**Medicine**

Changes in Health and Medicine

c.1349 to the present day

**Chapter 1: Causes of illness and disease**

Beliefs of Causes of Illness and Disease in the Medieval Period

In the Medieval Period, the most informed and upper class belief about disease involved the four humours. This was a bit of a weird system where each season caused you to imbalance in a certain body fluid: Blood (a spring disease caused by Hot and Wet, corresponding with Air), Yellow bile (Vomiting caused by the summer where it was Hot and dry, corresponding with Fire), Black Bile (An Autumnal disease caused by Cold and Dry Weather representing Earth) and Phlegm (Mucus caused by Winter when it is Cold and Wet Corresponding with Water). These were from Hippocrates and Galen from Ancient Greece combining all the elements together. Unfortunately it was very wrong and did not help cure disease, in fact often making disease worse. Because the Monks were the academics and did not want to change anything, the belief stood for a Millennium before Harvey proved Galen was wrong about blood.

God’s Punishment was also a huge belief about disease. People thought that God sent them the disease for sinning and they should not try to get rid of it, but instead pray and wait to get better. These movements included the flagellants who whipped themselves in the Great Plague to avoid getting the disease and repenting from God. Everyone in the Country was either Catholic or Jewish so this belief was very strong throughout this period. Monks were seen as the leaders and while the earliest of them knew about the other texts, they only translated parts of Galen in an attempt to make people stay religious. God was also a huge hindrance to progress as people believed it was a sin to dissect dead bodies (Resurrection of the Body) and so people’s medical knowledge was from Cows and Pigs who have very different bodies to us. Also the belief that you deserved the disease meant that other people were not going to research about the body in fear of going to hell or being kicked out of society (Like Roger Bacon).

Many People also believed that the Supernatural caused disease. Elves shooting you and causing stomach pain was a genuine belief. People also believed that witches caused the diseases people were getting. People tried to isolate witches and later on many witch trials took place which saw many of them executed. They believed that the race was against good and evil and so they prayed to god not to get disease.

Miasma was a sensible belief on the cause of disease. People believed that bad smells in the air led to you getting sick and then dying. People realised that more people got ill in the towns and they put them together believing that this is what was causing disease. The towns were unhygienic and this was what was causing disease, so the advice to stay away from towns would have helped but obviously it wasn’t quite right and the Use of Herbs would not have stopped you getting disease.

Everyone thought that death was inevitable early on and just lived with it. Today this seems crazy but consider how much they thought God existed back then. Since they were uninformed about the religion they all had certainty that they would go to heaven when they died, so they stood back from curing disease and instead focused on praying. There were obviously rushes to save children, and midwives would often baptise children as they were born. Infant mortality was high, but the belief in heaven demotivated people from looking into cures for a disease and instead focusing on appeasing God.

During the Black Death, people also came up with their own theories such as Jews Poisoning the Wells, a massive sin committed by everyone, a movement of the stars going against them, an earthquake in China and tolerance towards other people. People thought you deserved to get the disease as a Punishment from God and so nothing was really done to help people get better.

Actual Causes of Illness and Disease in the Medieval Period

Poverty was probably the biggest cause of disease during this period. As the population increased from Good harvests, a disaster was in the making. Every few years, a terrible harvest would happen and loads of people would be left hungry. Food prices went up leaving 75% of the population starving. Only a quarter could support themselves in a good year and in bad years such as 1317, labourers would have nothing to eat. People rarely died because they ate nothing, but they died of disease instead. For example, by not having enough food your immune system became weaker leading to people not being able to fight off basic diseases such as Flu. Combined with this, being poor meant you could not afford medical advice and while this advice may not have been correct, it would have told you to exercise and to try and stay health, but the poor did not have enough time to do this either because they were too busy at work, which was often laborious.

With less intelligence and no regulations for safety, many people also died from accidents, such as grown men falling from trees when branches snapped or stepping under construction work in the city walls. Such was a world without regulation or proper entertainment that people did stupid activities which often resulted in fatal injuries. The most humorous anecdote which sums up the medieval life was Joanna Appleton. She fell down a well, and hearing her screams a servant tried to rescue her. He fell in too. Seeing this, another servant thought it would be a good idea to try and help her out. He also died. Perhaps worst of all people had to drink the water that these bodies had drowned in.

Most certainly the towns were also a large cause of disease. They were incredibly dirty because there were no regulations. For example, butchers would slaughter the meat in the city and the blood would just run onto the streets. It would not clear away until it rained. The houses had thatched rooves which were the perfect habitation place for rats. There were no proper sewage system and either it would be thrown onto the streets or could even find itself in the river which people used as cooking water and to clean their clothes downstream. Construction work was unregulated, dangerous and often led to very cramped conditions, while animals were allowed to run along the streets along with humans. Perhaps worse was the smell. People believed in Miasma primarily because the Towns were where you got the disease and they smelt awful. It was said you could smell a town before you could see it. One exception was Coventry where an active effort was made to keep the towns cleaned. You would pay fines if you section was not cleaned, however the fact the law had to be passed multiple times suggests it wasn’t very successful. Either way, it would have been much cleaner than any other town, probably having a lower disease rate.

Finally, a lack of basic medical knowledge was a main cause of disease. If people had known that all these things were harmful they would have stopped doing them. However, the church continued to tell them that the main cause of disease was God giving you it as a punishment, and this belief stopped them taking any precautions to doing anything that could have stopped the disease. Moreover, many treatments such as Bloodletting made people worse, which came from the belief in the four humours. with this, being poor meant you could not afford medical advice and while people not being able to fight off basic disea

The Black Death and Wales

* By 1349, the Black Death had reached Wales.
* Over 1/3 of the population of Wales died.
* Haverfordwest in Pembrokeshire was the first town to experience the outbreak of the plague.
* Within a few months, the plague had struck settlements in North Wales, such as Ruthin where there we just under 80 deaths in the month of June alone.
* The medieval town of Cosmeston in the Vale of Glamorgan was greatly affected by the Black Death. It is thought that the majority of villagers died, leaving Cosmeston a deserted village.

The Black Death VS the Great Plague of London

The Black Death of 1348 was one of the largest epidemics ever in terms of proportion of people killed. It killed potentially over half the population of Europe while the lack of knowledge, treatment or prevention caused people to be terrified of it. In fact, the only people who really survived were those who were rich or already had immunity, although it infected all classes. We do not know how many people died of it because records taken were terrible, and this has led some to believe it was multiple diseases rather than just Bubonic plague. In 1665, London also got infected with the plague, however the better management of the disease led it to have far fewer deaths and not spread to every town in Britain: a huge improvement. This was down to a multitude of reasons.

Lists – By the Early Modern period, people started to account what people died from. This became more important during the Great Plague when it showed if a plague had hit a town. In that case, trade would be stopped and the city walls would be closed, although this was sometimes not a great measure because it often led to the rich escaping and leaving the poor to cope with their diseases, which spread the disease to other towns if they already had it.

Immunity – By the time the second plague came, more people had the genetic trait that stopped them from getting the plague, as they were descendants from the survivor of the Great Plague which killed many who did not have the disease. Enough people had this to stop the disease from spreading too much, leading to fewer people overall getting the diseases.

Increased Medical Knowledge – People had more knowledge know as far as concerned with disease. They realised that the disease was infectious, and this meant that they put a red cross on a house that had an infectious person, initiated quarantine and stopped other towns getting the disease, further decreasing the effect of the plague.

Plague Doctors – To treat the infected, Plague Doctors rather than priests and the families would treat them. It is likely there was a slightly higher survival rate than the 1348 plague, but also they stopped others getting infected. Their intimidating dress warned others to stay away, and their full body covering with wax stopped body fluids getting on them and causing diseases. They had amulets to ward away spirits and fresh herbs in their beak, so the things they thought worked did not work while the unintentional things did. Either way they were effective.

Great Fire of London – In 1666, the following year the whole of London burnt down. Realising that the disease was at least in part caused by the unsanitary conditions in the city, they rebuilt the city with more space, better materials and the fire killed all rats and fleas stopping the disease infecting anyone else.

Treatment – However, there was still no way to prevent or treat the spread of disease apart from to stay away from the infected. This meant it was still up to chance whether you got the disease or not. Also, the poor were most affected still before because the rich often left when the disease happened, and this also helped spread the disease.

Causes of Disease in the Industrial Period

During the 18th and 19th Centuries, an industrial revolution happened in Britain. The agricultural revolution that happened before that supported a country of more people with fewer farmers, and the new jobs became in mechanical industry. The inventions that came with it further made Britain a fast moving industrial country. The country went from 90% living in the countryside to 90% living in the city in just a century. However, the working conditions during this period remained very low due to the fact that the government did not want to get involved in what businesses did and did not do. This policy was known as Laissez-Faire.

Poverty – Poverty has been the ever present cause of disease in Britain, however in this period it became more of a problem. The believe that one earned the money so it is that of one led to few charitable people, and the inequality rate rose, causing people being unable to afford medical help and dying of preventable disease.

Sewage – There were no proper sewers at the beginning of the Industrial Revolution and this led to diseases like Cholera being an endemic. This means that the diseases was constantly there, and that the population was unable to stop the diseases from killing off the population.

Poor Housing – Houses became jerry built meaning that effort was not put in to make the house suitable for human habitation, but instead the house stood as a place for more workers to live. This led to Tuberculosis being a large problem because the air breathed in was closed in and of poor quality. Streets were also narrow so much so that people would often never experience any light, leading to them getting diseases like scurvy from a lack of vitamins.

Hygiene – People would often be unable to drink or clean with clean water, leading to them being unable to clear away any bacteria which led to them getting ill. The fact that sewage often leaked into clean water also caused a multitude of diseases, especially Typhus caused by lice and fleas.

Work Related – The new professions that came in also caused people to get ill. Phossy Jaw was a problem for matchmakers who saw the sulphur odours cause them disease, while many Chimney Sweeps got Scrotal Cancer. Injuries and accidents at work often remained common, and people would often lose arms in machines with no safety features to prevent this happening. Silicosis and other lung conditions also caused problems from people breathing these in, while employers said it was healthy, so workers continued to die.

Children – Children were especially vulnerable during this period. The infant mortality rate rose to 50% in many areas, because of all these reasons. They lived in poor housing and it was unlikely that a mother could afford to go to a hospital to be checked upon while incredibly it was expected for children to work at 4 years old in the early industrial revolution. It was believed that their small hands were able to get in crevices that adults could not, with many employers actively looking for children.

Cholera and Typhoid

Cholera – Cholera was brought over to Britain in 1831 presumably on a boat. The first epidemic that year caused 50,000 deaths in Britain. It is a bacterial infection that spread in dirty water. It was present in the faeces and vomit of an individual, so when they did this on the streets or in a toilet that leaked into the water supply, people got cholera. It was untreatable at the time because sugar, salt and hot water were expensive. Many died in hours. Nobody knew what caused it, people suggested miasma and immorality, but ruling these out, they asked a doctor to investigate. In 1854 during the third cholera outbreak, John Snow realised that it was a waterborne disease that happened when water was contaminated. The following separation of sewers and the water supply led to a reduced number of deaths, but many were horrified that the water they had drunk had leaked from the latrines and refused to accept that is what caused their condition.

Typhoid – Typhoid was another bacterial disease that spread through contaminated water. It was caused by poor sanitation and therefore it thrived in Victorian Britain. It was a lot slower than cholera which was a sudden disease, however it was also often fatal. Between 1830 and 1890 it was a large problem for the poor in England and Wales. Even when burning the clothing and bedding of the infected did not help, the health board believed that it must be miasma causing the disease. In 1884 the disease was discovered in Bangor in the water supply, and the improved knowledge of what caused the disease, helping them better prevent it. Vaccination and better hygiene also came during this period which both also helped limit the effects of typhoid.

Cholera in Wales

* During the summer months of 1832, 1849, 1854 and 1866, Wales was severely affected by outbreaks of cholera.
* There were hundreds of deaths.
* During the 1832 outbreak, the industrial town of Merthyr Tydfil was worst affected – 160 deaths.
* During the 1849 outbreak, the Merthyr district was again the worst affected with 1,682 deaths, compared to 396 in Cardiff. The Board of Guardians in Merthyr responded with measures to clean the town but their efforts had little impact. While there were no hospital facilities in Merthyr, the ironmaster Josiah John Guest opened a refuge for the healthy and a night dispensary where free medicine could be obtained.

Viral Diseases - Spanish Lady and AIDS

Spanish Lady – In 1918, the world was fighting the First World War, and as soldiers returned, they came back with a terrifying disease. You could be alive and well in the morning and dead by the evening it was said. The cause was Spanish Lady, a type of influenza virus that targeted specifically 20 to 40 year olds, when it is usually those out of this age range that suffer badly during the Flu Season. It lasted 2 years, and vaccines were not as advanced then as they are today, so the disease hit hard. This became the first Pandemic, where everyone in the world is infected with a disease at the same time. It claimed at least 50 million lives and was the secondary cause to death for millions of others. Influenza continues today to kill 250,000 a year, especially Swine and Avian flu.

We have now created flu vaccines, but there are many possibilities of which flu will hit this year, and it is impossible to know which strain it will be this year. This has led to many elderly people not getting vaccinated and dying from flu. It mutates very quickly and because flu is prevalent around the world, it is very possible that a serious strain will one day mutate. The problem with vaccinating for a viral disease is that it mutates too quickly for people to do anything about it to stop the disease with a vaccine, and they are so small no targeted medicines have been created yet.

AIDS – In the 1980s, a sudden new disease called Acquired Immunodeficiency Syndrome started to spread. It was an STI and many people blamed the disease on the new immoral lifestyles that people were following. It was at first a death sentence because there were no treatments. By the end of the millennium 8 million people died of AIDS. However, the fact that it could only be spread through blood and sexual fluids meant that people were safe as long as they did not share needles or have intercourse. There was an NHS blood scandal however, which resulted in many people dying from HIV. Recently we have created very complex medicines that stop the spread of HIV in the body into AIDS, leading to Timothy Ray Brown being the first person to be cured in 2008.

Causes of Disease in the Modern Day

In the 21st Century, many people still die from diseases caused by War Famine and Poverty around the world. In fact, the number of people who died of these 3 ailments was larger in the last century than all the others combined, mostly because of sharp population increase. Our understanding of what causes disease has grown a lot, but there are some things that we still struggle to treat. A lot of things that people get ill from are by their own lifestyle however, and these Non-Communicable Diseases usually occur much later on in life than other conditions.

Bacterial Infections – Many of the infections that would have been lethal a century ago have been now brought into control with the use of antibiotics, with significantly fewer people dying from these kinds of disease. However, people continue to suffer from sepsis which kills 1 in 5 people globally, where someone gets an infection that causes death.

Environmental Causes – With our Capitalist Society, more people are dying from being Workaholics and getting stressed. Heart attacks have become very common, resulting in the most deaths of any disease. In addition, working night shifts has become a necessity for many, resulting in a lower life expectancy because the circadian rhythm of the body is put off.

Old Age – In general, people who get common diseases such as Heart Disease and Cancer are very old. This means that these diseases are conditions of the old rather than young as was the case in previous periods. This has helped raise the life expectancy to 80 for men and women in this country, since most people who get these conditions are old before they get them. The body was not made for living past this age and while we will be successful in developing new technology we will not evolve to be older because people do not generally have children at that age so there is no point getting older in terms of evolution.

Lifestyle – Unhealthy habits such as overeating, alcohol consumption, smoking and drugs all contribute to early deaths. These are known as Lifestyle diseases. A movement forward is the fact that we induce these onto ourselves rather than the disease being a product of poverty, which is progress, however the rich still have a higher life expectancy in general than the poor. The diseases people die from include cancer, diabetes and heart disease, all of which are more risky if you consume a lot of meat, drink alcohol and smoke.

Perhaps one of the most unnoticeable continuities is the countryside being safer than the towns and cities. It is estimated that pollution in the UK is responsible for 300,000 premature deaths, while these conditions also cause Asthma and Bronchial diseases. In addition, people in the countryside tend to be able to have more exercise and live healthier lives, as well as being more likely to live in more spread apart areas which all decrease the risks of getting a disease.

Overall, the causes of disease have changed significantly over time. Far from dying falling down a cholera infested well as someone infected with bubonic plague infects you, Scientists now warn our lives are too germ free and it would be healthier to experience more bacteria

**Chapter 2: Attempts to prevent illness and disease**

Physicians’ Attempt to Prevent Disease

In Medieval times, there was little knowledge about what caused disease except a punishment from God, so they had no effective way of preventing it. There were only about 100 doctors in the whole country and while they were upper class and educated, they learnt from experience not a medical school. However, by the late middle Ages this changed as the trusted doctors had to go to a European Medical School. They were still ineffective and did not give any true information to the people, as the knowledge was still very limited and they could not dissect human bodies. Moreover, doctors were still rare and only accessible to the upper class. Doctors had a poor reputation anyway, being seen as scared of disease during the Black Death for not doing anything to try and cure these diseases.

Doctors accepted the ideas of the Ancient Greeks and never questioned them. They were often extremely wrong preventing people from stopping disease. They relied heavily on external observation and asking the patient since while they could use pulse and breathing, they had not medical instruments to check for these. Moreover, the belief about miasma saw them carry around flowers to stop disease spreading as opposed to using protective clothing.

Urine charts were partially helpful in stopping people from getting ill from a disease since they could diagnose diabetes or a UTI but they could not really do anything about them. They used to taste it to test for excesses of the four humours but this was often ineffective and could not prevent people getting more ill.

Prevention techniques relied of the four humours and checking for imbalances in blood, phlegm and bile. However, this stopped people from learning more about disease by blindly accepting these treatments that barely worked. Astrology was also used to predict illness and if it was seen that you had a good chance of getting ill that you might need to start bloodletting to get the blood out of your system stopping you get ill.

In Europe there was surprisingly little improvement during the Medieval Era. Universities in France and Italy were considered leading in knowledge, but this was Galen’s theories. They did no research so barely made any advances. In contrast, the Islamic Golden Age was in full swing in the Middle East. As doctors like Ibn Sina started to do research, they realised that Galen was wrong in a lot of ways. They developed themselves new ideas, but apart from slightly from Italy, these ideas were not spread to Europe because of the Crusades.

As always to do with medicine, the belief in God and religion held people back from development. The Church taught that everything was divinely inspired by God, and that illness was a deserved punishment for doing anything evil. The church was suspicious of anything to do with science that could challenge the authority of the church. Famously, Roger Bacon was imprisoned by the church for suggesting that doctors should do their own research. Such was the authority the church had in Ultra-Religious Medieval England. Any progress was limited because the church would also not let anyone dissect bodies, even those destined to hell and therefore we could not tell what caused the diseases people were getting. This led to people not knowing how to prevent disease or even suggest anything about disease being infectious.

Alchemists, Soothsayers and Ladies of the Manor

Many medieval scholars specialised into the school of alchemy. This was like an old form of chemistry, but its route was not to find more about elements, but to find an elixir to life. This was supposed to ward of disease and be the key to youth living forever. It was quite obviously unsuccessful, but the new technology that it created for finding this elixir did become useful for preparing herbal remedies which could sometimes help.

The Black Death offered a particular challenge for doctors. They were unable to highlight the cause of the disease, which obviously made prevention of the disease impossible. The church suggested to people that it was a punishment from God. The prevention was to seek forgiveness from God, however this movement into the church just made the disease worse, as did the extreme flagellants who went to the towns in Germany whipping themselves, causing the disease to spread even more.

Some told people to keep all doors and shutters closed, and to light fires. This would have kept miasma away. Another way Miasma was tackled was through cleaning the streets. This might actually have helped a bit to stop rats from having an ideal area, even if it was because of the wrong reason. People were also told by Hippocratic writings to eat, drink and exercise healthily, however this cannot always be done by the poor. These would have helped a bit to stop spread the plague by decreasing the ease of the plague surviving.

Others told patients not to bathe as this will open the pores and allow the pores in. This may not have been correct, but the others were actually actively damaging. Killing Cats and Dogs was an order as they were believed to spread the plague, but they actually stopped the spread of the plague by killing rats, leading to the rat population increasing leading to rat flea population increasing.

The Early Modern Era also unfortunately saw very little progress in the development of prevention of disease. Through people like Vesalius and Harvey, the Scientific Method helped identify the causes of disease, but this had no short term effects on the treatments instead.

In 1682, Anton Van Leeuwenhoek even discovered bacteria from a 200x magnification microscope which caused the bubonic plague and so many other diseases however he could not realise what caused these diseases and also people did not realise the significance, so it took 200 years until people realised these tiny microorganisms caused disease.

The Smallpox Vaccine

During the Late 18th and Early 19th Centuries, the Scientific Method was finally used as the priority for finding new methods for prevention to disease. Scientists started to use observations, carry out experiment and then record the findings that they had. Unfortunately, there were still many continuities with the work of the four humours being used by some and people did not know the reason their prevention techniques worked a lot of the time.

The Great medical development for prevention of this time was the Smallpox Vaccine. This was discovered by Edward Jenner as a 100% method for stopping people from getting the most deadly disease of Europe, the first time prevention became as important as the cure. Smallpox was a pandemic that was present throughout Europe in the History of European Medicine. It killed 30% of the infected and about a third of children at the time.

People had tried to prevent Smallpox for thousands of years. In China, the idea of getting the scabs off victims, leaving them and then giving a mild form of the disease spread. However, sometimes the disease would be just as severe and still kill the person. This idea spread to Turkey where Lady Montague saw this in action and brought it back to England. It became known as inoculation, but involved risks still, as the poor could not afford it and some people still died of the mild dose given.

In the Late 18th Century, Edward Jenner was working as a doctor in Gloucester and noticed that he never had to treat milkmaids for smallpox, while others in their family got very sick. He believed people who caught the far milder cowpox became immune to the Smallpox disease.

He then decided to test his idea on a boy called James Phipps. James was inoculated with cowpox and after a while with a large dose of Smallpox. It would have shown up symptoms but it did not. He did this test on many others and found the same result. He had proven that an inoculation of Cowpox stopped you from getting Smallpox. This made him call this special form of inoculation a Vaccine.

However, there was a very angry and sceptical reaction from most people. Some said that it was dangerous (as doctors used the same needle on many people) and some thought it was wrong from God to use animal diseases to cure human diseases. Others saw it as a loss to their livelihood from inoculation and even the Royal Society rejected this work as not credible. It would take Centuries before Smallpox Vaccines wiped out the disease finally.

Jenner had to publish the work himself. He called the technique vaccination meaning Cow. This work still attracted many people. Parliament was impressed, giving Jenner £30,000 to open up a smallpox vaccination clinic, while doctors in America and France used it to stop disease getting smallpox.

Unfortunately, it was not until the great smallpox epidemic in 1853 that the Vaccination Act was passed making the Vaccination from Smallpox compulsory for everyone, and in 100 years, the disease was practically wiped out of the United Kingdom and Europe. In 1980, the disease was FULLY ERADICATED from the world, the first disease to be eradicated and seen as one of the greatest medical successes in Human History.

The Change in Attitude from 19th Century to Today

Despite the fact that the first Vaccine had been created, people still did not believe in Vaccination or prevention to disease. Parents refused to get their children Vaccinated, even after it became compulsory. Even some medical practitioners refused to accept the compulsory vaccination as helpful arguing that it was unproven. Not only did people not trust the new forms of medicine but they also stuck on to the old ones. God was seen as the cause of disease so the way to prevent disease was to stay on his side, and the fact that they were trying to stop this would continue the spread of disease. Along with this Miasma stayed as a main belief as people tried to stay away from Bad Smells to stop the disease from spreading to them.

However, a new wave of thinking saw that it was better to prevent a disease than to cure it. This message encouraged the Middle Class Victorians to start living healthier lives to stop contracting these disease. This also focused Scientists on to looking for more vaccines and preventative methods to stop all kinds of diseases from harming people. Minds turned to Cholera, a disease killing hundreds of thousands in Cities like London and Manchester and a constant pandemic that seemed ever present.

John Snow was an English Doctor who was considered a leader in the Victorian Hygiene to prevent disease. He was a large sceptic of the Miasma theory and with no Germ Theory invented yet, he needed to use the Scientific Method to find out what really caused the disease. By talking to local residents and creating a map of where people had caught the disease on a map, he identified the source of the disease as the Public Water Pump on Broadwick Street. He persuaded the council to remove the handle of the pump which practically wiped out the disease.

Later on, it was show that the pump had been created less than a metre away from a cesspit storing faecal matter which had begun leaking in to the water causing the disease to spread into the water. While people were originally disgusted by the thought this disease was from drinking faecal matter, people came to the theory after it was found the disease was spread by a water pump in another area of the city.

People suddenly realised that the way to stop disease from being such a killer was not through cure but through prevention. This saw the start of Victorian Proverbs about how to stay healthy for the Middle Class such as “An apple a day keeps the doctor away” and “Cleanliness is next to Godliness”. These all helped to inform people properly about how to prevent disease, helping them to not get ill.

Scientists now looked into how to stop spreading disease as opposed to how to cure and treat disease. Vaccination has become the preferred route of stopping disease from being a killer. The WHO reports that vaccines are available for 25 different diseases, mostly by the work of two scientists from rival countries aiming to create prevention methods for disease faster.

Pasteur, Koch and Bacteriology

Louis Pasteur was a scientist who wanted to find out what really caused disease. With the invention of the Microscope, and its increase in resolution, he was able to discover little microbes that he theorised caused disease, calling these Germs. He then experimented to see where these microbes came from, using a Swan Neck bottle. He disproved spontaneous generation, meaning that bacteria and germs did not come simply themselves, but spread through the air.

Next, Pasteur experimented to see why these germs caused food to go off. He discovered it was these same microbes that caused milk and wine to go off. He used a system called Pasteurisation to stop this from happening where you heat the liquid to just under 100C to kill any pathogens. It also increased the length of time these products could be used for helping stop people from drinking sour wine and milk which could cause disease.

Robert Koch was in Germany and very interested in Pasteur’s work, especially these newly discovered Germs that caused disease. He wanted to see why these germs caused disease through working with organs from sheep that had died from disease. Using the new Petri Dish to grow these Germs he discovered different diseases were caused by different Bacteria. This basically founded the science of Bacteriology and meant that people now researched different bacteria and what diseases they caused.

Now there was a large possibility that you could develop more vaccines for more diseases. But first, they had to discover how vaccines worked. Pasteur started straight away with Chicken Cholera. He inserted thousands of inoculations, but all of them killed the animals. Eventually, a student accidentally injected one from the Start of the summer. The bird survived and did not get Cholera. Pasteur realised that the disease was stopped when you injected a weaker form of the disease into the human body. The body then fought off these diseases and could not be infected with them again.

Koch wanted to know what he could now stop spreading and went to work studying different bacteria. All he had to do was weaken or kill the bacteria and then simply put it into egg white to store the pathogens. He soon found vaccines for diseases that were causing death a few years ago, such as Typhoid, Cholera and Tuberculosis.

Vaccinations were to come to those most vulnerable, especially the army. 10 million vaccines were given out for those fighting in the First World War for Britain and this helped hundredth the death rate from Typhus and many other infectious diseases. Vaccines had now become an integral part of prevention to disease. They are now given out on the National Health Service to the most vulnerable and there are now targets to ensure that people have herd immunity and do not give the disease to anyone else.

However, Vaccines have recently suffered a hit. In the 1997 - 1998 year, “Dr” Andrew Wakefield published a paper where he claimed that the Measles, Mumps and Rubella (MMR) vaccine caused Autism. The paper was discredited and a complete lie, but it led to the rise in the Anti Vaccine campaign. People believe it is a personal right to refuse a vaccine, which has led to people who can’t get vaccinated getting diseases and also leading to the 95% target not being hit. Even today some people don’t get vaccinated from this paper.

Vaccines continue to make leaps and bounds into the future. In 2008, the first Cancer (HPV) vaccine was created, helping thousands of women not getting Cervical Cancer each year. The disease continues to be a problem, but Vaccines cut out and eventually eradicate a disease.

**Chapter 3: Attempts to treat and cure illness and disease**

Treatments of Disease in the Medieval Era

In the Medieval period, there was a small portion of the population who could go to a doctor for a treatment. Most never saw the 100 Physicians in the country. Instead, they looked to traditional treatments of Prayer, Soothsayers and Barber Surgeons. Those who did see a Doctor probably wished they didn’t. Doctors were notably useless being unable to do anything with the human body apart from Bloodletting which did not help at all. Patients were cut and bled into a bleeding cu0p, while some used leeches. Using Astronomy was the important part, and the time that the operation was done was seen to be the most important time. Since both rich and poor were unlikely to recover, there was actually a bit of equality in life expectancy.

Barber Surgeons were a notable practitioner of the time. They would perform external surgery and amputations with no use of anaesthetic or antiseptic. These surgeries were therefore often dangerous. Amputations never worked well from the sealing technique leading to too much blood loss, and this caused them to be dangerous. Lancing, a simple boil removal technique today, was ok, but the barber surgeons rarely removed the blood or pus from their aprons, leading to further infections for other patients. Overall, they were not a very successful surgeon, but were sometimes fine for small operations as long as you did not go septic or get an infection.

Soothsayers were used for internal cures during the Medieval Period. Their methods of treatment were not very good, and they even trialled on people without telling them. They did have a few treatments that did work, such as chalk for indigestion, but they were mostly based around superstition and spells. They were for the Working Classes who could not afford treatment from the expensive physicians. They were incredibly effective in helping pregnant women give birth, as well as using traditional remedies combined with the Placebo that we still use today.

Apothecaries were another group that tried to stop disease. They were pharmacists who sold herbal remedies to treat disease. They were for the Middle Class and were relatively effective. Of course, they were not medicinal and they did not understand the reasons behind them, but many of the treatments worked. They worked in similar ways to the Soothsayers of giving out information as well as taking remedies, but were less superstitious focusing instead on developing secular cures.

Alchemists were another way to cure disease, however they were incredibly ineffective, not coming up with a single cure that worked to help cure disease. Their aim was developing the potion of youth which would help you live forever. They used chemicals and mixtures to try and create medicines and were very early chemists. In the long term they helped chemistry and science, but in the short term they were very ineffective being unable to cure any disease.

Obviously Prayer was the main form of treatment for disease. This would either involve praying to get better, or getting a Priest to give you an indulgence by paying a set amount out of your income for God to forgive you. This was incredibly ineffective as Supernatural Beings do not cure disease, and in the Long Term hindered progress because people were so set on this belief that humanity were deserving of disease and it was wrong to look for cures, that they would not work, and that it would be a waste of money attempting to stop it.

Surgeons were the final group, and looked down upon as to be the final resort. While setting broken limbs and lancing boils was not a problem for surgeons, but internal surgery was risky. There were no effective anaesthetics, so if you did go into surgery you would be in immense pain, with a high chance of dying from Shock or Blood Loss, and with there being no antiseptics there was a high change your wound would go septic. However, as time went on, surgery got a bit better but still bad.

Common treatments in medieval Wales

* The laws of Hywel Dda (the ‘mediciner’) held an important place in the home of any medieval Welsh prince or lord. The laws provided herbal remedies to treat the sick.
* The Dyn Hysbys (wise men) were found in many parts of Wales during the medieval period. They were said to possess the power to break spells and undo the evil spread by witches. They used charms and magic spells.
* The physicians of Myddfai were a family of physicians who lived in the village of Myddfai in Carmarthenshire and operated there from the 13th century to the 18th century. They used the stars to help prevent illness and believed that the movement of the planets dictated what patients should eat and drink each month of the year.
* The curative wells became a ficus of many pilgrimages, the most famous being Ffynnon Gwenfrewi in Holyhead. A common ritual across North Wales for getting rid of warts involved finding a piece of sheep’s wool on the way to a curative well, pricking the wart with a pin, rubbing the wart with the wool, bend the pin and throw it into the well, then place the wool on the first whitethorn tree on the way home.

The Development of Anaesthetics

In the early 19th century, surgeons faced the major problems that had existed for centuries. The pain that the patient experienced often made surgery hard to concentrate in for the surgeons, endangering the patient. Shock and blood loss along with the infection all directly led to the proportion of patients going into surgery being very hard. People had to do operations in a rushed manner, with legs being amputated in 3 minutes, leading to mistakes easily being made, raising the mortality rates. Even after the operation, patients were not safe. In some London Hospitals, 9/10 of people died from infection after their surgery, so it was still extremely risky.

One hilarious example is that of Robert Liston. He was a typical surgeon, but renowned for being fast and making small errors. Perhaps one of his most famous blunders was when he amputated a leg in 2.5 minutes, but “In his Enthusiasm, the Testicles as Well”. He is also the only Surgeon in the History of Medicine to have performed a Surgery with a 300% mortality rate. During this high speed operation he killed the patient from Sepsis, his assistant from cutting his fingers off and Sepsis, and the inspector by slashing his coat and dying of shock. He was a competent example. In 1835, he became the first Professor of Surgery at University Collage London and in 1846 carried out the first ever operation using ether as an anaesthetic in Europe.

In the 19th Century, scientists realised that operations could be more successful if they put patients to sleep before carrying them out. They started to experiment with anaesthetics to put the patient to sleep to make the operation more successful. The first used was laughing gas, which was used very successfully in dentistry, but not so good for long operations. In 1846, Ether was first used in America and then by Liston in London. It did knock the patients out, but also often caused damage to the lungs.

In 1847, the largest development happened when James Simpson learned to use chloroform. First he tried himself and his doctor friends, and they tried different doses until they were unconscious. They then went back and did the operation under it, successfully putting the patient under. As a professor of midwifery, the first use was for women in Labour, but soon it was also used for long operations. It was reliable with long lasting effects. Unfortunately, there were of course originally objections. Some surgeons preferred the patient to be awake so they could fight for their lives better. Others thought that the pain in childbirth was a punishment from God for their Ancestors eating a piece of fruit, and it was difficult to get the dosage right. Hannah Greener, a 15 year old girl, died while having her toenail removed, and many others found the similar thing of the anaesthetic being hard to control. However, it was great overall because it allowed surgeons to slow down, take their time and relieve the pain of the patients. It potentially saw the start of internal surgery

Unfortunately, the use of anaesthetic actually led to the Black Period of Surgery when mortality rates went up for 20 years in Surgery. However, this was not because more people died in the external operations, but by having more time they could now perform invasive surgery which had a higher death rate. Doctors still did not bother to wash their hands, coughed over patients and wore bloody aprons as an honour on the wards, so infection was a huge problem. Despite this, improvements kept coming. In the 1850s, John Snow developed an inhaler to help regulate the dosage of Chloroform, Queen Victoria used it during the birth of children making it more acceptable, and other developments such as antiseptic helped reduce mortality. All this helped to make surgeries more successful and practical, as well as slowing them down, making them safer and making new operations such as internal surgery now a proper possibility.

The Development of Antiseptics

Until Pasteur created the Germ Theory in the 1860s, surgeons did not take any precautions to stop wounds and surgery getting infection. They did not wash hands before operating, nor did they clean the equipment of the operating table. People wore dirty aprons as a badge of honour to show that they had performed many surgeries, but this just helped bacteria and sepsis spread from patient to patient in the operating theatre.

This changed slowly in 1867 when Joseph Lister discovered that Carbolic Spray was very effective in stopping wounds from Getting Gangrene. He developed antiseptic surgery by spraying medical instruments with this to sterilise them, Catgut (a cord used for ligatures and sewing up) and the bandages with a 1 in 20 solution of carbolic acid which made surgeries a lost safer from the significantly reduced risk of the patient getting sepsis.

However, there was much opposition at first despite the revolutionary nature of the antiseptic. Many surgeons claimed that Lister’s Methods would slow down surgery. This was very important because at that time blood loss was a large concern during surgery, and therefore people would still die, just of blood loss. As well as this, Lister was not the best to other surgeons, so it is possible that surgeons did not listen to him and his methods as a result. Finally, despite the fact that this seems shocking, surgeons expected that most patients would die as a normal part of a faultless surgery, and were actually not that bothered about changing anything.

Despite the original opposition, it soon became clear that Lister’s methods were a success. In three years, he reduced the death rate from 46% to 15%. Others soon copied his methods, realising the dramatic extent to the change. In the 1880s, appendectomies were being performed with 1896 seeing the first successful surgery on the heart where Cardiac Surgery was performed on a damaged stabbed heart. Because surgery was safer from Antiseptic and Anaesthetic and you could slow down, the diversity of surgery being performed broadened as people were able to do more specific internal surgery without so many complications.

In the latter part of the 19th Century, there were other developments that helped reduce the death rate during surgery. In the 1860s, Florence Nightingale spread her message about having clean wards realising the huge effect it had had in the Crimean War. People copied this and soon followed in British Hospitals. The 1890s saw the beginning of aseptic surgery, where there was a miniscule chance of a patient contracting Sepsis because the room was so well sterilised as was the room. People started to wear disposable gowns, rubber gloves and face masks which were all sterilised to stop sepsis and infection. In the Early 20th Century, the Roentgen Ray was developed which allowed people to perform X Rays before surgery to look inside, target the correct area and take any precautions before the operation, further stopping blood loss being such a problem when operations did not quite go right.

However, the one remaining problem was blood loss. It took until 1901, when Austrian Karl Landsteiner discovered blood groups (ABO+-) which revolutionised the blood transfusion. These transplants had been done before, but often killed the patient because mixing blood groups does not work and kills the patients. By matching the blood groups, the transfusion is successful, and the First World War saw these being used significantly more. In 1938, the National Blood Transfusion Service was set up. Each person donated a pint of blood, the blood was checked for the group, and then when somebody needed blood, they were given the blood sample. If you were not on the list, you were given O-, so this blood group even today is the type that people need to help fight blood loss the most. All this revolutionised surgery, and made it extremely safe.

Cancer, Marie Curie and Her Developments

Marie Curie sits among one of the greatest female scientists of all time, being the first woman to win a Nobel Science Prize and the only person ever to win one in both Physics and Chemistry. Working with her husband Pierre, she helped make advancements in Radiation and Chemistry, which also helped move medicine forward through X Rays and Radiation Therapy.

In July 1898, she discovered 2 new chemical elements – Polonium and Radium. These elements were really important in the long term, being used to destroy cancerous tumours with the invention of Radiotherapy. This was a huge leap forward and the first time that Cancer in Humans could be treated. Her husband died in 1906 in a car accident, but she continued to make huge progress in her work, now moving towards more scientific progress.

The Curie research was crucial in the development for X rays in surgery during the First World War. She got 200 X Ray Units into field hospitals, and 20 Movable X Rays called Petites Curies. These were incredibly effective for fast diagnosis if you had broken your arm or leg. They were very efficient and helped people decide whether surgery was a good idea. As well as this, she became renowned in France and after the War was made head of the Radiological Service for the Red Cross, helping train medical orderlies and doctors the new X Ray Techniques.

Radiation Treatment started off the treatment for Cancer. It is still one of the main treatments, and has improved by being more targeted, with surgery putting in radioactive substances to kill the cells in this area. Cancer is still the 2nd biggest Killer of people in the UK, but new treatments are constantly coming along to help treat cancer better while making the experience less bad for the patient. Unfortunately, being surrounded by these radioactive elements all day led to her developing Leukaemia (Blood Cancer) from killing her normal cells. She left a legacy for the discovery of elements, radiation and the creation of the portable X ray.

Chemotherapy was the next advancement in helping treat cancer. This is where you are injected with chemicals that flush out cancer and kill many cells. However, while being very effective it is also invasive and dangerous, leading to the death of other cells which can be very harmful. However, not only are medicines being developed to help treat against this, but they also learning to do targeted radiotherapy, so that the only part of your body that is effected by the cancer will have cells that are dying.

The Public focus is also on developing new cancer cures, with UK charities like Cancer Research and Cancer Care charities getting donations to help treat cancer with both the mental and physical side. Survival rates continue to go up as discovery and cure techniques both continue to go up. However, death rates from Cancer are still going up, mostly because people are now having more unhealthy lifestyles which leads to getting cancer, and while it has become much more treatment, there is still much more progress to be made and it is doubtful that a single cure will be found in the next half millennium for cancer.

Alexander Fleming and the Discovery of Penicillin

The discovery of penicillin was a major medical breakthrough. It was the first time that an effective, reliable antibiotic had been created. Antibiotics are used to kill bacteria, which helped cure several major diseases of the time. As well as this, small infections were no longer a problem. Once, a small injury could have been deadly. Not only this, but it was a treatment medicine rather than a preventative method, meaning that it could be taken even if the person had the disease.

Penicillin was first discovered in the 19th Century, but nobody really realised the significance, thinking that it was just another mould. However, when Alexander Fleming was investigating a way to prevent infections like septicaemia, and in 1928 he started experimenting with the new substances to create an antibiotic and ended up with mould on his petri dishes after returning from a holiday. This accident he still examined and to his amazement he found that the mould had attacked and killed the bacteria. He used the word antibiotic to describe the characteristics, but he was unable to carry on research on production because he did not have the money or the research.

In the late 1930s, two Oxford Scientists by the names of Ernst Chain and Howard Florey took up the challenge of carrying on the research to its dangers and production. With the start of the war in 1939 they were given even more funding to try and speed up the research. The problem was production of Penicillin. Thousands of Milk Bottles was only enough to treat 4 mice at the time, and though the mice survived with few side effects, when in 1941 they tested it on a man who fell into a rosebush, he died when the supply of antibiotics ran out. However, it was clear that it was an effective treatment and the government got involved in trying to produce the medicine.

By 1943, Penicillin was able to be mass produced after America donated 80 million dollars into researching the substance. It was estimated that by the end of the war the US army was giving two million doses per month to stop infections. During the 20th Century Penicillin continued to be used to fight infections that used to be incurable and lead to death. This significantly reduced the amount of people who died from entirely preventable infections all because of one specific type of mould.

In the 1940s and 1950s, other antibiotics started to come in to treat disease which have been very successful in fighting infection and bacterial disease. However, the World Health Organisation has recently tried to reduce the amount being used for less serious conditions because of antibiotic resistance. This is where a generation of bacteria has evolved that cannot be killed with general antibiotics known as superbugs. These are incurable often and while none are currently serious, there are worries that the whole of humanity could die out from a simple infection because of this new overuse of antibiotics.

The Development of Transplant Surgery

Before this time period, most forms of surgery were measures to remove part of a body. This included amputations, appendectomies and removing infected tissue from organs. However, during the 20th Century, all sorts of new techniques came in which were able to not only remove parts of the body, but replace them with fully transplanting organs. This allowed for all sorts of new treatments and meant that if an organ failed, you could get a replacement, which was vital if you had heart disease or kidney disease.

The biggest one of these was the first successful heart transplant. On the 3rd December 1967, Professor Christiaan Barnard performed the world’s first heart transplant. The operation was successful and beyond the expectations of most people on the success of the operation. While the Patient Louis Washkansky died 18 days later, his heart remained strong and successfully working. Other heart transplants were attempted, but the risk of rejection remained high. This is overcome today however because of the development of cyclosporine and other immunosuppressants which have been able to stop the immune system from rejecting the new organ. Other important surgeries of transplants have also been carried out and still happen today.

In 1905, the first ever transplant was performed. It was a cornea transplant which replaced the frontal part of the eye. This operation is now replaced with synthetic surgery, but it was an important step forward where the invention of transplant surgery came into effect.

Plastic Surgery – During the World Wars, plastic surgery had to be used to rebuild the faces of those who had been affected by shrapnel, bullet and burning wounds. This helped to bring in the plastic surgery and facial improvements for injuries in the future.

Bone Marrow Transplants – In the 1980s the ability of Bone Marrow Transplants meant that you could now treat leukaemia and blood problems. This was extremely important for the future developments of cancer treatments. Bone Marrow Transplant is done while the donor is still alive, but you need to be the same ethnicity and the fact that donation is considered painful means there is a lack of donors and many people still die of leukaemia even though it would be entirely preventable if someone just donated an organ.

Kidney Transplants – This is one of the most common operations and is done for someone with Kidney disease. While this operation is not vital, it means that dialysis (a very invasive and time consuming treatment) is no longer needed to flush Urea out of your blood stream.

Transplants today – In 2005, doctors in France carried out a partial facial transplant including nose and mouth transplant. Some surgeons are even considering the possibility of transplanting a head in the future. Transplants are normal today, with 200 heart transplants a year being carried out in the UK. They have a very high survival rate, but the problem is finding a donor. In recent years, both England and Wales have introduced laws meaning you opt out from Organ Transplant as opposed to opting in. This has meant that the amount of donors have gone up significantly, meaning that more people can be treated with an organ transplant.

In order to increase success after operations, sports are encouraged. The World Transplant Games Federation was set up in the UK to encourage people who have had an organ donated to them to keep up with sports. It has been very successful in getting more people active and acts like the Olympics with representatives across the Developed World.

Modern Advancements

Marie Curie’s work on radiation has allowed for the first successful treatments for cancer. Modern scanning techniques, blood tests and genetics have all helped us to diagnose cancers earlier. Chemotherapy and Radiotherapy have also developed and allowed for a reduction in cancer deaths. This is one of the most successful advancements, while we continually get better at treating cancer at the same time as developing new treatments.

We have also been getting better at surgery. Modern anaesthetics are now injected directly into the bloodstream which helps prevent overdosing and the advancement of keyhole surgery was important because now we can perform less invasive surgery with only a small incision. Greater specialisation of surgeons means that surgeons are experts in their fields and become better at conventional surgery while attempting experimental surgery better as well. Scanning techniques have given surgeons a better understanding of what the surgery that needs to be performed involves, making them more accurate and creating a plan. The creation of checklists are also important, because these have allowed for fewer mistakes to be made.

Viral Infections – Despite the fact that we have made so much progress in Non-Communicable Diseases and bacterial diseases, we still struggle to cure viral infections. Acquired Immunodeficiency Syndrome still remains incurable, as does the Common Cold and the Flu Virus. However, life expectancy is increasing, and these diseases have treatments and preventative measures. AIDS is no longer deadly, and while NCDs may never be cured completely, we can treat them far better all the time and perform much better surgeries and treatment measures.

Antibiotic Resistance – Another concern is that the overuse of medicines has led to a condition known as Antibiotic Resistance, where Bacteria are no longer killed by Antibiotics. This has led to antibiotic Chlamydia and other conditions that cannot be removed without immune enhancement. There are worries that this could become the case for more serious diseases if people do not take medicines properly leaving to more people dying of simple infections again.

**Chapter 4: Advances in medical knowledge**

Medical Ideas during the Medieval Period

Medical ideas in the Medieval Era were mostly influenced by Roman and Greek texts. During the Dark Ages, nobody in Britain did any medical research and people forgot to write anything down. The only people who could read were the monks. They were the ones who translated texts from Greek and Latin to English. They did not translate anything that went against the Catholic Church so the amount translated was limited.

The two people that all medical ideas were based around were Hippocrates and Galen. Although these two were not Christians they both were accepted by the Catholic Church because he believed humans had a soul and referred to a single Creator. To question Galen was to question the teachings of the church. The main idea that was accepted by Physicians for 1000 years to how the body got ill was the belief of the four humours.

The Four Humours stated that there were four key bodily fluids: phlegm, blood, yellow bile and black bile. They believed that if the humours stayed in balance a person was healthy, but too much of a single fluid led to people getting ill. If a patient had a cold it was because of an excess of phlegm. Nosebleeds were an excess of blood while nausea was an imbalance of bile. The way to get better was to remove these fluids and rebalance them. Excess blood was removed from bloodletting and leeches, a warm bath would remove phlegm while excess bile could be removed with a purgative which helped cleanse the bowels and flush everything out. Although this teaching was flawed and wrong, the fact people were told to do everything in moderation would have made them slightly better off than they would have been without any medical advice.

Astrology was another medieval belief that would affect illness. They believed that planets had an influence on when people got ill. This is where the world Influenza comes from. Each part of the body was associated with an astrological sign. Bleeding and cures would only take place if the moon was in the correct position. Physicians knew more about astrology than they did about the human body. Even medicinal herbs were believed to be influenced by astronomy, and apothecaries would advise that you take them at only a specific time of the lunar cycle.

In fact, rather than improving over time, knowledge actually got worse. As time went on, even more Roman and Greek texts were lost and replaced by superstitious beliefs and practices. Before this period, people had known a lot about the human body, but now this had all been lost. People also believed that a cure for Tuberculosis was a King’s touch while there was very little change because of the fact that the Church forbade the dissection of the corpses. Instead, medical knowledge was gained through dissection of pigs which led to many misconceptions such as the fact that humans had two jawbones, but actually we have one. However, it was also the church who led the Crusades where people came into contact with Muslim doctors who were much more knowledgeable. Slowly, the Arabian ideas bled into Europe until they became the main belief they had at the time.

The Medical Renaissance of the 16th and 17th Centuries

The Renaissance was a time of renewed interest in the Greek and Roman knowledge. With the invention of the Printing Press, their ideas could easily be spread across Europe and Scientists could now start collaborating with new works. The voyages of Christopher Columbus brought back new herbal remedies and knowledge from Native Americans while the Renaissance Artists started to study the human body more closely and this led to improve to medical knowledge. As people unravelled the teachings of the church and showed they were less true than people had thought, people were encouraged to think for themselves, to actually start experimenting and to challenge the teachings of Hippocrates and Galen.

People learnt from the activities of the ancient nations. The Dissections that the Ancient Egyptians had performed helped them learn a lot more about the human body which they had written down while Greek Temples of Healing were an exemplary example of how to healthily treat someone for disease. Finally, the legendary Roman Sanitation helped them from getting any waterborne diseases. People read about all these and started to do the same actions as these people. Finally, new ideas from China of gunpowder meant people had to treat diseases differently, and now freer to experiment, they started to look into ways to cure these injuries.

Andreas Vesalius – Andreas Vesalius practically founded the field of anatomy. Before Vesalius, doctors relied on the works of Galen and ancient writers. However, they had dissected animals which had a different anatomy to humans. In 1537, he became professor of Medicine at Padua University, and insisted his students performed human dissections to find out about how the human body worked. A local judge allowed Vesalius to use the bodies of executed criminals who were going to hell anyway. This allowed him to make dissections on hundreds of bodies. In 1543 he published his book called The Fabric of the Human Body. He employed artists to make accurate drawings and gave doctors more knowledge about anatomy. He proved many of the previously thought ideas on anatomy were wrong such as Galen’s jaw theory of two bones. His research encouraged countless others to start dissecting human bodies and not accept the traditional teachings.

Ambroise Pare – Pare changed ideas about surgery. Before his work, wounds were treated by pouring boiling oil on them and to stop bleeding they were cauterized with a hot iron. As you could imagine, this would be extremely painful and did not usually work. Pare was an apprentice to his brother who was a barber surgeon. In 1536 he became a surgeon in the French Army. During this time he developed many ideas about surgery. Maybe the most significant development was the use of the Roman dressing. He used an ointment of egg yolk, oil of roses and turpentine which he had read about from ancient Roman texts. This was extremely successful, less painful and healed much better. As well as this, he popularised the use of ligatures which were silk threads to tie blood vessels during amputation. Unfortunately, while they were successful in stopping bleeding, they also led to more infections from dirty hands and contaminated ligatures. Finally, he developed artificial eyes and limbs for injured soldiers. As well as being respected because he was a good surgeon, people liked him because he was nice and was very well respected. In 1575, he published a book called The Collected Works of Ambroise Pare which proposed changes to the way that surgeons performed the surgeries of the time.

William Harvey – William Harvey discovered that blood circulated through the body and no new blood was created. He showed that through dissecting lizards and finding out about veins, and that these linked to the heart which was where all blood passed through. Before this time, people believed that blood was made in the liver and burnt up by the muscles. He became a physician for James I and Charles I. Both were interested in science so Harvey’s work was very encouraged. Having developed a lot of knowledge about the cardiovascular system, he was able to disprove Galen’s four humours. You could not produce too much blood because you already have all the blood you needed. In 1628 he published this information to the world with An Anatomical Account of the Motion of the Heart and Blood in Animals. In this book, he proved heart was pump responsible for recirculation blood. This started the attempts of blood transfusions for patients with blood loss, however because many people had different blood groups they often failed. In the short term it did not really achieve anything, but in the long term the fact that we now had people challenging Galen’s ideas led to huge changes.

The Impact of Vesalius, Pare and Harvey

Vesalius, Pare and Harvey made huge contribution to the medical field. A combination of chance, luck and the Renaissance all helped these scientists to carry out their work without so much hindrance and for people to accept them. As well as this, the Medical Research that they had started helped many others in future centuries to carry out research freely.

Church having less influence – The largest cause of change was the decreasing power of the church. This started off with the Protestant Reformation, which split religions and meant the church was no longer followed by anyone. Moreover, the countries that this research was taking place in started experiencing disestablishmentarianism which led to more freedom. As these scientists proved the church wrong, the church could not punish them while their ideas gained merit. It meant that in the future, scientists were able to practice with freedom from the church and that the general public started to follow this field more than religion.

The Printing Press – Before the Renaissance all ideas had to be written out then copied, however with the printing press you could make one template and then publish a piece of work multiple times. This allowed them to spread their books as well as making all parts of Europe up to date on the latest scientific news. Harvey even used the Frankfurt book fair in Germany to publish his book so that everyone in Europe would be there to read it.

The Gain of the Support from the influential – Pare treated four kings of France who were happy with him while Harvey was the physician for two English kings. As well as this, Vesalius had the support of the authorities in Padua to start dissecting bodies. All this meant that they had the backing of the monarchy and powerful behind science for the first time. It allowed for people in the future to be supported by these people and to make many medical advances.

However, despite the huge progress that was made during this period, there were still many obstacles to progress. Many doctors refused to accept the new knowledge and stuck with traditional treatments and the beliefs of people like Galen. In addition, the fact that Pare wrote in French and was not a university trained doctor meant that he was looked down upon by medical professionals. Finally, Harvey was resisted by many and lost many patients after he published his book in 1628 because his ideas were so stupid.

Although the Renaissance saw huge improvements in medical knowledge, it was not a time that everyday health was improved. The knowledge of anatomy was good, but people still got infected when they needed surgery and the fact there was no anaesthetic stopped internal surgery from being performed. In addition, ligatures were rarely cleaned, and this led to wounds becoming infected. Finally, the heart could not be accessed and very few things could be done for blood transfusions. Instead it took until the 1890s for surgery to be performed and 1918 for blood transfusions to be performed successfully 100% of the time.

Koch and Pasteur

At the beginning of the 19th Century, there had been a few medical advances since the Renaissance period, however scientists still did not understand what caused disease. This started to change however in the 19th Century. In 1826, Joseph Jackson Lister developed a microscope with 1000x magnification. This would see the ability to look at human cells and most significantly – Bacteria

Louis Pasteur and Germ Theory – In the 1850s, French Chemist Louis Pasteur was employed by a brewing company to find out why their beer was going sour. Through Lister’s microscope, he discovered that microorganisms were growing in the liquid. He believed that it was these germs that was making the beer go off. He discovered that you could kill these bacteria by heating up, inventing Pasteurisation. This meant that food did not go off and make people sick. He also believed these germs could be the reason behind disease. In 1861 he published his findings of Germ Theory and in 1865 he had definitively proven that there was a link between germs and disease. In 1879, he discovered the method for creating a vaccine through his work with Chicken Cholera. He found that when the germ was exposed to air it weakened and injecting this back into the Chicken led to them developing a vaccine. In 1881, he developed a vaccine for anthrax and in 1885 one for rabies.

Robert Koch – In the late 1870s, German Scientist Robert Koch began to apply these ideas on human diseases. He created the science of bacteriology. Using dye and then isolating it, he managed to identify that different bacteria caused different diseases and that you could use them to make a vaccine. He went through 20 generations of mice to ensure he had the right anthrax and stained them so their growth could be seen easily. Koch was very significant as he inspired a rivalry with Pasteur which sped up science significantly. The German Government started to invest in Koch while the French Government started to invest in Pasteur. In the 1880s and 1890s, rapid progress was made by identifying the bacteria and developing the vaccines against them.

The Starting of Scientific Teams – Their rivalry also led to the significant development in teams of scientists and more experienced scientists hiring students. This led to the creation of a generation of brilliant minds who sped up scientific progress. They made many advancements of their own working with these resources and these scientists. Emil Von Behring who was working for Koch discovered anti toxins which helped counter a harmful substance. Emile Roux who was working for Koch discovered the vaccine for diphtheria while Paul Ehrlich made a huge step forward when he produced the drug Salvarsan 606 to treat syphilis. This was the first silver bullet which was designed to target a specific germ.

The bonesetters of Wales and the foundations of orthopaedics

**Thomas Royce Jones**

* Son of a Pembrokshire farmer.
* He learned from his father’s skilful treatment of animal diseases.
* He applied this knowledge to the treatment of human injuries.
* He moved to Monmouthshire and quickly grew a reputation aa an effective bonesetter.
* He came up with new methods to set bones, developed curved wooden splints with a foot piece and added wedges to the inside of shoes to help sprains.
* His methods were used on a daily basis for at least 50 years before they became standard practice for dealing with these types of injuries.

**The Thomas family of Anglesey**

* Lots of generations of the Thomas family established reputations as bonesetters.
* Hugh Owen Thomas (1834-91) designed splints that kept injured bones straight.
* Today, he is best remembered for the development of the Thomas splint.
* The Thomas splint was very successful in reducing blood loss, helping to reduce the risk of infection and as a result, reducing the number of amputations needed.

**Sir Robert Jones, the father or orthopaedics**

* He was born in Rhyl and was the nephew of Hugh Owen Thomas.
* He was greatly inspired by his uncle’s ideas and methods.
* During the First World War, he was appointed Inspector of Military Orthopaedics and during 1915-16, he made sure that the Thomas splint was available for the treatment of wounded soldiers in the trenches.
* Because of his insistence on using the Thomas splint, the number of deaths from fractures of the femur fell from 80% to 20%.
* He wrote manuals on military medicine which had a big influence on treatment on the Western Front.
* As a result of his work, he was knighted and elected at the first president of the International Society of Orthopaedic Surgery.

The Development of Scanning Techniques in the 20th Century

Medical Knowledge has improved significantly in the 20th and 21st Centuries. Part of this can be put down to the new scanning techniques that we can now use. Before this period, the only way to find an internal problem or to check a body part was ok was to operate and open them up. However, with the development of scanning techniques, we can check for issues and find the exact area of the problem without the need to operate. They have helped make operations significantly safer as well as helping it faster to sort through patients with specific problems such as broken bones.

X Rays - The First Scanning Technique was Wilhelm Roentgen’s X Ray in 1895. While experimenting with cathode rays he found that they could pass through flesh without going few bones. As quickly as six months later, X rays were being installed in hospitals and they were having a huge impact on medicine. Doctors could now see inside a human body without operation for the first time. However, the first machines produced a lot of radiation so they were slightly dangerous. As the machinery developed, they began to be safer with less radiation being given off. During the First World War, the Petites Curies saved thousands of lives, because surgeons were able to operate more accurately. Since then, they have been used to investigate issues with bones in hospitals.

Ultrasound – This uses a high frequency sound to see inside the body. It does not produce any radiation so there is no concern like this. It produces 3D images of internal organs like the heart and kidneys and muscles. Since the 1970s, it has also been used to check the progress of embryos.

MRI – Magnetic Resonance Imaging uses radio waves and with these builds up a detailed picture of organs and tissues, used to detect any areas of disease in the body. They can be used on any part of the body and are very specific and detailed. You go into a large scanning machine and it checks for any abnormalities while a doctor will watch and take pictures of the scans.

PET and CT Scans – Position Emission Tomography uses a special die with radioactive traces. These are injected into the vein and as organ absorb the tracer, they are highlighted under a PET scanner. They are very useful in investigating diseases such as Cancer and Heart Disease. CT Scans (Computed Tomography) takes many X Ray images at different angles to create a cross section image of the internal organs and structures of the body. However, while these are both very useful at looking at a person’s organs, they are also extremely expensive. This makes it very hard for the NHS to manage the costs, so these scans will often be uncommon.

All of these scanning techniques have revolutionised medical knowledge. For the first time we have been able to look at the human body while sealed up and conscious, and are all extremely safe. They are non-invasive meaning they do not involve puncturing or performing incisions on the skin, so they are a lot more comfortable. Finally, they have been extremely useful in helping identify Organ Diseases and continue to improve the chances of survival for someone with this disease.

The Development in Understanding Genetics

Deoxyribonucleic Acid is the substance that codes for life in the human body. It is extremely delicate but also extremely important for human life. A single miscoding can be the difference between a normal person and someone with a genetic disease. With our knowledge of genetics it is possible to identify these diseases, prevent them happening, and perform abortions if required and to remove these from the population in the future.

The Discovery of DNA – DNA was first discovered in the 19th Century, but its function remained a mystery. In the 1950s, two scientists called Rosalind Franklin and Maurice Wilkins studied DNA using X Rays. Franklin produced an image that allowed two other researchers called James Watson and Francis Crick to work out the 3D structure of DNA. It was found to be a double helix. This model helped explain how DNA replicated and how it carried genetic information in humans. This caused huge progress in molecular biology and ensuring that growth and developing are all in order for children and adults to stay healthy.

The Human Genome Project – The Genetic Information in an organism is called the genome. The Human Genome Project started in the 20th Century involving scientists from 18 nations and was the first time this kind of huge cross scientific collaboration happened. It was extremely ambitious and lasted for 13 years because so much had to be done. First of all, you had to work out the sequence of all 3 billion base pairs in the human genome and then identify the disease. Then, the scientists needed to develop fast methods for sequencing this DNA so that it remained successful. It was finished in 2003 and work continues today to identify the genes in the human genome.

Sir Martin Evans – One important area of genetic research has been into stem cells. Professor Martin Evans of Cardiff University took stem cells from mice and grew them in his laboratory. By genetically altering them, he created a new gene and then put them in the wombs of female mice. Incredibly, the altered gene was passed on. This breakthrough known as gene targeting has helped to develop new treatments for genetic diseases. Stem Cells have the ability to replace damaged cells and treat disease. In 2007, Martin Evans won the Nobel Prize in Medicine and Physiology for his work.

Gene Targeting Today – Currently, gene targeting is carried out by treating bone marrow or blood cells, which cannot be passed on to the next generation. However, using egg and sperm cells you can pass through generations, however Catholics are against this and show controversy to these methods. While it could stop genetic disorders, it can be considered as offensive to someone with this disease, and there could be long term side effects we do not know about. People affected by this would not be born, so they could also not choose the treatment, meaning that it seems more unfair rather than being a choice an adult can do on themselves knowing the risks they are taking.

**Chapter 5: Developments in patient care**

The Role of the Church in Patient Care

In the Medieval Era, the Church played a major role in patient care. The Church taught that it was a Christian’s job to care for the sick and therefore the monasteries and churches provided hospital care. It also funded the church universities where doctors would train. There were about 1200 places in medieval England and Wales that described themselves as hospitals. Nearly all of them were run by the churches with most of them being run by the monasteries.

However, they were not really hospitals that we would recognise today. They were run by the monks and nuns, and the spiritual welfare was considered more important than physical health. Therefore, they were incredibly ineffective at treating any kind of disease and instead wasted time on trying to get people spiritually better in case they died. The monks would only have basic medical knowledge, and therefore they did not treat the patients very well. As well as this, many people were excluded such as lepers, cripples, the insane, children and pregnant women. They knew that leprosy was contagious and thought the others would pass on their disease or would make too much noise and distract the monks and nuns while they were trying to pray.

Only about 10% of medieval hospitals actually cared for the sick. Even then it was vastly different to the way we would consider a hospital today. They were only called hospitals because they provided hospitality with a place to rest. Many were actually alms-houses for the deserving poor and elderly which provided nursing from the nuns but no medical treatments. Others were places for pilgrims to rest acting as a hostel while 30% were Leper Hospitals. These were designed to isolate lepers and bring them away from the towns, and to stop them coming into contact with anyone and making them sick.

It is even questioned whether Doctors and Physicians even ever went into a Medieval Hospital. Obviously their time was spent with the rich, but they were still surprisingly absent from any list of hospital visits. They were so religious and superstitious that you were more likely to be visited by the King of England than by a Doctor in a hospital. There was occasional treatment such as the King of England coming in to touch all the patients and Apothecaries offering charitable Herbal Remedies in exchange for an indulgence, but the places were not for physical treatment. However, the fact that you were getting a proper meal three times a day with rest did improve people’s health because their bodies had time to recover from the gruelling work in the Medieval Period.

Bimaristans – In the Islamic World at the same time, patient care far exceeded that in Europe. A Bimaristan was a hospital in Baghdad (there were 60 here whereas London had 1 hospital) which treated people with actual medical remedies and treatments. They served everyone, including White Christian travellers if they ended up here, women and the lower classes. Incredibly before their time, they also had separate wards for different illness, with contagious disease, non-contagious disease, mental illness, eye diseases and surgery all being separated which was unheard of anywhere in Europe. Each contained a kitchen, pharmacy, library, mosque and even sometimes a chapel for Christian Patients. They served as medical schools to train doctors in these areas, while to comfort the patients, Musicians were hired to play music. It is just incredible the contrast between the Europeans and their religious treatments while the Islamic World had Early 20th Century European Standard Hospitals.

Voluntary Charities, Royal Hospitals and Endowed Hospitals

In the 1530s, Henry VIII ordered the dissolution of the monasteries in England and Wales. This was a turning point in patient care. They had provided medical care for centuries and the care with the monasteries mainly focusing on Spiritual care were now replaced with councils having to step in and taking control. This was good as they were not so religious meaning that for the first time hospitals actually started to offer treatment rather than religious care.

In London, the city authorities sent petitions to the Kings following the reformation to keep open the city hospitals for patients. Both gave endowments for the running of five hospitals, including St Bartholomew’s and St Thomas’ Hospitals. They still were mainly providing for the poor, but they were now giving treatments and they even started to specialise into hospitals for Venereal Disease, Children and the Insane.

Though the Royal Endowments of land were not generous and the hospitals were short of money, this was a very important development. Now it was the Government’s job to look after the ill. They had never provided medical care, and it was an important step away from Feudalism and into the government having a role in Patient Care.

Outside London, local councils had to find endowments from the nobility to keep their hospitals open. In Norwich, the council successfully kept St Giles Monastery open as a hospital. It started with just four women providing care, but evolved and by the end of the century had added a barber, a surgeon and a bonesetter. However, many poorer areas were not able to do this. In 1665, there were only four small hospitals with 36 beds for the whole of North West Wales. They were nearly all alms houses and none had a doctor, so many in rural and poor areas did not have any access to a doctor at all and the hospitals were ineffective.

The Enlightenment – The 18th Century saw a period of Enlightenment. Medical Societies encouraged new scientific methods while many new hospitals were opened. The great new wealth saw wealthy businessmen like Thomas Guy donate money to open new voluntary hospitals to treat the growing population. Eleven new hospitals opened in London and another 46 in the rest of the country. Slowly, hospitals started to ambitiously treat illness and carry out surgeries. They also started to be centres for doctors to train. Treatment was free, and the emergence of dispensaries (early pharmacies) meant that poor people could also get medicines for cheap prices. The first one of these was Finsbury Dispensary which opened in 1780.

Specialist Hospitals – As well as general infirmaries, the Enlightenment started many new specialist hospitals during the 19th Century. Great Ormond Street is one of the most famous example. This endowed hospital was set up in 1852 and treated ill children. Quarantine also became important with Isolation Hospitals being established to treat patients with infectious diseases. They were like leper hospitals in that they would often be isolated in the outskirts or on an island, but the patient care there would have been significantly better.

The establishment of voluntary hospitals across Wales

Stanley Sailors’ Hospital, Holyhead

* Established on Salt Island, Holyhead, in November 1861.
* Paid for by a local philanthropist, William Owen Stanley.
* Initially, it only treated sailors.
* William’s niece, Dame Jane Henrietta Adeane played a prominent role in running the hospital from 1881.
* The hospital was taken over by the military during the First World War.
* The hospital eventually became a general hospital and was taken over by the NHS in 1948.

Royal Hamadryad Hospital, Cardiff

* Set up by Cardiff’s Medical Officer for Health, Dr Henry Paine.
* It was a seaman’s hospital in the docklands area of Cardiff.
* Dr Paine was worried that sailors might bring infectious diseases such as smallpox, cholera and typhoid into Cardiff.
* Dr Paine organised for the HMS Hamadryad ship to be fitted out as a hospital at a cost of £2,791.
* By 1900, over 10,000 seamen were being treated each year.

The Influence of Florence Nightingale on Nursing

Although at least they were now being treated in a hospital, conditions were often very poor in the early 19th Century. Wards were very cramped and rarely cleaned, so infection spread rapidly. Nurses were not trained, and it was looked down upon as a working class job. They even had a reputation for being drunk and lazy. When Charles Dickens described a nurse in Martin Chuzzlewit, it was extremely derogatory, but what was expected from nurses at the time. Nursing was not a profession for the upper classes, being looked down as prostitutes, but after the Crimean War, everything changed.

Florence Nightingale – Florence Nightingale came from a wealthy family. It was therefore a shock for them when she went to Germany to study as a nurse in 1851. When war broke out in Crimea, she went there with a team of nurses to care for wounded soldiers. She realised how awful the conditions were. People were lying in their own fluids with rats coming up to them and chewing on the dead bodies. There were no beds and the soldiers were not given food. As somebody rumoured to have OCD, she was very stressed by this and began to change them for the better.

Florence Nightingale’s Changes – She separated patients according to their illness. This was huge as it stopped people getting infected with more diseases. The ward system allowed for them to be put in pulmonary, circulatory and infectious diseases. This helped to stop people get infected from each other and meant that doctors could start staying in a single ward, as well as the nurses knowing patients. Beds were spaced apart in order for clean space and clean air to circulate. People generally got better from this. Strict hygiene rules was perhaps the most important change. The floors were scrubbed so that everything was clean, patients were washed daily and bedding was changed regularly.

Florence Nightingale’s Impact – In just six months she managed to reduce the death rate significantly, with death rate dramatically dropping from 32 to 3 per hundred. She also created her own mortality chart which showed the death rates from soldiers. This helped to identify infectious diseases and know if they needed to send more people. News had spread about her work from soldiers who had been able to return home. The press was amazed at her impact and stories of her work rapidly spread across Britain.

Returning Home – When she returned to Britain in 1856, she found herself to be very famous. People had set up donations for her and with this money she set up the first training school for nurses in St Thomas’ Hospital where they learnt the practices that had been done in Crimea. Nurses were now here for patient care as well as for cleaning. In 1859 she published a book Notes for nursing which was a bestseller and she started to be consulted on new hospital designs. The proper use of fresh air, light, warmth with cleanliness and the proper selection and administration of diets were her priorities. She most importantly transformed nursing into a respectable position. She significantly improved patient care because now nurses were carers, not just cleaners.

Mary Seacole – However, Florence Nightingale’s success is partially down to her being white and middle class. Another nurse who has a significant part to play was Mary Seacole. She used her own money to travel from Jamaica to Crimea, and was even brave enough to go round the battlefield with a medical bag. She also established a British Hotel near Balaklava to provide care for the sick. She was extremely well respected by the soldiers who called her Mother Seacole, however the fact that she was mixed race meant that there was no money back home for her to set up a nursing school. She did write a book, but it was nowhere near as successful as Florence’s book despite them doing exactly the same work and in some ways Mary doing more to revolutionise battlefield care.

Besti Cadwaladr

* Elizabeth Cadwaladr was born in Bala in North Wales in 1789. She was commonly known as Betsi Cadwaladr
* In her 30s she became a maid to a ship’s captain. This gave her the opportunity to see more of the world. She spent time in South America, Africa and Australia.
* Although she hadn’t received any formal training as a nurse, Betsi Cadwaladr often cared for the sick when she was on board the ship.
* Betsi was moved by an article in *The Times* detailing the conditions facing those injured in the Battle of the Alma (one of the conflicts in the Crimean War). She decided to train as a nurse in London, and she joined the military nursing service.
* Florence Nightingale, who came from a privileged background, did not want the Welsh working-class Betsi Cadwaladr to go to the Crimea, but Betsi, who was now in her 60s, went anyway.
* She was posted to the hospital being run by Florence Nightingale in Scutari in Turkey. The two nurses didn’t get on. Florence Nightingale felt that strict rules and regulations should be in place, whereas Betsi believed in a more instinctive and intuitive approach to caring for the sick.
* Betsi Cadwaladr was moved to Balaclava. She worked twenty-hour days and made massive improvements to the hospital. Even Florence Nightingale was impressed by Betsi’s work in Balaclava.
* Betsi Cadwaladr was forced to return to London in 1855. She had cholera and was suffering from dysentery.  She died in 1860.
* In 2009 the Betsi Cadwaladr Health Board was named in honour of the Welsh nurse.

The Liberal Reforms and Beginning of the Welfare State

In the beginning of the 20th Century, a new form of Liberalism was forming in the Liberal Party – Social Liberalism. Far from the Libertarian history of the party, it now admitted that it was the role of the government to care for the poor and ill. In 1905, they came into power, during the height of the Boer War. Seeing the damage that this had done to their soldiers, they realised that they needed to do something. They introduced the Liberal Reforms that saw the end of the Laissez Faire Capitalism that had come before and the introduction of the Welfare State that ensured that the welfare of everyone in the country was of high priority.

1906 Free School Meals – This year saw the introduction of free school meals. It was made compulsory in 1914 and ensured that every child had a healthy meal during school. This improved health because now everyone was having at least one large meal a day. 14 Million Were served every day by the beginning of the First World War and this number supported continued to rise.

1907 School Medical Inspections – These inspections were provided for free in school and ensured that children were staying healthy. They would be given free medical advice, however the fact that if they needed medicines they still needed to pay held back children’s health slightly.

1908 Children’s Charter – This forbade the selling of tobacco and fireworks to children. This saw the end of the Laissez Faire Policies of the past that saw businesses having no regulations on who they hired or sold to.

1908 Introduction of Pensions – This pension scheme saw everyone contributing a small amount of money to a pension scheme which was then invested into markets. Then, when you turned 70 you were given 5 shillings a week. However, the majority of people did not reach this age so there was some backlash to this policy with many refusing to pay into it.

1909 Labour Exchanges – This scheme saw the creation of job centres to help people find jobs. This reduced unemployment and allowed accessibility of jobs to increase. This was also good for employers because now they found employees faster. This also took out part of the need to hire children because they were no longer needed with adults filling the positions instead.

1911 National Insurance Act – This act ensured that people could afford to get better after getting sick. It guaranteed 6 months of sick pay, with 10 shillings a week for the first 3 months then 5 shillings for the next 3 months. This was extremely important as it ensured that people could take days off work if they were unwell, and also saw the creation of the official welfare state. It was also extremely important in providing medical care in a similar way to the US today. Both you and the employer pay a bit into national insurance and then if they get ill you get free healthcare. People who did not get sick were slightly unhappy, but at least now there was a good safety net.

After the First World War – The First World War had killed and maimed so many people that something needed to be done and even the Conservative Party were admitting this. Lloyd George was still the Liberal Prime Minister and he promised a land fit for heroes. He built 200,000 new houses and increased the viability of the National Insurance Act to more people.

Overall, these has a huge impact on Patient Care. Now the Government was firmly responsible for helping out the sick and being responsible for their care. It was a huge step in the right direction for the welfare state and for the health of the nation. However, it did not help the unemployed adults and it pales in comparison to the work of the first Labour Majority in 1945.

The Change of Public Attitude in the Second World War

In the 1930s, people were relatively happy with the National Insurance Act. It was certainly not perfect because Wives and Children of the workers were not helped. Dentistry, Medicine and Glasses still had to be paid for and many could not afford these vital services. The rural people did not really realise the impact that this was happening. This all changed however in 1939 when children were being evacuated into the countryside. These middle class families were shocked by the state of these children who clearly had not been to the hospital for years. They were covered in lice and scabies and some did not even know how to use a toilet. These influential adults in the countryside now looking after their children wanted to change this. They wanted to change this and started to pressure their MPs for change.

Eventually, William Beveridge from the Liberal Party started to look into Welfare. The committee published a report which sold 600,000 copies in December 1942. It held five evils responsible for the poor state of these children: Want, Ignorance, Squalor, Disease and Idleness. However, Winston Churchill promised to do nothing about this while Clement Atlee of the Labour Party said that they would tackle this issue, gaining them huge support in places they would never expect to win.

1945 Election – Despite being a national hero, Winston Churchill lost the election to Clement Atlee and the Labour Party. They won nearly every single seat in London, Manchester and the Midlands showing the huge support the Urban Communities had for his policies. He promised to tackle these five evils, which the public supported overwhelmingly.

Ignorance – The Labour Party’s Method to tackle Ignorance centred on the Education System. The aim was to ensure that every child came out of the education system with a good ability to read and write as well as the basic skills. In 1944, Education had been made free under an Atlee Amendment, and in 1947 they made the school leaving age 15 so that everyone had 11 years of education.

Want – In 1946 the Labour Government passed the National Insurance Act. Everyone of working age had to pay a weekly contribution based on Salary, but in return they were entitled to a huge range of benefits, from Orphans, Unemployed, Widows, Sick and Pensions. However, self-employed people and married women were not included unless pregnant so the scheme was not perfect.

Idleness – The 1948 Employment and Training Act had helped people get into employment, with many getting skilled training to go into a trade. This increased average wages, productivity and reduced the number of unemployed people because everyone became useful to the country.

Squalor – The 1946 and 1949 housing acts saw the number of houses rise by 700,000. These were council houses, so people who were poor and could not afford council housing could now afford it. This was a massive change. The problem of Squalor was fully removed with a following Labour Government in the 1970s which destroyed the Slum Houses and replaced them with housing standards. These standards replicated those in the 1940s which ensured that all new builds were healthy, well ventilated and safe against fires.

Disease – But by far the largest change to Public Health was the Creation of the National Health Service. This provided healthcare for all no matter age, employment status and gender. Hospitals opened up across the country and replaced the old private hospitals. After the huge amount of injuries that had been brought back from the Second World War and the conditions of Children in the 1930s and early 40s, this was a massive change.

A History of the National Health Service

The Labour Government knew that their main target was stopping disease. Clement Atlee had promised Universal Healthcare that had been seen in New Zealand and in Germany. This was a huge ambition and it was known that it would need a lot more money to be effective. Despite this, the policy was wildly successful and the NHS is still around with us today.

In 1946, the new Labour Government passed the National Health Service Act. This model was based on the one used in Tredegar in South Wales. The new Minister for Health was Aneurin Bevan who was MP for Tredegar and knew that this policy would benefit the country. However, there was a lot of opposition at first.

The British Medical Association was a body that represented doctors. They believed that doctors would earn less money under this system and threatened strikes. Along with this, many local authorities were already running hospitals. They were quite happy doing this, and wanted to keep in control. Finally, there were fears that the cost would be too great, especially from the Conservative Party.

5th July 1948 – Despite the Opposition, the National Health Service was implemented on this date. It was part of the series of Cradle to Grave moves from the Labour Government. It brought in a radical but successful change to Britain’s Health System. Free medical treatment was given to all British Citizens while the nationalising of hospitals brought them all under a single standard of the Ministry of Health with equal funding. An important part was also the distribution of doctors around the country with GPs, Dentists and Opticians in all areas of the country.

Successes – The NHS has made healthcare accessible to everyone across the country, and means that anyone can go to medical professionals for advice and prescriptions. It has had a major contribution in increasing the Life Expectancy to the United Kingdom above countries like the United States that do not have Universal Healthcare. It has also continually reduced mortality of both the mother and child in childbirth and has helped bring major breakthroughs in research, transplant surgery and cancer treatment. The wide range of services help prevent diseases and treat cancer, asthma and many other NCDs. It has encouraged an emphasis of preventative medicine like smocking campaigns and vaccinations for free which has helped eliminate smallpox and polio from the country. Finally, the NHS helped feminism by reducing the pressure of women to be carers, with the role instead going to the health service.

Problems facing the NHS – However, today the NHS still facts many problems. The cost of the NHS has continued to rise each year putting pressure on the Government and the Health Service’s budget. As well as this, the NHS is no longer completely free. In 1952, prescription charges were introduced and since then charges have been introduced to other services like eye tests and dental treatment. The lack of government funding since Austerity Measures in 2010 has led to waiting lists for operations and some people having to be refused costly services and medicines. Finally, the fact that the NHS has increased life expectancy has actually led to the ageing population putting a lot of pressure from the NHS, especially as entitled Boomers go to the NHS with Colds.

The Health Service in the 21st Century – The NHS is one of the World’s biggest employers, with an article in 2012 finding that it hires 1.7 million – the 5th biggest in the world. This has caused it to be very expensive to run. However, many initiatives continue to be implemented to try and decrease costs. This includes Hospital Trusts, NHS Direct (111) and many advertisements discouraging abuse of the health service. The increasing price is undeniable. In a single year, the price rises by £44 billion and this seems unsustainable to keep the health service in the future, even if it is a vital service.

**Chapter 6: Developments in public health and welfare**

Public Health in the Medieval Period

Medieval towns were very unhealthy places. Public health was not a priority on many councils in England. There were never any sewage systems or fresh water supplies, and they were known for their bad smell as you could smell a town before you could see it. Human waste and rubbish was simply thrown onto the streets contributing to the problem and this helped spread many diseases. Houses were made out of wattle and daub (Mud and Wood) overhanging the streets. The lack of light and air made the streets perfect conditions for animals. Rats, lice and fleets survived very well in the rushes and thatches of people’s houses while slaughterhouses were found on the streets with the blood running down into the streets and combining with the urine, faeces and rubbish.

However, people did not want it to be like this. Most people in this era did realise the importance of cleanliness and personal hygiene. For example, when King John travelled around the kingdom he took a bathtub around with him. The problem was that cleanliness was a luxury that few people could afford. Most people could not afford the hot water, so most people had to wash in unclean and reused cold water.

As well as this, some cities tried to improve their public health. Coventry is a prime example of a city that was extremely good with public health. You were fined 1p if the front of the house you were in was not clean and 12p if you did not empty faeces over the river over the city walls. The water was not clean from upstream, but it was better than what was going on elsewhere. They did have to implement this 7 times, so there is some question however into whether it was actually very successful regulation, although the streets would have certainly been clean. Finally, the fact you needed permission to build allowed for there to be enough light in the areas as well as stopping the houses being ideal dwellings for rats.

By the Later Medieval Era, there was a growing awareness in the importance of hygiene and municipal authorities were spending money on trying to keep cities clean. Towns began to provide public latrines which were toilets with a hole and controlled waste management. By the 15th Century, London had over 10 of these latrines. They were still placed over rivers however, and therefore the waste was still going into the Thames. London produced 50 tons of excrement a day, so muck rakers started to be hired to the streets, the first time interest was taken into public health. Towns also started to get bath houses. These were connected to bakeries to keep them warm in the water. Finally people were able to clean themselves in warm water. Southwark has 18 Bathhouses.

Many tows started to introduce quarantine laws to help tackle the issue of the Plagues, and boarded up the houses of those infected. As well as this, they isolated people with Leprosy by putting them in Lazar Houses. This stopped diseases spreading and was action from the government to improve public health. When the crusaders started to bring back soap, people started to make this meaning washing was cleaner.

Monasteries also had very strict rules about cleanliness. They were in the outskirts of town to stop diseases spreading to them, and they observed strict rules. They had running water, lavers for washing in, reredorters which acted as toilets connected to sewers, and even a compulsory bath four times a year.

Even small towns started to bring in public health regulations. Sanitation was clearly thought as important. There was also a lot of rules about food being sold, preventing dumping waste in the city walls and butchers were not allowed to slaughter animals on the streets. However, during this time the worst fines remained for disrupting business so it seems that businesses were more important than public health. It was 5s for playing tennis in the street while only a few pennies for breaking public health laws.

The Government also started to take steps to improve public health and hygiene. It issued £30 fines for damaging public health which was a huge sum of money during this period. During the Black Death, Edward ordered for the streets of London to be cleaned and many people started to try improving city health.

However, despite the many efforts that medieval people took to try and improve public health, there is little evidence to suggest public health actually improved. People still did not know anything about what caused diseases and people believed it was caused by bad smells. The latrines still emptied into the rivers, and the river water was used for cleaning and cooking so there was little improvement, while people did not bathe.

Public Health in the Early Modern Period

During the 16th, 17th and 18th centuries there were many attempts to try and improve public health. Henry VII passed a law so that all slaughterhouses should be outside town walls. Henry VIII went further and gave towns the power to raise taxes and build sewers, but few did. In 1647, the town council in Aberdeen started pest control by poisoning rats and mice. People did start to make the link between dirt and disease, but they still did not really understand why.

The Great Plague of 1665 highlighted how public health did not really improve that much. Authorities did try to deal with the plague by putting houses under quarantine and posting soldiers to stop anyone leaving, but they stopped spread rather than trying to prevent disease. The lists did help a bit, but still people died in large numbers while government action was slow.

The real cause of change was the Great Fire of London in 1666. The fire meant that building had to start again, and the measures to prevent fires also helped prevent disease spreading. Streets became much wider while houses started to be built out of bricks with slate roofs which rats could not live in. This dramatically changed the public health in London and made it a much healthier place to live in.

By the 18th Century, the Agricultural revolution was making the country significantly richer. They could now afford to build houses out of bricks replacing the old wood houses. These were better insulated and healthier improving public health, while the introduction of common land enclosures produced more food because farming became more efficient. This improved people’s diet and led to the country becoming healthier.

However, these attempts to improve public health were met with limited success. It was difficult to raise money to build sewers or employ enough people to remove all the rubbish. Monarchs raising taxes during this period was for war as opposed to improving the lives of those in the country. Therefore these are often unsuccessful. As well as this, towns grew rapidly as food production capacity and population also grew, leading to it being impossible to keep clean. Slums comparable to India started popping up and causing problems with Disease. Moreover, many slaughterhouses continued to operate in towns such as Smithfield in London. Blood and manure was still a waste problem with them sometimes spilling onto the street. Moreover, the disease was still thought to be caused by Miasma and while this should have given people an initiative to clean the streets, it also distracted from cholera and made them believe disease was inevitable.

The Impact of Industrialisation to Public Health

In the Late 18th and Early 19th Century, there was a period of industrial revolution. There was huge migration from the countryside into the new industrial towns and cities, drawn by the prospect of better wages. However as new people came in, the towns became overcrowded while public health and town conditions became worse.

Living conditions for most of the working class actually deteriorated while life expectancies fell significantly. The Government’s attitude of Laissez Faire did not help anyone out, and resulted in poor working, housing and sewage conditions. The spread of disease was a huge problem while not much was done to stop it out. A bad example is in Merthyr Tydfil in Wales. The Iron industries emptied out iron onto the rivers, causing them to go very filthy while nobody in the government did anything about it. Equally, the closed in conditions caused diseases like TB to spread easily.

The Worst Area of this city was a slum area known as China and Little Hell. Its 1500 inhabitants probably lived in the worst conditions in Britain. The slum was based around narrow streets, badly ventilated areas and full of crowded houses. There were no toilets in these cities, and people went back to throwing waste onto the streets. People even lived in cellars underground, infested with rats and with no light, probably full of water. In these kinds of tows, 60% of deaths were from people under the age of 5 with very few living to the age of adulthood.

One of the main problems was the lack of sympathy from the rich. The Government believed that it was not their responsibility because this was popular. The wealthy thought that it was somehow the fault of the poor that they were living in this condition. It was those who owned land and property that had the vote, so poor people could not get their message heard. The rich could afford people like night soil men who picked up rubbish from Chamber Pots whereas the poor could not. They wanted to not have to pay higher taxes to provide for the poor and so the poor conditions continued.

Developments in the later 19th Century

In the 1840s, attitudes started to change about the importance of Public Health. Reports realised the true scale of the Public Health crisis in Britain. The inequality led to such inequality in the diseases people got that it impacted life expectancy by 20 years. Pressure grew, and governments started to pass laws to ensure that the health of the country became a major concern. Along with these Public Health Acts, posters were now being created and doctors commissioned to get to the root of the source of the causes of disease, helping people avoid getting ill.

Edwin Chadwick – He was a civil servant and asked to investigate living conditions in Britain by Parliament. He was a part of the Poor Law Commission which helped evaluate the success with which the country was treating the poor. His 1842 report concluded that people were getting ill because of the terrible living conditions rather than Laziness or Idleness. The Report on the Sanitary Conditions of the Labouring Population helped change the attitudes of the ignorant middle classes at the time. The difference in life expectancy was shocking. A labourer in rural Rutland might expect to live for 40 years, while a Labourer in Manchester would expect no more than 17. Today that would hardly even be enough time to start employment.

Results – Chadwick realised the country needed three things to improve health. Refuse Removal funded by the government ensured everyone had equal sanitary conditions, and stopped people living in Rubbish. A proper sewage system and clean water in every house would allow for cholera to be eradicated and other diseases to stop spreading while a qualified medical officer designated for each area would ensure that everyone had access to check-ups and that the professional people saw was properly qualified. However, unfortunately not much happened. The Dirty Party of MPs supporting Laissez-Faire refused to do anything about the health crisis while the rates for local councils would have to go up, which was unpopular with the powerful middle class.

1848 Public Health Act – This act set up a Board of Health which was the first time the Government actually cared about health issues which was a huge step forward. Chadwick’s request was partially answered when an officer of health was appointed to each reason, who had to be legally qualified in general practice but also there to investigate how to build sewers and collect rubbish to eventually provide for proper sanitation. However, it was not compulsory and many councils refused to do anything about it. Its recommendations were simply guidelines. It was not until 1875, nearly 30 years later that these guidelines were made compulsory.

1858 Sewers – In 1858, an extremely hot summer for the time hit, and it caused the industrial and human waste in the Thames to be smelt from a large distance away. This was potentially the point where they realised how important sewers were. 13,000 sewers were laid under the direction of the chief engineer Joseph Bazalgette. However, few councils invested in sewage the way that London did and by 1872 only 50 councils had a Medical Officer of Health, because it was too costly.

1870 Education Act – Made schooling compulsory. Some of this education would have been about health, but it was mostly to keep the poor children out of work. The gift of literacy that provided allowed people to read government Pamphlets and warn themselves about health. The poor also benefited from the Artisans Dwellings Act of 1875 which provided better houses for working families and the 1876 laws around pollution in rivers, all of which helped improve public health.

Case Study: Saltaire

Titus Salt: A successful spinning and weaving mill owner in Bradford.

1843: A local man, Samuel Lister, invested a wool combing machine that put thousands of wool combers out of work.

Salt set up and paid for soup kitchens. He became the 2nd mayor of Bradford and tried to persuade the council and other factory owners to improve working and living conditions.

He even paid for his 2,000 workers to have a day out in the country on the newly opened railway.

In 1850, Salt made the decision to move his factories out of Bradford and bought a site at Shipley.

Shipley was in the country but next to the railway, the Leeds-Liverpool Canal and the River Aire.

Here he built the largest and most up-to-date mill in Europe.

The building of reservoirs in Wales

* In the 19th century, there a growing demand for clean water because the populations of Britain’s industrial towns were growing.
* The first reservoir built in Wales by an English corporation was called Liverpool Corporation.
* The water from Lake Vyrnwy was transported to Liverpool
* In order to transport this water, the Corporation had to build an aqueduct and lay pipes from Lake Vyrnwy to Liverpool.
* The Birmingham Corporation also looked to Wales for water. Buying up land in the Elan Valley, they planned to create a series of man-made lakes from damming up the Elan and Claerwen Rivers.
* The Birmingham Corporation Water Act (1892) allowed the Corporation to acquire land by compulsory purchase within the Elan Valley.
* The Elan Reservoir was opened in 1904 by King Edwards VI and Queen Alexandra.
* With a regular supply of fresh water, public health in Liverpool and Birmingham. Significantly improved.

Developments in the 20th Century

Liberal Reforms – In 1906, a new Liberal government got into power. It wanted to see the end of Laissez Faire to replace it with a more sustainable system that would provide for all. This was further enhanced when during the Boer War, a third of all recruits had to be turned away because their health was so bad. They introduced a range of social reforms designed to wage implacable warfare against poverty and squalidness. In 1906 Free School Meals were introduced to give children one good meal a day. In 1907, school medical inspections happened to keep check of the health of the children. In 1908, Old Age Pensions Act granted a pension for anyone over 70 stopping people getting to that age falling into poverty, however it was often the rich who got that pension because the poor did not live that long. Finally, in 1909 Minimum Wages were introduced in some industries to give a living wage to workers. David Lloyd George then increased taxes on the rich to ensure that everyone paid their fair share for these Liberal Reforms. Then, at the end of the First World War, the prime minister promised a land fit for heroes with the 1919 housing act to build 500,000 homes in 3 years – the first council housing. While only 200,000 were eventually built, it was the first time that electricity, running water, bathrooms and gardens entered the house so it was considered a success. By 1939, over 1 million council houses had been built across the UK.

Labour Reforms – Then, after the Second World War, when people realised how awful the Working Class were treated and their poor health. This caused a demand for a better care for public housing, starting with better housing. The Labour Government created over a Million new homes between 1945 and 1951, while the problem of poor housing remained. In the 1970s, the slum housing in London was demolished and replaced with suitable housing, while they also created surveys to see how the houses are doing finding 10% are unfit for human habitation. This government also saw the creation of the NHS and the running of hospitals and local centres. Public Health England run by the NHS also has been created to ensure people remain healthy. To avoid STIs and people not getting vaccinated, they asked health workers to come in and talk about how to prevent them. Health Visits would be mandatory for new mothers while campaigns like Change4Life, 5 a day and Veganuary have all tried to make people healthier. Finally, to encourage personal hygiene, schools were encouraged to ask students to check for nits and to brush teeth regularly to become healthier.

All this has helped Life Expectancy increase by 30 years in the 20th Century. Public health created a concern for people’s health which continues today, while the simple age has gone from 50 to 80 that overall the population lives too. Each decade, the health expectancy is now expected to rise by a quarter of a decade and it is a failure if this does not happen. However, it has not been perfect. As Britain became richer, diets have become worse with much more obesity than ever before, and a sharp increases in diseases like diabetes associated with it. Moreover, many people still drink too much alcohol and some people still smoke and nearly everyone fails to exercise enough. Perhaps the worst continuity is the fact that poverty continues to have a bad effect on Public Health, causing many diseases as well as adverse effects on Public Health.

**Chapter 7: Study of a historic environment: Urban Cardiff in the nineteenth century**

Growth

* Dramatic growth in the nineteenth century.
* 1801 = Welsh-speaking, small-scale trade.
* 1901 = Most populous town in Wales, caused by spectacular growth of the docks and railways that could transport coal from the valleys to the ports to be exported across the world. Cardiff became the coal metropolis of the world with a population that had become heavily anglicised.

Growth: Taff Railway

* Coal had originally been transported by canal.
* ***Turning point*** in Cardiff’s development = The building of the Taff railway, connecting Merthyr Tydfil with Cardiff.
* South Wales was now connected to the Midlands and London.
* By 1900, South Wales was the most important coal exporting area in Britain.

Growth: Docks

* ***Significant individual*** in development of the docks = The Marquis of Bute – built the Bute West Dock in 1839 and they got bigger over time.
* Cardiff had competition from places such as Barry and Newport but fought off this rivalry to become the main port for the export of coal from the Cynon, Rhondda and Rhymney valleys.

Growth: Population

* The building of the docks and other industrial sites resulted in large numbers of people moving to Cardiff from the small valley towns and rural villages of the Vale of Glamorgan and the west of England.
* Cardiff’s population rose sharply – by 1871, a quarter of town’s population had been born in England and 10% were from Ireland.
* By the end of the 1800s, Cardiff became know as the ‘Chicago of Wales’ due to its mix of immigrants from places such as Italy, Germany, India and Somalia.

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|  | **1801** | **1901** |
| Merthyr Tydfil | 7,750 | 69,228 |
| Cardiff | 1,871 | 164,333 |

Living Conditions

Living Conditions: Lack of Regulation

* As with many towns in Victorian Britain, rapid expansion resulted in loads of public health concerns.
* As Cardiff developed, there was more need for housing for the migrant workers.
* There was no official planning and regulation so houses were poor quality. Many were without ventilation, drainage and an adequate water supply.
* Many of the streets followed streams that were used to get rid of human waste.

Living Conditions: Health Concerns

* The Health Act (1848) showed that there were serious health concerns in the rapidly expanding industrial towns.
* Common problems were bad drainage, inadequate supplies of clean water, and overcrowded and squalid living conditions.
* Cardiff was just like this – full of disease and with statistics which were worse than the UK average.
* There were 4% more deaths than births in Cardiff!

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|  | **Cardiff** | **UK Average** |
| Death Rate | 30 per 1,000 | 20 per 1,000 |

Living Conditions: Poor Sanitation

* In the poorest area of Cardiff, there were 222 houses in which 2,920 people lived.
* On average, there were 26 people in each house.
* Sanitation was very poor and outdated.
* Houses had a small privy (toilet) which opened onto the living room.
* Waste was rarely emptied so it was very smelly.
* The streets were about 4 ½ metres wide with waste thrown across them.
* This waste sometimes got into the water supply.

Living Conditions: Overcrowding

* The unhealthy environment was made worse by the overcrowding.
* In order to make extra money, lots of people took in lodgers.
* For example, in 1851, 54 people lived in 17 Stanley Street in Cardiff.
* A bigger population meant a higher risk of disease and death from illness.
* Poor diets meant that people were too weak to fight off diseases.

Living Conditions: Water Supply

* Polluted water was a reason for the outbreaks of disease.
* In Cardiff, people got their water from either the Glamorgan Canal, the Bute Dock, the River Taff, town pumps and some private wells.
* Often this waster was poisoned by leakages from cesspits.
* Following the two cholera outbreaks in 1849 and 1854, it was shown that most deaths happened nearer the poorer overcrowded areas. For example, there were 33 deaths in Bute Docks.

Outbreaks

* Typhoid: Common in industrial towns. It was spread through contaminated water. Cardiff experienced a number of typhoid outbreaks but they were never as bad as the cholera ones.
* Cholera: An infectious disease with a high death rate. Was usually caused by contaminated water and symptoms were vomiting and diarrhoea.
* There were four **significant** outbreaks of cholera in Wales (1832, 1849, 1854 and 1866).
* The first cholera outbreak arrived in Cardiff via a sailor who was taken ill on a ship from Gloucester.

Outbreaks: Cholera (1849)

* Cardiff was badly affected by the second outbreak of cholera.
* The first recorded case in Wales was in Cardiff on 13th May 1849, when a 19 year old canal worker died less than 24 hours after catching the disease.
* The outbreak had a devastating impact on the town. In just one month (June) 135 people died.
* To try and combat the outbreak, Cardiff was divided into 3 districts and officials would make house-to-house visits in the poorest areas (sometimes twice a day). They had the power to order cleansing and whitewashing.
* As the death rates rose, Cardiff was divided into 7 districts, with medical officers appointed to each.
* Dispensaries were opened across Cardiff where ‘remedies’ and advice were given out.
* There were disagreements amongst medical officials in Cardiff about what caused the outbreak.
* The epidemic caused lots of anti-Irish feeling. The Irish became scapegoats. Some said that the disease had increased by 5% and 8% because of high Irish migration to Cardiff.
* Some people blamed the epidemic on the drunkenness and irresponsible spending habits of the poorest classes.

Outbreaks: Cholera (1854, 1866 and 1893)

* 1854: 225 died in Cardiff. This was high, but less than the 445 deaths that happened in Merthyr Tydfil.
* 1866: 76 deaths in Cardiff.
* 1893: 3 deaths. This lower number was due to improvements such as piped water and sewers.

Improving Public Health

Improving Public Health: Acts

* **Public Health Act (1848)**: The starting point for gradual improvement in public health. Towns set up bards which were responsible for things like sewers, water supplies, providing burial grounds, etc.
* More than one tenth of the population in Cardiff signed a petition calling for a Board of Health to be set up in the town.
* Dr Henry James Paine was Cardiff’s first Medical Officer of Health.
* **Rammell Report (1850)**: An inspection of the state of public health in Cardiff was carried out by Thomas Rammell, the Superintendent Inspector of the General Board of Health.
* His report showed that there were many issues in Cardiff such as open sewers, unclean public water and overcrowding. His report made a number of suggestions for improving Cardiff’s public health. For example, he suggested a safe supply of pure water, a drainage system, collecting rubbish, better housing for the poor and opening a new cemetery on the edge of town.
* **The work of Dr Henry James Paine** was important in improving public health in Cardiff.
* Dr Paine pushed for a new system of sewage and drainage which cost over £200,000. This improved water supply meant that the 1866 cholera outbreak had a smaller impact than the previous one.
* To reduce the threat of cholera entering the town from the sailors, Dr Paine bought and fitted out the HMS *Hamardryad* hospital ship.
* He reduced smallpox in Cardiff through inoculation.
* He passed laws banning the tipping of rubbish and sewage into the River Taff.
* It is estimated that Dr Paine’s work saved over 15,000 lives in Cardiff.
* **Sanitary Act (1866):** This meant that local authorities were responsible for sewers, water supply and street cleaning.
* In Cardiff, action had to be taken before this. The Cardiff Waterworks Act (1850) resulted in the building of a pumping station and the laying of water pipes across the town, supplying filtered water to the people.
* **Glamorgan and Monmouth Infirmary and Dispensary (opened in 1837)**: Following a donation of £3,550 by a local solicitor, the hospital was built to provide free treatment for the ‘deserving poor’ but charged those who could pay.
* **Cardiff Infirmary (opened in 1894 and renamed in 1895)**: This new hospital was built to meet the demands of the growing population.
* **Public Baths and Wash Houses Act (1846)**: This gave local authorities the power to raise money through rates to build new bath houses.
* In the early 1870s, a bath house at Guildford Street was forced to close down due to low attendance as poor people could not afford the entrance fee. The bath house was taken over by another company towards the end of the 1700s and increased in popularity.

Improving Public Health: Effectiveness

Causes for improvement in public health:

* Government Inquiries and Acts
* Changing Attitudes

**Evidence of the impact of improvements in public health:**

1. Decline in number of deaths despite rising population.

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| **Cholera outbreak** | **Number of deaths in Cardiff** | **Population of Cardiff** |
| 1849 | 396 | 18,351 |
| 1854 | 225 | 18,351 |
| 1866 | 76 | 48,965 |
| 1893 | 3 | 128,915 |

2. By 1900, Cardiff had the fourth lowest infant mortality rate of a town of similar size in Britain. In the 1840s, a quarter of children in Cardiff died before their first birthday.