Mycobacterium tuberculosis:
• Primary and post primary infection
  • Primary
    o bacteria settle into lungs and grow
    o in low resistance individuals, acute pulmonary infection, destruction of lung tissue, spread of infection and death.

Mycobacterium leprae (Leprosy)
• can cause folded, bulblike lesions, especially on the face
• poor prognoses for multibacillary form

*IMPORTANT*
• Gram-positive organisms can cause a wide range of infections of varying severity
  • Infections include:
    o Tuberculosis
    o MRSA
    o Leprosy
    o Pneumonia
    o Scarlet fever

Morphology:
This is the study of form in bacteria
This includes:
• Shape
• Size
• Cell structure
• Motility
• Spore formation
• Capsule formation
• Toxin production

Gram-negative Bacteria:
Salmonella:
• Salmonella causes salmonellosis which causes vomiting and diarrhoea
• Found in the GI tract of birds and animals
• Rod shaped bacteria, non-spore forming!
• Predominantly motile Enterobacteriaceae
• Have a flagella which grades in all directions
• Many infections are due to the ingestion of contaminated food
• Can be passed from non-human to human (zoonotic)
- Skin
- Oral cavity
- Respiratory tract
- Intestinal tract
- Urogenital tract

Skin:
- Most organisms are associated with the sweat glands
- Most gram-negative bacteria continuously inoculate skin, can't multiply and usually die
- Most gram-positive bacteria (staphylococci) are anaerobic and aerobic

Oral cavity:
- Colonisation:
  - Streptococcus sanguis
  - Streptococcus sobrinus
  - Streptococcus mutans
  - Streptococcus mitis
- Dental caries (tooth decay) occurs when plaque accumulates and acid products form. Micro-organisms penetrate the matrix.

Respiratory tract:
- Trachea, bronchi and lungs are usually sterile
- Organisms settle on walls of passages
- Usually streptococci

Urogenital tract:
- Escherichia coli
- Acidophilus (vaginal infection)

Disinfection and sterilisation:
- Sterilisation – the complete elimination or destruction of all forms of microbial life
- Disinfection – a process that eliminates many or all pathogenic microorganisms on inanimate objects, except bacterial endospores.

Factors affecting microbial killing:
- Population size – a large population takes longer to kill than a smaller one
- Population composition – microbes can vary in susceptibility
- Concentration of anti-bacterial agent – the more concentrated, the more effective
- Duration of exposure – the longer the population is exposed to an agent, the more effective
- Temperature – most chemicals kill more effectively at a raised temperature
- Environment – presence of organic matter can protect the effects of agents

Physical methods:
- Heat – dry/moist heat
- Autoclave – moist heat sterilisation 100°C+
- Dry heat – kills by oxidation
- Pasteurisation – doesn't sterilise but kills most pathogens
- Filtration – depth filters (thick layers of granular or fibrous materials) or mem. Filters
- Radiation – kills by disrupting nucleic acid replication

Chemical methods:
- Phenolics – non-sterile, kill by protein denaturation
- Alcohols – kill by denaturing proteins
- Halogens – Chlorine/iodine, oxidises cell constituents