Treating, curing and preventing disease - Biology

Vaccinations

Pathogens are microbes that cause diseases. Vaccines allow a dead or altered form of the disease-causing pathogen to be introduced into the body, which contain a specific antigen. This causes the immune system, specifically the white blood cells, to produce complementary antibodies, which target and attach to the antigen. When a white blood cell engulfs and digests a pathogen it is called phagocytosis.

Herd immunity -

Following a vaccination, a person can become immune to the specific disease. This immunity gives protection against illness in an individual. The majority of the population must be vaccinated against serious diseases, which can reduce the chance of people coming into contact with specific pathogens, leading to herd immunity.

There are three recognised scenarios in relation to herd immunity:

- The majority of the population are not vaccinated against a specific disease, however, a few people are ill and contagious. This can develop easily into a mass infection because the majority of the population are not vaccinated.
- Most of the population are not vaccinated against the specific disease but are well, some are vaccinated and healthy, and a few are not vaccinated, but ill and contagious. Mass infection can result again, but a small number of vaccinated individuals remain healthy and some that are not vaccinated will also be healthy.
- The majority of the population are vaccinated and healthy against a specific disease, a few are not vaccinated but well. A few are not vaccinated against the disease, and they are ill and contagious. The result is that the majority are protected due to the high level of vaccination. A few individuals will still become ill, but the large number of vaccinated individuals gives protection.