



7.1 / HUMAN HEALTH AND DISEASE

Common Diseases in Humans

A clinical guide to pathogens, their mechanisms, and systemic prevention.

[STUDY DOSSIER]

[BIOLOGICAL TAXONOMY]

THE PATHOGEN FRAMEWORK

What is a Pathogen?

Disease-causing organisms or parasites that harm the host by living in or on them.

[BACTERIA]

[VIRUSES]

[FUNGI]

[PROTOZOANS]

[HELMINTHS]



1. Entry

Pathogens breach the body and adapt to the host environment (e.g., gut pathogens surviving low stomach pH).



2. Multiplication

The parasite thrives and replicates inside the host's system.



3. Interference

Normal vital activities are disrupted, resulting in morphological and functional damage.

DIAGNOSTIC MATRIX / BACTERIA & VIRUSES

Respiratory and Systemic Intruders

Typhoid [BACTERIAL]	Pneumonia [BACTERIAL]	Common Cold [VIRAL]
Pathogen: <i>Salmonella typhi</i>	Pathogen: <i>Streptococcus pneumoniae</i> / <i>Haemophilus influenzae</i>	Pathogen: Rhino viruses
Site: Small Intestine (migrates via blood)	Site: Lungs (Alveoli)	Site: Upper Respiratory (Nose/Passages, NOT lungs)
Transmission: Contaminated food & water	Transmission: Inhaled aerosols/droplets, shared glasses	Transmission: Droplets & contaminated objects (fomites)
Symptoms: Sustained high fever (39°–40°C), stomach pain, constipation. Severe cases lead to intestinal perforation.	Symptoms: Fluid-filled alveoli, chills, cough. Severe: bluish lips/nails.	Symptoms: Nasal congestion, sore throat, cough lasting 3-7 days.



Clinical Note: Typhoid is confirmed by the Widal test. Historically infamous via Typhoid Mary, a cook who unknowingly spread the disease for years.



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DIAGNOSTIC PROFILE / PROTOZOAN

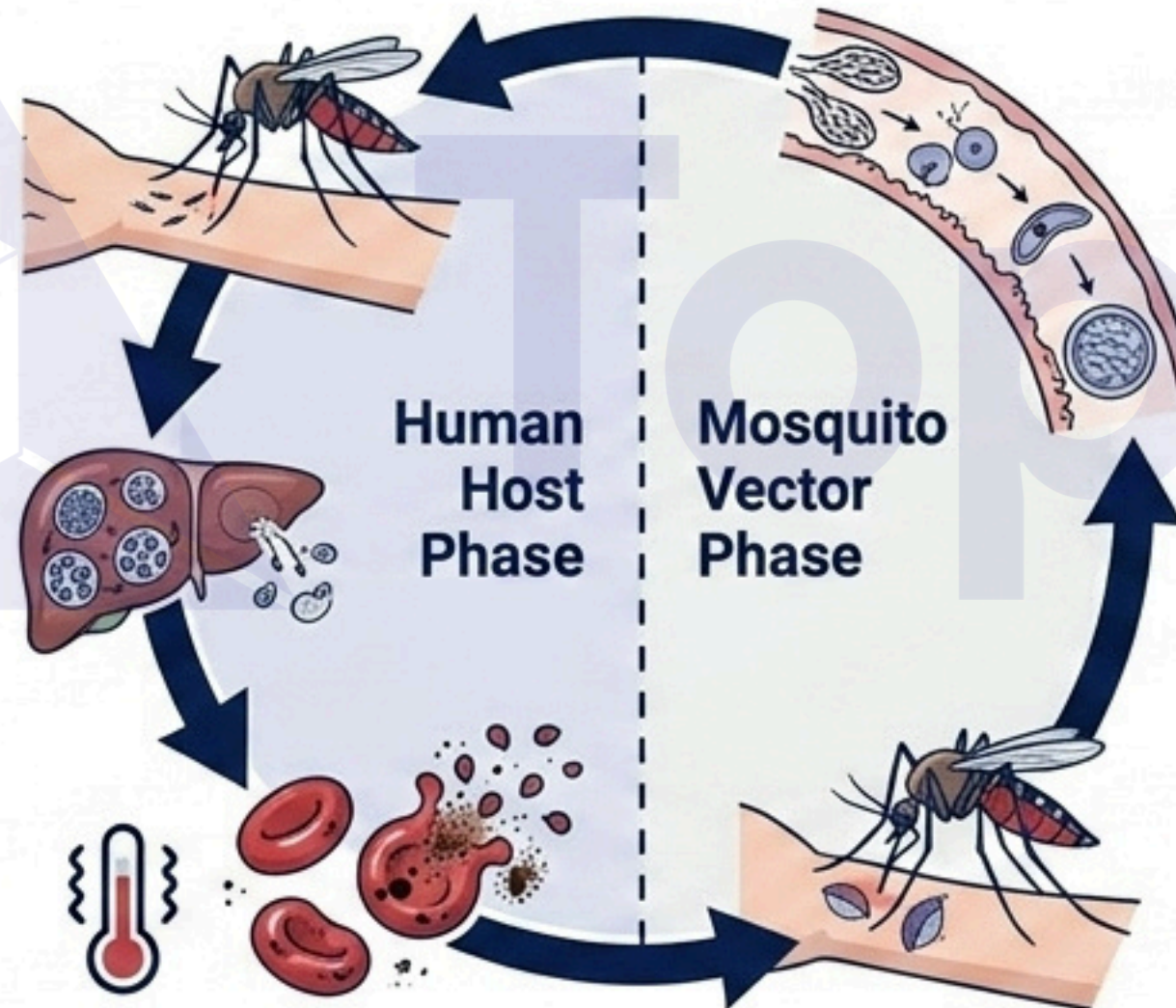
The Malaria Lifecycle

Pathogen: *Plasmodium* (Note: *P. falciparum* causes fatal malignant malaria).

1. Infection: Infected female *Anopheles* mosquito injects sporozoites into human.

2. Multiplication: Parasites multiply within human liver cells.

3. Rupture: Parasites attack Red Blood Cells (RBCs). Rupture releases haemozoin, a toxin causing recurring toxic chills and high fever every 3-4 days.



5. Development: Parasites multiply in the mosquito, forming new sporozoites stored in its salivary glands, ready for the next host.

4. Vector Uptake: Another female *Anopheles* mosquito bites the infected human, taking up the parasite.

Intestinal & Lymphatic Invaders

Intestinal Tract



Amoebiasis (Amoebic dysentery) [PROTOZOAN]

- **Pathogen:** *Entamoeba histolytica*
- **Transmission:** Houseflies act as mechanical carriers from faeces to food/water.
- **Symptoms:** Abdominal cramps, stools with excess mucous and blood clots.

Ascariasis [HELMINTH]

- **Pathogen:** *Ascaris* (common roundworm)
- **Transmission:** Faecal-oral route (contaminated soil, water, plants).
- **Symptoms:** Internal bleeding, muscular pain, blocked intestinal passage.

Lymphatic System



Elephantiasis (Filariasis) [HELMINTH]

- **Pathogen:** *Wuchereria* (*W. bancrofti*, *W. malayi*)
- **Transmission:** Female mosquito vectors.
- **Symptoms:** Slowly developing chronic inflammation of the organs where they live for years, typically the lymphatic vessels of the lower limbs. Results in gross deformities.

DIAGNOSTIC PROFILE / FUNGI

Fungal Pathogens

Disease: Ringworm

Pathogens: Genera Microsporum, Trichophyton, and Epidermophyton.



Clinical Presentation

Appearance of dry, scaly lesions on various parts of the body (skin, nails, scalp) accompanied by intense itching.



Environmental Catalysts

Fungi thrive in heat and moisture, favoring skin folds such as the groin or between the toes.



Transmission Vectors

Acquired directly from contaminated soil, or by sharing towels, clothes, or combs with infected individuals.

Prevention & Control Strategies



Personal & Public Hygiene

Targets: Typhoid, Amoebiasis, Ascariasis (Food/Water-borne)

Actions: Consumption of clean water, proper waste disposal, periodic cleaning and disinfection of water reservoirs and pools.



Airborne Precautions

Targets: Pneumonia, Common Cold (Aerosol/Droplet-borne)

Actions: Avoiding close contact with infected persons or sharing their belongings (glasses, utensils, fomites).



Vector Control

Targets: Malaria, Filariasis, Dengue (Insect-borne)

Actions: Eliminating stagnant water, using mosquito nets, installing wire mesh on doors/windows, and introducing Gambusia fish in ponds to feed on mosquito larvae.

Key Takeaways

1

Pathogen Diversity

Human disease is driven by five major biological groups—Bacteria, Viruses, Fungi, Protozoa, and Helminths—that adapt to and hijack normal host body functions.

2

Vector Dynamics

Many severe pathogens (like Plasmodium and Wuchereria) require intermediary hosts to complete their lifecycles, making environmental vector control a primary line of defense.

3

Scientific Triumphs

Advancements in biological science, immunology (vaccines), and pharmacology (antibiotics) have successfully eradicated deadly diseases like smallpox and controlled many others.



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