

*RELATIONSHIP BETWEEN HOSPITAL ACQUIRED INFECTION AND
INCREASE AVERAGE LENGTH OF STAY*

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Objectives:

- To understand the prevalence rate of HAI in India and Worldwide.
 - To ascertain the prolonged hospital length by patients due to HAI compare with patients without HAI.
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Hospital Acquired Infection

- According to WHO definition “an infection acquiring in a patient in a hospital or other healthcare facility in whom the infection was not present or incubating at the time of admission. This includes infections acquired in the hospital but appearing after discharge and also occupational infections among staff of the facility”.
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Study Selection:

- **Inclusion Criteria:** Original Research, provide the correlation between HAI with extra LoS, done in Intensive Care Unit, adult patients age above 18 years. Patients up to 48 hours after admission in hospital.
 - **Exclusion Criteria:** Bellow 18 years of age group, who are not ICU patients, before 48 hours of hospitalized patients.
 - **Sample Size:** 24864 ICU Hospital Acquired Infection patients, above 18 years.
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HAI Types & Most Common Pathogens

1. Central Line-associated Bloodstream Infection (CLABSI):

Coagulative negative staphylococci, Enterococcus, P. aeruginosa.

2. Catheter-associated Urinary Tract Infections (CAUTI):

E.coli, klebisella, Enterococcus, P. mirabilis, P. aeruginosa.

3. Ventilator-associated Pneumonia (VAP)-

S.aureus, P. aeruginosa. Enterobacteriaceae. H. influenza, S. Pneumonia, MRSA, Extended spectrum beta-lactamase (ESBL)-producing Enterobacteriaceae, A. baumannii.

4. Surgical Site Infection, (SSI)-

S.Aureus, S.epidermis, Enterococcus, E.Coli, P. Aeruginosa.

Impact of HAI:

■ Direct Hospital Costs

- Excess hospital stay
- Extra medication
- Added health professional time

■ Indirect costs

- Decrease productivity on the job
- Increase morbidity
- Increased death risk
- Family/friends opportunity-cost visiting and assisting.

■ Intangible cost

- Economic anxiety
- Physical pain and suffering
- Social stigmatization

Source: Haddix et al. (1996)



Magnitude of the Healthcare Associated Infections:

Its a world-wide problem.

Low and middle income country has more burdens then the higher income countries.



According to a WHO, systematic literature review the entire prevalence rate of HAI in high income countries 5.1%-11.6%, and low income countries reported between 5%-19%.

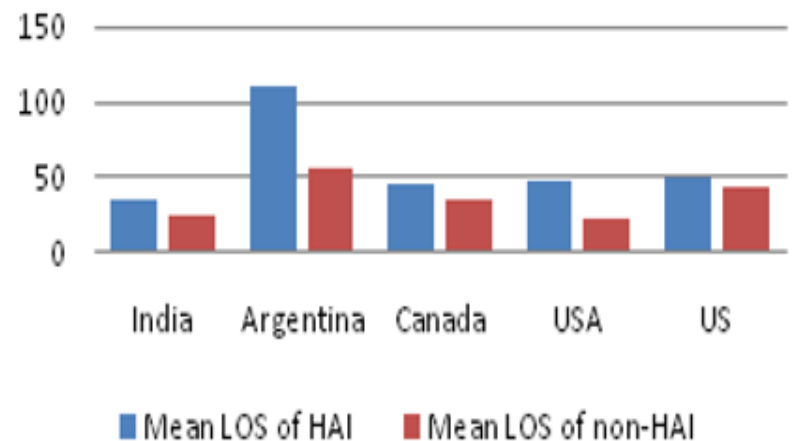
Situation of India

- The overall rate of HAI is 4.5% and 9.1%
- Based on a INICC report of device associated nosocomial infection in Intensive Care Unit (ICU) from 7 cities in India, the HAI rates are: VAP was 28.61% of whole HAIs, CAUTI was 9.0% of entire HAIs.
- The extra mortality rate among CAUTI patients are 11.6%. 18.61% of VAP, and 4% of CLABSI.
- In addition to extra length of stay for CAUTI are 8 days, VAP are 11 days, and CLABSI are 5 days.
- the most common type of HAI in India was UTI (71%), CLABSI (19%), VAP (8%), and SSI (2%)
- CLABSI was the most common reason of death.

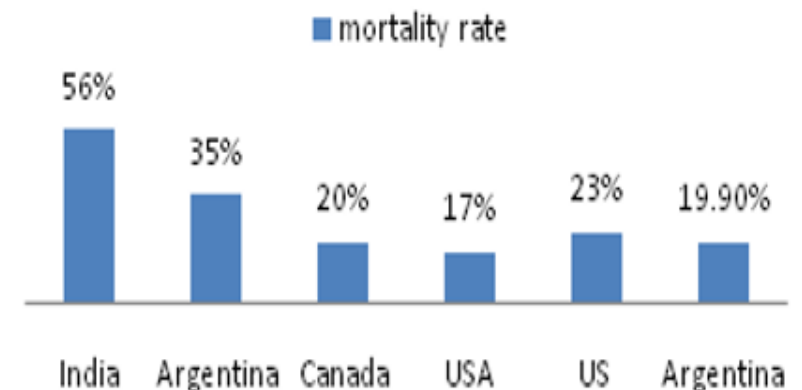
CLABSI associated LOS

- The graph shows the extra Length of Stay (LOS) and extra mortality rate respectively among the patients who are acquired at least one infection and the patients without infection.
- Most of the time patients who are terminally ill required central venous access for the admission of fluid, medicines, blood product and for that they are highly susceptible to evolve bloodstream infection.

CLABSI associate LOS



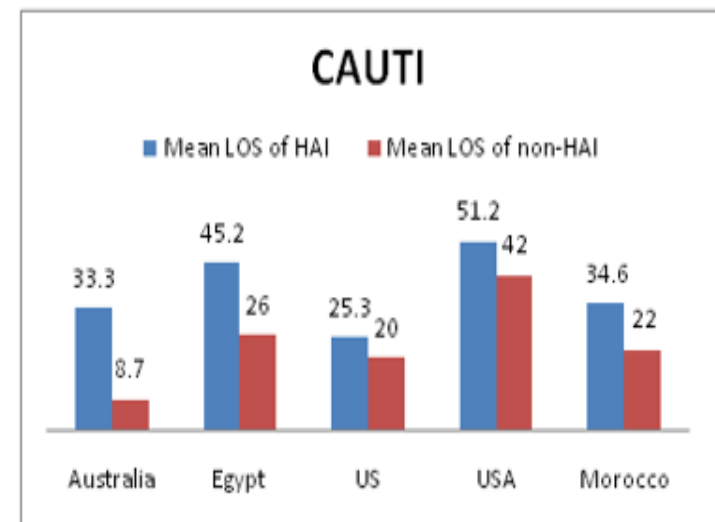
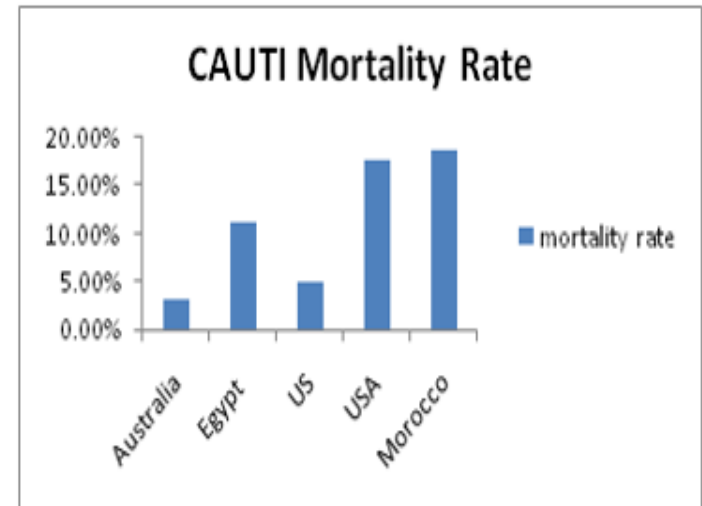
CLABSI extra mortality rate



CAUTI associated LOS

These two graph shows the extra Length of Stay (LOS) and extra mortality rate respectively among the patients who are acquired at least one infection and the patients without infection.

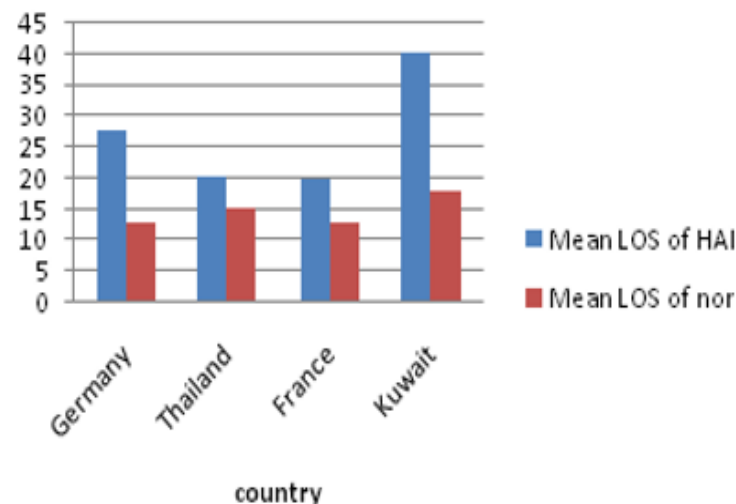
The most familiar nosocomial infection is urinary tract infection. In all 1.7% patients who were hospitalized more than two days acquired CAUTI. Female and elderly patients were greater risk of acquiring a CAUTI.



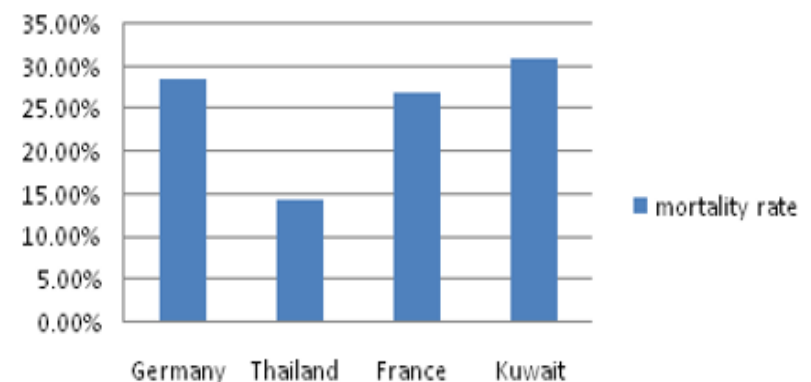
VAP associated LOS

These two graphs show the long hospital stay (LOS) and death rate respectively among the patients who are acquired at least one infection (ventilator acquired infection) and the patients without infection. Ventilator-associated pneumonias (VAPs) are a universal issue that make patient morbidity, death, and hospital days or LOS remarkably high.

Ventilator-associate Infection

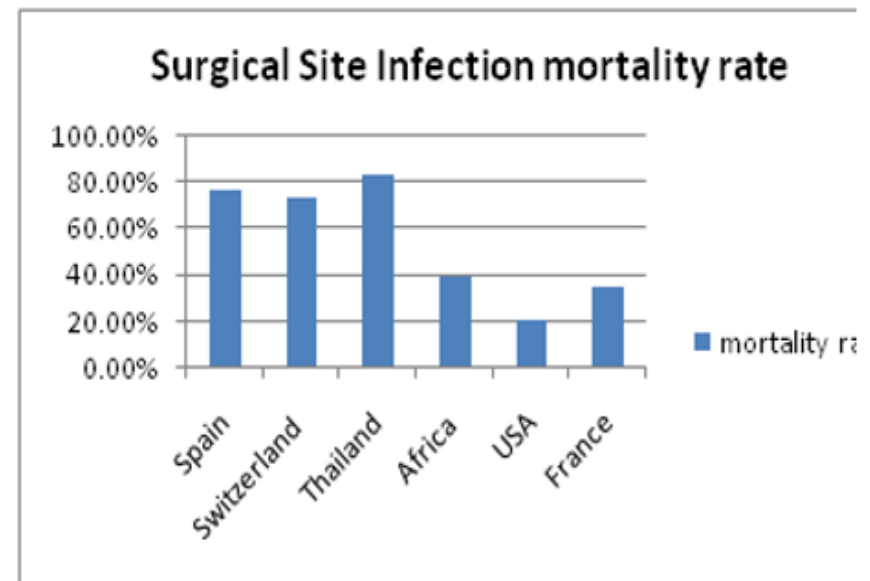
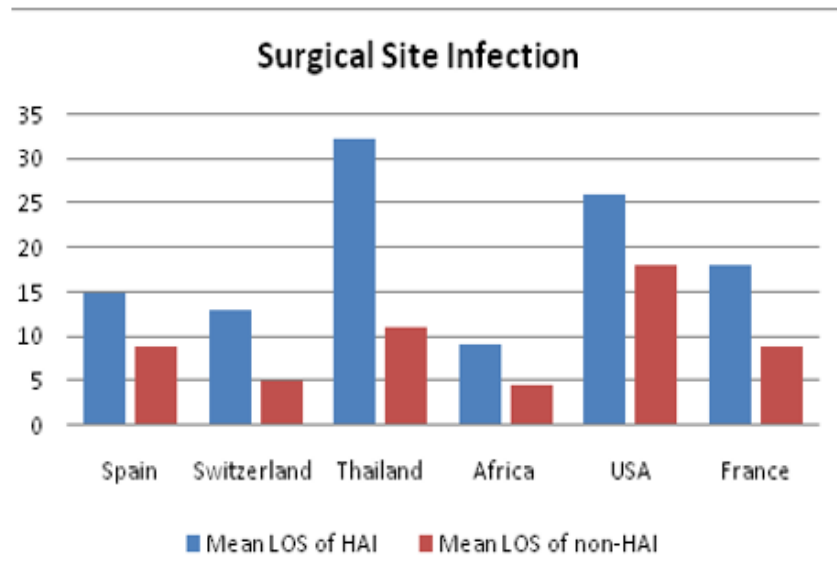


ventilator-Associated Infection Extra Mortality Rate



SSI associated LOS

- These two graphs show the extra Length of Stay (LOS) and extra mortality rate respectively among the patients who are acquired at least one hospital infection (surgical site infection) and the patients without infection. Surgical Site Infection is the common threat of surgical patients. 5% of all patients who undergo surgery will experience the SSI.



Discussion

HAI is a worldwide issue and still no country can be ascertain for solving this issue. Based on WHO report 5.9% -13.5% patients are affected by HAI.

In study D.Tarara (2015) in tertiary hospital in Argentina per HAI patients paid extra \$40000.

In Canada tertiary hospital G.B. Gregson (2018) HAI patients paid extra \$8513.

USA Teaching hospital (Lena, 2020) (extra \$59741), study by Wasim Quadir, 2017 (extra \$11971).

Evelyn Shaw (2018) study done on Spain HAI patients paid extra US\$392,

Edin Mujagic (2018) on Switzerland, HAI patients paid extra US\$142.

Not only direct cost patients also lost the productivity cost, increase mental anxiety, morbidity and mortality. And also some time reduce the quality of life.



Conclusion

- Excess LOS approximated 5 days credited to Nosocomial infection in the ICU. The economic burden also increases 2-4 times to the patients with HAI.
 - An extend hospital stay of HAI patients in ICU is dependent on the diversity according to disease severity, patients age, time period, number and type of infections.
 - The avoidance of HAI needs to be a global attitude.
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Recommendation

The prevention of HAI requires a comprehensive approach. **Infection control program in the health facilities is the only way** to prevent the HAI, the following specific strategies for HAI control program in the health facilities of India:

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1. **Compliance with the guidelines:** The guidelines are on appropriate hand hygiene use, antibiotic use and specific medical procedures on appropriate ventilatory care, gastrointestinal care, oropharyngeal care and urinary catheter care.
 2. **Education of Health Care Worker**

Thank You

