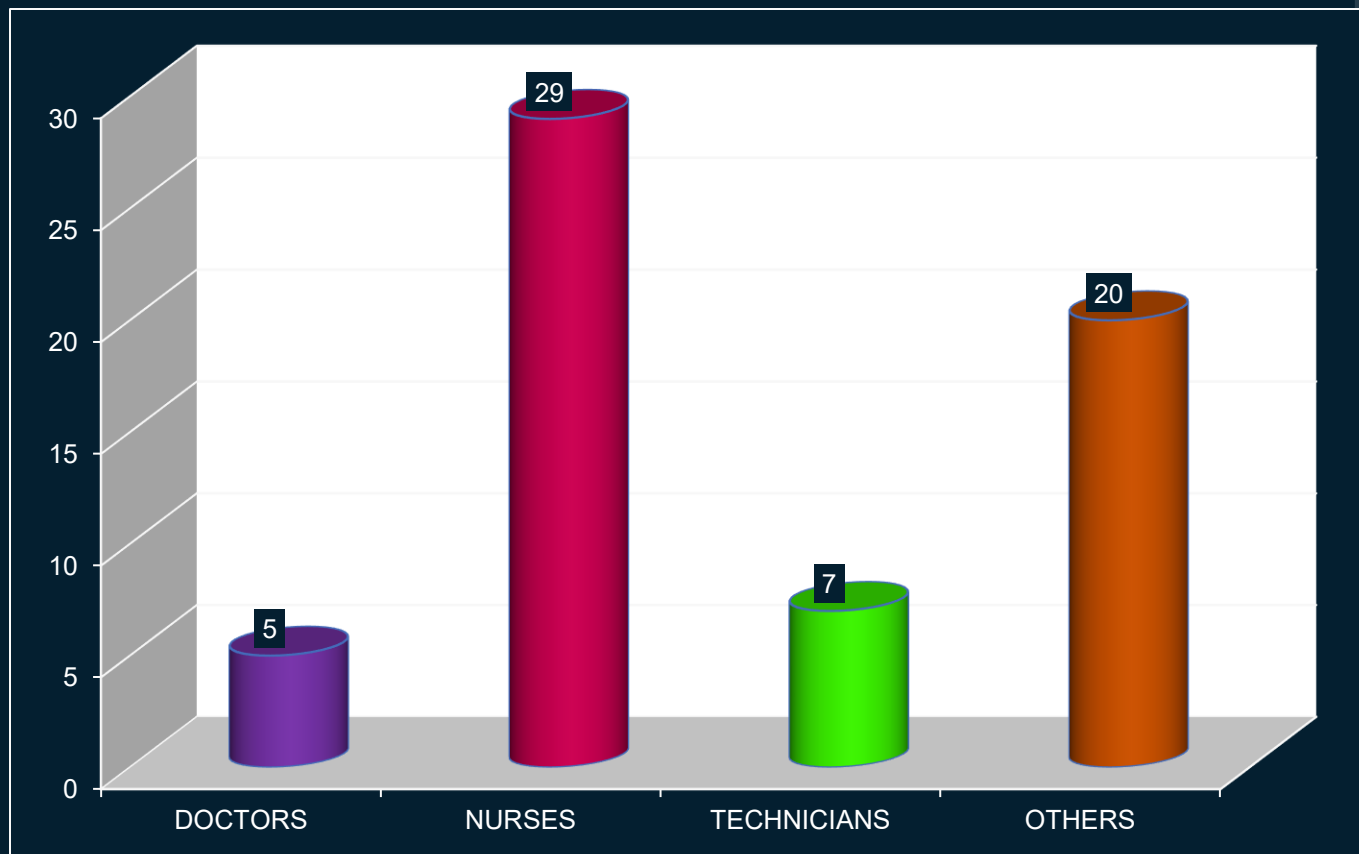


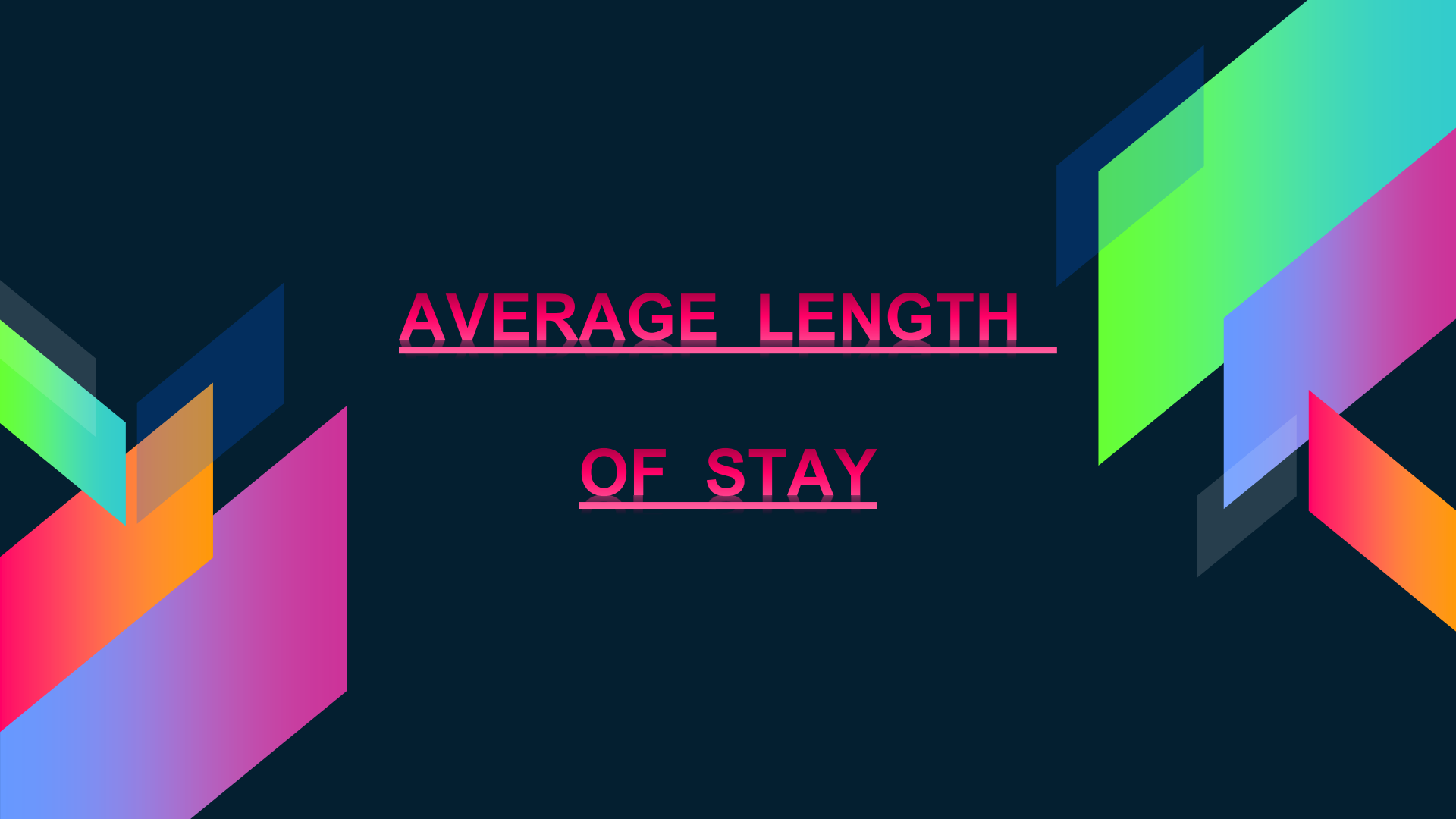
## AGE WISE VAP DISTRIBUTION



The background is a dark navy blue. It features several large, overlapping, semi-transparent geometric shapes in various colors: bright green, cyan, magenta, orange, and light blue. These shapes are arranged in a way that creates a sense of depth and movement, with some appearing to be layered on top of others. The overall aesthetic is modern and graphic.

# NEEDLE STICK INJURIES



The background is a dark navy blue. It features several large, overlapping, semi-transparent geometric shapes in various colors: bright green, cyan, magenta, orange, and light blue. These shapes are arranged in a way that creates a sense of depth and movement, with some appearing to be layered on top of others. The overall aesthetic is modern and graphic.

AVERAGE LENGTH

OF STAY

| <b>HAI</b>                | <b>Total ALOS<br/>(IN DAYS)</b> | <b>Total ALOS after infection<br/>(IN DAYS)</b> |
|---------------------------|---------------------------------|-------------------------------------------------|
| <b>CAUTI</b>              | <b>17.4</b>                     | <b>6.8</b>                                      |
| <b>CLABSI</b>             | <b>19.3</b>                     | <b>14.7</b>                                     |
| <b>VAP</b>                | <b>44.17</b>                    | <b>29.7</b>                                     |
| <b>Multiple Infection</b> | <b>30.4</b>                     | <b>17.9</b>                                     |

The background features several overlapping, three-dimensional geometric shapes in various colors including cyan, magenta, orange, and blue. These shapes are arranged in a way that creates a sense of depth and movement, with some appearing to recede into the background and others coming forward.

# HAI MORTALITY RATE

➤ Number Of Deaths In 2025 Due To HAI= 07

➤ Main Cause- Either Septic Shock or Sepsis

### ❖ Mortality Rate

Number of death/ total number of HAI in a year\*100

$$= 7/90 * 100 = 7.77\%$$

Abstract geometric shapes in the top left corner, including a green triangle, a blue parallelogram, and a pink parallelogram.

ECONOMIC

IMPACT OF

HAI

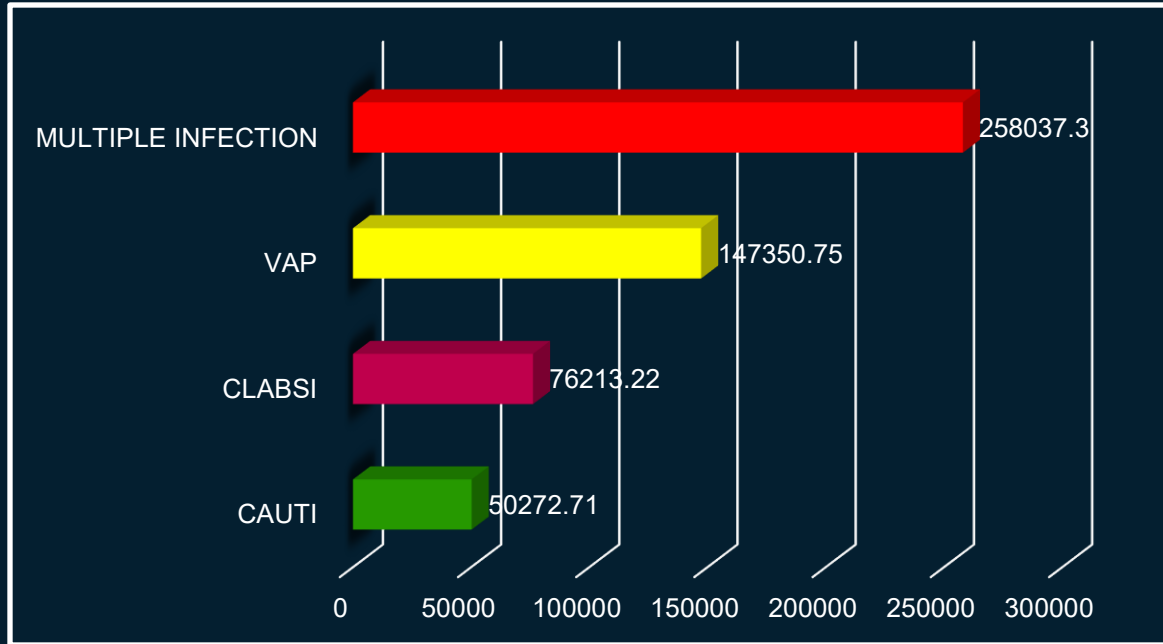
Abstract geometric shapes in the bottom right corner, including a green triangle, a blue parallelogram, and a pink parallelogram.

- 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

- cost of antibiotic administered to the patient,
- Room rent,
- Nursing charges,
- Consultancy of doctor,
- Investigation charges and
- Some consumables.

We identified average cost incurred by patient of CAUTI, CLABSI, VAP and Multiple infections



❖As per the cost and ALOS after infection , the extra cost incurred by CAUTI was 50272.71 rupees, by CLABSI was 76,213.22 rupees, by VAP it was 1,47,350.75 rupees and for multiple infection it was 2,58,037.3 rupees.

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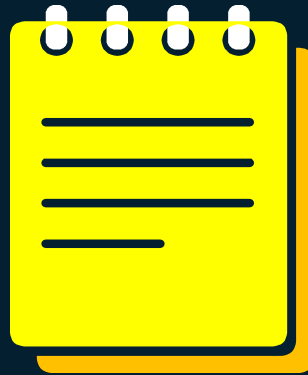
# ECONOMIC IMPACT OF HAI ON HOSPITAL

❖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 it by an appropriate ratio of cost to the charges (RCC).

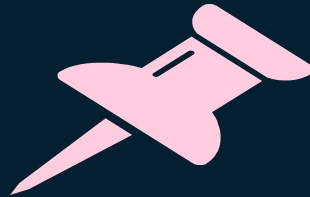
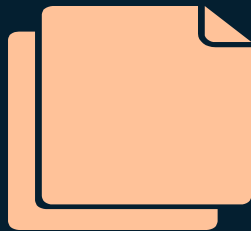
❖In SSI cases there is multiple visit of OPD for daily dressing after surgery and re-admission or re-exploration costs a huge amount which is really difficult to calculate. It also bear a huge opportunity cost because of multiple visit in hospital to the patient and their attendant.

# RECOMMENDATIONS



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1. Sanitization should be done properly.
  2. Identifying patients at risk of nosocomial infections
  3. Increase the education to hospital staff.
  4. Spreading awareness among healthcare workers.
  5. Preventing the Patients from Walking Barefoot.

# 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 in the resource allocation between primary and secondary health care by diverting scarce fund to the management of potentially preventable condition

# Thank you

