Legionella

Background

- American Legion Convention 1976
- Philadelphia, Bell Vue Stratford hotel
- 182 cases with 29 deaths
- Discovered by Dr. Joseph McDade
- Bacteria common in water and soil

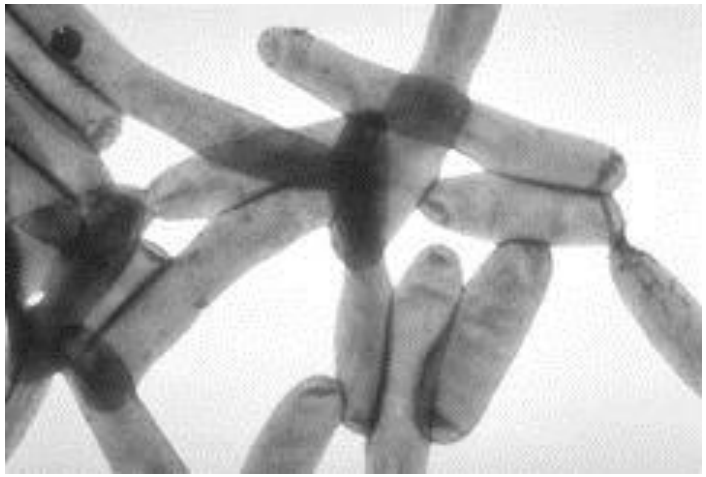
Background

- Legionella is water-borne bacteria
- Naturally widespread in the environment
- Over 50 different species identified
- 20 known to cause disease in man
- Legionella pneumophila
  - Legionnaire's Disease
- Pontiac Fever / Lochgoilhead Fever

Legionella

Legionella sp. **under UV illumination**

Legionella pneumophila



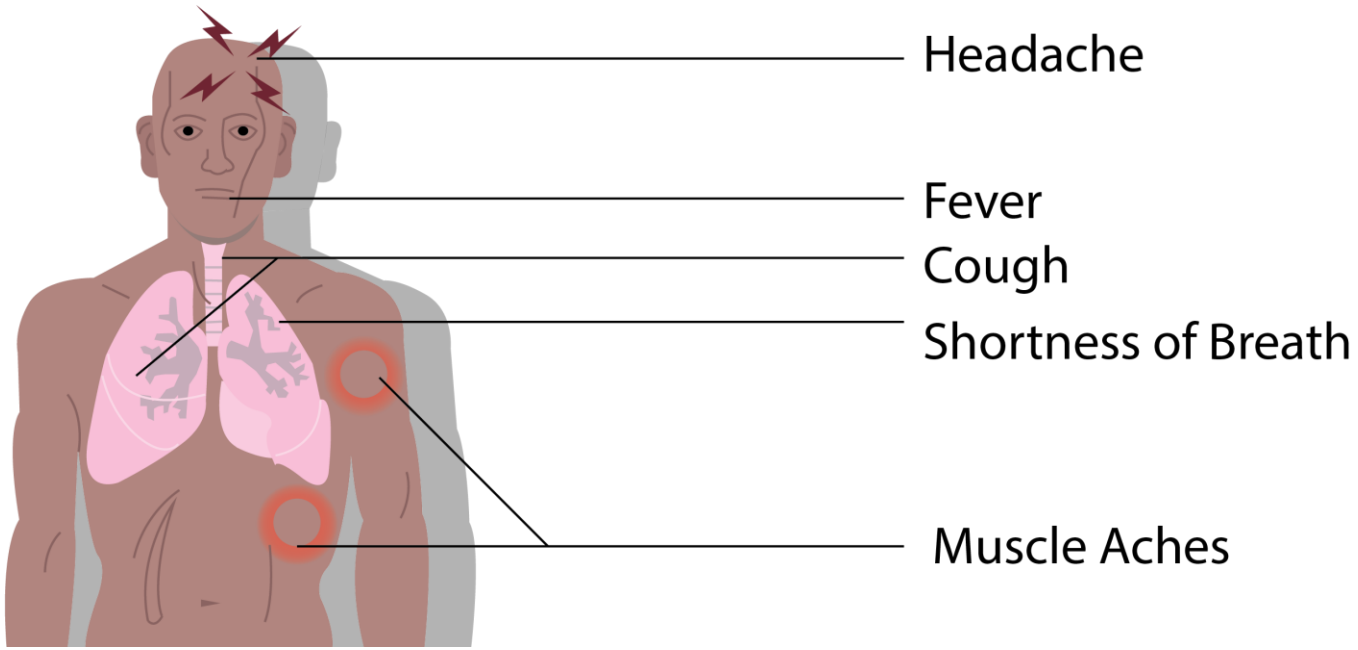
How Legionella Multiplies

- Favourable pH & temperature 20 – 45 °C
- Optimum growth rate between 32 – 42 °C
- Ideal is 37 °C (human body)
- Stagnation provides time for multiplication
- Key nutrients are free iron & L cysteine
- Biofilm protection

Routes of Entry

- Primarily through inhalation of aerosols, fine droplets, and mists.
- Can be contracted by choking on contaminated water.

Symptoms



Infection

- Inhalation of Bacteria, size is important
- Incubation Period 2-10 Days
- Can difficult to diagnosed
  - severe pneumonia: dry cough, diarrhoea, vomiting, breathing difficulty, high fever, chills,
  - headache, some become confused or delirious
- Fatality rate is about 12% but increases in aged or immuno-compromised patients
- Can be treated effectively with antibiotics

Susceptibility

- Increasing age, especially over 50
- Gender; men
- Smokers, alcoholics
- Chronic respiratory or kidney disease
- Diabetics, cancer sufferers

Simple Chain of Events

1. Bacteria present in the water system
2. Slow moving or stagnant water
3. Adequate source of food
4. Temperature Range 20 – 45 °C
5. Aerosol/Mist formed
6. People Present

Risk Areas

- Hot & Cold Water Systems
- Cooling Towers & Air Conditioning
- Storage Cisterns
- Calorifiers
- Deadlegs
- Showers
- Spa pools
- Decorative water features
- LEV’s/ Fume Cupboards

How clean is your water tank?

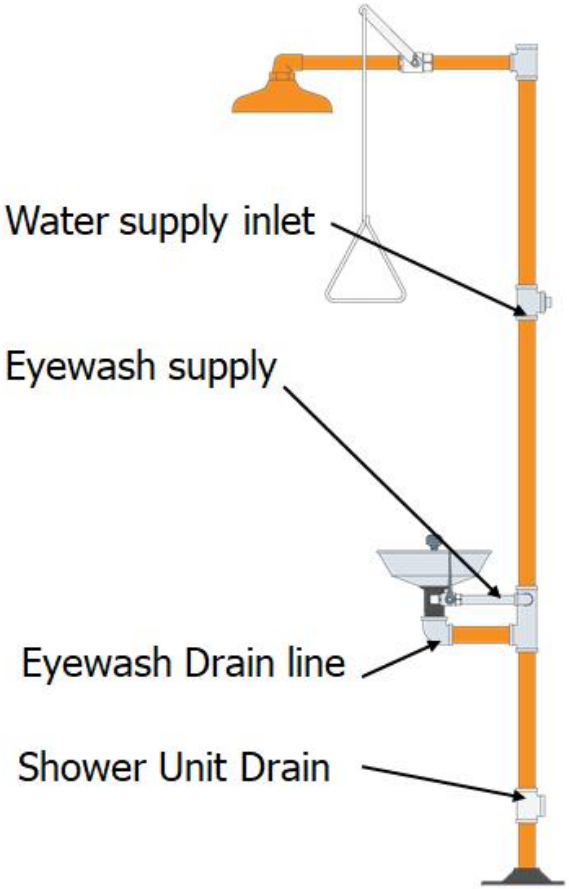
How clean is your water tank

Dead-legs

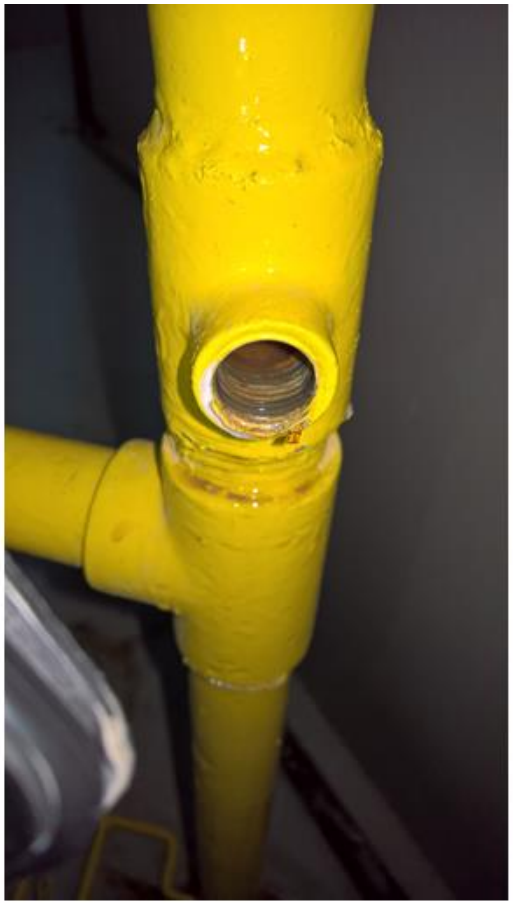
Case Study

- Local facility has 38 safety showers
- Monthly analysis in water tanks indicate legionella is not present
- Flushed regularly in accordance with their own procedures (10 minutes per week)
- Yet, the bacteria was still present in the showers

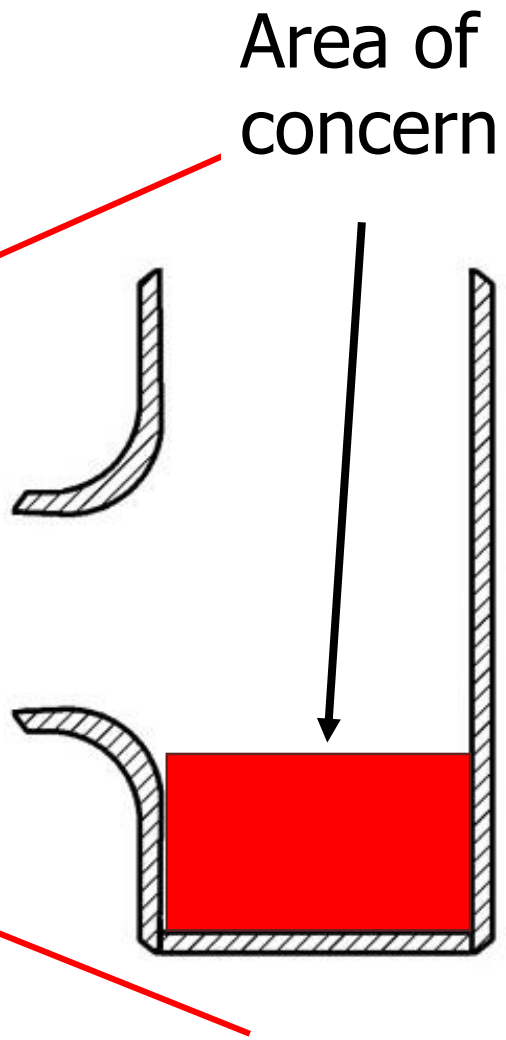
Case Study


Water supply inlet
Eyewash supply
Eyewash Drain line
Shower Unit Drain

Case Study

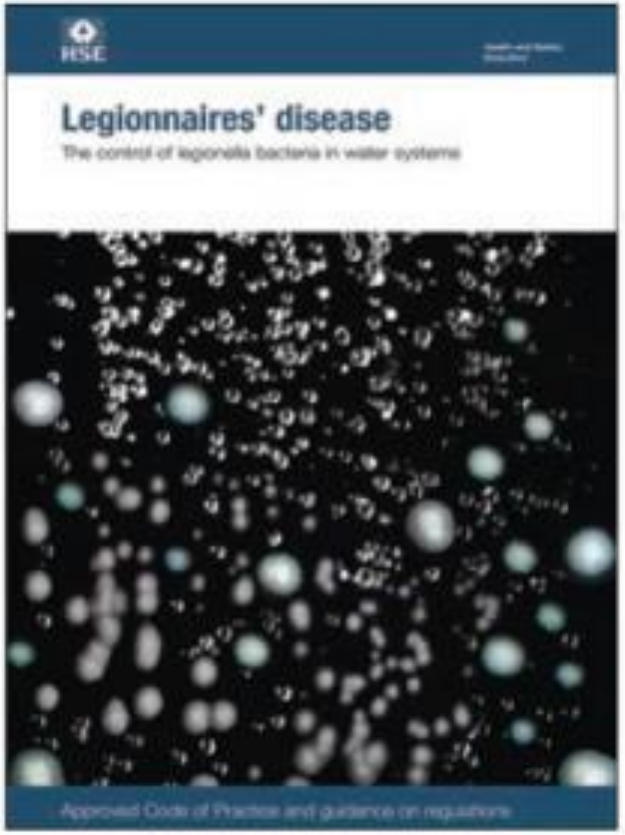


Case Study

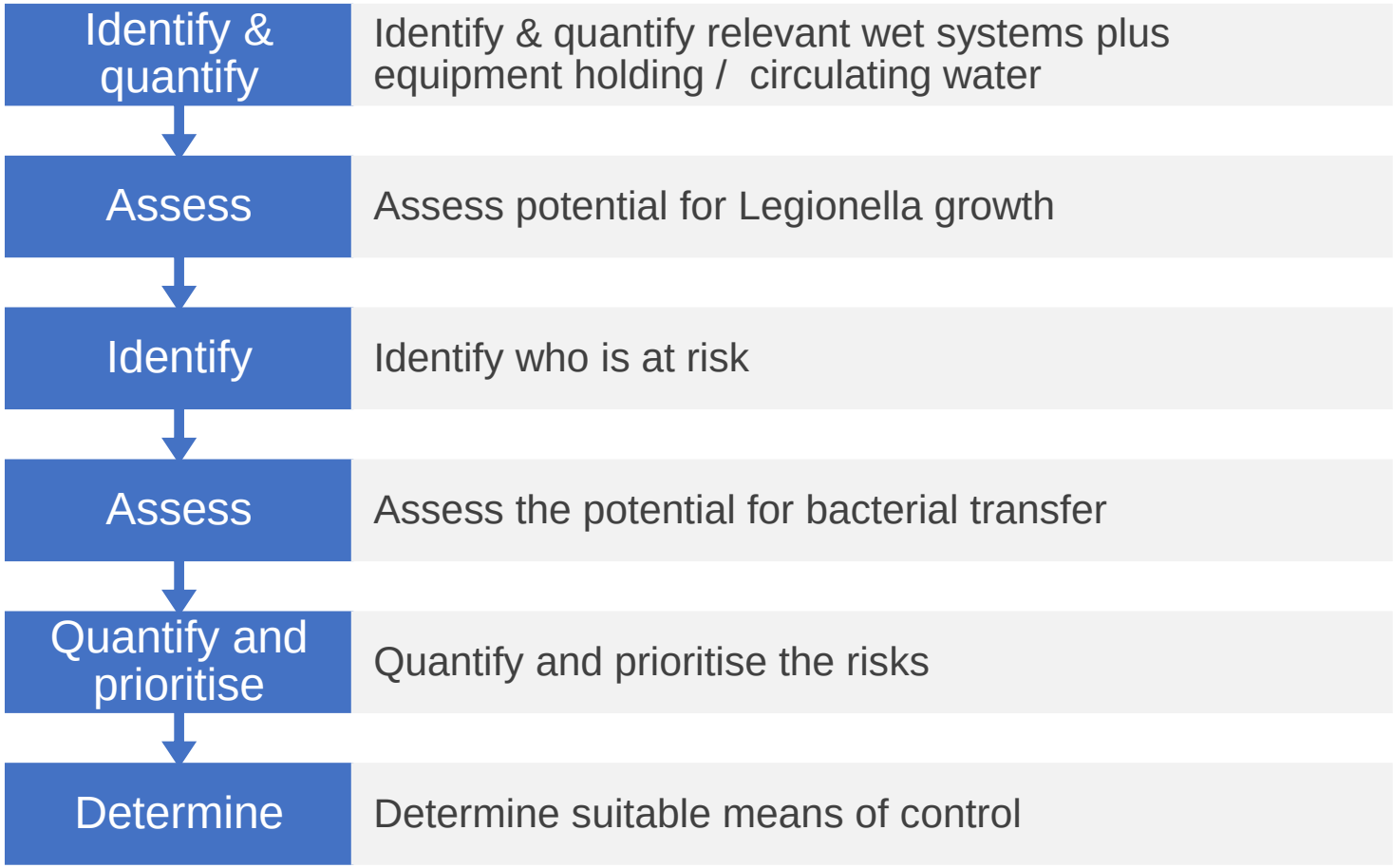


Approved Code of Practice

- Identification and assessment of risk
- Prepare a scheme for preventing or controlling the risk
- Implement, manage and monitor precautions
- Keep records
- Appoint a person to be managerially responsible



Risk Assessment



Controlling Legionella Bacteria

- Know the system
- Temperature monitoring
- Controlled release of water spray
- Avoid temp. conditions 20 – 45 °C
- Avoid water stagnation
- Clean storage tanks
- Maintain cleanliness of spray outlets
- Water treatment where necessary
- Flushing regime for rarely-used outlets

Treatment Options

- Add disinfectants
- Add descalers
- Empty out the water, thoroughly clean & disinfect, drain again, refill with fresh water
- Clean & disinfect spray heads
- Flush rarely-used outlets weekly
- Arrange for removal of dead-legs

Thank You