### History Knowledge Organiser: Britain, Health and the People

#### 1. Britain: Health and the People Timeline:

<table>
<thead>
<tr>
<th>Period</th>
<th>Beliefs</th>
<th>Key developments and events</th>
<th>Individuals</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The Middle Ages 1476-1445AD</td>
<td>A period of turmoil and recovery after the Fall of Rome. The rise of the Catholic Church.</td>
<td>Fall of the Roman Empire, The Black Death, Islamic/Christian medicine</td>
<td>Bacon, Rhazes, Ibn-Nafis, Galen (Ancient Greece)</td>
</tr>
</tbody>
</table>

#### 2. Galen and Hippocrates:
- Before the Middle Ages, two doctors had been extremely important in the empires of Ancient Greece and Ancient Rome: Hippocrates and Galen.
- Before Hippocrates and Galen, most people believed that diseases were supernatural punishments from the Gods, which could be healed through offerings and prayer.
- Hippocrates is known as the “father of medicine”: he argued that doctors should observe patients to find out what was wrong with them.
- Hippocrates believed that there were four fluids in the body, called humours, which needed to be kept in balance to keep patients healthy. This could be achieved by controlling exercise and diet. Medicine was seen as a last resort.
- Galen, a Greek doctor in the Roman Empire, built on Hippocrates’ ideas and made them popular.
- Both doctors wrote a huge number of books, many of which remained in use up to the 19th century.
3. The Middle Ages:
- The Middle Ages was the period between the fall of Rome in 476AD and the Renaissance, which began in the 1300 and 1400s.
- At beginning of the Middle Ages, life was extremely difficult for most people, and survival became more important than literature, culture of art.
- However, as the Middle Ages progressed, living standards improved and people became more wealthy.

<table>
<thead>
<tr>
<th>Key Event/Development</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Catholic Church became more important.</td>
<td>Many people looked to God and the supernatural to explain diseases. Monasteries were built, which served as the first hospitals in Europe. The Church passionately supported the works of Galen.</td>
</tr>
<tr>
<td>The large Roman Empire was replaced by multiple, smaller kingdoms.</td>
<td>It was more difficult to travel and spread new ideas. Many ancient texts were destroyed. Wars regularly broke out, giving surgeons the chance to practice.</td>
</tr>
<tr>
<td>The Islamic Empire developed in Africa and the Middle East.</td>
<td>The Islamic Empire preserved and translated many ancient texts from Greece and Rome. Individuals in the Islamic Empire, such as Ibn Sina, wrote books and did research.</td>
</tr>
<tr>
<td>The Black Death killed around 1/3 of Europe’s population (14th century).</td>
<td>Living standards and freedoms for the poor improved.</td>
</tr>
</tbody>
</table>

![Timeline of the Middle Ages](image)

- 476AD: The Fall of Rome
- 1066AD: The Norman Invasion of Britain (and an increase in the building of monasteries.)
- 1315AD: Mondino’s dissection manual published.
- 1348-1350AD: The Black Death in England
- 865-925AD: Life of Al-Razi
- 980-1037AD: Life of Ibn Sina.
- 1267AD: Hugh and Theodoric of Lucca’s book criticising encouraging the formation of pus in wounds published.

**History Knowledge Organiser: Britain, Health and the People**

### 4. The Impact of Christianity on Medicine in the Middle Ages:
- After the fall of the Roman Empire in the 400s, Christianity began the dominant religion in Europe.
- Over time, the Church became extremely **wealthy and powerful**.
- The Church put emphasis on **tradition, its own authority** and a belief in **God**.
- However, the Church also believed that it should **follow Jesus’ example** and help the poor, sick and those in need.

![Patients at the Hôtel Dieu in Paris in the Middle Ages in 1482.](image)

### Area | Christian Medicine:
--- | ---
**Disease** | - The Church believed that **disease was sent by God as a punishment**.
| | - The Church also had respect for the ideas of **Galen** as he believed in there only being one god.
**Hospitals** | - The church helped to set up hospitals throughout Europe during the Middle Ages.
| | - **Monasteries** would also have small **infirmaries** which would offer beds to the poor and sick for free.
| | - Many hospitals focused on providing **warm beds, prayer** and **food** for patients and people in need, rather than being places for treatment.
| | - **Lazar houses** were up for people with **leprosy**, as it was seen as a highly **contagious** disease.
| | - Many hospitals **did not have doctors**, but were run by monks or nuns.
**Doctors** | - Many doctors were **also members of the clergy**. Universities were often run by the Church.
| | - Doctors were seen as people who would try to explain **why people had been punished by God**, to predict symptoms and then make people as **comfortable as possible** as they died.
| | - Physicians who trained at university often did so without ever seeing a patient.
**Mental illness** | - Special hospitals were set up for the mentally ill, such as Bedlam in London.
| | - Mental illness was seen as the same as other diseases: **punishment from God or possession**.
**Attitude to Galen and ancient writers** | - The Church **supported Galen's ideas** as Galen argued that there must only be one God.
| | - The Church was willing to take steps to silence people who challenged Galen: Roger Bacon was imprisoned in the 1200s for suggesting that doctors should do their own research.
**Preservation of knowledge** | - Monks copied out the works of **Galen** and other ancient writers by hand.
| | - By the end of the Middle Ages, some texts from the **Islamic Empire** were reaching Europe and being translated. However, the tension between the two religions meant that ideas from the Islamic Empire **travelled slowly**.

**Keywords:**

**Galen:**
A doctor during the Roman Empire who built on the work of Hippocrates to develop the four humours.

**The four humours:**
The belief that the body has four liquids (humours) which must be in balance to keep the body healthy.

**Infirmary:**
An area in a monastery where monks would care for the sick.

**Leprosy:**
A disease which can cause damage to the skin and limbs.

**Contagious:**
When a disease spreads easily.

**Clergy:**
Members of the Church.

**Symptom:**
A physical or mental sign that something is wrong with the body or mind.
5. The Impact of Islam on Medicine in the Middle Ages:
- After the fall of the Roman Empire in the 400s, Islam became the dominant religion in the Middle East and North Africa.
- The Islamic Empire was a huge area of land which was ruled by a Caliph.
- The Islamic Empire placed huge emphasis on science and education.
- As a result, the Islamic Empire helped to preserve knowledge which would otherwise have been lost after the fall of the Roman Empire.

**Area** | **Islamic Medicine:**
--- | ---
Disease | - Islamic doctors believed that disease was natural.  
- Doctors were supposed to observe symptoms, form a diagnosis and then prescribe the correct treatment for patients.

Hospitals | - Hospitals were designed to treat diseases.  
- Hospitals were secular and often contained libraries and medical schools.  
- Many hospitals had separate wards for different groups or conditions.  
- The first Islamic hospital was founded in Baghdad in 805 and by the 1100s every large town had a hospital.  
- Hospitals treated people from all different classes in society.

Doctors | - Doctors were secular and worked only as doctors.  
- Doctors trained by working with a more experienced doctor in a hospital.

Mental illness | - Mental illness was seen as a natural disease which could be treated.  
- Special hospitals were set up for people with mental illnesses.

Attitude to Galen and ancient writers | - Most Islamic doctors accepted Galen and Hippocrates’ theories.  
- Some doctors, such as Al-Razi, challenged Galen’s ideas but there was little support for this opposition.

Preservation of knowledge | - Islamic scholars translated and copied books into Arabic.  
- Many Caliphs advocated science and education, and put huge sums of money into the preservation of books and the building of libraries, such as the one in Baghdad.  
- Al-Razi and Ibn Sina (also known as Avicenna) wrote huge medical encyclopaedias which contained the work of ancient writers along with their own knowledge.
6. Public Health in the Middle Ages:
- During the Middle Ages, public health was generally poor.
- Epidemics were common and some, like the Black Death, wiped out a huge amount of Europe’s population.
- Individuals like De Chauliac and Alderotti emphasised the need for a good diet and regular exercise but it was extremely difficult for people in the Middle Ages to avoid disease.

<table>
<thead>
<tr>
<th>Factor:</th>
<th>Significance:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Taxes</strong> were unpopular and governments often had to spend a large amount of money fighting wars.</td>
<td>Any laws towns introduced were difficult to enforce. Poor areas of towns and cities were not cared for.</td>
</tr>
<tr>
<td>Many towns and cities did not have paved streets and had open sewers. These sewers would often overflow. Most human waste was collected in cesspits emptied by gongfermers.</td>
<td>Bacteria from waste would regularly come into contact with people and clothing.</td>
</tr>
<tr>
<td>Between 1250 and 1530 the population of towns grew.</td>
<td>Diseases spread more quickly due to overcrowding.</td>
</tr>
<tr>
<td>People did not know about germs and disease.</td>
<td>Methods to control or cure diseases rarely worked.</td>
</tr>
<tr>
<td><strong>Trade</strong> increased throughout the Middle Ages.</td>
<td>Diseases spread between towns and countries quickly.</td>
</tr>
<tr>
<td>People lived close to animals.</td>
<td>Diseases quickly spread from animals and parasites, such as fleas and ticks, to humans.</td>
</tr>
</tbody>
</table>

7. Monasteries in the Middle Ages:
- Monasteries in the Middle Ages were often much cleaner than other areas in Britain.
- They also served as the first hospitals since the Roman Empire (see the page about Christian and Islamic Medicine).
- There are a number of reasons why monasteries were usually healthier than other places in the Middle Ages.

<table>
<thead>
<tr>
<th>Factor:</th>
<th>Significance:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monasteries were usually isolated.</td>
<td>Monks avoided major outbreaks of disease.</td>
</tr>
<tr>
<td>Monks have a religious duty to be clean.</td>
<td>Monks would unintentionally wash away germs.</td>
</tr>
<tr>
<td>Monasteries were wealthy as people gave them goods in return for prayers.</td>
<td>Monasteries could afford facilities such as running water, good drainage systems and communal lavatories.</td>
</tr>
<tr>
<td>Monasteries were usually near rivers, allowing them to have running water and good drainage systems.</td>
<td>Waste didn’t build up and monks usually drank clean water (or beer which would kill germs).</td>
</tr>
</tbody>
</table>

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**Keywords**

**Taxes:** A certain amount of money which people have to pay to a council or government.

**Open sewers:** A channel, open to the air, which carries away waste.

**Cesspit:** A pit where liquid waste and sewage would be stored.

**Gongfermer:** A person who was hired to empty cesspits.

**Drainage systems:** A system of pipes or sewers which allows waste to be carried away from an area.

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Fountains Abbey, Yorkshire
8. Medical care in the Middle Ages:
- In the Middle Ages there were a range of options which people could use when they were unwell.
- Most options for treatment were ineffective and reflected the strong influence of the Catholic Church on medicine.
- Alongside medical professionals, many people relied on folk medicine from healers in their communities.

<table>
<thead>
<tr>
<th>Option</th>
<th>Medical care offered:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physicians</td>
<td>- Paid professionals who trained at universities (usually run by the church).</td>
</tr>
<tr>
<td></td>
<td>- Treatments focused on balancing the humours and explaining why God may have punished a patient.</td>
</tr>
<tr>
<td>Barber-surgeons</td>
<td>- Barbers who trained as apprentices but also offered basic surgeries and treatments.</td>
</tr>
<tr>
<td></td>
<td>- Treatments usually focused on blood-letting.</td>
</tr>
<tr>
<td>Wise women/men</td>
<td>- Ordinary people who lived in communities and gained their knowledge through tradition and word of mouth.</td>
</tr>
<tr>
<td></td>
<td>- Treatments focused on herbal remedies and supernatural cures, such as amulets.</td>
</tr>
<tr>
<td>The church/saints</td>
<td>- People could go to monasteries or churches to ask them to pray for their healing.</td>
</tr>
<tr>
<td></td>
<td>- Specific saints would be prayed to in order to treat different conditions.</td>
</tr>
</tbody>
</table>

9. Physicians in the Middle Ages:
- Physicians in the Middle Ages were trained. However, their treatments were almost always ineffective, they were extremely expensive and they were only available in cities and large towns.

<table>
<thead>
<tr>
<th>Area</th>
<th>Situation in the Middle Ages:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Training</td>
<td>- Physicians would train at universities, most of which were controlled by the Church.</td>
</tr>
<tr>
<td></td>
<td>- They would spend 7 years attending lectures and discussing ancient texts.</td>
</tr>
<tr>
<td></td>
<td>- Most of the time physicians would complete university without any hands on experience with patients.</td>
</tr>
<tr>
<td>Diagnosis</td>
<td>- Medieval physicians believed in the ancient Greek method of observing patients and using their symptoms to produce a diagnosis.</td>
</tr>
<tr>
<td></td>
<td>- In reality, physicians would only concentrate on the pulse and examination of the urine.</td>
</tr>
<tr>
<td>Treatment</td>
<td>- Most treatments by physicians involved balancing the humours through bloodletting, vomiting or inducing diarrhoea.</td>
</tr>
<tr>
<td></td>
<td>- Doctors would often use astrology to determine the best time to treat a patient.</td>
</tr>
<tr>
<td></td>
<td>- Doctors sometimes combined treatments with supernatural approaches, like charms.</td>
</tr>
</tbody>
</table>
10. **The Black Death 1348-1350:**
- The Black Death was an epidemic which killed 1.5 million people in Britain between 1348 and 1350.
- It is actually two diseases, the **pneumonic plague** and the **bubonic plague**.
- The pneumonic plague causes coughing and a fever and is spread coming into contact with the **breath** or **blood** of someone with it.
- The bubonic plague causes swellings, called **buboes**, in the armpit and groin and is spread by fleas which carry the bacteria.

<table>
<thead>
<tr>
<th>Causes</th>
<th>Reaction</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>What actually caused it:</strong></td>
<td><strong>Individual people:</strong></td>
<td><strong>Short term:</strong></td>
</tr>
<tr>
<td>- Poor disposal of rubbish in towns encouraged rats.</td>
<td>‘Cures’ for the Black Death were ineffective. They included:</td>
<td>- 1/3 of Europe’s population died.</td>
</tr>
<tr>
<td>- As <strong>trade</strong> increased during the Middle Ages, diseases could spread more widely.</td>
<td>- Drinking mercury</td>
<td>- Towns and cities suffered from <strong>food shortages</strong> due to the lack of <strong>labourers</strong> in the countryside.</td>
</tr>
<tr>
<td>- Towns and ports were <strong>crowded</strong>, meaning the disease spread quickly.</td>
<td>- Self-flagellation (not popular in England)</td>
<td>- This made food more <strong>expensive</strong>.</td>
</tr>
<tr>
<td>- People hat poor diets, meaning their immune systems were weak.</td>
<td>- Popping buboes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Praying</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Avoiding sin</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Attacking Jews (not in Britain)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Fleeing to the countryside</td>
<td></td>
</tr>
<tr>
<td><strong>What people thought caused it:</strong></td>
<td><strong>Government:</strong></td>
<td><strong>Medium term:</strong></td>
</tr>
<tr>
<td>- People at the time were <strong>completely wrong</strong> about what caused the Black Death.</td>
<td>- Local councils tried to <strong>quarantine</strong> infected areas.</td>
<td>- <strong>Living conditions and wages for peasants</strong> improved: as there were fewer of them they were more valuable.</td>
</tr>
<tr>
<td>- Most of their explanations focused on <strong>supernatural</strong> causes.</td>
<td>- King Edward III ordered <strong>church services</strong> and <strong>prayers</strong> every day where people would ask forgiveness from God.</td>
<td></td>
</tr>
<tr>
<td>- People thought causes included:</td>
<td>- King Edward III tried to have streets in London cleaned to <strong>remove bad smells</strong>.</td>
<td></td>
</tr>
<tr>
<td>- The position of stars and the planets (astrology).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Jews poisoning wells.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- God punishing people for their sins.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Bad air (miasma)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Keywords:**
- **Bubo:** A swelling in the armpit or groin.
- **Epidemic:** A widespread outbreak of one disease.
- **Pneumonic:** Something which affects the lungs.
- **Astrology:** The study of the movement and position of stars and planets.
- **Miasma:** The belief that bad smells cause disease.
- **Supernatural:** Something which cannot be explained by science.
- **Resentful:** When someone is angry because they feel they have been treated unfairly.
- **Self-flagellation:** When someone whips themselves.
## History Knowledge Organiser: Britain, Health and the People

### 11. Surgery in the Middle Ages:
- The Middle Ages was a period of **intense warfare**.
- This warfare gave **field surgeons** the opportunity to practice and to develop new theories and techniques.
- However, because of a lack of effective **antiseptics** and **anaesthetics**, surgery remained **basic and a last resort**.
- Most surgery for ordinary people would be carried out by **barber surgeons** and would focus on minor surgery or blood letting to balance the four humours.

### Situation in the Middle Ages:

<table>
<thead>
<tr>
<th>Area</th>
<th>Surgical training</th>
<th>Available treatments</th>
<th>Dissection and anatomy</th>
<th>Dealing with pain</th>
<th>Dealing with infection</th>
<th>Dealing with blood loss</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Barber surgeons</strong></td>
<td><em>Barber surgeons</em> were surgeons who learned through apprenticeships and who didn’t go to university.</td>
<td><em>Barber surgeons</em> could perform <strong>minor surgery</strong>, such as bloodletting, remove small tumours or deal with dislocated limbs. <strong>Trephination</strong> was sometimes used as a treatment for epilepsy.</td>
<td><em>Dissections</em> happened at universities. However, they were rare and did little to advance anatomy.</td>
<td>Some herbal anaesthetics, such as <strong>mandrake</strong>, <strong>opium</strong> and <strong>hemlock</strong> were used.</td>
<td>Most medieval surgeons, such as De Chauliac, believed that pus was a sign of healing.</td>
<td>Most major wounds were closed using <strong>cauterisation</strong> which was extremely painful.</td>
</tr>
<tr>
<td><strong>Apprenticeship</strong></td>
<td><em>Many surgeons gained experience on the battlefield as field surgeons.</em></td>
<td><em>Most ordinary people avoided surgery as much as possible.</em></td>
<td><strong>Influential individuals, such as Mondino</strong>, stated that dissections should be about proving Galen right, rather than trying to make new discoveries.</td>
<td>However, dosages were difficult to get right, making their use dangerous.</td>
<td><strong>Hugh and Theodoric of Lucca</strong> believed that pus was bad and used wine (a basic anti-septic) on wounds. Their ideas were generally unpopular.</td>
<td>Islamic surgeon, Abulcasis, began using ligatures to tie blood vessels shut. However, knowledge from the Islamic Empire travelled to Europe extremely slowly.</td>
</tr>
<tr>
<td><strong>Bloodletting</strong></td>
<td></td>
<td></td>
<td><strong>Usually the patient was held down</strong> and operations were performed as <strong>quickly as possible</strong>.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Amputation</strong></td>
<td></td>
<td></td>
<td><strong>Cauterisation</strong>: Burning a wound shut, often with a hot iron.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Trephination</strong></td>
<td></td>
<td></td>
<td><strong>Ligature</strong>: A thread which is used to tie blood vessels closed.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Keywords:**
- **Field surgeon**: A surgeon who works on the battlefield.
- **Antiseptic**: Something which destroys germs.
- **Anaesthetic**: Something which makes a patient unconscious or causes insensitivity to pain.
- **Apprenticeship**: When someone learns by working alongside someone who is already qualified.
### 12. The Renaissance:
- The Renaissance, meaning “rebirth”, was the period between the Middle Ages and the Enlightenment and Industrial Revolution.
- During this period, people wanted to look back to Ancient Greece, when there was an emphasis on education and beauty.
- While anatomical knowledge and surgery advanced during this period, public health and the treatment of disease made little progress.

<table>
<thead>
<tr>
<th>Key Event/Development</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trade, travel and discovery</td>
<td>People began to <strong>explore</strong> the world, making <strong>trade links</strong> and bringing back <strong>new products</strong> from other countries. Some of these products were used in medicine.</td>
</tr>
<tr>
<td>The invention of the printing press</td>
<td>The printing press allowed books to be printed <strong>quickly</strong> and <strong>cheaply</strong>. As a result, more people had access to <strong>new knowledge</strong> and ideas could <strong>spread more quickly</strong>.</td>
</tr>
<tr>
<td>Realism in art</td>
<td>Realism was a movement which tried to make art <strong>as realistic as possible</strong>. This allowed for the creation of <strong>accurate anatomical diagrams</strong>, allowing people to learn about the human body without as much dissection.</td>
</tr>
<tr>
<td>Military technology</td>
<td>New military technology, such as <strong>gunpowder</strong> and canons meant that soldiers got <strong>new wounds</strong>. Field surgeons had to develop <strong>new techniques</strong> to treat them.</td>
</tr>
<tr>
<td>The Reformation</td>
<td>As many countries and people <strong>broke from the Catholic Church</strong>, people became willing to <strong>question</strong> traditional ideas and to experiment. The <strong>scientific method</strong> developed as people tested new ideas.</td>
</tr>
</tbody>
</table>

### History Knowledge Organiser: Britain, Health and the People

- **1445AD**: The printing press is invented.
- **1492AD**: Columbus ‘discovers’ the New World (the Americas).
- **c.1440AD**: The printing press is invented.
- **1537AD**: Paré accidentally creates his anti-septic solution.
- **1543AD**: Vesalius publishes “On the Fabric of the Human Body”.
- **1538AD**: Paracelsus is exiled from Basel.
- **1632AD**: Harvey publishes his book about the circulatory system.
- **1665AD**: The Great Plague hits London.
- **1750AD**
13. Medical care in the Renaissance:
- During the Renaissance the treatment of diseases was mainly based on the **four humours** and **bloodletting**.
- The care of the sick in church hospitals and **monasteries** largely stopped after Henry VIII dissolved the monasteries.
- People still relied on some **supernatural cures**: many people still believed that the king’s touch could cure scrofula.
- However, the **printing press** and products which were brought back by **explorers** helped to expand **herbal medicines**.

![An illustration of Charles II touching a patient to cure them of scrofula.](image)

<table>
<thead>
<tr>
<th>Option</th>
<th>Medical care offered:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physicians</td>
<td>- Treatments <strong>still</strong> focused on <strong>balancing the humours</strong>, although this now focused on <strong>blood-letting</strong>.</td>
</tr>
</tbody>
</table>
| Barber-surgeons | - Barbers who trained as **apprentices** but also offered basic surgeries and treatments.  
- Treatments usually focused on **blood-letting**. |
| Wise women/men | - Ordinary people who lived in communities and gained their knowledge through **tradition** and **word of mouth**.  
- Treatments focused on **herbal remedies** and **supernatural cures**, such as **amulets**. |
| Apothecaries    | - Shops which would sell **herbal remedies**, **potions** and **medicines**.  
- Apothecaries had **little or no medical training**. |
| Quacks          | - Travelling salesmen who would sell **cure-alls** and **homemade medicines**.  
- These usually had no medical basis. |
| Herbals         | - Books, printed cheaply using the **printing press**, which contained **herbal remedies**. |

14. Surgery in the Renaissance:
- The Renaissance was a period of **frequent warfare**. This gave many **field surgeons** the chance to practice and develop new techniques.
- However, during this period **effective anaesthetics** and **anti-septics** were still unavailable. As a result, for most ordinary people surgery remained **basic** and a **last resort**.
- There was significant progress in **anatomy** and **dissection** due to the work of individuals such as **Vesalius** and **Harvey**.
- Many of the advances in anatomy during this period spread due to the **printing press**, which allowed books to be published quickly and cheaply.
15. Key Renaissance Individual: Vesalius:
- Andreas Vesalius was a Professor of Surgery at the University of Padua in Italy during the 16th century (the 1500s).
- He originally taught and studied at the university of Paris, where he had taught Galen’s work.
- He contributed to the development of anatomy during the Renaissance.

**Contributions:**
- Vesalius dissected humans and proved Galen wrong. For example, he proved that the breastbone was made of three parts rather than seven (like some animals).
- Vesalius encouraged investigative dissection.
- Vesalius published a book called “On the Fabric of the Human Body” in 1543 which used realism to accurately show different systems, like the skeleton.
- In the late 16th century, many English surgeons were influenced by Vesalius’ books.

**Limitations:**
- Vesalius had to leave his job as professor of surgery because of the backlash he suffered for disagreeing with Galen.
- Vesalius’ work helped advance anatomical knowledge, but without effective anaesthetics and antiseptics, it didn’t help many patients at the time.

16. Key Renaissance Individual: Paré
- Ambroise Paré was a French royal surgeon who became the most famous surgeon in Europe in the 16th century.
- He started his career as an apprentice in a hospital and a field surgeon.

**Contributions:**
- Gunshot wounds were relatively new and were usually treated with boiling oil. In 1537 Paré accidentally discovered a more effective way of treating them using egg whites, turpentine and rose oil.
- Paré promoted the use of ligatures to tie closed blood vessels, rather than cauterising wounds. Using ligatures had been recommended by Galen.
- Paré also worked to develop prosthetic limbs for wounded soldiers.
- Paré was inspired by Vesalius and wrote a number of books which were published throughout Europe.

**Limitations:**
- Paré did not know why his cream of egg whites, turpentine and rose oil helped gunshot wounds to heal more quickly.
- Ligatures were time consuming and, because Paré did not know about germs, they often increased the risk of infection.

**Keywords:**
- Investigative dissection: Dissecting the body in order to make new discoveries, rather than to just prove Galen right.
- Realism: A style of art, popular in the Renaissance, which tried to make art as close to real life as possible.
- Backlash: A strong negative reaction by a large number of people.
- Field Surgeon: A surgeon who works on the battlefield.
- Ligature: A thread which is used to tie a blood vessel closed.
- Cauterisation: Burning a wound in order to close it and stop blood loss. In the Renaissance this was done with a hot iron.
- Prosthetic limb: A fake limb.
17. Key Renaissance Individual: Paracelsus
- Paracelsus was a field surgeon who travelled all over Europe.
- He eventually becoming Professor of Medicine at Basel University in Switzerland in 1526.
- Paracelsus openly challenged Galen and encouraged ordinary people to attend his lectures.

**Contributions:**
- Paracelsus passionately challenged Galen and Ibn Sina, publically burning their books.
- In particular, Paracelsus disagreed with the four humours.
- Paracelsus encouraged people to experiment with new ideas.
- Paracelsus argued that the body was a chemical system which needed to be in balance. He introduced a number of chemical treatments.

**Limitations:**
- Paracelsus’ ideas were so controversial that he was exiled from Basel in 1538 (he worked there for 12 years).
- Paracelsus’ alternatives to balancing the humours were incorrect: he believed people should look for plants which looked like different body parts to find cures.
- Some of the chemical cures that Paracelsus introduced, such as mercury to treat syphilis, were wrong and actually damaged patients.

18. Key Renaissance Individual: Harvey
- William Harvey was a royal physician for Charles I.
- His work focused on anatomy and the circulatory system.
- Harvey read the work other anatomists of this period and used their work and his own experiments to make his discoveries.

**Contributions:**
- Galen believed that blood was a fuel which was made in the liver and used up in the muscles. Harvey proved that blood could only move one way around the body.
- Harvey’s work proved that bloodletting would not treat disease.
- Harvey published a book about his work in 1632.
- Harvey’s work is a good example of the scientific method: Harvey had an idea which he carefully investigated. It took him 12 years to publish his work.
- Harvey’s work paved the way for blood tests, blood transfusions and other major operations.

**Limitations:**
- Harvey could not explain why blood in the arteries and veins was a different colour.
- Many people objected to Harvey’s ideas. This was because he questioned Galen and many physicians made a lot of money from bloodletting.
- Harvey’s ideas were not taught in universities until 50 years after his death.
- Blood transfusions would not be possible until the discovery of blood groups in 1901.
19. The Great Plague 1665:
- In 1665 a epidemic of the plague hit Britain, particularly London, killing roughly 70,000 people.
- Small outbreaks of the pneumonic plague and bubonic plague had hit England since the 14th century, but it had not hit Britain on this scale since 1348.
- The Great Plague demonstrated that, **while people still did not understand how to treat diseases**, they were **beginning to understand how they spread**.

<table>
<thead>
<tr>
<th>Causes</th>
<th>Reaction</th>
<th>Significance</th>
</tr>
</thead>
</table>
| **What actually caused it:**
Many causes of the Great Plague were the same as the Black Death in the 14th century:
- Poor disposal of rubbish in towns encouraged rats.
- Towns and ports were crowded, meaning the disease spread quickly.
- People fleeing the disease carried fleas and the plague on their clothes. | **Individual people:**
‘Cures’ for the plague remained ineffective. They included:
- Bleeding with leeches
- Breathing through sponges soaked in vinegar.
- Using pomanders to keep away bad smells.
- Using animals to draw out the ‘poison’.
- Moving to the countryside (the rich and Charles II). | **Short term:**
- Roughly 70,000 Londoners died.
- **Bills of Mortality** showed that most people died in the poorest and dirtiest parts of the city. |
| **What people thought caused it:**
People’s ideas about the causes of disease had changed very little, although the focus was now on miasma. People thought the plague was caused by:
  - The position of stars and the planets (astrology).
  - Jews poisoning wells.
  - God punishing people for their sins.
  - Bad air (miasma) | **Government:**
- **Searchers** took note of people with the plague.
- When a plague victim was discovered, their house was quarantined and guarded.
- **Public gatherings** were banned.
- Bodies were buried at night.
- **Trade** between towns was stopped.
- Fires were lit on street corners.
- Cats and dogs were killed. | **Medium term:**
- When London was rebuilt after the Great Fire of London, it was built with spacious streets and stone buildings, temporarily improving living standards. |
| | | **Long term:**
- The Great Plague was the last major outbreak of plague in Britain. |

**Keywords:**

**Epidemic:**
A widespread outbreak of one disease.

**Pomander:**
A ball, sometimes worn around the neck, which contained sweet smelling herbs.

**Miasma:**
The belief that bad smells cause disease.

**Bills of Mortality:**
Documents which show how many people died from which causes within a certain time period.

**Leeches:**
A bloodsucking worm which was used to balance the four humours.

**Quarantine:**
When people are isolated to make sure they can’t spread diseases.
20. The Industrial Revolution:
- The industrial revolution was a period of **huge technological progress** in Britain.
- This period saw significant developments in public health, surgery and the treatment of disease.

<table>
<thead>
<tr>
<th>Key Event/Development</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enlightenment ideals (science can improve life)</td>
<td>People became much more willing to experiment and to challenge traditional ideas. Huge <strong>technological advances</strong> were made, allowing further research into the cause of disease.</td>
</tr>
<tr>
<td>The invention of the factory</td>
<td>Thousands of people <strong>migrated</strong> to towns and cities, having a huge impact on housing and public health. Goods, such as soap, could be produced quickly and cheaply.</td>
</tr>
<tr>
<td>The laissez-faire approach to government</td>
<td>Governments in the early 19th century believed that they should only be concerned with protecting the country, causing <strong>public health in growing cities</strong> to decline rapidly.</td>
</tr>
<tr>
<td>1867 Reform Act: working class men get the vote</td>
<td>The government were forced to address the concerns of working class men for the first time.</td>
</tr>
<tr>
<td>New methods of communication</td>
<td>Inventions like the <strong>electric telegraph</strong> and the beginning of <strong>medical journals</strong>, such as The Lancet, allowed ideas to spread to more people much more quickly.</td>
</tr>
</tbody>
</table>

**History Knowledge Organiser: Britain, Health and the People**

- **1796AD**: Jenner proves that cowpox can protect people from smallpox.
- **1844 - 1847AD**: The development of effective anaesthetics.
- **1854AD**: The Broad Street cholera outbreak in London.
- **1858AD**: The Great Stink in London.
- **1861AD**: Pasteur publishes his paper on germ theory.
- **1864AD**: Lister develops anti-septic surgery.
- **1867AD**: The Public Health Act 1848.
- **1871 – 1885AD**: The identification of germs and vaccines by Pasteur and Koch.
- **1875AD**: The Public Health Act 1875.
### Hospitals in the 18th century:
- In the 18th century, there was a **huge increase in the number of hospitals** in Britain.
- As well as an increase in number, the **purpose** of these hospitals changed: in the Middle Ages and the Renaissance, hospitals were primarily about keeping patients **comfortable**; in the 18th century, doctors began using modern medicine to try to **treat** patients.
- This was largely because the ideas about the **causes of disease** were changing: more people began to see disease as **natural** rather than as a **punishment from God**.

### The old site of St. Thomas’ Hospital in Southwark, London.

<table>
<thead>
<tr>
<th>18th century hospitals</th>
<th>Christian medieval hospitals</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Patrons</strong></td>
<td></td>
</tr>
<tr>
<td>Hospitals were founded by <strong>wealthy philanthropists</strong> or <strong>groups</strong> who clubbed together to fund them. Some were still run by the <strong>church</strong>.</td>
<td>Most hospitals were based in <strong>monasteries</strong> and were funded by the <strong>church</strong>.</td>
</tr>
<tr>
<td><strong>Patients</strong></td>
<td></td>
</tr>
<tr>
<td>Ordinary people were treated for <strong>free</strong>. People were <strong>assessed</strong> before being allowed in. <strong>Specialist hospitals</strong> were set up for specific groups or illnesses, such as The Foundling Hospital for orphaned children.</td>
<td><strong>Anyone in need</strong> was admitted free of charge. Hospitals would often care for the <strong>poor and elderly</strong> as well as the sick.</td>
</tr>
<tr>
<td><strong>Motivation</strong></td>
<td></td>
</tr>
<tr>
<td>People wanted to show they were <strong>good Christians</strong> through their <strong>actions</strong>, not just worship.</td>
<td>Hospitals should provide <strong>charity</strong> to all, just as Jesus had taught that people should do through stories like <strong>The Good Samaritan</strong>.</td>
</tr>
<tr>
<td><strong>Treatments</strong></td>
<td></td>
</tr>
<tr>
<td>Most treatments were based on <strong>balancing the four humours</strong>.</td>
<td>Most treatments focus on <strong>prayer</strong> and keeping patients <strong>comfortable</strong> as most hospitals believed that disease was a punishment from God.</td>
</tr>
<tr>
<td><strong>Medicines and herbal remedies</strong></td>
<td></td>
</tr>
<tr>
<td>In the late 18th century, <strong>dispensaries</strong> in hospitals began offering <strong>free medicines</strong> and <strong>herbal remedies</strong> to patients.</td>
<td>Some herbal remedies were available to make patients more <strong>comfortable</strong>.</td>
</tr>
<tr>
<td><strong>Doctors</strong></td>
<td></td>
</tr>
<tr>
<td>Hospitals were staffed by <strong>physicians</strong> (many got jobs at hospitals to get a good reputation). <strong>Medical students</strong> would train by following experienced doctors as they treated patients.</td>
<td>Most hospitals were staffed by <strong>monks or nuns</strong> and did not have a <strong>physician</strong> on staff. <strong>Physicians</strong> were often members of the <strong>clergy</strong>.</td>
</tr>
</tbody>
</table>
### 22. Key Enlightenment Individual: John Hunter

- John Hunter was a **physician** and **surgeon** who was friends with Edward Jenner.
- He trained with his brother and worked as a **field surgeon**.
- Hunter focused on **advancing anatomical knowledge** through **dissection**.
- Hunter also produced a number of **books** about different areas of medicine, demonstrating the importance of the **scientific method**.

#### Contributions:
- Hunter wrote a number of different books about **anatomy** and **disease**.
- Hunter demonstrated the importance of the **scientific method** when he infected himself with gonorrhoea to prove that it was a separate disease to syphilis!
- Hunter experimented with ways to **avoid surgery** by diverting blood vessels.

#### Limitations:
- Surgery was still limited by the **lack of effective anaesthetics and anti-septics**.
- Hunter did not understand what caused gonorrhoea, simply that it was not the same as syphilis.

### 23. Key Enlightenment Individual: Edward Jenner

- Edward Jenner was a **country physician** who was friends with John Hunter.
- Jenner proved that infecting people with **cowpox** could protect them from **smallpox**.
- Before this point, rich people would **inoculate** themselves through **variolation**: snorting smallpox scabs or putting the pus from a smallpox victim into the cut of a healthy person.
- This was a **dangerous** procedure: King George III’s son died after being variolated against smallpox!

#### Contributions:
- Through careful testing and experimentation using the **scientific method**, Jenner proved that **infecting someone with cowpox would protect them from smallpox**.
- Jenner’s inoculation with cowpox was much **safer** than variolation.
- Jenner provided inoculation with cowpox for free from his home.
- By the 1800s, doctors in Europe and North America had read about his work and were using his methods.
- By the 1980s, smallpox was declared **eradicated**.

#### Limitations:
- Jenner did not make this discovery; he only confirmed what many people already thought.
- Jenner could not explain **why** his method worked, only that it did.
- As people didn’t understand about **germs**, willingly giving someone a disease was hard for many people to accept.
- Many doctors did not believe Jenner because he was not a **fashionable city doctor**.
- Some doctors tried to recreate Jenner’s experiment (incorrectly) but failed.
- Some still argued that **God** had sent illness to punish them for sin or to test their faith.
24. Public Health in the 19th century:
- During the 19th century **public health** in towns and cities **massively declined**.
- **Life expectancy** in Britain was low: in 1840 the average life expectancy in Britain was 40!
- This was largely due to the fact that during the **Industrial Revolution** (between 1750 and 1900), thousands of people **migrated** to cities and towns in search of work.
- This increase was so sudden that many towns and cities **struggled to keep up** and the existing **public health facilities** struggled to cope.
- Governments during this period also had a **laissez-faire** attitude: they believed that governments should only be responsible for defence and not for public health.
- During the first half of the 19th century, there were regular outbreaks of diseases such as **cholera** and **typhus**.

A cartoon from 1866 called “Death’s Dispensary”.

<table>
<thead>
<tr>
<th>Factor:</th>
<th>Significance:</th>
</tr>
</thead>
</table>
| Thousands of people **migrated to towns and cities** in search of work. | - Housing became overcrowded, causing diseases to spread more **quickly**.  
- Houses were built **quickly and poorly** to accommodate the growing population. |
| Houses were **poorly built** with little **insulation**. | - People’s immune systems were weakened by constant exposure to **cold and damp conditions**, making it more likely that they would contract diseases. |
| Most families **did not have toilets** or used a **communal toilet** which was shared by many people. | - People were **regularly exposed to germs** which caused diseases like cholera. |
| Most of the **sewage** ended up in rivers, which served as many people’s water supply. | - People would **ingest** water which was **contaminated** with bacteria, leading to outbreaks of cholera.  
- It was difficult to **clean clothes** or other items. |
| Most working class people had a **poor diet**. | - People’s **immune systems** were weakened, making it more likely that they would contract diseases. |
| The government had a **laissez-faire** attitude to public health. | - Little effort was made in the early 19th century to improve public health.  
- The conditions in poorer areas of cities became increasingly worse. |
| People thought that disease was called by **miasma**. | - Efforts to improve public health would focus on **smells**, ignoring possible causes of disease, such as dirty water or weakness in the population. |

**Keywords:**

**Life expectancy:** How long people are expected to live for.

**Migration:** The movement of people from one place to another.

**Laissez-faire:** A government policy of letting things run their course without interfering.

**Typhus:** A disease spread by lice on clothing.

**Cholera:** A disease spread by drinking contaminated water.

**Insulation:** Material which helps to keep houses warm.

**Miasma:** The belief that bad smells cause disease.

**Immune system:** The network of cells in the body which resists bacteria and disease.
25. Key 19th century individual: Edwin Chadwick
- In 1842 the government published a report by a solicitor called Edwin Chadwick which showed that many people in Britain were living in poor conditions and that these poor conditions affected their life expectancy.
- Over 10,000 copies of Chadwick’s report were handed out to politicians, journalists and important figures.
- The report made the government take action in the form of the Public Health Act 1848.

**Contributions:**
- A central Board of Health was set up.
- Councils were given money to clean up streets.
- Councils were made responsible for providing clean water, paving streets and drainage.
- If the death rate in an area was above 23 per 1000 people, a local Board of Health had to be set up.

**Limitations:**
- Chadwick believed in miasma.
- The Act was not compulsory for most towns: only 103 towns set up their own Board of Health.
- While cities like Birmingham improved their cleanliness, many did nothing.
- In 1854, the National Board of Health was shut down.

26. The Broad Street Cholera Outbreak 1854:
- In the early 19th century, Britain and London suffered from many epidemics of diseases such as typhus (carried by lice), cholera (carried by dirty water) and smallpox.
- In 1854 a major outbreak of cholera occurred in Broad Street in London.
- The local doctor, John Snow, investigated the cause and proved that cholera was transmitted by water rather than by ‘bad smells’.

<table>
<thead>
<tr>
<th>Causes</th>
<th>Reaction</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>What actually caused it:</strong> Poor quality sewage and water pipes had caused the Broad Street pump to become contaminated with cholera bacteria.</td>
<td><strong>Individual people:</strong> - Ordinary people could do very little. - John Snow, a local doctor, used a map to prove that only people who had used the Broad Street pump were dying from cholera.</td>
<td><strong>Short term:</strong> The number of people who were dying from cholera around Broad Street slowed to a halt.</td>
</tr>
<tr>
<td><strong>What people thought caused it:</strong> Miasma</td>
<td><strong>Government:</strong> The local council eventually listened to Snow’s advice and removed the handle from the Broad Street pump.</td>
<td><strong>Medium term:</strong> Snow provided further evidence against miasma, although people continued to support miasma until after Pasteur’s germ theory.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Long term:</strong> Snow’s investigation helped to encourage the acceptance of germ theory in the 1860s.</td>
</tr>
</tbody>
</table>

**Keywords:**
- **Life expectancy:** How long people are expected to live for.
- **Act:** A law.
- **Miasma:** The belief that bad smells cause disease.
- **Germ theory:** The correct theory that germs cause disease, rather than being the product of it.
- **Compulsory:** When you have to do something.
- **Board of Health:** An organisation, run by the government or council, which is in charge of the public health in an area.
- **Cholera:** A disease, transmitted by dirty water, which causes violent vomiting and diarrhea.
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27. The Great Stink 1858:
- In 1858 a **heat wave** in Britain forced the British government to recognise the building problems with public health.
- The heat wave revealed tonnes of rotting waste in the Thames. The smell was so bad that MPs in the **Houses of Parliament** tried soaking their curtains in chlorine to cover it.
- The smell prompted the government to hire **Joseph Bazalgette** to build a new sewer network throughout London to **intercept** waste before it reached the Thames.
- Bazalgette’s **planning** and **engineering genius** meant that the sewer system was complete by **1866**.

A photograph from 1860 showing Bazalgette observing the building of his sewer network.

<table>
<thead>
<tr>
<th>Causes</th>
<th>Reaction</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>What caused it:</strong></td>
<td><strong>Bazalgette:</strong></td>
<td><strong>Short term:</strong></td>
</tr>
<tr>
<td>- <strong>Overcrowding</strong>, increased migration and a lack of <strong>public health laws</strong> meant that a huge amount of waste had been dumped in the Thames.</td>
<td>- Bazalgette designed and built a network of <strong>sewers</strong>, <strong>pumping stations</strong> and <strong>embankments</strong>.</td>
<td>- There was only further <strong>cholera outbreak</strong> in London, which was where Bazalgette’s sewers had yet to reach.</td>
</tr>
<tr>
<td>- The Thames did not flow quickly enough to move <strong>waste</strong> which had been dumped in it.</td>
<td>- The <strong>embankments</strong> made the Thames flow more quickly, removing a lot of the existing waste.</td>
<td>- It took a while for the sewers to have an effect: when the SS Princess Alice sank in 1865, many victims died due to the dirty water in the Thames.</td>
</tr>
</tbody>
</table>
| - A freak **heat wave** caused the level of the Thames to go down, revealing the waste and causing it to rot further. | - The sewers were designed to use **gravity** to get the sewers to flow downstream. | **Medium term:**
| | | The government began to introduce further **public health laws** (there were other factors!). |
| | | **Long term:** Bazalgette predicted that London’s population would grow and planned for it: many of his sewers are still in use today. |

**Government:**
- The government **invested £3 million** (roughly £1 billion today) to put Bazalgette’s plans into action.

**Keywords:**
- **Houses of Parliament:** The building in London where politicians meet.
- **Engineering:** The application of science and knowledge to design.
- **Embarkment:** When the bank of a river is artificially raised, sometimes creating a walkway.
- **Cholera:** A disease spread by drinking contaminated water.
- **Invest:** When people or a government puts money into something to help it to develop.
- **Intercept:** To stop something from reaching a destination.
- **Sewer:** A channel which carries away waste.
28. Why public health improved in the late 19th century:
- In 1800 the death rate in Britain was 39 per 1000 people. By 1900 this had dropped to 18 by 1900.
- This improvement was largely due to **laws which improved public health** in the late 19th century.

<table>
<thead>
<tr>
<th>Law</th>
<th>Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Health Act 1848</td>
<td>Councils could set up a <strong>board of health</strong> but it was not compulsory.</td>
</tr>
<tr>
<td>Vaccination Act 1853</td>
<td>Vaccination against <strong>smallpox</strong> was made compulsory.</td>
</tr>
<tr>
<td>Sanitary Act 1866</td>
<td>Towns had to have a <strong>health inspector</strong> and were made responsible for <strong>sewers, water</strong> and <strong>street cleaning</strong>.</td>
</tr>
<tr>
<td>Artisans Dwellings Act 1875</td>
<td>Councils had the power to buy and demolish <strong>slum housing</strong>.</td>
</tr>
<tr>
<td>Public Health Act 1875</td>
<td>Councils had to appoint a <strong>medical officer</strong>. They also had to provide <strong>clean water, cover sewers</strong> and <strong>keep them in good condition, collect rubbish</strong> and provide <strong>street lighting</strong>.</td>
</tr>
<tr>
<td>Sale of Food and Drugs Act 1875</td>
<td>Guidelines were set up to check the quality of food and medicine before it was sold to the public.</td>
</tr>
</tbody>
</table>

- There were a number of factors which made these laws possible:

  **Luck:**
  
  *The Great Stink* in 1858 forced the government to take action.

  **Science and technology:**
  
  *The scientific method* helped Snow to prove that cholera was carried by water.
  
  Advances in *engineering* made Bazalgette’s sewer network possible.

  **Government:**
  
  The government *paid* Bazalgette to improve the sewers.
  
  In 1867 *working men* were given the vote, giving them more influence in law-making.
  
  The government *paid* for Chadwick’s report into living conditions.

  **Communication:**
  
  *Chadwick’s report* in 1842 alerted people to the problems with public health.
  
  Chadwick’s report in 1842 alerted people to the problems with public health.

  **Individuals:**
  
  **Chadwick** showed that living conditions affected life expectancy.
  
  **Snow** showed that improvements needed to be made to water systems to stop cholera epidemics.
  
  **Bazalgette** had the engineering expertise and planning to build sewers which could cope with London’s waste.
  
  **Pasteur** proved that miasma and spontaneous generation were incorrect.

  **Engineering:**
  
  The application of science and knowledge to design.

  A cartoon from 1883 showing Bazalgette as a sewer pipe, cleaning up the Thames.
### 29. Effective Anaesthetics in the 19th century:

- Anaesthetics existed before the 19th century, but they were often **dangerous or ineffective**.
- As a result, surgery before anaesthetics had to be **simple, quick** and often a **last resort**.
- Even as effective anaesthetics were developed, people **objected** to their use. Some argued:
  - A screaming patient was a patient who was definitely alive and was what surgeons were used to.
  - God had given people (particularly women in childbirth) pain because it is what He expected.
  - Invasive surgeries increased the risk of death from **blood loss** and **infection**.

#### Before the 19th century:
**Patients were given** **alcohol** or **opium** to numb pain.

#### The late 18th century – 1844:
- In 1795 Thomas Beddoes and Humphry Davey showed that inhaling **nitrous oxide** (laughing gas) made him feel relaxed.
- Dentist, Horace Wells, tried to show that it could be used in **tooth extraction** in 1844.

#### 1842-1846:
- William Clark used **ether** for a successful tooth extraction in 1842.
- William Morton publically demonstrated the use of ether in 1846. **Robert Liston**, a British surgeon, was influenced by this and used ether to perform a successful leg amputation in the same year.

#### 1847:
- **James Simpson**, a Scottish obstetrician, was testing different substances and accidentally discovered **chloroform**.
- Queen Victoria was given chloroform during the birth of her son in 1853. She recommended it.

#### However,…
- **Opium** was addictive and **difficult to measure**. Alcohol raised the heart rate, leading to further blood loss and there were **religious** objections to its use.
- **Wells’ demonstration** was unsuccessful due to an incorrect dosage, making people think that nitrous oxide was ineffective.
- **Ether** was **difficult to inhale**, **highly flammable** and could cause **vomiting**.
- Some people argued that God gave women pain in childbirth as a punishment and so they should be made to endure it.
- Invasive surgeries increased the risk of death from **blood loss** and **infection**.
  - Some patients, like **Hannah Greener**, died from chloroform overdoses.

**Keywords:**

- **Anaesthetic:** Something which makes a patient unconscious or causes insensitivity to pain.
- **Opium:** A highly addictive drug made from poppies from which drugs like morphine are derived.
- **Amputation:** Removing a limb through surgery.
- **Invasive surgery:** Surgery which goes deep into the body, often involving vital organs.
- **Obstetrician:** A doctor who specialises in pregnancy, childbirth and health directly after birth.
30. Germs and disease:
- In 1673 Leeuwenhoek observed bacteria for the first time. He called them animalcules.
- People knew that bacteria existed, but didn’t know what they did. The theory of spontaneous generation developed in the 18th century: germs were the result of decay, not the cause of it.
- Over time, people began to challenge this idea. However, by the 19th century, most people still believed that miasma caused disease and that germs appeared because of spontaneous generation.
- Definitive proof against spontaneous generation was eventually provided by Louis Pasteur in 1861.

1677AD: Leeuwenhoek invents the microscope and discovers “animalcules”.

1835AD: Bassi recognises a link between a specific bacteria and silkworm disease.

1861AD: Pasteur publishes his paper on germ theory.

18th century AD: Spontaneous generation becomes popular.

1840AD: Henle challenges spontaneous generation for the first time.

31. Key 19th century individual: Louis Pasteur
- Louis Pasteur was a French chemist who published a paper in 1861, which proved germ theory.
- Pasteur’s experiments with beer and wine showed that bacteria caused decay and that bacteria could be killed by heating substances to the right temperature. This is known as pasteurisation.
- Pasteur went on to make discoveries about specific germs and to develop vaccines for different diseases.

Contributions:
- Pasteur demonstrated that germs cause decay rather than being the result of it (spontaneous generation).
- Pasteur published his work in 1861. This paper went on to inspire individuals, such as Joseph Lister and Robert Koch.
- Pasteur built on the work of Jenner; as he now understood why vaccines worked, he could develop vaccines for diseases like rabies and chicken cholera.

Limitations:
- Pasteur confirmed what many people had already been alluding to throughout the 19th century.
- Pasteur’s work faced fierce opposition when it was first published.
- Pasteur’s work focused on identifying bacteria and preventing diseases through vaccines, rather than curing diseases.
32. Key 19th century individual: Joseph Lister
- Lister was a Professor of Surgery in Glasgow in the 19th century.
- Lister read Louis Pasteur’s paper on germ theory and used it to develop anti-septic surgery.
- Lister argued that it didn’t matter if wounds were exposed to air and oxygen, questioning both miasma and spontaneous generation.
- Instead, Lister argued that infection occurred when the skin was broken and germs got into the wound.

Contributions:
- Lister published a paper in 1867 which showed that using bandages soaked in carbolic acid could stop infections, even in compound fractures.
- Lister demonstrated that the anti-septic method could also work in operating theatres: the acid could be sprayed in the air, on wounds, on the surgeons hands, on ligatures and bandages and on the instruments.
- Lister’s experiments provided further support for germ theory.

Limitations:
- Many doctors still did not accept germ theory.
- Carbolic acid irritated the lungs and skin.
- Lister did not fully understand germ theory: he rinsed his hands in acid rather than scrubbing them and he wore his street clothes while operating.
- William Halsted (an American) developed aseptic surgery at the end of the 19th century which built on Lister’s principles.

33. Key 19th century individual: Robert Koch
- Koch was a German scientist who became known as the “father of bacteriology”.
- Koch was inspired by Pasteur’s germ theory (although the pair were rivals).
- Koch developed methods for proving that specific bacteria caused specific diseases and developed technology and methods which allowed bacteria to be more easily studied.
- Koch also contributed to the development of vaccines (see page about vaccines.)

Contributions:
- Koch used microscopes and animal testing to prove that specific germs cause specific diseases. Before this point many people thought all germs were the same.
- Koch used agar to grow bacteria which allowed them to be easily studied.
- Koch found a way of dyeing bacteria so that they would stand out when being studied.
- Koch developed methods of photographing bacteria for later study.

Limitations:
- Koch’s work focused on identifying bacteria, rather than curing diseases.
34. The acceptance of germ theory in Britain:
- Although Pasteur published germ theory in 1861, it was only truly accepted in Britain in the 1880s.
- Most people in Britain during this period believed in spontaneous generation, such as Edwin Chadwick or Charlton Bastion, Professor of anatomy at University College London.
- There were a number of factors which both helped and hindered the acceptance of germ theory in Britain.

1861AD:
Pasteur publishes his paper on germ theory.
Prince Albert dies from typhoid fever.

1866AD:
The 1866 cattle plague

Communication:
A number of articles were written in British medical journals in the 1870s, answering questions about germ theory.
Tyndall delivered lectures supporting germ theory.
Cheyne translated Koch’s work into English.

1867AD:
Lister publishes his paper about anti-septic surgery.

1870AD:
Tyndall begins defending germ theory.

1874AD:
Klein incorrectly identifies typhoid bacteria.

1879AD:
Cheyne (Lister’s assistant) translates Koch’s work into English.

1880s onwards:
General acceptance of germ theory in Britain

1880s onwards:
General acceptance of germ theory in Britain

Science and technology:
The multi-lens microscope allowed Beale to prove that a specific bacteria caused the 1866 cattle plague.

Luck:
Prince Albert’s death from typhoid fever in 1861 brought the disease to the British public’s attention.
The 1866 cattle plague gave Beale the opportunity to prove that a specific bacteria caused the disease.
Farmers paid attention as it allowed them to minimise the number of cattle they needed to kill.

Individuals:
Professor Lionel Beale proved that a specific bacteria caused the 1866 cattle plague.
Professor Charlton Bastion (anatomy at UCL) defended spontaneous generation.
Physicist John Tyndall supported germ theory and delivered lectures about it.
Emmanuel Klein incorrectly stated he had found the bacteria which causes typhoid fever in 1874 (later corrected by Koch).
Lister’s work on antiseptic surgery provided proof of germ theory.

Antiseptic surgery:
Destroying germs which come in contact with wounds.
The development of vaccines in the 19th century:

- Between 1861 and the 1890s intense competition between Louis Pasteur and Robert Koch resulted in the identification of many different germs and the development of effective vaccines for them.
- Koch and Pasteur built on the work of Edward Jenner (who discovered that cowpox could protect people from smallpox) with their new understanding of the relationship between germs and disease.

1871-1876AD:
Pasteur’s team develop vaccines for chicken cholera and anthrax.

1861AD:
Pasteur publishes his paper on germ theory.

1876AD:
Koch identifies the bacteria which causes anthrax.

1882AD:
Koch identifies the tuberculosis bacteria.

1884AD:
Koch identifies the bacteria which causes typhoid.

1885AD:
Pasteur’s team develops a vaccine for rabies.

1883AD:
Koch identifies the bacteria which causes cholera.

- There were a number of factors which allowed for the identification of germs and the discovery of vaccines:

Communication:
Pasteur performed demonstrations of his anthrax vaccine in front of politicians and journalists. Pasteur’s demonstrations were spread by telegraph. Koch and Pasteur wrote scientific articles.

Individuals:
Pasteur linked germs to disease. Koch made the study of germs easier. Many of the individuals in Koch and Pasteur’s teams went on to make further discoveries, such as Ehrlich.

Government:
The French and German governments gave their respective scientists funding and teams.

War:
France and Germany were often at war during this period; the governments wanted healthy armies.

Luck:
Chamberland (Pasteur’s team) accidentally used a weakened sample of chicken cholera in 1879, discovering a vaccine.

Science and technology:
New technology, like the multi-lens microscope, the petri dish and photography made studying germs easier.

Keywords:
Vaccine:
A substance which gives someone a weakened form of a disease to protect them from it (inoculation).

Anthrax:
A deadly disease which is found in cattle but which can transfer to humans.

Tuberculosis:
A deadly disease which mainly affects the lungs.

Typhoid:
A disease causing fever which is highly contagious.

Electric telegraph:
A device which allows messages to be transmitted over long distances through the use of morse code.

Petri dish:
A sealed dish which allows scientists to observe a sample without contaminating it.

Multi-lens microscope:
A microscope which can view objects at different levels of magnification.
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36. The Modern Day:
- The 20th century was marked by two major wars
- These wars, changes to the political system and huge technological developments led to huge improvements in public health, surgery and the treatment of disease.

<table>
<thead>
<tr>
<th>Key Event/Development:</th>
<th>Significance:</th>
</tr>
</thead>
<tbody>
<tr>
<td>World War One and World War Two</td>
<td>World War One and World War Two alerted governments to the poor health of the population. The wars also caused government to invest in advances in the treatment of infection and surgical advances.</td>
</tr>
<tr>
<td>International organisations</td>
<td>Groups like the European Union allow information to be easily shared. NATO and the UN ensure that people in developing countries have access to healthcare and emergency supplies. The World Health Organisation (the WHO) coordinates international efforts to improve medical care.</td>
</tr>
<tr>
<td>Electoral reform and the labour party</td>
<td>From 1970 all men and women over 18 got the right to vote. The expansion of voters over the 20th century led to the establishment of the Liberal government and the Labour Party, who focused improving the lives of ordinary people.</td>
</tr>
<tr>
<td>Advances in technology</td>
<td>Advances such as the telephone, fax and the internet have made sharing information much easier. Medical technology has made huge advances, make procedures like heart transplants and keyhole surgery possible.</td>
</tr>
</tbody>
</table>

**Timeline:**

- **1900AD**
  - 1906 - 1914AD: Liberal reforms to improve public health.
- **1914 - 1918AD:** World War One
- **1914 - 1918AD:** World War Two
- **1928AD:** Fleming publishes his article about penicillin.
- **1928AD:** The NHS is established.
- **1942AD:** The Beveridge Report is published.
- **1948AD:** The WHO (World Health Organisation) declares smallpox eradicated.
- **1967AD:** The first successful heart transplant is performed.
- **1980AD:** The WHO (World Health Organisation) declares smallpox eradicated.

**World War One and War Two** alerted governments to the poor health of the population. The wars also caused government to invest in advances in the treatment of infection and surgical advances.
### Contributions:
- Ehrlich’s magic bullet, **salvarsan 606** (1909) treated **syphilis**, a common sexually transmitted disease.
- Ehrlich’s research inspired other individuals, like **Emil von Behring** to discover other magic bullets for other diseases, such as blood poisoning and pneumonia.
- Ehrlich’s discovery encouraged doctors to look **further than the symptoms** of a disease and focus instead on its cause.

### Limitations:
- Administering salvarsan 606 was extremely complicated and painful.
- Salvarsan 606 caused extreme **side effects**, sometimes resulting in death.

### Contributions:
- Booth’s report showed that **30% of people in London** did not have enough food, despite the fact that they had full time jobs.
- Rowntree’s report showed that roughly **30% of people in York lived in poverty**. He stated that a poor and weak population would result in a poor workforce and an unproductive country.
- Rowntree was friends with **David Lloyd George**, a politician who became **Prime Minister** in 1916.
- Booth was also a successful **businessman** who had links in **politics**.

### Limitations:
- Neither man had the ability to make laws for themselves.
- Many of the reforms introduced in the early 20th century fell short of what was needed.
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#### 39. Why public health improved in the early 20th century:
- In 1899, the British government discovered that **40% of its young male population** were unfit to fight.
- Five years later, a series of **laws** were introduced which tried to make Britain’s population healthier and fitter.

<table>
<thead>
<tr>
<th>Law</th>
<th>Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provision of School Meals Act 1906</td>
<td>The council could provide <strong>free school meals</strong> to pupils in need. However, by 1914 only just over half of local authorities had a school meals service.</td>
</tr>
<tr>
<td>Education Administrative Provisions Act 1907</td>
<td>Schools could give <strong>free medical treatment and check-ups to schoolchildren</strong> after 1912. However, very few authorities actually provided this service.</td>
</tr>
<tr>
<td>Old-Age Pensions Act 1908</td>
<td>People over 70 who earned a certain amount would receive money from the government every week. However, there were a number of <strong>exceptions</strong>, meaning many in need were excluded.</td>
</tr>
<tr>
<td>Labour Exchange Act 1909 National Insurance Act (Unemployment) 1911</td>
<td><strong>Labour exchanges</strong> were set up to help people <strong>find work</strong>. People who looked for work through labour exchanges would be <strong>given money</strong> every week to help them survive.</td>
</tr>
<tr>
<td>National Insurance Act 1909</td>
<td>People who earned under a certain amount would get <strong>medical insurance</strong> which was paid for through <strong>their earnings and a contribution from their employer</strong>.</td>
</tr>
</tbody>
</table>

- There were a number of factors which made these laws possible:

  **Communication:**
  - Rowntree and Booth’s **connections with politicians** meant they were heard.
  - Rowntree and Booth **published reports** into the poverty in Britain.

  **Government:**
  - The **Liberal Government** introduced the **laws** which made many improvements possible.
  - Many laws gave the government the power to **provide funding** for schemes, such as free school meals.

  **Individuals:**
  - **Rowntree** and **Booth** highlighted the issues with poverty around Britain.
  - **David Lloyd George** fought within government and Parliament to put public health laws into place.

  **War:**
  - The **Boer War** between 1899 and 1901 and the **First World War** between 1914 and 1918 **highlighted the poor health of the people**.
  - The government wanted a **strong population to have a strong army**.

  **Keywords:**
  - **Pension**: A regular payment made to people over a certain age by the government.
  - **Medical Insurance**: A scheme where people regularly pay in and, in return, their medical bills are paid for them when they need it.

  **Prime Minister**:
  - **The head of an elected government**.

Free school meals in 1907.
### Contributions:
- Fleming proved that penicillin could kill the staphylococcus germ.
- Fleming **published his discovery in 1928**. This paper went on to inspire Florey and Chain to do further experiments.

### Limitations:
- Fleming was not the first to make this discovery: people had known that mould could kill germs since the 1870s.
- Fleming made his study **accidentally**: he left some petri dishes out when he went on holiday and examined the mould which had grown when he returned.
- Fleming **did not make the link** between penicillin and treating infections.
- Fleming **did not see his work as important** and lost interest in it.

### Contributions:
- Florey and Chain proved that penicillin **could be used to treat infections**.
- Because of funding from the American government, they found ways of **mass producing** penicillin so it could be used to **treat soldiers**.
- Penicillin **saved thousands of soldiers’ lives** during World War Two.
- Penicillin helped **pharmaceutical companies**, like GlaxoSmithKline to become successful.
- **Other antibiotics** were discovered after penicillin.

### Limitations:
- Florey and Chain’s first experiment (on a policeman with an infection) **failed** when they ran out of penicillin.
- Florey and Chain **were not funded by the British government**.
- Anti-biotic resistant infections have begun to become a serious issue in the 21st century.
### 42. The Impact of World War One on medicine:
- Between 1914 and 1918 most of the countries in Europe were involved in **World War One**.
- Over this period new weapons, such as mustard gas and grenades were developed, causing new injuries.
- **Conditions in the trenches** also made infection extremely common.

**Keywords:**
- Blood transfusion: When lost blood is replaced.
- Saline: A salt water solution.
- Skin graft: The transfer of skin from one area of the body to another.
- Splint: Something which is used to hold a broken limb in place.
- Logistics: Organising a large scale business or organisation.
- Shrapnel: Small pieces of metal or other material thrown out by an explosion.
- Poverty: When people are forced to live in poor conditions because they do not have enough money.
- Diptheria: A bacterial infection which usually kills children.

<table>
<thead>
<tr>
<th>Area</th>
<th>Developments:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disease</td>
<td>Surgeons began soaking wounds in <strong>saline</strong> as a short term solution to stop gangrene.</td>
</tr>
<tr>
<td>Surgery</td>
<td><strong>X-rays</strong> were already being used, but they were in hospitals and could be unreliable. During the war, x-rays were made more <strong>reliable</strong> and <strong>mobile x-ray units</strong> (petites curies) were invented. <strong>Blood transfusions</strong> were already possible (Landsteiner discovered blood groups in 1900), but during WW1, it was discovered that <strong>sodium citrate</strong> could be used to <strong>store blood over a long period of time</strong>. <strong>Harold Gillies</strong> (an army surgeon) worked with injured soldiers to develop techniques for <strong>plastic surgery</strong>. In particular, he focused on <strong>skin grafts</strong>. The <strong>army leg splint</strong> was developed, which held broken bones in place while they healed.</td>
</tr>
<tr>
<td>Public health</td>
<td>Many public health <strong>laws</strong> in the early 20th century were designed to create a <strong>fit and healthy</strong> population. After the war, Prime Minister <strong>David Lloyd George</strong> tried to turn Britain into a “<strong>land fit for heroes</strong>”.</td>
</tr>
</tbody>
</table>

### 43. The Impact of World War Two on medicine:
- Between 1939 and 1945 most of the countries in Europe went to war again during **World War Two**.
- Further **weapons** were developed during this period and medical technology developed with it.

<table>
<thead>
<tr>
<th>Area</th>
<th>Developments:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disease</td>
<td><strong>Florey and Chain</strong> mass produced penicillin, the first <strong>antibiotic</strong>.</td>
</tr>
<tr>
<td>Surgery</td>
<td><strong>Archibald Mclndoo</strong> (Gillies’ cousin!) developed <strong>plastic surgery</strong> further through his experiments on the “guinea pig club” at Queen Victoria’s Hospital in London. The <strong>logistics</strong> surrounding <strong>blood transfusions</strong> became much more advanced: by 1945 the <strong>Blood Transfusion Service</strong> was efficient, storing blood and transporting it to where it was needed. American surgeon <strong>Dwight Harken</strong> began removing bullets and <strong>shrapnel</strong> from <strong>hearts</strong>, pionerring the first <strong>heart surgery</strong>.</td>
</tr>
<tr>
<td>Public health</td>
<td><strong>Rationing</strong> meant that people ate more <strong>fruit and vegetables</strong> which they grew in their gardens. Many children, who had been living in <strong>poverty</strong> in cities were <strong>evacuated</strong> to the countryside. <strong>Public Health Campaigns</strong> encouraged people to keep <strong>clean, healthy</strong> and <strong>active</strong>. The government began <strong>vaccinating</strong> children against <strong>diptheria</strong>. The <strong>Beveridge Report</strong>, written in 1942, prompted the government to establish the <strong>NHS</strong> after the war.</td>
</tr>
</tbody>
</table>
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44. The Welfare State:
- In 1942 **William Beveridge** wrote a report which stated that the government should look after people “from the cradle to the grave” and that they should tackle the ‘five giants’ of public health: want (need), disease, ignorance, idleness and squalor (poor living conditions).
- After the end of the Second World War in 1945, the government set up the welfare state to try to solve these issues.

<table>
<thead>
<tr>
<th>Area</th>
<th>Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disease</td>
<td>The NHS was set up which provide free healthcare to all who wanted it.</td>
</tr>
<tr>
<td>Ignorance</td>
<td>Children had to stay in education until they were 15. More free university places were made.</td>
</tr>
<tr>
<td>Idleness</td>
<td>The government nationalised some industries, such as iron and steelworks, to make sure that people would keep their jobs even if the industries ran into difficulties.</td>
</tr>
<tr>
<td>Squalor</td>
<td>The government demolished large areas of poor quality housing and built new council houses to replace them. 14 new towns were created across Britain.</td>
</tr>
<tr>
<td>Want</td>
<td>National Insurance was extended to cover all adults, providing a wide range of benefits, including unemployment benefits, family allowances, old-aged pensions and maternity benefits.</td>
</tr>
</tbody>
</table>

- There were a number of factors which made this system possible:

  **Communication:**
  Beveridge made his suggestions to the government through the Beveridge Report, which was published in 1942.

  **Government:**
  The government commissioned the Beveridge Report.
  The Conservative government (during the war) passed the laws which made a lot of the welfare state possible.
  The Labour government (after the war) created the systems of the welfare state, like the NHS.
  The Liberal government (the early 20th century) first created the national insurance scheme.

  **Individuals:**
  William Beveridge created the framework of the welfare state in the Beveridge Report.
  Clement Atlee, prime minister after the Second World War, led the labour government and made Beveridge’s suggestions law.
  Aneurin Bevan, minister for health, helped to set up the NHS.

  **War:**
  After the two World Wars many people wanted to create a better life for those who had made sacrifices.
  Many people in the countryside saw the appalling conditions that many children were in when they were evacuated from the cities during World War Two.

**Keywords:**

- **Welfare:** The health and happiness of a person.
- **Family allowance:** Money given to a family every week to help with healthcare costs.
- **Pension:** A regular payment made to people over a certain age by the government.
- **Maternity:** The period in which a woman is pregnant.
- **Ignorance:** A lack of knowledge.
- **National Insurance:** A scheme which offered medical insurance to all working people, earning under a certain amount, who paid into it.
- **Evacuation (during the Second World War):** When children from cities were moved out to live with families in lower risk areas in the countryside.
45. Establishment of the NHS:
- The NHS was established in 1948 by the Labour government.
- The Minister of Health at the time was Aneurin Bevan, the son of a Welsh coal miner.
- Most hospitals were nationalised and put under the control of local governments.
- Healthcare, medicines, non-essential care (such as dental work or glasses) was provided to all people for free. An ambulance service was also established.
- Although the NHS was extremely popular after it had been introduced, many politicians and doctors objected to it. This was because:
  - Conservative politicians argued that the cost would be too high (many argued that the cost would go down as people became healthier. This did not turn out to be the case.)
  - Many doctors argued that they would look autonomy and income if they had to work for the government.

46. Modern issues in medicine:
- Only four years after the establishment of the NHS, charges were introduced for prescriptions and later for dentistry and other, non-essential work.
- This was only one of the problems which the NHS faced and continues to face.

<table>
<thead>
<tr>
<th>Problem</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anti-biotic resistance</td>
<td>Due to the widespread prescription of anti-biotics after the Second World War, some bacteria have developed a resistance to them, causing dangerous infections like MRSA. The NHS has begun campaigns to reduce the prescriptions of antibiotics and to make sure people always finish their prescriptions.</td>
</tr>
<tr>
<td>An ageing population</td>
<td>As life expectancy increases and the birth rate declines the population is generally becoming older. This leads to the NHS focusing on different issues, such as dementia and arthritis.</td>
</tr>
<tr>
<td>Cost of medical technology</td>
<td>Medical technology is becoming more expensive which is having an effect on the NHS’s budget.</td>
</tr>
<tr>
<td>Waiting times</td>
<td>As the population increases and the NHS’s budget becomes more stretched, people are having to wait longer to be seen by a doctor or to have operations and treatments.</td>
</tr>
</tbody>
</table>