

Surname	Centre Number	Candidate Number
Other Names		2



**GCE AS/A level**

1661/01

**APPLIED SCIENCE  
UNIT 1**

A.M. THURSDAY, 16 May 2013

1½ hours

For Examiner's use only			
	Question	Max. Mark	Mark Awarded
<b>Section A</b>	<b>1-8</b>	<b>30</b>	
<b>Section B</b>	<b>9</b>	<b>8</b>	
	<b>10</b>	<b>12</b>	
	<b>11</b>	<b>9</b>	
	<b>12</b>	<b>5</b>	
	<b>13</b>	<b>10</b>	
	<b>14</b>	<b>6</b>	
<b>Total</b>		<b>80</b>	

**ADDITIONAL MATERIALS**

In addition to this examination paper, you will need a calculator and ruler.

**INSTRUCTIONS TO CANDIDATES**

Use black ink or black ball-point pen.

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** questions.

Write your answers in the spaces provided in this booklet.

**INFORMATION FOR CANDIDATES**

Section A is based on the pre-release article (included).

The number of marks is given in brackets at the end of each question or part-question.

You are reminded that assessment will take into account the quality of written communication used in your answers.

A **data sheet** is included on page 28.

1661  
010001

## Pre-release article

## Swine flu case study: Tragedy struck young mother only weeks after she gave birth

Among the first Scottish victims of the virus was a young mother who, according to her family, was fit and healthy before she died of swine flu just a month after giving birth to her second child. Sarah Johnston, from Clydebank, contracted the virus soon after giving birth to Leo in October last year. But within weeks of the birth on 29 November, Ms Johnston died, leaving behind the baby, her one-year-old son John and partner William Long, 27. The Scottish Government linked Ms Johnston's death to "underlying health problems" but her family insisted the only factors involved were the normal stresses of childbirth.

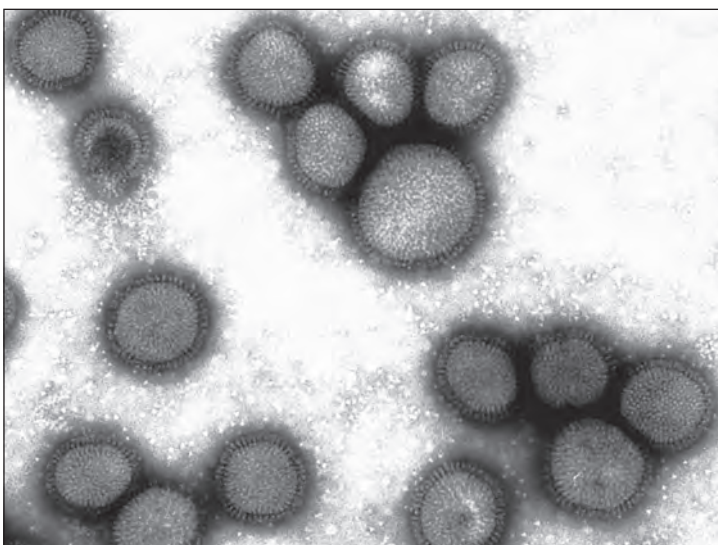
Family members said that both Ms Johnston and Leo were healthy when they were sent home to Clydebank, but the new mother complained of being unwell and developed symptoms of swine flu days later. A GP attended and ordered her to go straight to A&E at the Glasgow Royal Infirmary due to her breathing difficulties.

She was moved to the intensive care ward and treated with ventilators. She was later transferred to London's Royal Brompton Hospital for specialist treatment but died after complications, including deep vein thrombosis and bleeding on her brain. Following her sudden death, Ms Johnston's mother Mary, her brother Jim and sister Kay spoke of their devastation and urged all pregnant women to get the swine flu vaccination.

*news.scotsman.com*

### 20 What is Swine flu?

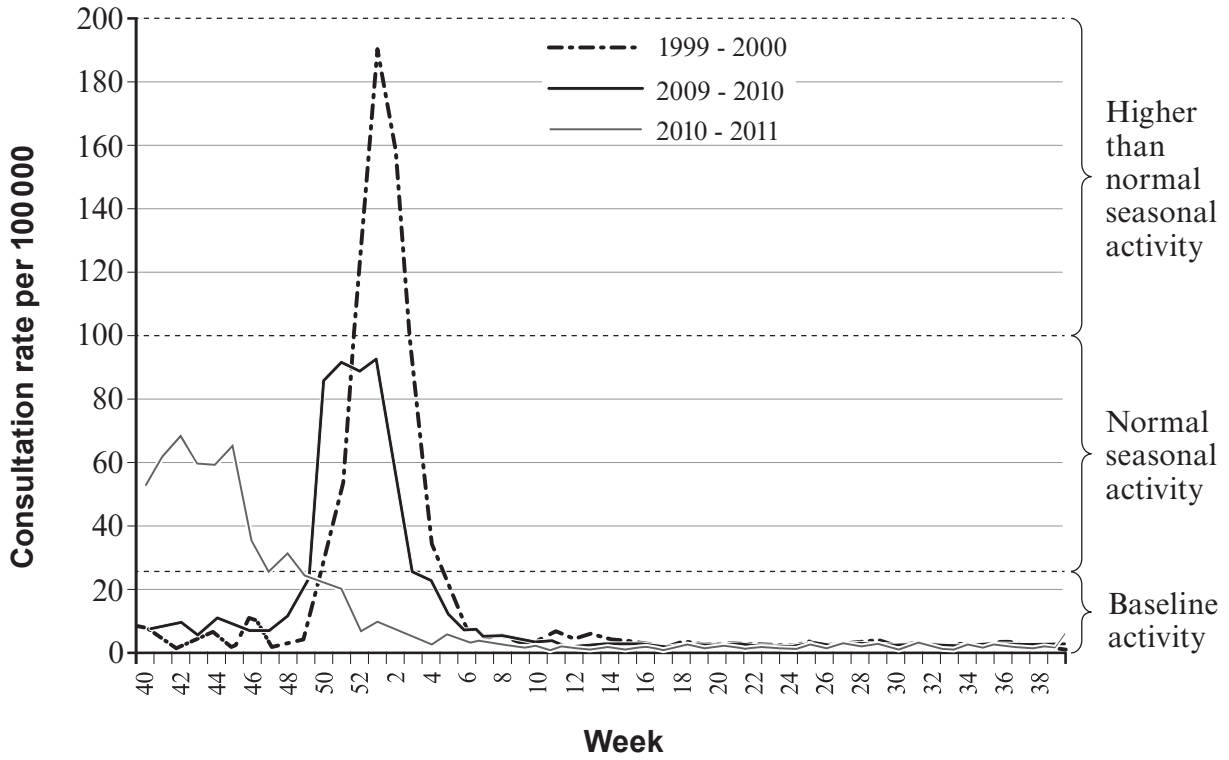
Swine flu is the common name given to a relatively new strain of influenza (flu) that caused a flu pandemic in 2009-2010. It is also referred to as H1N1 influenza (because it is the H1N1 strain of virus).



**Fig 1 The H1N1 (Swine flu) virus as seen under the electron microscope**

**Current status**

On 10 August 2010, the World Health Organization (WHO) declared that the H1N1 influenza pandemic was officially over. However, it is important not to ignore H1N1 flu.



Week 40 = October

30 Fig 2 The number of swine flu cases in 1999-2000, 2009-2010 and 2010-2011

1661  
010003

**Table 1 Swine flu cases across Wales in 2009**

<b>Local Health Board</b>	<b>Rate per 100 000 w/c 13.07.09</b>	<b>Rate per 100 000 w/c 07.12.09</b>
Anglesey	46.5	13.4
Gwynedd	75.3	28.1
Conwy	74.5	20.3
Denbighshire	109.9	28.7
Flintshire	131.4	31.4
Wrexham	156.3	40.2
Powys	113.8	17.8
Ceredigion	58.8	35.8
Pembrokeshire	65.0	36.0
Carmarthenshire	67.6	24.6
Swansea	55.4	21.6
Neath Port Talbot	52.2	31.1
Bridgend	83.4	28.7
Vale of Glamorgan	191.8	39.9
Cardiff	51.5	41.3
Rhondda Cynon Taf	80.1	16.8
Merthyr Tydfil	100.7	40.4
Caerphilly	129.2	88.5
Blaenau Gwent	129.8	25.2
Torfaen	174.2	20.9
Monmouthshire	151.7	36.6
Newport	181.6	34.5

**What to do if you have H1N1 flu**

People with H1N1 flu typically have a fever or high temperature (over 38°C) and may also have aching muscles, sore throat or a dry cough. The symptoms are very similar to other types of seasonal flu. Most people recover within a week, even without special treatment. The National Pandemic Flu Service no longer operates.

# Do you think you have swine flu?

DO	✓
Swine flu information line <b>0800 1 513 513</b>	<input checked="" type="checkbox"/>
NHS Direct <b>0845 4647</b>	<input checked="" type="checkbox"/>
GP	<input checked="" type="checkbox"/>

DON'T	X
GP	<input type="checkbox"/>
<b>H</b>	<input type="checkbox"/>
A&E	<input type="checkbox"/>
	<input type="checkbox"/>

**SWINE FLU INFORMATION**

**0800 1 513 513**  
[www.nhs.uk](http://www.nhs.uk)  
[www.direct.gov.uk/swineflu](http://www.direct.gov.uk/swineflu)

Do you have flu-like symptoms?  
 If yes, please STOP a moment and read below.

Please **do not** go into your GP surgery, A&E, walk-in centre or pharmacy if you have flu-like symptoms.

So that the virus is not spread, firstly, please call the freephone number above; NHS Direct on 0845 4647 or your GP from home. They will give you advice on your symptoms and the next steps you should take. Ask your flu buddy to collect any medicine you may need.

1661 010005

## High-risk groups

Some people are more at risk of complications if they catch flu. People are particularly vulnerable if they have:

- 40 • chronic lung disease
- chronic heart disease
- chronic kidney disease
- chronic liver disease
- chronic neurological disease (neurological disorders include motor neurone disease, multiple sclerosis and Parkinson's disease)
- immunosuppression (whether caused by disease or treatment)
- diabetes mellitus.

Also at risk are:

- 50 • patients who have had drug treatment for asthma in the past three years
- pregnant women
- people aged 65 and over.

## How to stop the virus spreading

The most important way to stop flu spreading is to have good respiratory and hand hygiene. This means sneezing into a tissue and quickly putting it in a bin. Wash your hands and work surfaces regularly and thoroughly to kill the virus. Anyone who is concerned about flu symptoms should contact their GP, who will determine the most appropriate action to take.

## How H1N1 flu is spread

60 Evidence from previous pandemics suggests that one person will infect about two others, and that flu spreads particularly rapidly in closed communities such as schools or residential homes. People are most infectious soon after they develop symptoms, although they can spread the virus for up to five days after the start of symptoms (for children this is seven days).

The H1N1 flu virus is spread in exactly the same way as ordinary cold and flu viruses. The virus is contained in the millions of tiny droplets that come out of the nose and mouth when someone coughs or sneezes. These droplets typically spread about 1 metre. They hang suspended in the air for a while, but then land on surfaces, where the virus can survive for up to 24 hours.

70 Anyone who touches these surfaces can spread the virus by touching anything else. Everyday items at home and in public places may have traces of the virus. These include food, door handles, remote controls, hand rails and computer keyboards. People usually become infected by picking up the virus on their hands from contaminated objects and then placing their hands near their mouth or nose. It is also possible to breathe in the virus if it is suspended in airborne droplets.

## Good hygiene

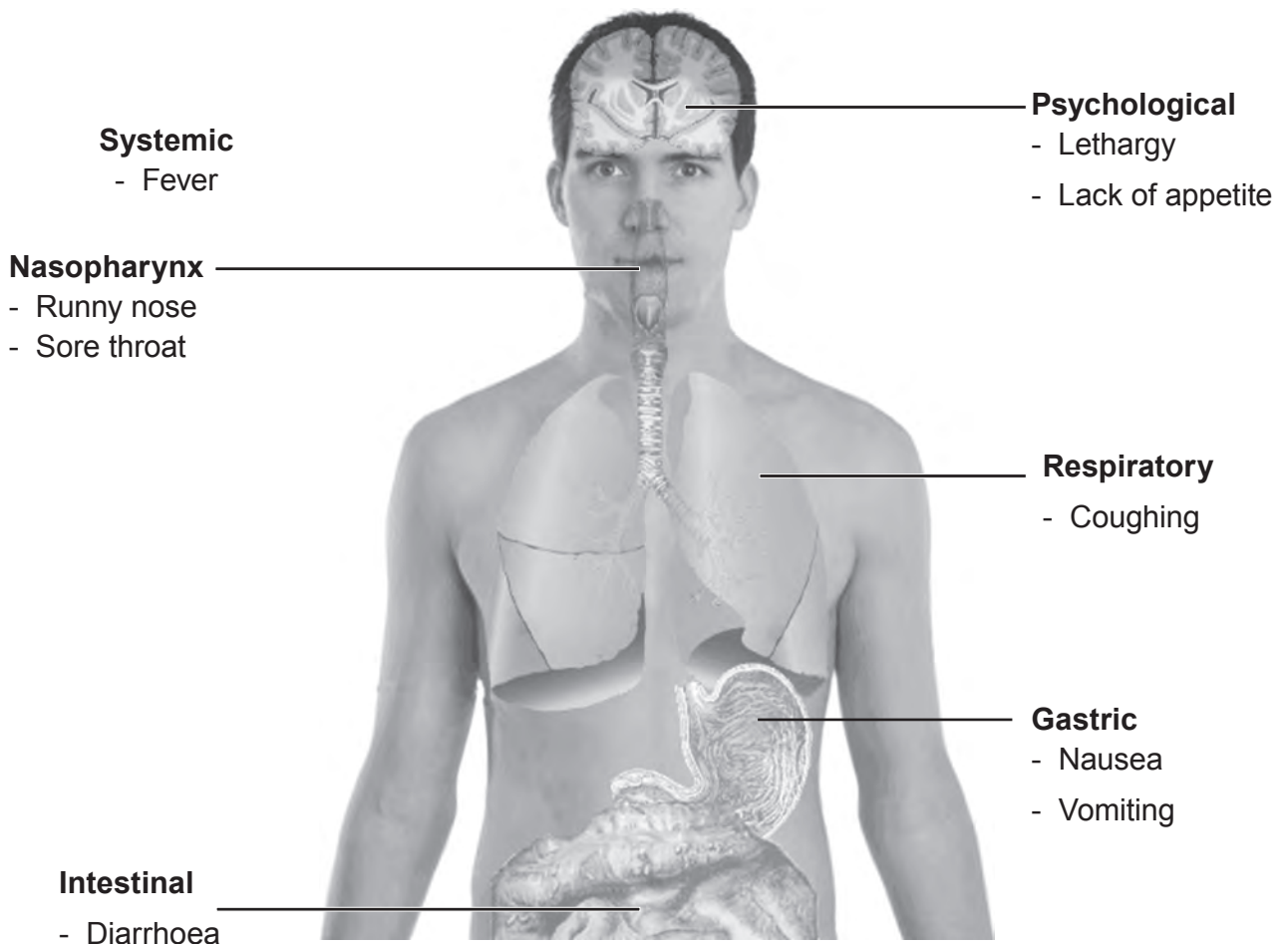
Preventing the spread of the virus is the most effective way to slow the spread of diseases such as swine flu:

- Ensure everyone washes their hands regularly with soap and water.
- Clean surfaces regularly.
- Use tissues to cover your mouth and nose when you cough or sneeze.
- Put used tissues in a bin as soon as possible.

## Symptoms of H1N1 flu

If you or a member of your family has a fever or high temperature (over 38°C) and two or more of the following symptoms, you may have H1N1 flu:

- unusual tiredness
- headache
- runny nose
- sore throat
- shortness of breath or cough
- loss of appetite
- aching muscles
- diarrhoea or vomiting.



**Fig 3 Symptoms of swine flu**



## What to do

- 90 If you have flu-like symptoms, stay at home, get plenty of rest and use over-the-counter painkillers to relieve symptoms. If you are concerned, contact your GP, who will determine the most appropriate action to take.

## Outlook

For most people, the illness appears to be mild. For a minority of people, the virus can cause severe illness. In many of these cases, other factors contribute to the severity of the illness. When complications occur, they are usually caused by the virus affecting the lungs. Infections such as pneumonia can develop.

## What happens in the lungs during swine flu?

- 100 Scientists have examined microscope slides of lung sections taken from patients who died during the swine flu pandemic. They found “a spectrum of damage in both the upper and lower respiratory tract”. In all cases, the upper respiratory tract (the trachea and bronchi) were inflamed and sometimes severely damaged. In over half of the cases studied, damage was also seen lower down, in the bronchioles, and in over three-quarters of cases there was also damage to the alveoli. This damage to the lung differs from seasonal flu which can damage the trachea and bronchi, but does not cause deep lung damage.

## Treating H1N1 flu

### Paracetamol

As with ordinary flu, people who have H1N1 flu should get lots of rest and use standard paracetamol-based cold remedies to reduce their temperature and help relieve symptoms.

- 110 Some over-the-counter treatments used by adults can be given to children for the relief of the symptoms. Follow the instructions that come with each medicine. However, children under 16 **must not** be given aspirin or ready-made flu remedies containing aspirin. Always read the label or check with the pharmacist that a medicine is suitable for children.



## Antivirals

The antiviral medications oseltamivir (Tamiflu) and zanamivir (Relenza) may be used to treat some people with H1N1 flu. Your GP will decide if these are necessary.

Antivirals are not a cure for H1N1 flu, but will help:

- reduce the length of time you are ill by around one day;
- relieve some of the symptoms;
- 120 • reduce the potential for serious complications such as pneumonia.

Tamiflu and Relenza are both medicines of the same type, but Relenza comes as an inhaler (rather than a pill) and is recommended for use in pregnancy.

The National Institute for Health and Clinical Excellence (NICE) recommends the antiviral medicines Tamiflu and Relenza to prevent flu if **all** of the following apply:

- The amount of flu virus circulating is sufficient to mean that if someone has a flu-like illness, it is likely to have been caused by this flu virus;
- The person has a certain medical condition or is over 65;
- The person has been in contact with someone with a flu-like illness and can start treatment within 36 hours (Relenza) or within 48 hours (Tamiflu);
- 130 • The person has not been effectively protected by vaccination.

People who are not effectively protected by vaccination include:

- Those who have not been vaccinated since the previous winter;
- Those who cannot be vaccinated, or who have been vaccinated but it has not taken effect yet;
- Those who have been vaccinated for a different form of flu virus.

If there is an outbreak of seasonal flu in a residential or nursing home, Tamiflu and Relenza may be offered to people if they have been in contact with someone with confirmed flu. This is because these homes are closed places in which flu can spread quickly.

## Antibiotics

- 140 Antibiotics are used to treat H1N1 flu patients who develop complications. They help combat bacterial infections such as pneumonia. In hospitals, antibiotics will be used to treat the most ill patients and may reduce the length of hospitalisation.

## Seasonal flu jab

More recently, the H1N1 flu virus will be one of the main strains circulating, so it has been included in the seasonal flu jab. It means that the vaccine will protect you from H1N1 flu, as well as other strains.

Vaccination is given free of charge to the following at-risk people, to protect them from flu:

- 150
- people with a serious medical condition;
  - people aged 65 or over;
  - pregnant women;
  - people living in a residential or nursing home;
  - the main carers for an elderly or disabled person whose welfare may be at risk if the carer becomes ill;
  - healthcare or social care professionals directly involved in patient care;
  - those who work in close contact with poultry, such as chickens.

The seasonal flu vaccine has been extended to pregnant women not in the high-risk groups. This is because there is good evidence that all pregnant women are at increased risk from complications if they catch H1N1 flu. Previously, only pregnant women in high-risk groups were offered the seasonal flu vaccine.

**SECTION A***Answer all questions.*

1. Why is good hygiene important during flu outbreaks? [1]

.....

.....

2. (a) Patients suffering from chronic lung disease are more at risk from complications if they catch flu. Name **one** chronic lung disease. [1]

.....

- (b) State **two** other groups of patients that are considered at high risk of complications if they catch flu. [2]

.....

.....

3. For this question you will need to refer to the chart on page 3.

- (a) During what period of **2010-2011**, was the number of swine flu cases at its maximum? [1]

.....

- (b) The population of Wales is 3 million (3 000 000). Estimate the number of cases of swine flu in Wales at the peak of the outbreak in **1999-2000**. [2]

.....

.....

.....

- (c) How many cases per 100 000 are considered the **maximum** level for 'normal seasonal activity'? [1]

.....

- (d) Suggest **two** reasons why no data is shown on the chart for the period **2000-2009**. [2]

1. ....

2. ....

4. At the height of the swine flu outbreak patients were encouraged to ring their GP rather than booking an appointment. Suggest and explain a **medical** reason for this. [2]

.....

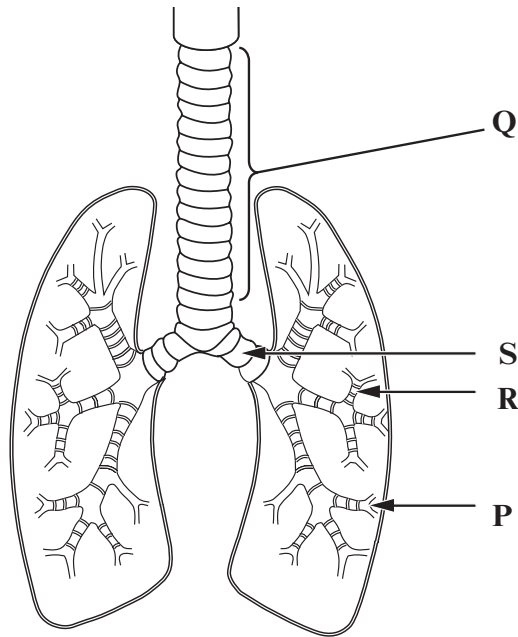
.....

.....

5. (a) State **two** symptoms of swine flu that affect the respiratory system. [2]

.....  
.....

(b) The diagram below shows the human respiratory system.



State which letter(s) correspond to the upper and lower respiratory systems. [2]

Upper respiratory system .....

Lower respiratory system .....

(c) Describe how damage to the **lower** respiratory system would affect the process of gas exchange. [3]

.....  
.....  
.....  
.....

- (d) The upper respiratory tract has a number of adaptations. **Complete** the table below to show how the upper respiratory tract is adapted for its function. [2]

Examiner  
only

Adaptation	Function
Ring of cartilage	..... .....
.....	Traps bacteria and dirt, lubrication
Cilia	..... .....

6. You need to refer to **Table 1** on page 4 showing ‘Swine flu cases across Wales’ to answer the following questions.

(a) State which Local Health Board had the highest incidence of swine flu during the week commencing 7/12/2009. [1]

.....

(b) Calculate the percentage change in the number of cases of swine flu in Carmarthenshire between 13/07/09 and 07/12/09. [3]

.....

.....

.....

(c) Suggest **one** reason why the Welsh Government monitors the number of swine flu cases. [1]

.....

7. Suggest **one** reason why everyone in the UK isn’t offered a vaccine for H1N1 flu. [1]

.....

8. (a) Suggest **one** reason why antibiotics aren’t routinely prescribed for swine flu patients. [1]

.....

(b) Give **two** reasons why antivirals are not prescribed for all swine flu patients. [2]

.....

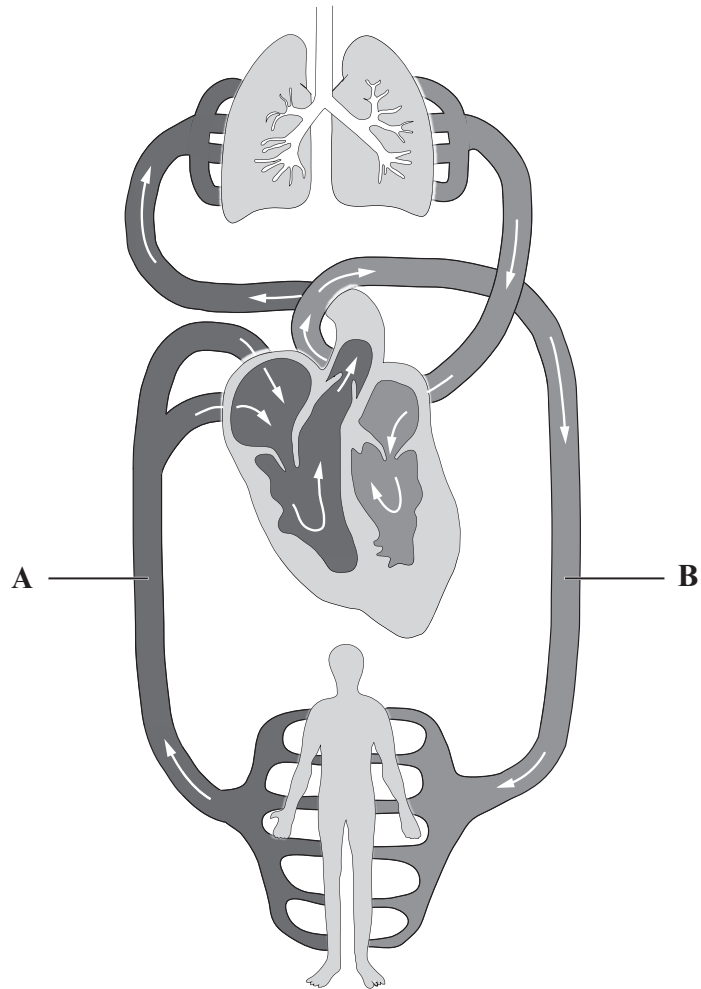
.....



**BLANK PAGE**

**SECTION B**

9. A trainee physiotherapist is studying the human circulatory system. The diagram below shows the circulatory system in the human body.



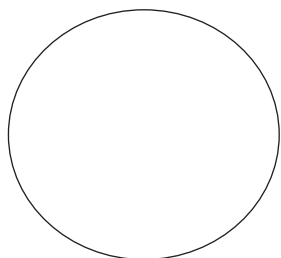
- (a) Identify the **types** of vessels shown at **A** and **B**. [2]

**A** .....

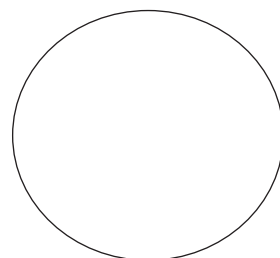
**B** .....

- (b) Using the outlines below, show how the wall and lumen of vessels **A** and **B** differ in size. [2]

**A**



**B**



(c) Besides the thickness of the wall and lumen size, state **two** ways in which vessel **A** is adapted for its function, and explain the importance of each adaptation. [4]

Adaptation 1: .....

Importance: .....

.....

.....

Adaptation 2: .....

Importance: .....

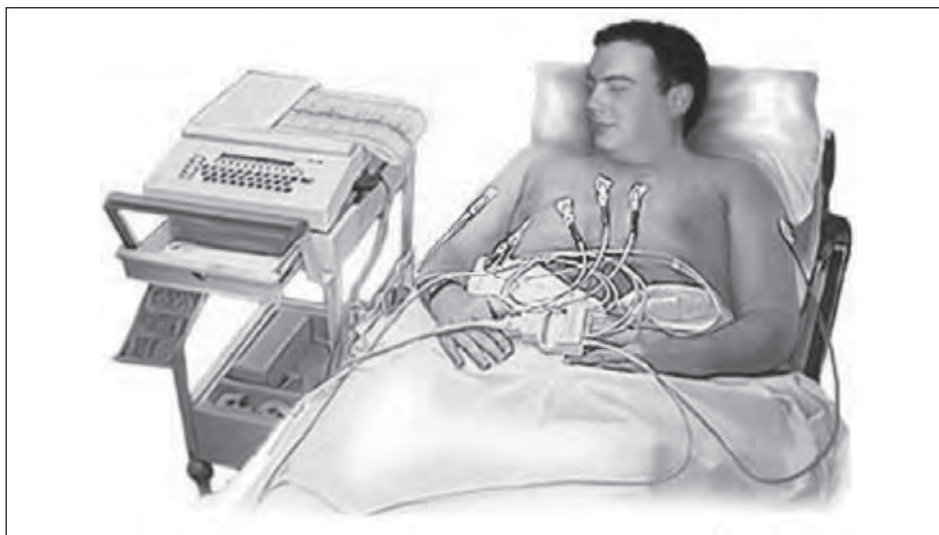
.....

.....

10. Gwynfor is a student nurse. During his training he needs to learn how to use physiological measurement equipment.

(a) Identify each item of equipment below and state what they are used for. [8]

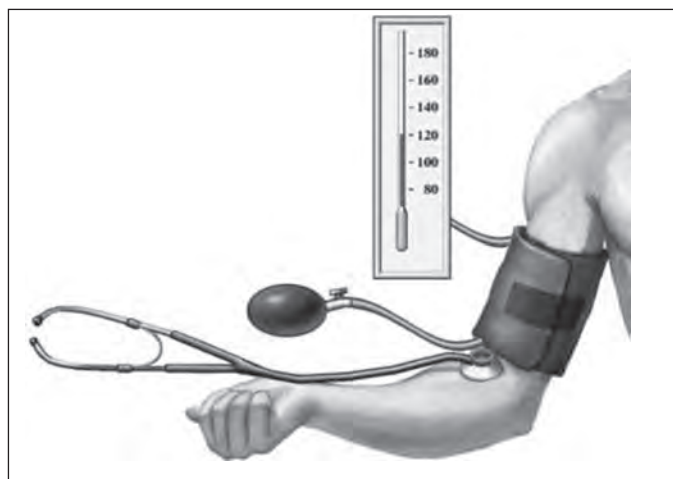
(i)



Name of Equipment .....

Use .....

(ii)



Name of Equipment .....

Use .....

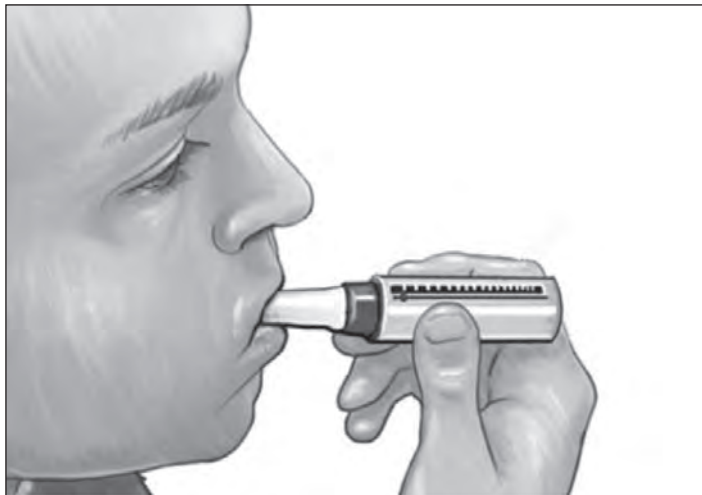
(iii)



Name of Equipment .....

Use .....

(iv)



Name of Equipment .....

Use .....

(b) Use the data sheet on page 28 to give the normal range for the equipment in (a)(ii) for a 20-year old male. [1]

.....

(c) The results below were obtained by testing different patients using equipment found in part (a) of this question. Match each trace to the correct diagnosis from the following list by inserting a letter **A**, **B**, **C**, **D** or **E** next to the test result. *One is done for you.* [3]

- | Diagnosis                  |
|----------------------------|
| A Normal heart activity    |
| B Bradychardia             |
| C Asthmatic                |
| D Normal breathing rate    |
| E Ventricular fibrillation |

**Results**

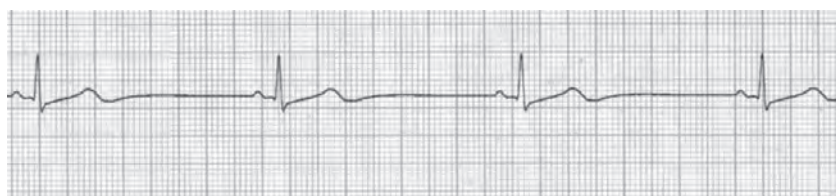
300 dm<sup>3</sup> min<sup>-1</sup>

12-15 breaths per minute

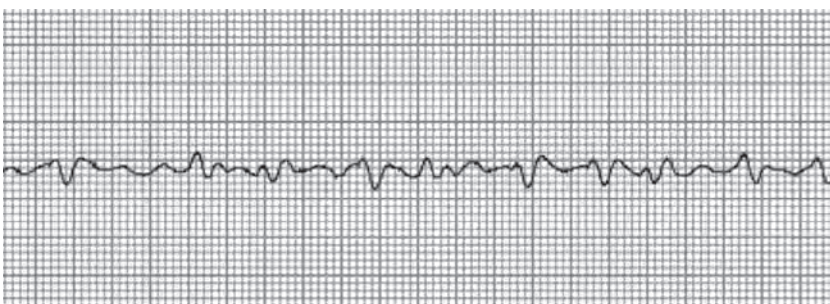
**Diagnosis**

C  
.....

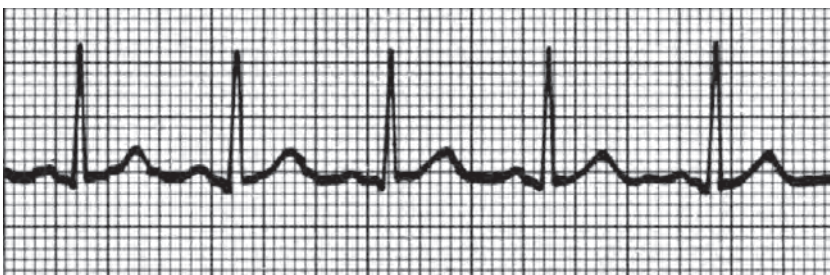
.....



.....



.....



.....

11. Ffion has broken her leg in a serious accident. An X-ray was taken of her leg.



(a) Describe how an X-ray produces the image shown above. [4]

.....

.....

.....

.....

.....

(b) State **three** safety precautions to prevent over-exposure to the radiographer. [3]

1. ....

2. ....

3. ....

(c) After surgery Ffion has metal plates inserted into her leg. Explain why an MRI cannot be used after this surgery. [2]

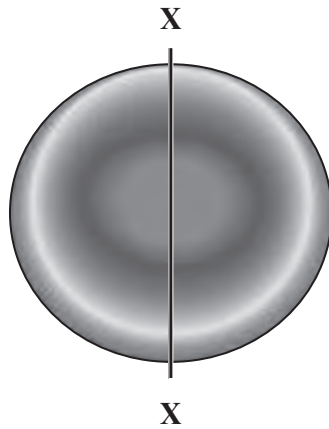
.....

.....

.....

.....

12. Brian was studying the different components of the blood. Red blood cells make up a large part of the blood.



(a) Draw a diagram in the space below to show the appearance of this cell along line **XX**. [1]

(b) Apart from shape, state **two** ways that a red blood cell is adapted for its function. [2]

1. ....

2. ....

(c) Describe the route taken by a red blood cell from leaving the right ventricle of the heart to entering the left atrium. [2]

.....

.....

.....

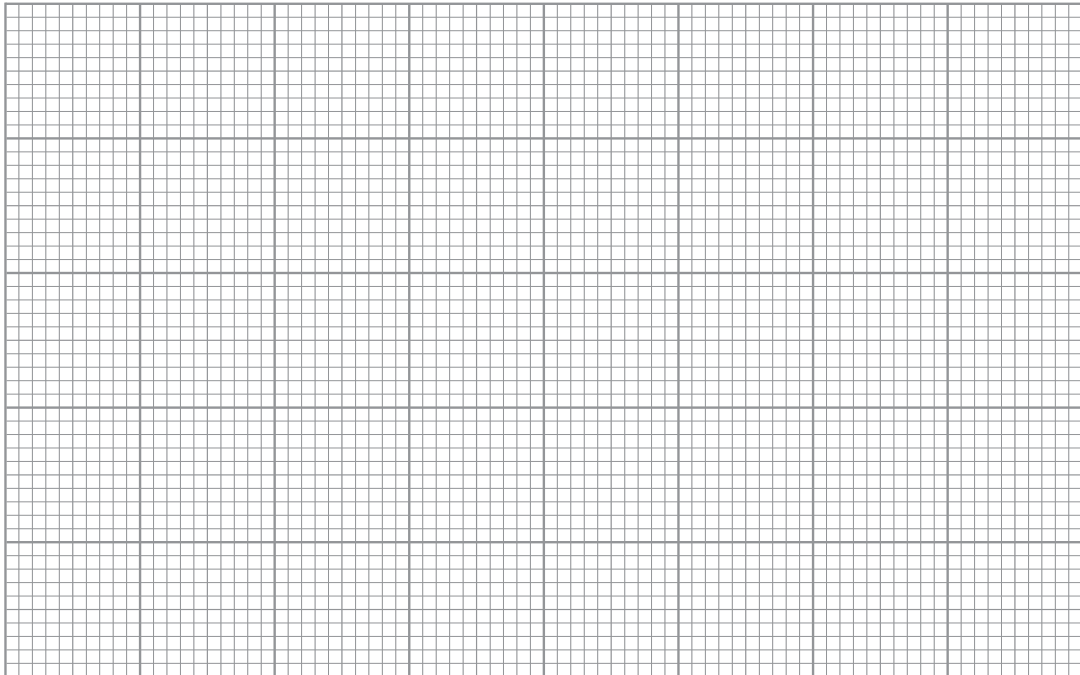
.....



13. During the 1970's it became widely accepted that cigarette smoking was a cause of lung cancer although earlier studies had already suggested a link. In 2007 the government banned smoking in public places. The data below shows the results of a study into the number of people smoking during the period 1950-2010.

Year	% Male smoking prevalence	% Female smoking prevalence
1950	62	38
1960	61	42
1970	55	44
1980	42	35
1990	31	29
2000	29	25
2010	22	20

- (a) Plot a chart to show how the number of male smokers has changed between 1950 and 2010. [4]



(b) Predict the number of male smokers in 2020. Give **two** reasons for your choice. [2]

.....

.....

.....

.....

(c) The following data was taken from an anti-smoking website.  
**Complete** the table below by filling in the missing data [2]

A person smoking 60 cigarettes per day could save over **£27 000** by stopping smoking!

Money in your pocket is one benefit you'll feel straight away.

Based on the price of 20 cigarettes = £5.10

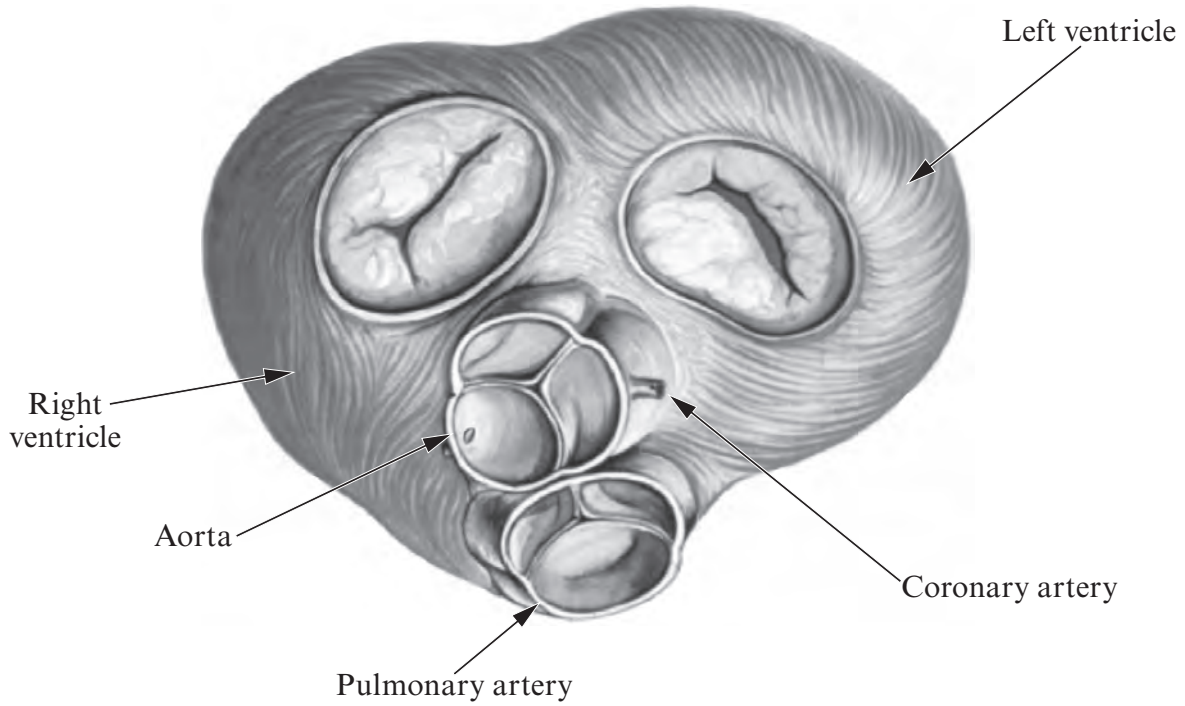
Cigarettes per day	1 day	1 week	1 month	1 year	5 years
5	£1.28	£8.96	£38.83	£465.92	£2 329.60
10	£2.55	£17.85	£77.35	£928.20	£4 641.00
20	£5.10	£35.70	£142.70	£1 856.40	£9 282.00
30	£7.65	£53.55	£232.05	£2 784.60	£13 923.00
40	£10.20	£71.40	£309.40	(i) .....	£18 564.00
60	£15.30	(ii) .....	£464.10	£5 569.20	£27 846.00

(d) Smoking is known to increase blood pressure. State **two** other factors that increase blood pressure. [2]

.....

.....

14. The diagram below is a cross section of the heart, showing the valves of the heart from above.



(a) Label the bicuspid and tricuspid valves. [2]

(b) The valves in the heart play an important part in the cardiac cycle. Explain how the atrio-ventricular (AV) valves are involved in the cardiac cycle. [3]

.....

.....

.....

.....

.....

(c) The coronary artery branches from the aorta. State the function of the coronary artery. [1]

.....

.....

**Data Sheet****Table 1** Normal values for some physiological indicators

Indicator	Adult Male	Adult Female
Pulse Rate	60 – 80 beats per minute	60 – 80 beats per minute
<b>BREATHING</b>		
Rate	12 – 15 breaths per minute	12 – 15 breaths per minute
Tidal volume	400 – 500 cm <sup>3</sup>	400 – 500 cm <sup>3</sup>
Vital Capacity	4.8 dm <sup>3</sup>	3.1 dm <sup>3</sup>
Peak Flow	400 – 600 dm <sup>3</sup> min <sup>-1</sup>	400 – 600 dm <sup>3</sup> min <sup>-1</sup>
<b>BLOOD PRESSURE</b>		
20 years old	125/80 mmHg	123/80 mmHg
40 years old	135/85 mmHg	133/85 mmHg

**Table 2** Reference ranges for some common blood tests

Test	Adult Male	Adult Female
Glucose (Fasting)	4.5 – 6.1 mmol dm <sup>-3</sup>	4.5 – 6.1 mmol dm <sup>-3</sup>
Sodium ions	133 – 147 mmol dm <sup>-3</sup>	133 – 147 mmol dm <sup>-3</sup>
Potassium ions	3.5 – 5.0 mmol dm <sup>-3</sup>	3.5 – 5.0 mmol dm <sup>-3</sup>
Calcium ions	1.15 – 1.29 mmol dm <sup>-3</sup>	1.15 – 1.29 mmol dm <sup>-3</sup>
Zinc ions	10 – 17 µmol dm <sup>-3</sup>	10 – 17 µmol dm <sup>-3</sup>
<b>RED BLOOD CELLS</b>		
Haemoglobin	140 – 180 g dm <sup>-3</sup>	115 – 160 g dm <sup>-3</sup>
Red Cell count	4.5 – 6.5 × 10 <sup>12</sup> dm <sup>-3</sup>	3.8 – 5.8 × 10 <sup>12</sup> dm <sup>-3</sup>
<b>WHITE BLOOD CELL COUNT</b>		
	4 – 11 × 10 <sup>9</sup> dm <sup>-3</sup>	4 – 11 × 10 <sup>9</sup> dm <sup>-3</sup>
<b>PLATELET COUNT</b>		
	150 – 400 × 10 <sup>9</sup> dm <sup>-3</sup>	150 – 400 × 10 <sup>9</sup> dm <sup>-3</sup>



**GCE AS/A level**

1661/01-A

**APPLIED SCIENCE  
UNIT 1**

**Pre-release Article for Examination in  
May 2013**

1661  
01A/01

**BLANK PAGE**

**Information for Teachers**

The pre-release article is intended as stimulus material in order to generate discussion. Questions will be set on the examination paper based on the information in the article and related aspects from the specification.

The article is based upon information found on various websites including news.scotsman.com.

**No recall or terminology is required over and above that in the specification.**

Students will be expected to have discussed and studied the article together with relevant specification content prior to the examination. However, they will not be expected to memorise any part of it as a copy will be provided in the examination paper.

1

## Swine flu case study: Tragedy struck young mother only weeks after she gave birth

Among the first Scottish victims of the virus was a young mother who, according to her family, was fit and healthy before she died of swine flu just a month after giving birth to her second child. Sarah Johnston, from Clydebank, contracted the virus soon after giving birth to Leo in October last year. But within weeks of the birth on 29 November, Ms Johnston died, leaving behind the baby, her one-year-old son John and partner William Long, 27. The Scottish Government linked Ms Johnston's death to "underlying health problems" but her family insisted the only factors involved were the normal stresses of childbirth.

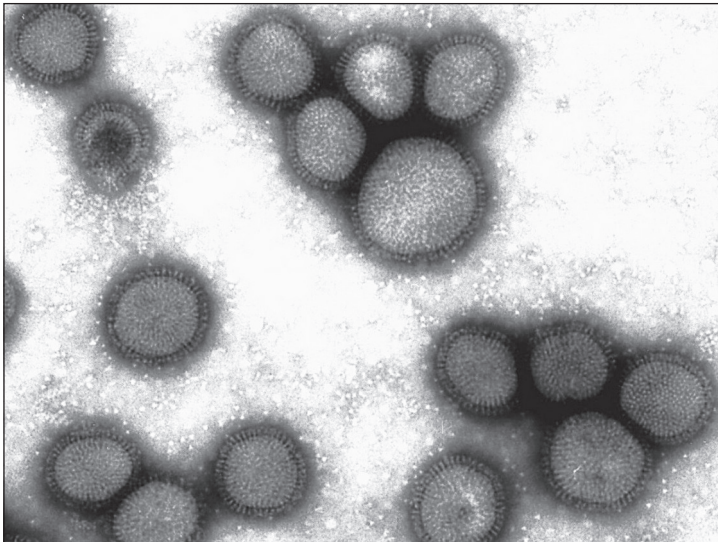
10 Family members said that both Ms Johnston and Leo were healthy when they were sent home to Clydebank, but the new mother complained of being unwell and developed symptoms of swine flu days later. A GP attended and ordered her to go straight to A&E at the Glasgow Royal Infirmary due to her breathing difficulties.

She was moved to the intensive care ward and treated with ventilators. She was later transferred to London's Royal Brompton Hospital for specialist treatment but died after complications, including deep vein thrombosis and bleeding on her brain. Following her sudden death, Ms Johnston's mother Mary, her brother Jim and sister Kay spoke of their devastation and urged all pregnant women to get the swine flu vaccination.

*news.scotsman.com*

## 20 What is Swine flu?

Swine flu is the common name given to a relatively new strain of influenza (flu) that caused a flu pandemic in 2009-2010. It is also referred to as H1N1 influenza (because it is the H1N1 strain of virus).

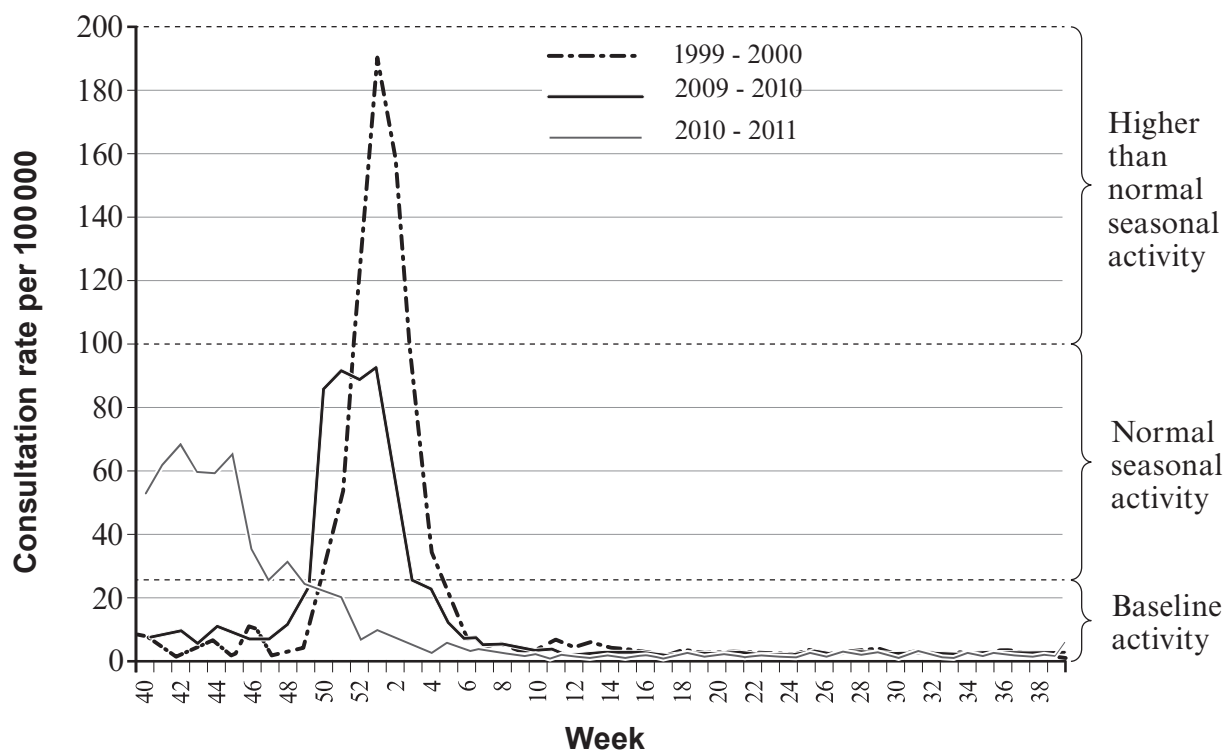


**Fig 1 The H1N1 (Swine flu) virus as seen under the electron microscope**



**Current status**

On 10 August 2010, the World Health Organization (WHO) declared that the H1N1 influenza pandemic was officially over. However, it is important not to ignore H1N1 flu.



Week 40 = October

30 Fig 2 The number of swine flu cases in 1999-2000, 2009-2010 and 2010-2011

1661-01A/05




**Table 1 Swine flu cases across Wales in 2009**

<b>Local Health Board</b>	<b>Rate per 100 000 w/c 13.07.09</b>	<b>Rate per 100 000 w/c 07.12.09</b>
Anglesey	46.5	13.4
Gwynedd	75.3	28.1
Conwy	74.5	20.3
Denbighshire	109.9	28.7
Flintshire	131.4	31.4
Wrexham	156.3	40.2
Powys	113.8	17.8
Ceredigion	58.8	35.8
Pembrokeshire	65.0	36.0
Carmarthenshire	67.6	24.6
Swansea	55.4	21.6
Neath Port Talbot	52.2	31.1
Bridgend	83.4	28.7
Vale of Glamorgan	191.8	39.9
Cardiff	51.5	41.3
Rhondda Cynon Taf	80.1	16.8
Merthyr Tydfil	100.7	40.4
Caerphilly	129.2	88.5
Blaenau Gwent	129.8	25.2
Torfaen	174.2	20.9
Monmouthshire	151.7	36.6
Newport	181.6	34.5





## What to do if you have H1N1 flu

People with H1N1 flu typically have a fever or high temperature (over 38°C) and may also have aching muscles, sore throat or a dry cough. The symptoms are very similar to other types of seasonal flu. Most people recover within a week, even without special treatment. The National Pandemic Flu Service no longer operates.

# Do you think you have swine flu?

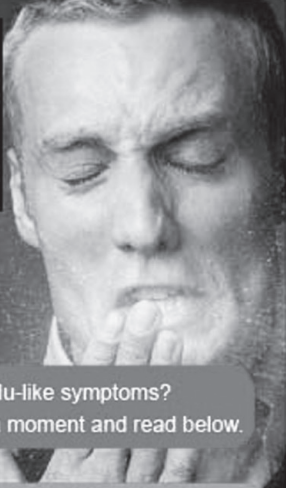
DO	✓
 Swine flu information line <b>0800 1 513 513</b>	<input checked="" type="checkbox"/>
 NHS Direct <b>0845 4647</b>	<input checked="" type="checkbox"/>
 GP	<input checked="" type="checkbox"/>

DON'T	X
 GP	<input type="checkbox"/>
 <b>H</b>	<input type="checkbox"/>
 A&E	<input type="checkbox"/>
 <b>+</b>	<input type="checkbox"/>

**SWINE FLU INFORMATION**

**0800 1 513 513**  
[www.nhs.uk](http://www.nhs.uk)  
[www.direct.gov.uk/swineflu](http://www.direct.gov.uk/swineflu)



Do you have flu-like symptoms?  
If yes, please STOP a moment and read below.

Please do not go into your GP surgery, A&E, walk-in centre or pharmacy if you have flu-like symptoms.

So that the virus is not spread, firstly, please call the freephone number above; NHS Direct on 0845 4647 or your GP from home. They will give you advice on your symptoms and the next steps you should take. Ask your flu buddy to collect any medicine you may need.

## High-risk groups

Some people are more at risk of complications if they catch flu. People are particularly vulnerable if they have:

- 40 • chronic lung disease
- chronic heart disease
- chronic kidney disease
- chronic liver disease
- chronic neurological disease (neurological disorders include motor neurone disease, multiple sclerosis and Parkinson's disease)
- immunosuppression (whether caused by disease or treatment)
- diabetes mellitus.

Also at risk are:

- 50 • patients who have had drug treatment for asthma in the past three years
- pregnant women
- people aged 65 and over.

## How to stop the virus spreading

The most important way to stop flu spreading is to have good respiratory and hand hygiene. This means sneezing into a tissue and quickly putting it in a bin. Wash your hands and work surfaces regularly and thoroughly to kill the virus. Anyone who is concerned about flu symptoms should contact their GP, who will determine the most appropriate action to take.

## How H1N1 flu is spread

60 Evidence from previous pandemics suggests that one person will infect about two others, and that flu spreads particularly rapidly in closed communities such as schools or residential homes. People are most infectious soon after they develop symptoms, although they can spread the virus for up to five days after the start of symptoms (for children this is seven days).

The H1N1 flu virus is spread in exactly the same way as ordinary cold and flu viruses. The virus is contained in the millions of tiny droplets that come out of the nose and mouth when someone coughs or sneezes. These droplets typically spread about 1 metre. They hang suspended in the air for a while, but then land on surfaces, where the virus can survive for up to 24 hours.

70 Anyone who touches these surfaces can spread the virus by touching anything else. Everyday items at home and in public places may have traces of the virus. These include food, door handles, remote controls, hand rails and computer keyboards. People usually become infected by picking up the virus on their hands from contaminated objects and then placing their hands near their mouth or nose. It is also possible to breathe in the virus if it is suspended in airborne droplets.

## Good hygiene

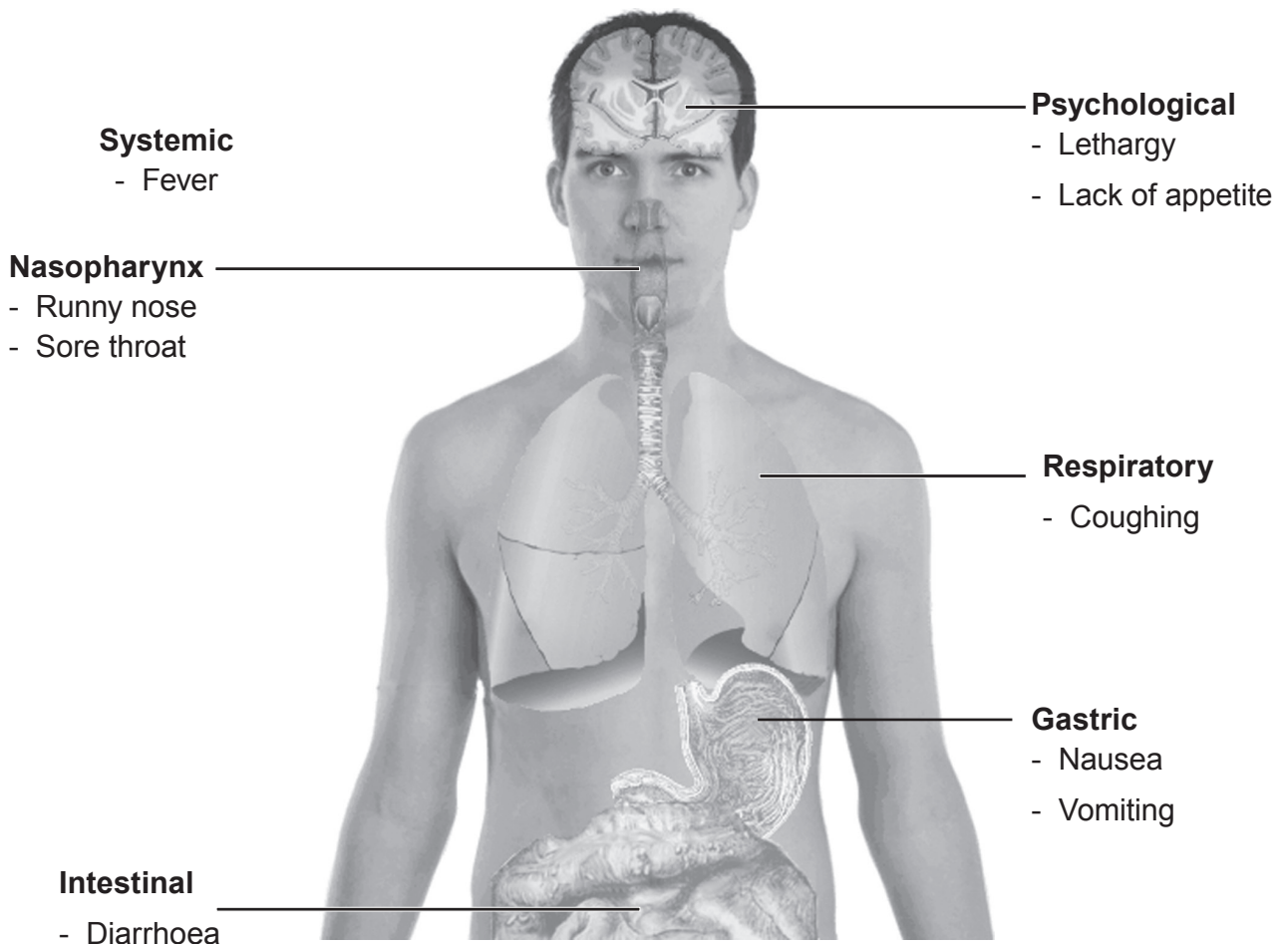
Preventing the spread of the virus is the most effective way to slow the spread of diseases such as swine flu:

- Ensure everyone washes their hands regularly with soap and water.
- Clean surfaces regularly.
- Use tissues to cover your mouth and nose when you cough or sneeze.
- Put used tissues in a bin as soon as possible.

## Symptoms of H1N1 flu

If you or a member of your family has a fever or high temperature (over 38°C) and two or more of the following symptoms, you may have H1N1 flu:

- unusual tiredness
- headache
- runny nose
- sore throat
- shortness of breath or cough
- loss of appetite
- aching muscles
- diarrhoea or vomiting.



**Fig 3 Symptoms of swine flu**

## What to do

- 90 If you have flu-like symptoms, stay at home, get plenty of rest and use over-the-counter painkillers to relieve symptoms. If you are concerned, contact your GP, who will determine the most appropriate action to take.

## Outlook

For most people, the illness appears to be mild. For a minority of people, the virus can cause severe illness. In many of these cases, other factors contribute to the severity of the illness. When complications occur, they are usually caused by the virus affecting the lungs. Infections such as pneumonia can develop.

## What happens in the lungs during swine flu?

- 100 Scientists have examined microscope slides of lung sections taken from patients who died during the swine flu pandemic. They found “a spectrum of damage in both the upper and lower respiratory tract”. In all cases, the upper respiratory tract (the trachea and bronchi) were inflamed and sometimes severely damaged. In over half of the cases studied, damage was also seen lower down, in the bronchioles, and in over three-quarters of cases there was also damage to the alveoli. This damage to the lung differs from seasonal flu which can damage the trachea and bronchi, but does not cause deep lung damage.

## Treating H1N1 flu

### Paracetamol

As with ordinary flu, people who have H1N1 flu should get lots of rest and use standard paracetamol-based cold remedies to reduce their temperature and help relieve symptoms.

- 110 Some over-the-counter treatments used by adults can be given to children for the relief of the symptoms. Follow the instructions that come with each medicine. However, children under 16 **must not** be given aspirin or ready-made flu remedies containing aspirin. Always read the label or check with the pharmacist that a medicine is suitable for children.



## Antivirals

The antiviral medications oseltamivir (Tamiflu) and zanamivir (Relenza) may be used to treat some people with H1N1 flu. Your GP will decide if these are necessary.

Antivirals are not a cure for H1N1 flu, but will help:

- reduce the length of time you are ill by around one day;
- relieve some of the symptoms;
- 120 • reduce the potential for serious complications such as pneumonia.

Tamiflu and Relenza are both medicines of the same type, but Relenza comes as an inhaler (rather than a pill) and is recommended for use in pregnancy.

The National Institute for Health and Clinical Excellence (NICE) recommends the antiviral medicines Tamiflu and Relenza to prevent flu if **all** of the following apply:

- The amount of flu virus circulating is sufficient to mean that if someone has a flu-like illness, it is likely to have been caused by this flu virus;
- The person has a certain medical condition or is over 65;
- The person has been in contact with someone with a flu-like illness and can start treatment within 36 hours (Relenza) or within 48 hours (Tamiflu);
- 130 • The person has not been effectively protected by vaccination.

People who are not effectively protected by vaccination include:

- Those who have not been vaccinated since the previous winter;
- Those who cannot be vaccinated, or who have been vaccinated but it has not taken effect yet;
- Those who have been vaccinated for a different form of flu virus.

If there is an outbreak of seasonal flu in a residential or nursing home, Tamiflu and Relenza may be offered to people if they have been in contact with someone with confirmed flu. This is because these homes are closed places in which flu can spread quickly.

## Antibiotics

- 140 Antibiotics are used to treat H1N1 flu patients who develop complications. They help combat bacterial infections such as pneumonia. In hospitals, antibiotics will be used to treat the most ill patients and may reduce the length of hospitalisation.

## Seasonal flu jab

More recently, the H1N1 flu virus will be one of the main strains circulating, so it has been included in the seasonal flu jab. It means that the vaccine will protect you from H1N1 flu, as well as other strains.



Vaccination is given free of charge to the following at-risk people, to protect them from flu:

150

- people with a serious medical condition;
- people aged 65 or over;
- pregnant women;
- people living in a residential or nursing home;
- the main carers for an elderly or disabled person whose welfare may be at risk if the carer becomes ill;
- healthcare or social care professionals directly involved in patient care;
- those who work in close contact with poultry, such as chickens.

The seasonal flu vaccine has been extended to pregnant women not in the high-risk groups. This is because there is good evidence that all pregnant women are at increased risk from complications if they catch H1N1 flu. Previously, only pregnant women in high-risk groups were offered the seasonal flu vaccine.