

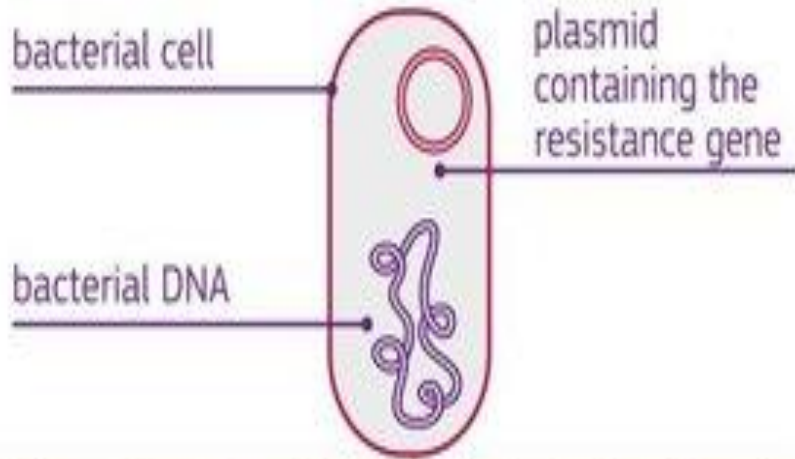
# Medical Microbiology

**Horizontal and Vertical Gene Transfer**  
**Antigenic Shift and Drift**  
**Nosocomial Infections**



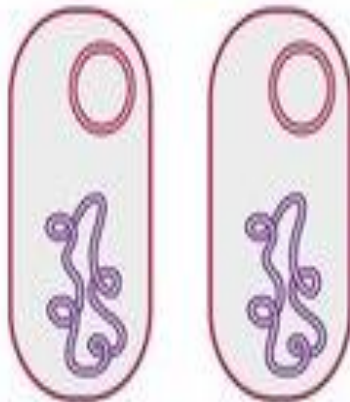
*Dr. Dharmesh Harwani*  
**Department of Microbiology**

## A: Vertical Transmission

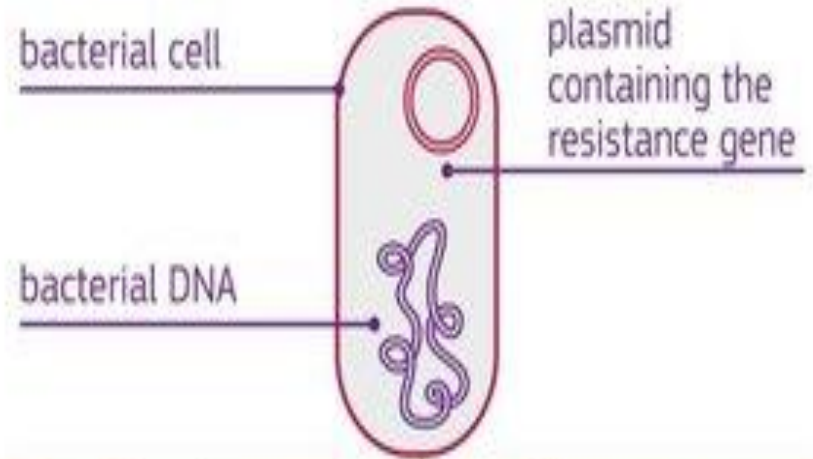


Plasmid transferred during replication to daughter cells

*Daughter cells*

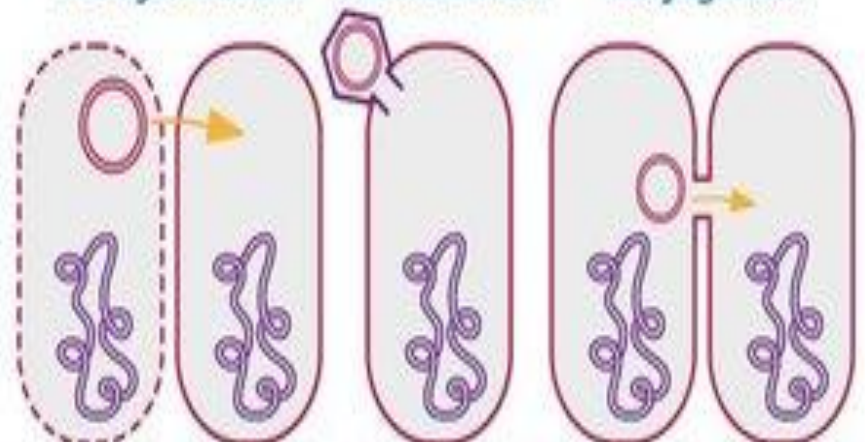


## B: Horizontal Transmission



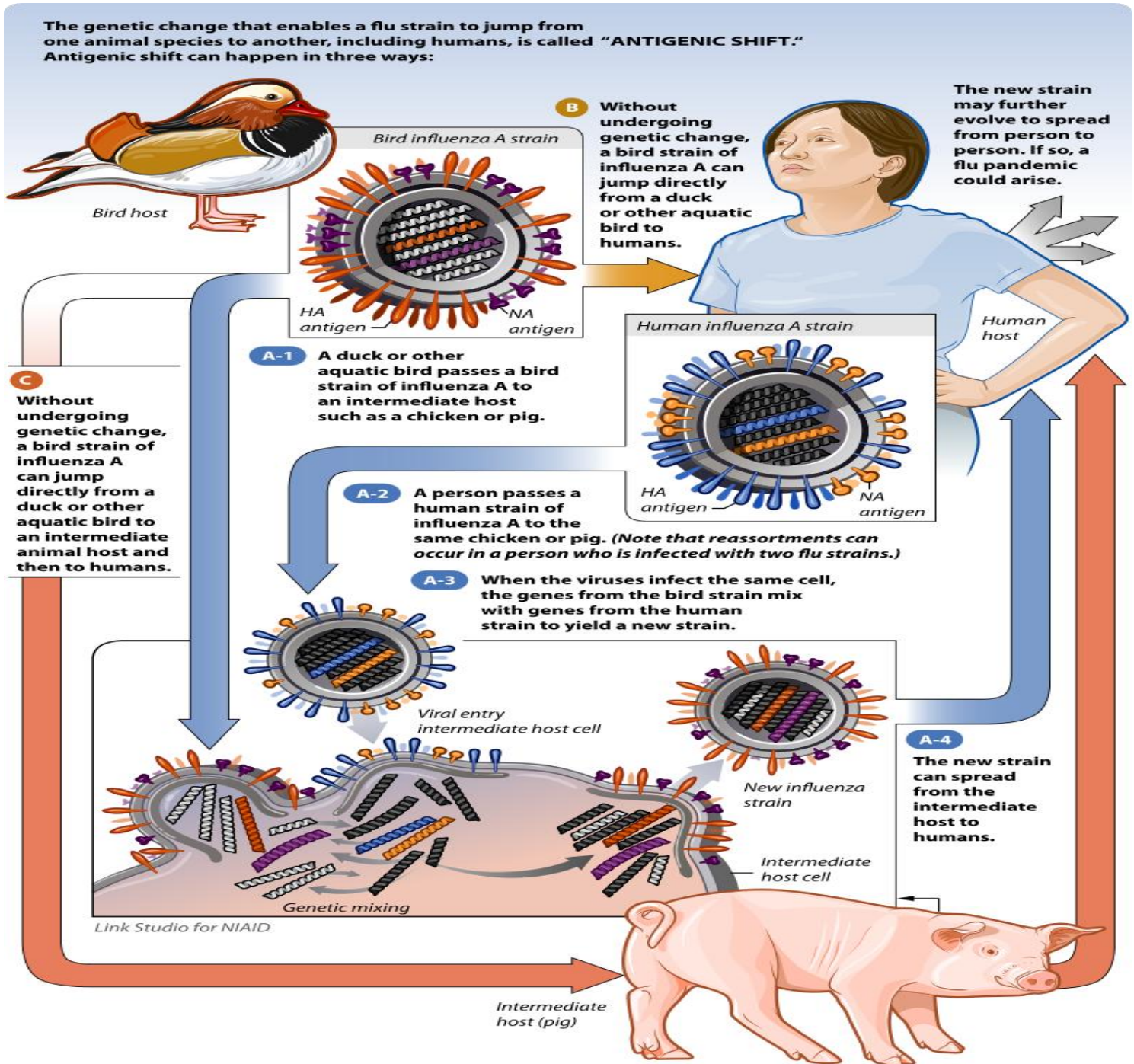
Plasmid transferring to other bacteria of the same generation

*Transformation Transduction Conjugation*

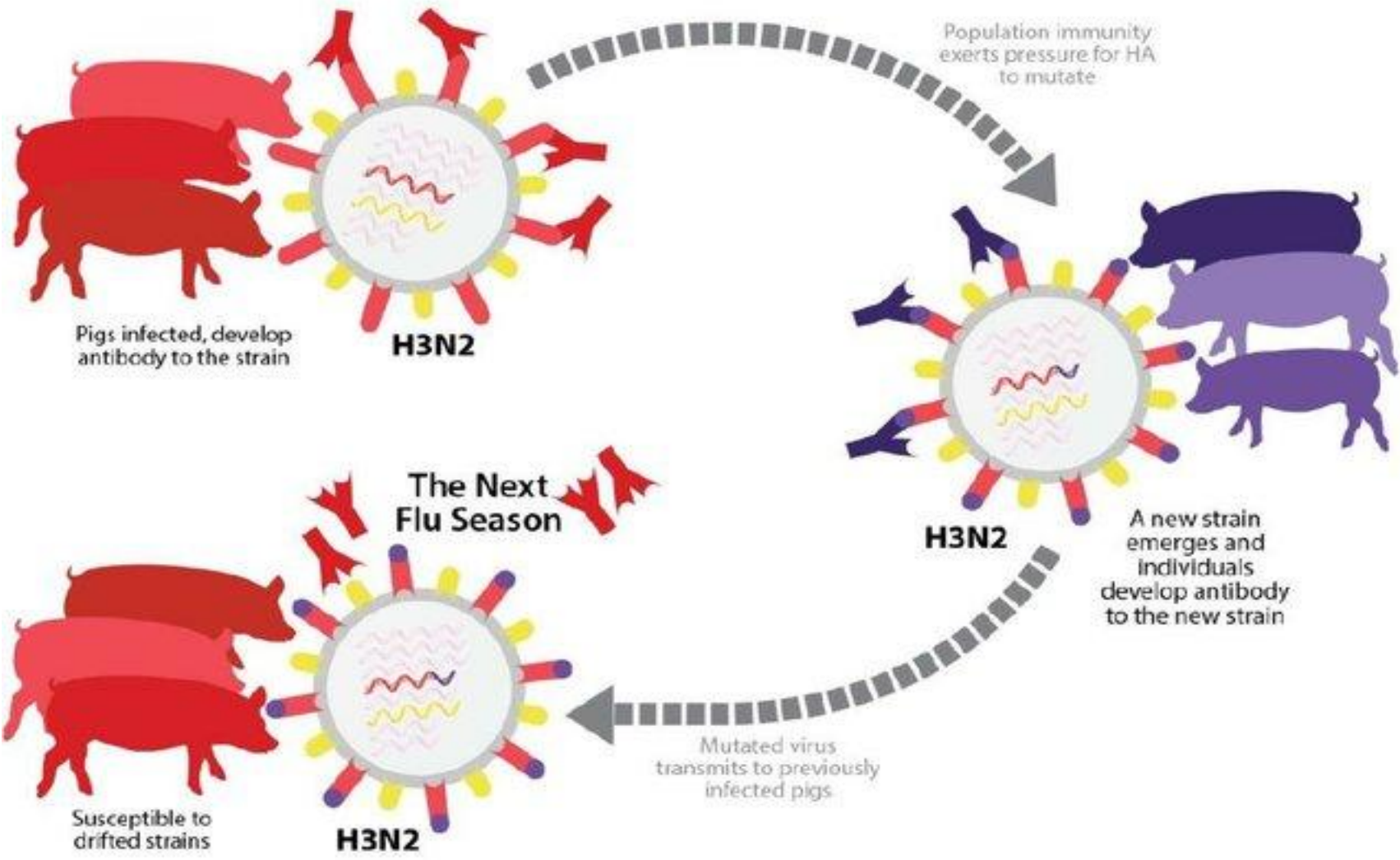


# Antigenic Shift

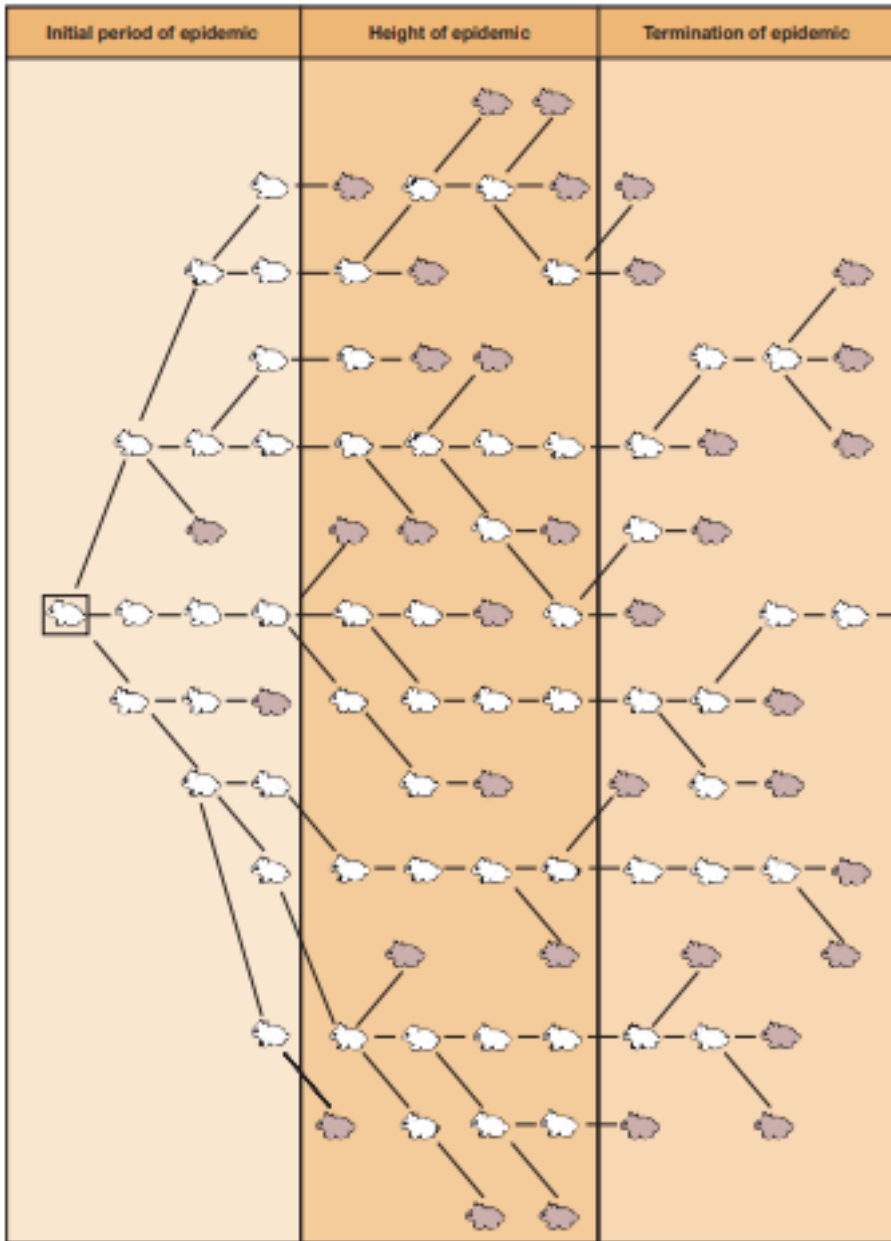
# Antigenic shift occurs only in influenza A





# Antigenic Drift

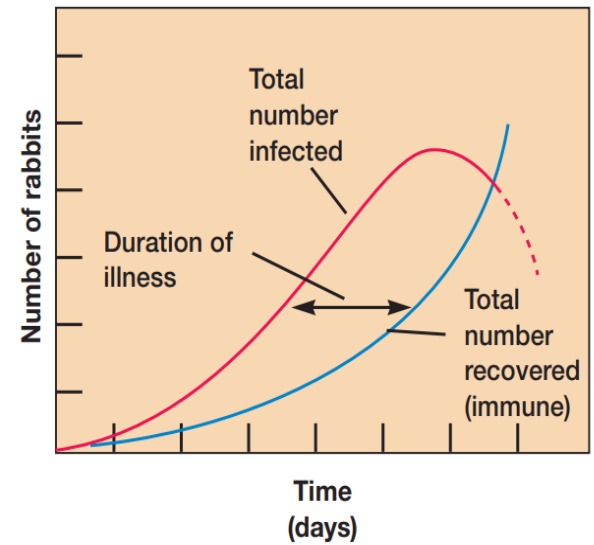


# Herd Immunity



 Infected rabbit who infects others

 Infected rabbit who is immune and fails to infect others



## DIFFERENCE BETWEEN EPIDEMIC AND PANDEMIC



### EPIDEMIC

- An epidemic is an outbreak of disease that affects many in a population and begins to spread rapidly.
- An outbreak of disease is considered an epidemic if it affects a certain number of people within a short period of time, typically within 2 weeks.



### PANDEMIC

- Pandemic is a larger epidemic. A pandemic covers several countries or spreads from one continent to another.
- In pandemic outbreaks, the number of people affected or killed doesn't matter as much as the rate of spread and how far it has spread.

# Nosocomial infections

[Greek *nosos*, disease, and *komeion*, to take care of]

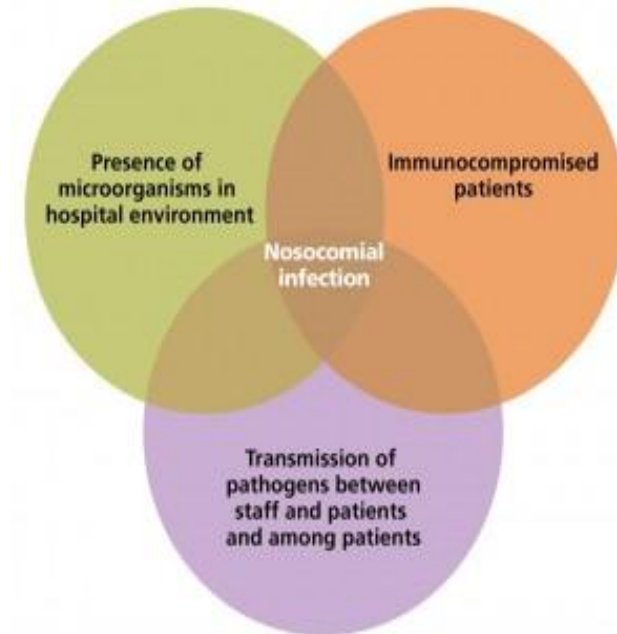
Infections that are incubating when patients are admitted to a hospital are not nosocomial; they are community acquired

approximately 40 million people are admitted to hospitals annually, about 2 to 4 million people may develop an infection they did not have upon entering the hospital

The nosocomial pathogens that cause diseases come from either endogenous or exogenous sources

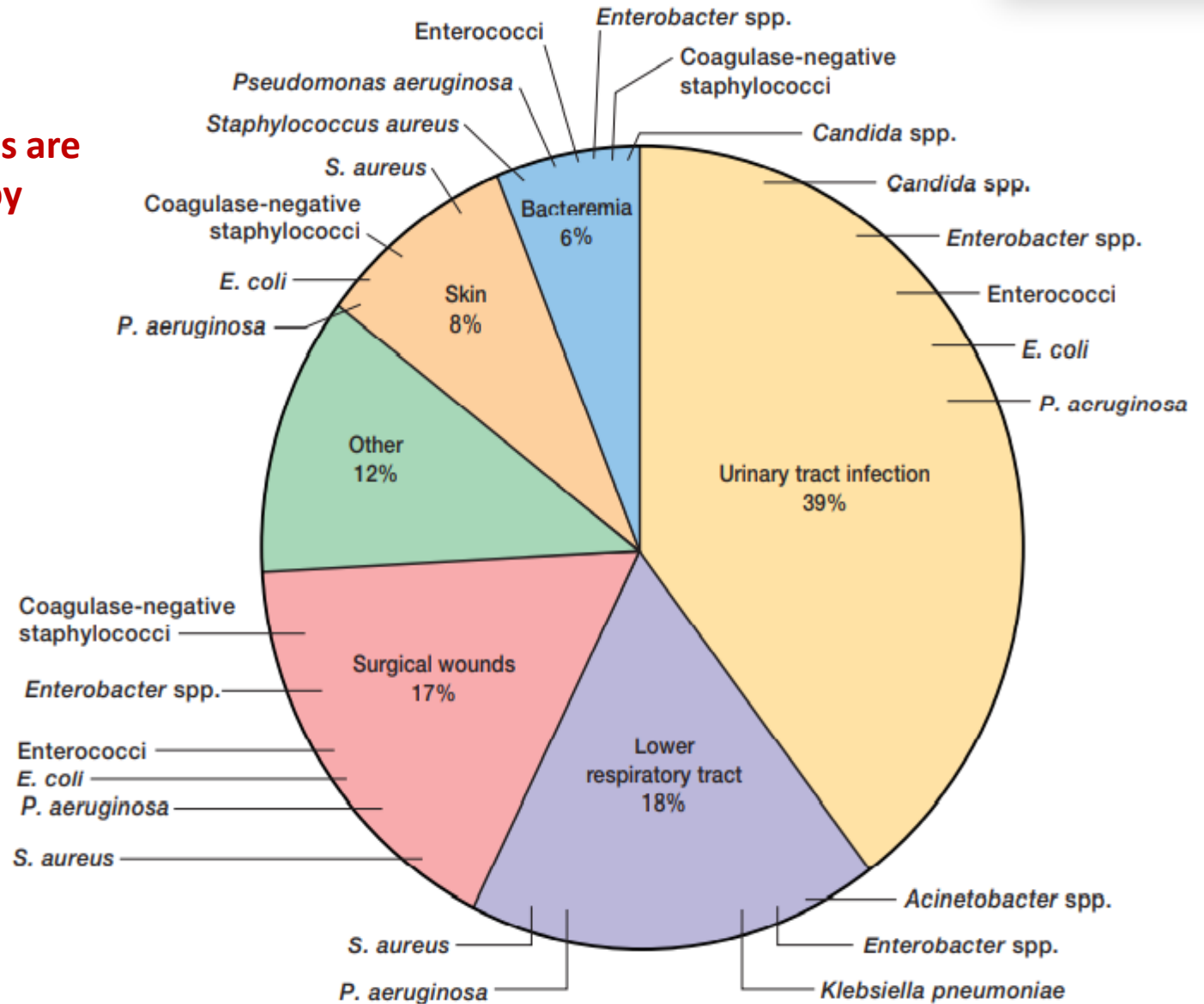
Animate sources are the hospital staff, other patients, and visitors. Inanimate exogenous sources are food, urinary catheters, intravenous and respiratory therapy equipment, and water systems

Over 20,000 direct and 60,000 indirect deaths annually



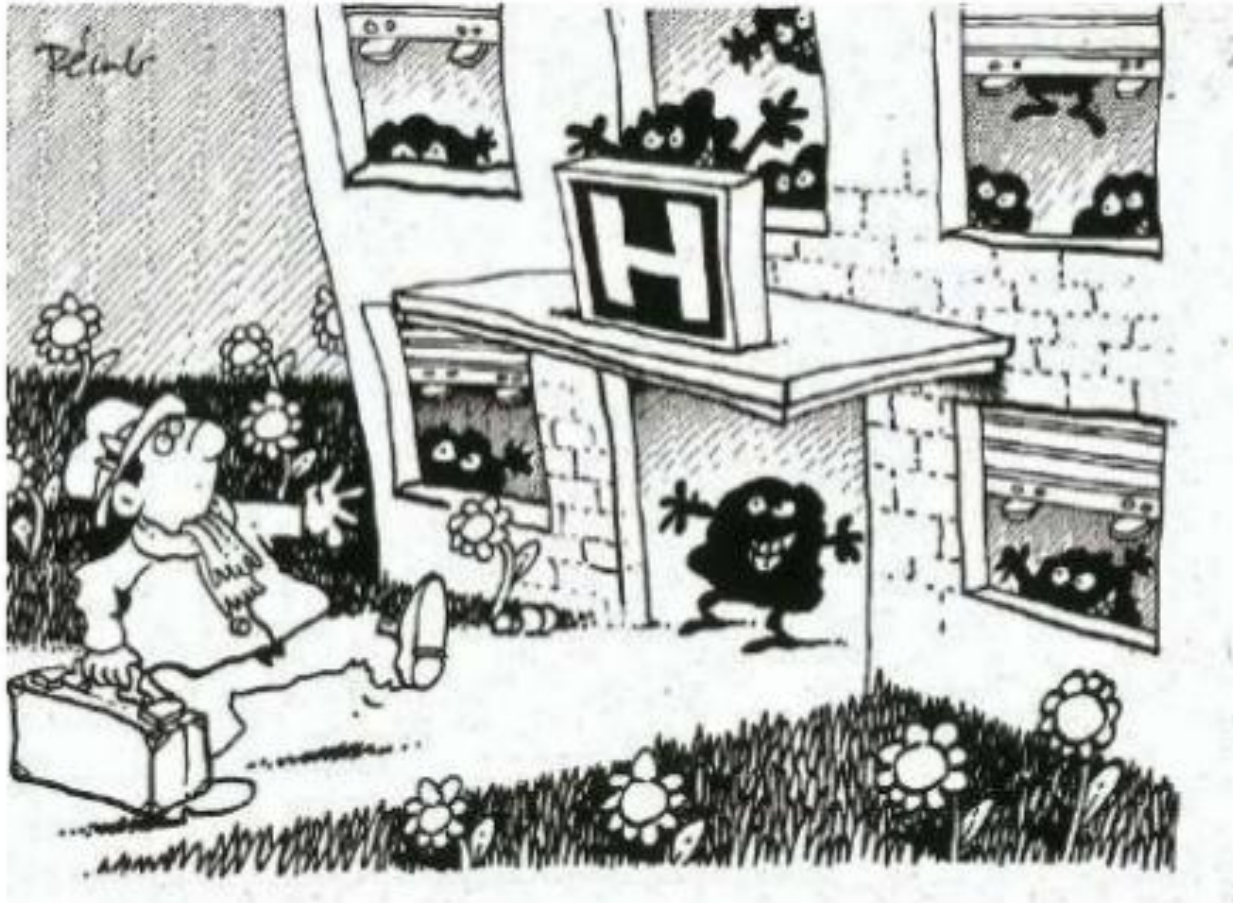
# Nosocomial Infections

Nosocomial diseases are usually caused by bacteria



Relative frequency by body site

# Nosocomial infections or Hospital acquired infections



Welcome to the  
hospital!  
Bugs are waiting  
for you!!!