

Edexcel (B) Biology A-level

6.5 - Other pathogenic agents

6.6 - Problems of controlling endemics

Flashcards

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Define endemic and epidemic.



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Endemic: disease occurs routinely in a geographical area.

Epidemic: temporary rapid increase in incidence of disease in a geographical area.



How is the influenza virus transmitted?



How is the influenza virus transmitted?

- Droplet infection.
- Direct contact with mucus containing virus.
- Zoonotic infection: contact with animal waste.
- Contact with fomites (infected surfaces).



Outline the mode of infection of influenza.



Outline the mode of infection of influenza.

1. Injects viral RNA into ciliated epithelial cells.
2. Viral RNA hijacks cell biochemistry to produce new virions.
3. Cell lysis releases virions.



What pathogenic effects does the influenza virus have?



What pathogenic effects does the influenza virus have?

Headache, coughing & sneezing, sore throat, vomiting, fever, muscular / joint pain.

Symptoms last roughly 5-7 days.



How is influenza treated?



How is influenza treated?

- Antiviral medication.
- Antibiotics treat secondary bacterial infection.
- Management of symptoms e.g. painkillers.



How is stem rust fungus transmitted?



How is stem rust fungus transmitted?

- Windborne spores.
- Host crops (cereal crops & Berberis) leave infected fragments in soil.



Outline the mode of infection of stem rust fungus.



Outline the mode of infection of stem rust fungus.

1. Presence of water enables spore to germinate & produce hyphae which enter through stomata.
2. Enzymes e.g. cellulase digest plant cells so fungus can absorb nutrients as it grows into mycelium & surrounds tissues.



What pathogenic effects does stem rust fungus have?



What pathogenic effects does stem rust fungus have?

- Depletes nutrients.
- Weakens stem.
- Plant loses control of transpiration rate (reduces photosynthesis).
- Pustules on epidermis release more spores when they burst.



Give the binomial name of the stem rust fungus on wheat crops.



Give the binomial name of the stem rust fungus on wheat crops.

Puccinia graminis



Name the malarial parasite.



Name the malarial parasite.

Plasmodium spp.

(a type of single-celled Protozoan)



Outline the mode of transmission and infection of the *Plasmodium spp* parasite.



Outline the mode of transmission and infection of the *Plasmodium spp* parasite.

Female *Anopheles* mosquito acts as vector when it transfers saliva to another organism during feeding.

Parasite reproduces asexually in red blood cells in liver, causing lysis.



What pathogenic effects does
Plasmodium spp have?



What pathogenic effects does *Plasmodium spp* have?

Paroxysm, liver damage, anaemia caused by damage to red blood cells, shaking, headaches, sweating, muscle pain.



How is endemic malaria controlled?



How is endemic malaria controlled?

Preventing mosquito bites: mosquito nets, insect repellent.

Controlling mosquito numbers: pesticide, chemical treatment of standing water & sewage, introduction of predators for mosquitoes.

Drug treatment: combination of quinine, chloroquine, artemisinin.



Suggest the ethical and social implications of controlling endemic malaria.



Suggest the ethical and social implications of controlling endemic malaria.

- Treatments must be evidence based to reduce safety concerns.
- Difficulty obtaining informed consent if knowledge of medical trials is poor.
- Using insecticide kills other organisms.



Suggest the social and economic implications of controlling endemic malaria.



Suggest the social and economic implications of controlling endemic malaria.

- Expensive to implement, especially since many affected countries have low GDP.
- Opportunity cost: money could be spent on other initiatives e.g. malnutrition.
- Preventative measures require change of customs.



Suggest the practical difficulties of controlling endemic malaria.



Suggest the practical difficulties of controlling endemic malaria.

- Widespread endemic.
- 2 hosts involved.
- High antigen variability.
- Parasite enters host cells, which shields it from immune response.



Explain the role of the scientific community in controlling malaria.



Explain the role of the scientific community in controlling malaria.

- Develop and test evidence-based treatments.
- Develop accurate diagnostic tools to avoid overuse of expensive drugs.

