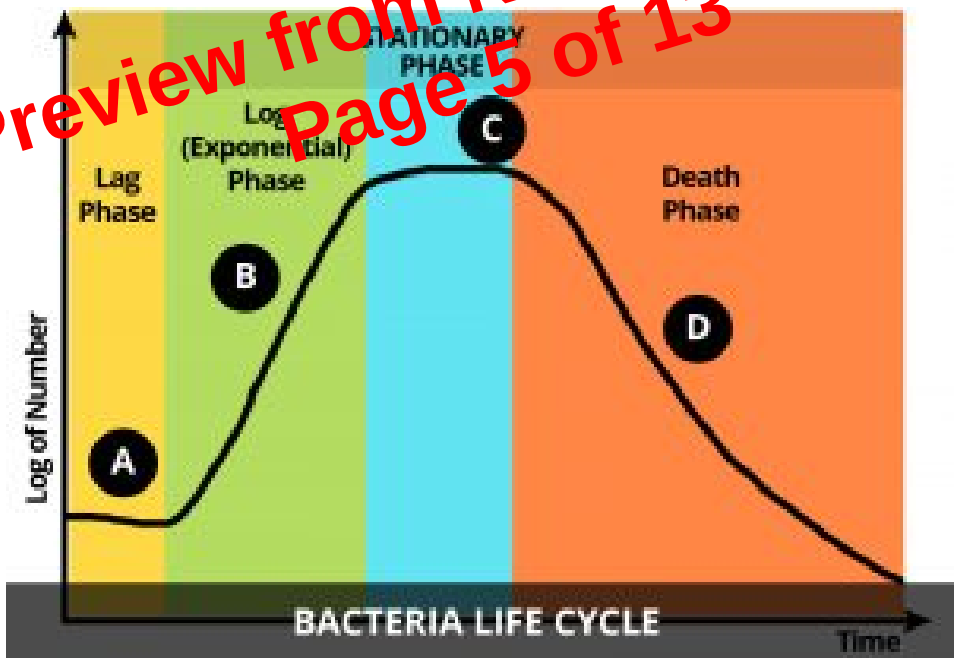
Phases of Bacterial Growth

The life cycle of bacteria under optimal growth conditions consists of four phases: **lag**, **log**, **stationary**, and **death**.

- **The Lag Phase**: – In this phase, bacteria do not grow. They understand their environment and try to adjust and metabolize. During this phase, they produce amino acids and vitamins which are required for division. Duration of this phase depends on the availability of nutrients. If enough nutrients are available, the duration will be short and if not then this phase will take time. Bacteria also make copies of DNA during this stage.
- **The Log Phase (Exponential Phase):** – In this Phase, bacteria get multiplied very rapidly. If provided favorable conditions then they can get doubled in approximately 15 minutes but if conditions are not suitable then this stage can take time. The time taken by bacteria to get doubled is known as 'generation time'. The process through which bacteria gets multiplied is known as binary fission.
- **The Stationary Phase:** – This phase is known as the phase of decline in bacteria growth. This decline depends on growth-inhibiting factors. Growth and death rates are equal in the stationary phase.
- **The Death Phase: –** As the name implies, it is the last stage. In this phase, bacteria lose the ability to reproduce.



Infections and diseases caused by bacteria

Bacteria can be strictly pathogenic, which means that they will cause disease if they manage to overwhelm the human immune system.

Many bacterial pathogens can spread via water and food, including Salmonella, Campylobacter and E. coli. Sometimes bacteria are transmitted directly or indirectly from animals to humans and cause disease. Such infections are called zoonotic infections. Other bacteria like Neisseria gonorrhea and Chlamydia trachomatis spread via sexual contacts.

Most Deadly Bacterial Infections

- Tuberculosis
- Anthrax
- Tetanus
- Leptospirosis
- Pneumonia
- Cholera
- Botulism
- Pseudomonas Infection
- MRSA Infection
- E.Coli Infection
- Meningitis
- Gonorrhea
- Bubonic Plague
- Syphilis

Sepsis

One in five people worldwide die of sepsis, which occurs when bacteria enter the blood and rapidly grow, triggering an inflammatory response cascade that causes septic shock, organ failure, and, if not treated quickly enough, death. In 40 per cent of cases, the type of bacteria causing the infection isn't identified in time, making it difficult to treat and causing the cascade of bodily responses that can become fatal.

Tuberculosis (TB)

TB is a lower respiratory tract infection caused by Mycobacterium tuberculosis, which infects the lungs. It remains a major killer because of a rise in drug-resistant strains. The vaccine against TB is one of the most widely used worldwide.