

Key idea: What changed in the Industrial Revolution?

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| 1 | Enlightenment ideas | People became much more willing to experiment and to challenge traditional ideas. |
| 2 | Technology | Allowing further research into the cause of disease. |
| 3 | Factories developed | Thousands of people migrated to towns and cities, having a huge impact of housing and public health. |

1. Understanding of Disease

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| 1 | What had changed? | <ol style="list-style-type: none"> With the invention of the microscope, people had discovered germs and bacteria This led to the theory of Spontaneous Generation – that something rotted and then created bacteria |
| 2 | The Impact of Pasteur | <ol style="list-style-type: none"> In 1861, French chemist Pasteur conducted experiments with flasks of water that proved germs caused decay – disproving spontaneous generation He published his work but didn't apply this work to humans until later |
| 3 | The impact of Koch | <ol style="list-style-type: none"> German doctor Koch was inspired by Pasteur's work and became the first to link specific bacteria to specific diseases He proved this using scientific experiments and photographic evidence |
| 4 | Understanding specific diseases | <ol style="list-style-type: none"> From 1860 to 1900, Pasteur and Koch competed with each other to link bacteria to different diseases Koch and his team identified the bacteria that caused TB, cholera and anthrax Pasteur built on these discoveries to develop vaccinations for different diseases e.g. Chicken cholera |
| 5 | Lasting impact of Koch | <ol style="list-style-type: none"> Koch's work and methods inspired other scientists By 1900 different teams had found the bacteria that caused typhoid, pneumonia meningitis, plague and dysentery By 1950, different teams had developed vaccines against typhoid, TB, diphtheria, tetanus, measles and polio |

2. Treatments

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| 1 | Changes in treatments | <ol style="list-style-type: none"> In 1889, Ehrlich (was part of Koch's team) started working on finding chemical cures that would work like antibodies In 1909 his team developed the Salvarsan 909 as a cure for syphilis – the first 'magic bullet' This was a big discovery, however it didn't affect Britain much until the mid 1900s |
| 2 | Everyday treatments and remedies - continuity | <ol style="list-style-type: none"> Treatments were slow to develop and the most common treatment was still home remedies If home remedies didn't work, people could buy 'patent medicines' that were advertised by their makers. There was no control over these manufacturers or the claims they made and many were dangerous In the 1880s the government introduced laws to control the use of harmful ingredients |

Key dates

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| 1 | 1844-47 | Development of first effective anaesthetics |
| 2 | 1848 | First Public Health Act |
| 3 | 1854 | Major cholera outbreak in Broad Street |
| 4 | 1858 | The Great Stink in London |
| 5 | 1861 | Pasteur publishes paper on germ theory |
| 6 | 1867 | Lister develops anti-septic surgery |
| 7 | 1875 | Second Public Health Act |
| 8 | 1871-1885 | Identification of germs and vaccines by Pasteur and Koch |

| Key word | Definition |
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| Germ Theory | Theory that germs (bacteria) cause disease |
| Miasma | Bad air/smells – it was believed up until the 19 th Century that this was the cause of disease |
| Spontaneous Generation | The belief that bacteria appear after an object has rotted |
| Vaccine | Using the dead germs of a disease or one like it to give a patient immunity |

Key Individuals

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| 1 | Pasteur | Developed the germ theory and proved disease was caused by bacteria |
| 2 | Koch | Developed Pasteur's work and linked specific bacteria to specific diseases |
| 3 | Lister | Developed the first antiseptic and promoted clean surgery |
| 4 | Simpson | Developed the first effective anaesthetic |
| 5 | Chadwick | Commissioned by the government to write the first report into the spread of cholera |
| 6 | Snow | Proved that cholera was spread through contaminated water not from |
| 7 | Bazalgette | Commissioned by the government to design and build London's sewer system |

3. Surgery

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| 1 | How did anaesthetics develop? | <ol style="list-style-type: none"> In the early 1800 scientists found that some chemicals reduced pain In 1799 Nitrous Oxide was suggested, but it wasn't always effective From 1846, Ether was used effectively in operations but it was flammable and difficult to inhale In 1847, James Simpson discovered chloroform would cause unconsciousness. He started using it for childbirth There was initial opposition to the use of chloroform but it was publicly supported by Queen Victoria |
| 2 | Why were anaesthetics important? | <ol style="list-style-type: none"> Anesthetics allowed surgeons to operate more slowly and carefully without fear of their patients dying from shock It allowed more complex operations Chloroform encouraged more research into anesthetics leading to chemicals which relaxed the muscles and local anesthetics later |
| 3 | How did antiseptics develop? | <ol style="list-style-type: none"> Joseph Lister was inspired by Pasteur's work and wanted to apply it to surgery He experimented with treating compound fractures using carbolic acid soaked bandages Lister published his results in 1867 and developed his work so that bacteria was being killed at every stage There was opposition to Lister from surgeons who disliked the irritating acid, the extra steps needed in operations among other reasons Lister persevered with demonstrations and education |
| 4 | Why were antiseptics important? | <ol style="list-style-type: none"> Antiseptics vastly reduced deaths from infection His work led to aseptic surgery by the 1890s |

4. Public Health

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| 1 | Conditions in towns and cities | <ol style="list-style-type: none"> With the Industrial Revolution, the urban population increased dramatically. Houses were built quickly and built close together. Houses would have a shared outside toilet and a shared water pump Little government involvement in people's health and living conditions |
| 2 | Hospitals and healthcare | <ol style="list-style-type: none"> Most poor people were treated in workhouses – conditions here were poor Over the 1800s some hospitals were founded by universities or medical school. These were used as training schools for doctors From 1860 onwards, cottage hospitals run by local doctors provided care for rural areas Florence Nightingale published her work on nursing in 1859 based on the poor conditions she saw in the Crimean War hospitals. She emphasised the need for hygiene and raised money to train nurses |

5. Public Health – Cholera

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| 1 | What was cholera? | <ol style="list-style-type: none"> Cholera is a disease caused by water contaminated with sewage It reached Britain in 1831 and over the next 35 years there were several cholera epidemics killing tens of thousands of people each time |
| 2 | Edwin Chadwick's report | <ol style="list-style-type: none"> In 1842, Edwin Chadwick published a report stating that living conditions in towns were worse than in the country. He suggested the government should pass laws for drainage and sewerage systems funded by taxes. Chadwick's report and the 1848 cholera outbreak triggered the First Public Health Act However, he still believed cholera was caused by miasma |
| 3 | John Snow's report | <ol style="list-style-type: none"> Snow conducted a scientific study in 1854 of the cholera outbreak in the Broad Street area of London. He proved the real cause of cholera and the need for clean water. The government didn't act on his report; many scientists still believed in miasma Even after a further epidemic in 1865, the government wouldn't act on his report due to their laissez-faire attitudes – they believed it wasn't their responsibility to help the poor and get involved in people's lives |

Key word
Definition

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| Anaesthetic | A substance that stops a patient from feeling pain |
| Antiseptic | Something that stops disease spreading organisms growing and spreading in the body |
| Aseptic | Sterile or totally free from contamination by viruses or disease |
| Cholera | A water borne disease that causes severe vomiting and diarrhoea |
| Laissez-Faire | A policy where the government should not get involved in people's lives |
| Miasma | Bad air/smells – it was believed up until the 19th Century that this was the cause of disease |
| Reform | To make changes in order to improve something |
| Vaccine | Protecting someone from a disease by giving them a weakened or dead organism |

6. Public Health –The Sewer System

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| 1 | The Great Stink | <ol style="list-style-type: none"> 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 and stinking waste in the Thames – this affected the government directly. |
| 2 | The building of the sewers | <ol style="list-style-type: none"> The government hire Joseph Bazalgette to build a new sewer network throughout London The government invested £3 million to build the network. Bazalgette's planning and engineering genius meant that the sewer system was complete by 1866. |
| 3 | What was the impact of the sewers? | <ol style="list-style-type: none"> Short term: Bazalgette's ideas were still based on miasma, but it unintentionally provided clean drinking water. Long term: Bazalgette predicted that London's population would grow and planned for it: many of his sewers are still in use today |

7. Public Health – Improvements by the government

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| 1 | Public Health Act 1848 | <ol style="list-style-type: none"> Councils could set up a board of health but it was not compulsory. |
| 2 | Vaccination Act 1853 | <ol style="list-style-type: none"> Vaccination against smallpox was made compulsory |
| 3 | Sanitary Act 1866 | <ol style="list-style-type: none"> Towns had to have a health inspector and were made responsible for sewers, water and street cleaning. |
| 4 | Artisans Dwellings Act 1875 | <ol style="list-style-type: none"> Councils had the power to buy and demolish slum housing. |
| 5 | Public Health Act 1875 | <ol style="list-style-type: none"> Councils had to appoint a medical officer. They also had to provide clean water, cover sewers and keep them in good condition, collect rubbish and provide street lighting. |
| 6 | Sale of Food and Drugs Act 1875 | <ol style="list-style-type: none"> Guidelines were set up to check the quality of food and medicine before it was sold to the public. |
| 7 | What was the impact of these acts? | <ol style="list-style-type: none"> This was a big change in the Laissez-faire attitude of the government In 1800 the death rate in Britain was 39 per 1000 people. By 1900 this had dropped to 18 by 1900 |

Key factors in the Early Modern period

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| 1 | Individuals | <ol style="list-style-type: none"> Individuals made significant breakthroughs in this time period. Individuals like Lister, Snow and Simpson continued their work despite opposition |
| 2 | Government | <ol style="list-style-type: none"> The government funded the research of a lot of individuals during this time However the government also held back the development of public health for longer than necessary due to their laissez-faire attitude In 1867 working men were given the vote, giving them more influence in law-making |
| 3 | Science and technology | <ol style="list-style-type: none"> Developments in science and technology allowed scientists to prove and develop new ideas – like germ theory It also allowed previous scientists work to be correct – e.g. germ theory could be used to prove Jenner's work The scientific method helped Snow to prove that cholera was carried by water. Advances in engineering made Bazalgette's sewer network possible. |
| 4 | Chance | <ol style="list-style-type: none"> Some developments like those of Simpson were discovered by chance The Great Stink in 1858 forced the government to take action. |
| 4 | Communication | <ol style="list-style-type: none"> Inventions like the electric telegraph and the beginning of medical journals, allowed ideas to spread quickly. Scientists also began to showcase their work, e.g. Louis Pasteur demonstrated his experiments to journalists Tyndall delivered lectures supporting germ theory. Cheyne translated Koch's work into English The reports of Chadwick and Snow were published and distributed to the public |