Cholera and TB: bacterial causes

Learn three linked pieces of information: the disease, the pathogen name and the pathogen type. Cholera and tuberculosis are both bacterial diseases, but their pathogens are different.

1. CHOLERA

Vibrio cholerae

TYPE: BACTERIUM

Cholera is the disease; *Vibrio cholerae* is its causative bacterium. Contaminated water or food is a transmission route, not the pathogen itself.

2. TUBERCULOSIS (TB)

Mycobacterium tuberculosis

Mycobacterium bovis

TYPE: BACTERIA

Both species are named in this syllabus. *M. tuberculosis* is the usual cause of human TB; *M. bovis* can also infect humans. Do not leave out the second species when recalling the complete syllabus list.

3. NAME THE SPECIES, NOT JUST THE GROUP

"Bacterium" gives the type, but not the species. "*Mycobacterium*" gives the genus, but not which species. A complete mapping pairs each named disease with its required pathogen name or names and the appropriate type.

Cholera pathogen: WHO, Cholera fact sheet.
TB pathogens in humans: CDC, About Bovine Tuberculosis in Humans.

Scope: Cambridge Biology 9700 syllabus, section 10.1, outcome 2, p. 30.

Malaria: four named protoctists

The malaria pathogens belong to the genus *Plasmodium*. Use the syllabus term protoctist for their type; they are not bacteria or viruses.

1. THE FOUR SPECIES REQUIRED BY THIS SYLLABUS

1. *Plasmodium falciparum*
2. *Plasmodium malariae*
3. *Plasmodium ovale*
4. *Plasmodium vivax*

2. THE PATHOGEN IS NOT THE MOSQUITO

Plasmodium parasites cause malaria. Infected female *Anopheles* mosquitoes transmit them and are vectors. If asked for the type of pathogen, write protoctist; naming the mosquito answers a different question.

3. KEEP THE SYLLABUS LIST AND BIOLOGY DISTINCT

These four names are the required learning list here, not a claim that only four species can ever cause human malaria. WHO also recognises *P. knowlesi* as a human malaria parasite. It is context, not an additional name required by this syllabus outcome.

Required species list: Cambridge Biology 9700 syllabus, section 10.1, outcome 2.
Human malaria species and mosquito vector: WHO, Malaria fact sheet.

Scope: Cambridge Biology 9700 syllabus, section 10.1, outcome 2, p. 30.

HIV: name the virus, not the syndrome

HIV stands for human immunodeficiency virus. It is the pathogen. AIDS is acquired immunodeficiency syndrome, an advanced stage of HIV infection, not a separate virus.

1. HIV INFECTION AND AIDS ARE NOT IDENTICAL

Human immunodeficiency virus (HIV)

TYPE: VIRUS

HIV damages the immune system. Without effective treatment, infection may progress to AIDS. Having HIV does not mean a person already has AIDS. Learn the agent and its category without treating the disease stage as another pathogen.

2. QUICK RECALL: DISEASE TO PATHOGEN TYPE

Cholera *Vibrio cholerae*	**Bacterium**
Tuberculosis Two *Mycobacterium* species	**Bacteria**
Malaria Four named *Plasmodium* species	**Protoctists**
HIV/AIDS Human immunodeficiency virus	**Virus**

3. WRITE SCIENTIFIC NAMES CONSISTENTLY

For the bacterial and protoctist species, capitalise the genus and use a lower-case species name; italicise both words when typed. After giving the full name, the genus may be abbreviated if unambiguous. Keep HIV as the standard capital-letter abbreviation.

HIV as the pathogen and AIDS as an advanced stage: WHO, HIV and AIDS.
Disease-pathogen-type mappings: Cambridge Biology 9700 syllabus, outcome 2.

Scope: Cambridge Biology 9700 syllabus, section 10.1, outcome 2, p. 30.