# Unit 43: Diseases and Infections

**Unit code:** M/502/5611

**QCF Level 3:** BTEC National

**Credit value:** 10

**Guided learning hours:** 60

## Aim and purpose

This unit aims to develop understanding of how different types of diseases and infections develop and spread, and what makes some of them fatal. Learners will investigate how these diseases and infections have an impact on people, society and the environment and how they can be treated and cured.

## Unit introduction

There are many types of disease. Several are simply infections, and have little impact on sufferers other than some discomfort. However, those same diseases may become fatal in certain conditions or among vulnerable groups such as the elderly.

While laboratory research is the basis for most research into the development of infection and disease, their spread is evidenced from environmental research, which doctors, medical researchers and scientists know as epidemiology. An appreciation of the dynamics of diseases and infections is essential for people in a number of working environments, ranging from controlled laboratory conditions to those necessitating direct contact with people suffering from disease, such as health workers or doctors.

In this unit, the 'development' of a disease is taken to mean its origins and the way in which it develops according to certain conditions. The 'spread' is interpreted to mean the ways in which it passes between people.

Both the development and spread of infections and diseases are influenced by a range of conditions. Environmental factors (for example temperature, humidity) and human factors (for example diet and disease resistance, vaccination programmes, availability of clean water) each influence disease and its spread and lead to differences in the health of people in one place compared with another.

Serious diseases and infections can have considerable impacts upon people and societies, ranging from local epidemics (for example cholera in war-torn regions) to global pandemics (for example HIV and AIDS). Impacts may range from local shortages of healthy, working-age people to national budgets in fighting and controlling infection. Some seriously affect life expectation in some countries. Many fatal infections and diseases (for example malaria, HIV) challenge human capabilities in finding a cure, including the effects of drug resistance.

## Learning outcomes

**On completion of this unit a learner should:**

1 Know the different types of diseases and infections

2 Understand the factors that can influence the development of diseases and infections

3 Be able to investigate the spread of diseases and infections

4 Know some of the impacts that diseases can have upon people, society and the environment

5 Understand ways in which diseases can be treated, cured or eradicated.

# Unit content

## 1 Know the different types of diseases and infections

*Infectious diseases*: protozoal eg malaria, giardia; metazoal (Schistosomes, trypanosomes) eg Bilharzia; arthropod infestation eg scabies, lice, ticks; helminthic eg tapeworms, hookworms; pathogenic bacterial eg staphylococci, gonorrhoea, meningitis; viral eg HIV, chicken pox; subcutaneous mycoses eg sporotrichosis, chromomycosis; systemic or deep mycoses eg respiratory and disseminated types

*Diseases with environmental causes and links*: nutritional deficiency diseases, eg rickets, anaemia; chronic dietary disease eg cardiovascular disease, obesity, diabetes; diseases caused by pollution eg asbestosis/ mesothelioma; diseases caused by chemical poisoning eg minamata; cancers eg those linked to radiation poisoning, those caused by exposure to UV A and B radiation (such as melanoma); lupus; immune diseases; allergies; asthma

*Degenerative diseases*: disease due to ageing and degenerative body function or where the causes are less clear, eg Alzheimer's, osteoporosis

## 2 Understand the factors that can influence the development of diseases and infections

*Pathogens*: parasital, pathogenic bacterial, fungal, viral (nature of, thriving conditions, lifecycle, likelihood of developing within humans)

*Environmental causes*: nutritional deficiency diseases (relationship between deficiency of particular vitamins, minerals or proteins and the development of disease, progressive nature of the deficiency disease, its potential for being reversed); chronic dietary disease (links between particular dietary habits and the development of disease, the psychiatric nature of some diseases); diseases due to environmental factors (direct impacts of some pollutants and their effects, relationship between cancers and radiation or exposure to UV A and B radiation, relationship between environmental conditions and disease)

*Where the cause is uncertain*: body degeneration, eg Alzheimer's, osteoporosis (where causes are complex, multiple, or are unclear)

## 3 Be able to investigate the spread of diseases and infections

*Direct contact*: person-to-person eg direct transfer of bacteria, viruses; animal to person, infected animal bites or handling animal waste; mother to unborn child eg through the placenta (HIV or toxoplasmosis), during delivery (group B streptococcus)

*Indirect contact*: surfaces eg bacteria; endemic organisms eg fungal (histoplasmosis) and bacterial infections (anthrax)

*Spread through the air*: droplet transmission eg from coughing; particle transmission eg airborne virus, bacterium such as tuberculosis, pollution particulates and possible links to asthma

*Spread through vectors*: bites and stings transferring infection eg mosquitoes, fleas, lice or ticks

*Food and water contamination*: contaminated food and water eg Escherichia coli (E. coli)

## 4 Know some of the impacts that diseases can have upon people, society and the environment

*Symptoms*: change over time eg speed of onset, chronic, relapsing or remitting; symptomatic; asymptomatic; specific symptoms eg direct pain, relating to an organ or location; general symptoms affecting the entire body or being, eg fever, weight loss, depression; presenting symptom (as described to a doctor); cardinal symptom (evidence leading to a specific diagnosis)

*Impacts upon*: individuals eg debilitation, ability to work; populations eg the impacts of HIV on a community, city, region or country; economy eg costs of drug treatment, debilitation and its effects on economic growth

## 5 Understand ways in which diseases can be treated, cured or eradicated

*General types of treatment*: treatment of protozoal infections eg using amoebicides; antibiotics (chemotherapeutic agent against micro-organisms); why viruses are difficult to treat; the use of antivirals

*Treatments for particular diseases and their effectiveness*: links to the stage of development of the disease or infection; alternative strategies; how different treatments may have different impacts; availability of treatment and finance for drug treatments; the effectiveness of treatments against killer disease; their side effects; cure, remission, containment, delay

*Progression in treatment over time*: how treatments have changed for particular infections and diseases over time; how recent developments may have altered treatments eg new drug treatments or therapies; impacts of treatments upon patient care and survival rates; how some infections become drug resistant eg malarial treatments

*Programmes designed to reduce and/or eradicate disease and their effectiveness*: global aid programmes eg UNICEF programmes for reducing infant mortality and its causes; the impact of education and healthcare programmes eg diarrhoeal treatment and oral rehydration therapy; targeted aid programmes eg HIV antiretroviral funding; eradication programmes eg the Roll Back Malaria campaign; immunisation; screening programmes; assessing the effectiveness of these

# Assessment and grading criteria

In order to pass this unit, the evidence that the learner presents for assessment needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria for a pass grade describe the level of achievement required to pass this unit.

| Assessment and grading criteria | | |
|---|---|---|
| **To achieve a pass grade the evidence must show that the learner is able to:** | **To achieve a merit grade the evidence must show that, in addition to the pass criteria, the learner is able to:** | **To achieve a distinction grade the evidence must show that, in addition to the pass and merit criteria, the learner is able to:** |
| **P1** describe the main types of diseases and infections [IE1] | **M1** explain the differences between the main types of infections and diseases | **D1** assess the basis for the classification of different infections and diseases |
| **P2** explain some of the human and physical conditions that lead to the development of diseases and infections [IE1] | **M2** explain how and why these infections and diseases develop in the way that they do | **D2** assess the importance of human and/or physical environmental conditions in explaining the development of these diseases and infections |
| **P3** carry out an investigation into the spread of diseases and infections [IE2; SM3] | **M3** explain how and why these infections and diseases spread in the way that they do | **D3** assess the factors which explain the spread of these diseases and infections |
| **P4** describe the impact that diseases and infections can have upon people, society and the environment [IE1] | **M4** explain the links between the diseases selected and the impact that these may have | **D4** assess the impact that these infections and diseases may have, both on individuals and on communities at different scales |
| **P5** describe how diseases and infections can be treated, cured or eradicated. [IE1; EP3,4] | **M5** explain the reasons for treatments to cure or eradicate diseases and infections. | **D5** assess the effectiveness of treatments given for these infections and diseases. |

**PLTS**: This summary references where applicable, in the square brackets, the elements of the personal, learning and thinking skills applicable in the pass criteria. It identifies opportunities for learners to demonstrate effective application of the referenced elements of the skills.

| Key | | | |
|---|---|---|---|
| | IE – independent enquirers | RL – reflective learners | SM – self-managers |
| | CT – creative thinkers | TW – team workers | EP – effective participators |

# Essential guidance for tutors

## Delivery

Tutors delivering this unit have the opportunity to use as wide a range of techniques as possible. Lectures, discussions, seminar presentations, site visits, supervised laboratory work using, for instance, microscope evidence, research using the internet and/or library resources and the use of individual personal journals and diaries, interviews with doctors and patients would all be suitable. Delivery should stimulate, motivate, educate and enthuse learners.

Clearly any visits or work placements for this unit require the most careful planning. Human evidence in assessing the impact of disease upon individuals is rich, for example, but of course is highly sensitive and should be considered only under the most carefully monitored conditions. Similarly, experience working with medical staff – for example doctors, nursing staff, laboratory workers – should be very carefully monitored, not least for issues of confidentiality. Learners and supervisors must be made aware of the requirements of this unit before doing any work-related activities, so that evidence can be collected. Observation records and/or witness statements can be used as evidence but must be free of any identity of person or institution. Guidance on the use of observation records and witness statements is provided on the Edexcel website.

Health and safety issues relating to working with infection or with staff who deal with infected persons must be stressed and regularly reinforced, and risk assessments must be undertaken prior to any practical activities or contact with medical staff.

Tutors should consider integrating the delivery, private study and assessment relating to this unit with any other relevant units and assessment instruments the learners are taking.

Learning outcomes 1 and 2 are directly linked. These are likely to be delivered through formal lectures, discussion, site visits, practical work and independent learner research. Learners will become aware of the different types of killer infection and disease, how these can be classified, and the physiology and development of these. Health and safety issues must be addressed before learners undertake any field or laboratory work. Microscopic slides or photos of these would be excellent sources of evidence, together with internet research. Adequate personal protective equipment (PPE) must be provided and used following the production of suitable risk assessments. Visiting expert speakers could add to the relevance of the subject for the learner; for example, a doctor, medical laboratory worker or nurse could talk about their work, the situations they face and the methods they use in treating disease and patients.

Learning outcome 3 is more likely to be directed towards secondary sources, so that medical dictionaries and textbooks and online research will focus upon the spread of disease. Historical studies are as useful as contemporary, so records of past epidemics and their comparison with present-day examples will be useful. Given the historical perspective, learners should consult historians and their records as part of their research plan. Tutors should ensure that learners have access to a suitable range of records or media that will help them to investigate diseases and infections from a range of scales (for example local outbreaks of bilharzias compared with global extents of malaria). Tutors can tailor the actual selection of diseases and infections to the interests of learners and/or the local environment (for example in a localised influenza outbreak).

Learning outcome 4 considers the impacts of a selection of diseases and infections, at different scales from individual through to global communities. As well as formal lectures, personal interviews and research investigations are essential to deliver this learning outcome effectively. Personal diaries and interviews can be a valuable source of information against which to compare secondary sources in terms of patient experiences in suffering certain infections or diseases. As with other learning outcomes, centres must ensure that appropriate PPE is provided and risk assessments undertaken before any interviews, practical work or site visits. Visiting expert speakers, such as doctors or nursing staff, could again be useful and could describe the impacts of infections and diseases upon different people, or different age groups, or those in different locations. Overseas infections and diseases could be described by visiting staff who have worked overseas in a professional capacity.

Learning outcome 5 considers the effectiveness of treatment at an individual level and of treatment programmes across whole regions or countries. Therefore formal lectures, personal interviews and research investigations are essential to deliver this learning outcome effectively. Internet research into programmes such as Roll Back Malaria are essential, as access to a range of journal articles and reports. Tutors should be aware of the complexities of many of these, and guide learners in trying to evaluate or interpret complex professional evidence. Visiting expert speakers, such as doctors or nursing staff, could be useful, particularly where they have experience in different locations or overseas in a professional capacity.

## Outline learning plan

The outline learning plan has been included in this unit as guidance and can be used in conjunction with the programme of suggested assignments.

The outline learning plan demonstrates one way in planning the delivery and assessment of this unit.

| Topic and suggested assignments/activities and/assessment |
|---|
| Introduction to unit and programme of assignments. |
| Introducing infections and diseases.<br><br>The physiology and development of diseases; laboratory work investigating their nature through microscopic slides and/or photos, and internet research.<br><br>Researching a selection of diseases and infections, identifying their differences and the basis on which they can be classified.<br><br>Lecture from a local doctor or medical staff and interviewing them about the physiology of particular diseases. |
| Assignment on the main types of infection and disease and how and why these vary; an assessment of the basis for classification of diseases and infections to achieve D1.<br><br>**Assignment 1 – What Lies within … (P1, M1, D1)** |
| Developing a research file of diseases and infections, to show how each develops physiologically, using journals and internet research.<br><br>Investigating through research the conditions under which such diseases and infections develop, including their life cycle.<br><br>Exploring the causes of particular diseases and infections, eg nutritional (deficiency and dietary diseases), pollution and chemical poisoning, radiation, parasital and bacterial, viral and fungal. |

| Topic and suggested assignments/activities and/assessment |
| --- |
| Links between particular diseases and infections and the conditions under which they develop.<br><br>Personal primary research (eg through interviews with social or health workers), the conditions under which nutritional deficiency diseases develop; supported by secondary internet or journal research.<br><br>Investigating research into the development of chronic dietary diseases, eg diabetes, some cancers, eating disorders<br><br>Assessing the link between environmental factors and disease, eg geographical conditions and human factors, eg pollution or radiation. |
| Research and present information on the development of particular diseases and infections for assignment; for learners targeting D2, an assessment of the links between environmental factors and the development of particular diseases.<br><br>**Assignment 2 – Killing Me Softly … (P2, M2, D2)** |
| Researching secondary sources about how diseases and infections spread in different geographical locations and the factors that encourage this spread.<br><br>Interviewing/researching primary and/or secondary sources about past epidemics of infections and disease.<br><br>Comparing historical examples of infections and disease with present-day examples.<br><br>For learners targeting D3, evaluating the relative importance of factors which explain the spread of these diseases and infections. |
| Developing assignment work about the spread of infections and disease and the conditions which lead to this.<br><br>**Assignment 3 – Coming to a Town Near You … (P3, M3, D3)** |
| Researching symptoms of selected diseases and infections on individuals and how and why these differ.<br><br>Interviewing individuals and/or medical/research staff about a selection of diseases and infections in terms of:<br><br>• disease symptoms<br>• the different impacts that each may have upon people and communities.<br>• internet research into diseases and infections to compare how impacts vary in different localities and the impacts of these diseases upon populations, the economy and society. |
| Preparing a report to show the impacts of killer diseases and infections on people and societies<br><br>**Assignment 4 – It Gets to You … (P4, M4, D4)** |
| Research different ways in which a selection of diseases and infections can be treated.<br><br>Interview doctors/medical staff about the effectiveness of particular treatments. |
| Research on the internet, journal articles and reports into the nature and effectiveness of treatment programmes which cover regions or countries, eg Roll Back Malaria.<br><br>Interview aid workers or those with experience in working overseas about how treatment programmes differ in different countries. |
| Prepare a report into types of treatment of killer diseases and infections and (for learners targeting D5) their effectiveness.<br><br>**Assignment 5 – Fight the Good Fight … (P5, M5, D5)** |
| Review of unit and programme of assignments. |

## Assessment

All the pass grade criteria must be met in order for a learner to achieve this unit.

As a minimum throughout all the assignments, learners must provide evidence for at least three infections and diseases of different types (for example protozoal, viral and degenerative) in order to appreciate their broad nature. These may be the same infections or diseases as those used for other grading criteria.

For P1, learners must describe the main types of infection and disease. Tutors should identify a selection of diseases and/or infections, or agree them in discussion with the learner. Evidence could take the form of a pictorial presentation with notes (possibly using appropriate software or OHPs), annotated poster, leaflet or project.

For P2, learners must explain some of the human and/or physical conditions that can lead to the development of diseases and infections. Learners could include annotated diagrams, or photos from microscopic slides, or film sequences (for example to show bacterial growth) showing development characteristics. Centres should endeavour to make this criterion as relevant as possible to the workplace or lifestyles, in order to understand the contexts in which diseases and infections develop. Diseases studied could include tropical disease such as malaria, where there is considerable resource material on the internet. Evidence for this could take the form of a pictorial presentation with notes (using appropriate software), an annotated poster, leaflet, report or project.

For P3, learners must investigate how a selection of infections and diseases spreads, and the factors that influence this. Their prime study should be epidemiological, and show different ways in which diseases can spread. Evidence for this could take the form of a pictorial presentation with notes (possibly using appropriate software or OHPs), an annotated poster or leaflet, or a project. Alternatively, learners could provide evidence taken from notes from visits to for example a healthcare laboratory or doctor's surgery, perhaps presented as a journal, log or wiki.

For P4, learners must research material that helps them to describe the impacts of a selection of infections and diseases, particularly upon individuals. These should cover symptoms and evidence for the onset of disease or infection and might be particularly relevant to the local area, eg in an outbreak of influenza. Personal interviews and investigations of patient experiences could be used as evidence via a learning journal, log or wiki. It will assist learners if the symptoms and development of diseases or infection are contrasting and produce different kinds of symptoms. They could produce a presentation or website on their research that includes annotated diagrams, or photographs, with accompanying descriptive text.

For P5, learners must research a selection of ways in which infections and diseases can be treated, and of programmes that are intended to reduce the extent of these. It will assist learners if the treatments of diseases or infections are different for example using different kinds of drug types or regimes, or surgery. They could produce a presentation or website on their research that includes annotated diagrams, or photographs, with accompanying descriptive text.

For a merit grade, all the pass grade criteria and all the merit grade criteria must be met.

For M1, learners must explain the differences between the main types of infections and diseases, and know the basis on which these can be classified. The need to explain should be made clear to learners from the outset. Where possible, the nature and complexity of the diseases should be the same for all learners to ensure the fairness of assessment. Learners must provide evidence for at least three killer infections and diseases of different types (for example protozoal, viral and degenerative) in order to appreciate their broad nature. Evidence could take the form of a pictorial presentation with notes (possibly using appropriate software or OHPs), annotated poster, leaflet, or project.

For M2, learners must explain how and why selected infections and diseases develop in the way that they do, and explains the links between their development and the human and/or physical conditions in which these develop or thrive. Evidence can be presented in the same form as for M1, and may be linked to the assessment of M1 and M2.

For M3, learners must explain how and why killer infections and diseases spread in the way that they do and the factors that lead to this spread. Their prime study should be epidemiological and show different ways in which diseases can spread. As a minimum, learners must provide evidence for three different killer diseases and infections which can be the same as those evidenced for M1 and M2. However, attention should be paid to explaining clearly other means by which disease and infection spreads; some early attention to this (perhaps in planning M1 and M2) will help learners. Evidence for this criterion may be linked to that for others, for example M4.

For M4, learners must explain the links between the diseases selected and the impacts that these may have, both on individuals, and on communities. Evidence may be the same as that presented for P4, but with additional focus upon the impact of disease upon communities. This might be in the form of restrictions on people movement (for example swine flu), or the devastating impact of HIV/AIDS upon populations of African countries. These may be the same places or processes as those used to provide evidence for other grading criteria. Evidence for this criterion may be linked to that for others, for example M3.

For M5, learners must explain the reasons for treatments studied. They should also investigate methods used in reducing the extent of these killer infections and diseases through programmes such as Roll Back Malaria or upgrading the provision of fresh water as a means of reducing infection. Evidence for this criterion may be linked to that for others, for example M3-4.

For a distinction grade, all the pass, merit and distinction grade criteria must be met.

For D1, learners must assess the basis for classifying different infections and diseases, and evaluate the strengths and weaknesses of this classification. They need to assess how or to what extent the classification is all-embracing, or how helpful it is as a classification for medical staff. Given their lack of experience in the unit at this stage, tutors can enable this kind of evaluation to develop by setting up visits for learners to discuss with those who work in the medical profession. Evidence can be presented in the form of a written evaluation.

For D2, learners are required to assess the importance of human and/or physical environmental conditions in explaining the development of these diseases and infections. They may link the evidence for this criterion with that for others, such as M2. They should establish criteria by which the relationship between environmental factors and disease development may be established, and then apply it. Learners must consider all of the important stages in the life cycle of diseases, citing specific examples which could be used as evidence for other grading criteria. Evidence can be presented in the same form as for P2.

For D3, learners are required to assess the relative importance of the factors which explain the spread of these diseases and infections. For example, they could include discussion and evaluation of a recent infection, spreading rapidly through air travel, compared to slower spread of disease in less technologically advanced environments (for example cholera outbreaks in Asia in the 19th century). Learners could contextualise their evidence to workplaces eg hospitals in order to assess local spreads of influenza. Evidence may be presented in the same form as for P3.

For D4, learners must assess the importance of the impact that these infections and diseases may have, both on individuals and on communities at different scales. The same three environments used to provide evidence for other grading criteria can be used, but it is essential that learners adopt a wider view so that, as well as personal and local impact of disease and infection, they explore broader implications of, for instance, population losses (for example AIDS), movement restrictions (for example swine Flu) or clean water provision (for example cholera). Tutors should therefore enable learners to develop those critical skills and select the means and research materials by which they can achieve this. Evidence may be presented in the same form as for P3.

For D5, learners must assess the treatments given for these infections and diseases, their effectiveness, and that of programmes intended to reduce the extent of these. The same evidence for other grading criteria may be used, but it is essential that learners adopt an evaluative view, so that they are able to evaluate programmes such as Roll Back Malaria or upgrading the provision of fresh water as a means of reducing infection. They should establish criteria by which such programmes can be judged. Tutors should therefore enable learners to develop those evaluative skills and select criteria and exemplars from their research by which they can achieve this. Evidence may be presented in the same form as for P3-4, and evidence by which to judge the programmes of disease eradication can be (but does not have to be) presented in the form of a written evaluation.

### Programme of suggested assignments

The table below shows a programme of suggested assignments that cover the pass, merit and distinction criteria in the assessment and grading grid. This is for guidance and it is recommended that centres either write their own assignments or adapt any Edexcel assignments to meet local needs and resources.

| Criteria covered | Assignment title | Scenario | Assessment method |
|---|---|---|---|
| P1, M1, D1 | What Lies within … | In groups, you research about three types of infection or disease, classifying them using a means given by the tutor, and then research more individually devising a presentation. | Presentations, with written evaluation to meet criterion D1. |
| P2, M2, D2 | Killing Me Softly ... | You conduct individual research into the development of three infections or diseases of different types. | A report on the development of three diseases and infections of different types.<br>Or<br>A multi-modal (pictures, sound, maps, data analysis) presentation of the conditions leading to the selected diseases/infections. |
| P3, M3, D3 | Coming to a Town Near You ... | You investigate how three different diseases spread by different means, using interviews with doctors, health workers, internet and/or library research. | Display of results showing the geographical spread/ epidemiology of different diseases. |
| P4, M4, D4 | It Gets to You ... | You compile a learning journal or log of notes and reflections from work experience in a hospital, doctor's surgery or laboratory.<br>Or<br>A research exercise on the impacts of three diseases on communities, eg HIV/AIDS. | A reflective journal on the impact of diseases upon individuals.<br>Or<br>A report on the impacts of disease upon communities, countries or continents (eg HIV in Africa). |

| Criteria covered | Assignment title | Scenario | Assessment method |
|---|---|---|---|
| P5, M5, D5 | Fight the Good Fight … | Research from the internet, visiting speakers (eg drug companies, health workers) about ways in which three infections and diseases can be treated.<br>Research ways in which large-scale programmes can aim to reduce the extent of infections and diseases. | Essay on available treatments for named infections or diseases.<br>Or<br>A presentation on a major programme, with written evaluation if targeting D5. |

## Links to National Occupational Standards, other BTEC units, other BTEC qualifications and other relevant units and qualifications

This unit forms part of the BTEC Applied Science sector suite. This unit has particular links with the units shown below in the BTEC Applied Science suite of qualifications:

| Level 2 | Level 3 |
|---|---|
| Biology and Our Environment | Physiology of Human Body Systems |
| Health Applications of Life Sciences | Medical Physics Techniques |
| Science in Medicine | Biomedical Science Techniques |
| | Physiological Investigations |
| | Medical Instrumentation |

## Essential resources

There are many opportunities for practical research work in this unit. Internet research is essential for information for this unit, from occurrence of particular diseases to their development and spread, through to treatment. Additional valuable information could be arranged through work experience in medical laboratories (for example as laboratory assistant) in which the learner is given access to compendia of treatments into different diseases. Similarly, it will be helpful if interviews or talks with local doctors can be arranged so that learners gain access to practical details regarding treatment of selected killer diseases and infections. College or school staff may prove useful, for example History staff in researching historical epidemics. Similarly, provided that strict adherence is paid to patient confidentiality, interviews could be arranged with willing patients, for example of osteoporosis or cancer.

In all practical situations, learners should have access to current health and safety regulations and equipment.

Learners should be given access to computers for research and presentation of assignments.

## Employer engagement and vocational contexts

Learners will depend on the availability of local companies according to the local environment in which they live or work, so that a rural area may offer very different experiences from urban, with greater distances to hospitals and fewer opportunities to visit health laboratories or drug companies. However, the kinds of companies approached need to work in areas related to this unit. The organisations are sometimes national, but will offer help locally.

## Indicative reading for learners

### Textbooks


Bannister B et al – *Infection: microbiology and management* (Wiley-Blackwell, 2006) ISBN 9781405126656

Crawford D – *The Invisible Enemy: A Natural History of Viruses* (Oxford University Press, 2002) ISBN 9780198564812

Dimmock N et al – *Introduction to Modern Virology* (Wiley-Blackwell, 2006) ISBN 9781405136457

Gillespie S and Bamford K – *Medical Microbiology and Infection at a Glance: 3rd edition* (Wiley-Blackwell, 2007) ISBN 9781405152556

Murray P et al – *Medical Microbiology: with student consult online access* (Mosby, 2008) ISBN 9780323054706

Nesse R and Williams G – *Why We Get Sick* (Vintage Books, 1996) ISBN 9780679746744

Scientific American – *Infectious Disease: a Scientific American Reader* (Chicago University Press, 2008) ISBN 9780226742632

Struthers J and Westran R – *Clinical Bacteriology* (Manson Publishing, 2003) ISBN 9781840760279


### Journals

*British Medical Journal*

*The Lancet*

*The Student British Medical Journal*

### Websites

*General health issues*

| | |
|---|---|
| www.bbc.co.uk/health | BBC health page |
| www.dh.gov.uk | UK Government Department of Health |
| www.nhsdirect.nhs.uk | UK NHS Direct website |

*Global health organisations*

| | |
|---|---|
| www.globalhealth.org | Global Health Council |
| www.malaria.org | Malaria |
| www.UNAIDS.org | HIV/AIDS |
| www.UNICEF.org | UNICEF |

*Drug and pharmaceutical companies*

| | |
|---|---|
| www.bayer.com | Bayer |
| www.gsk.com | GlaxoSmithKline |
| www.jnj.com | Johnson and Johnson |
| www.pfizer.com | Pfizer |

## Delivery of personal, learning and thinking skills

The table below identifies the opportunities for personal, learning and thinking skills (PLTS) that have been included within the pass assessment criteria of this unit.

| Skill | When learners are ... |
|---|---|
| **Independent enquirers** | [IE1] researching material on diseases and infections<br>[IE2] carrying out investigations |
| **Self-managers** | [SM3] using time effectively when carrying out an investigation |
| **Effective participators** | [EP3,4] contributing to discussions on how diseases and infections can be treated, cured or eradicated. |

Although PLTS are identified within this unit as an inherent part of the assessment criteria, there are further opportunities to develop a range of PLTS through various approaches to teaching and learning.

| Skill | When learners are ... |
|---|---|
| **Independent enquirers** | [IE4,6] developing independence as learners; working to a brief and researching into it; initiating enquiries regarding research sources using the library effectively |
| **Reflective learners** | [RL3,4,5] developing evaluative skills, particularly for those learning outcomes working to distinction level |
| **Team workers** | [TW1,2,4] working together, researching and problem solving; devising presentations; peer review and assessment |
| **Self-managers** | [SM5,6] demonstrating effective management of time, delivering assignments on time; being able to work effectively through own motivation |
| **Effective participators** | [EP4,5] critically evaluating own and others' work in a supportive manner; contributing to discussions and feedback; participating frequently in debate and supporting others in research tasks. |

## Functional Skills – Level 2

| Skill | When learners are ... |
|---|---|
| **ICT – Use ICT systems** | |
| Select, interact with and use ICT systems independently for a complex task to meet a variety of needs | searching for information; entering data; writing documents in relation to the requirements of assignment briefs |
| Use ICT to effectively plan work and evaluate the effectiveness of the ICT system they have used | reflecting on the way that an assignment has been tackled |
| Manage information storage to enable efficient retrieval | saving information in suitable files in suitable folders |
| Follow and understand the need for safety and security practices | following safety and security procedures when data recording |
| **ICT – Find and select information** | |
| Select and use a variety of sources of information independently for a complex task | using internet searches to meet the requirements of an assignment task |
| Access, search for, select and use ICT-based information and evaluate its fitness for purpose | researching articles on disease symptoms; assessing treatments for different diseases and making judgements about their effectiveness |
| **ICT – Develop, present and communicate information** | |
| Enter, develop and format information independently to suit its meaning and purpose including:<br>• text and tables<br>• images<br>• numbers<br>• records | collating results of interviews carried out with patients or medical staff<br>researching and collating data on disease incidence<br>finding microscopic images of the development of bacterial or viral infections<br>collecting and recording data on the development of epidemics<br>assessing the value of different treatment regimes for people affected by disease |
| Bring together information to suit content and purpose | selecting and combining information to meet the requirements of an assignment task such as producing a portfolio of practical work or a synthesis map |
| Present information in ways that are fit for purpose and audience | presenting information on disease occurrence and interviews carried out to meet the requirements of assignments 3, 4 and 5 |
| Evaluate the selection and use of ICT tools and facilities used to present information | reflecting on the way that assignments have been presented |
| Select and use ICT to communicate and exchange information safely, responsibly and effectively including storage of messages and contact lists | sending emails to tutors with appropriate information attached; demonstrating to tutors that email has been used appropriately; responding to feedback on assignments |

| Skill | When learners are ... |
|---|---|
| **Mathematics** | |
| Understand routine and non-routine problems in a wide range of familiar and unfamiliar contexts and situations | analysing data on the characteristics of particular diseases and infections |
| Identify the situation or problem and the mathematical methods needed to tackle it | interpreting mathematical models that plot trends in epidemics and how they can be used to predict numbers of cases or how to respond appropriately with treatment programmes |
| Select and apply a range of skills to find solutions | assessing the costs and benefits of different treatment programmes for similar diseases and infections |
| Use appropriate checking procedures and evaluate their effectiveness at each stage | checking that the scales of graphs or epidemiological maps are appropriate |
| Interpret and communicate solutions to practical problems in familiar and unfamiliar routine contexts and situations | describing how treatments can vary for the same disease and have different outcomes |
| Draw conclusions and provide mathematical justifications | assessing the effectiveness of a disease treatment programme |
| **English** | |
| Speaking and listening – make a range of contributions to discussions and make effective presentations in a wide range of contexts | discussing the ways in which diseases spread in different situations interacting with visiting speakers making presentations about particular epidemics |
| Reading – compare, select, read and understand texts and use them to gather information, ideas, arguments and opinions | reading text, describing the nature of different symptoms of particular diseases<br>reading internet articles about treatment regimes, perhaps in relation to controversial programmes such as the treatment of HIV |
| Writing – write documents, including extended writing pieces, communicating information, ideas and opinions, effectively and persuasively | writing about the impacts of disease upon societies<br>producing reports about an epidemic explaining the importance of the environmental conditions for the development of malaria. |