

THE ANNUAL REPORT OF THE DIRECTOR OF PUBLIC HEALTH 2014



FROM THE BEATLES TO BEYONCÉ



1964 - 2014

Five Decades of Change in Public Health

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FOREWORD

This year, I celebrated my 50th birthday. Attaining your half century makes you think about your life and the things that have happened during it. My public health report this year reflects on the public health changes that I've seen over my lifetime.

The topics that I've chosen are varied but they have something in common – they've shown huge changes and yet they still present us with challenges for the future. Most of the topics are also examples of health inequalities.

We begin with a look at cardiovascular disease – the most significant cause of death when I was a child and still a leading cause of death today.

Tuberculosis is a disease that we all thought was something of the past. The memories of the sanatoria of my parents' and grandparents' generations faded with the arrival of antibiotic treatments. But TB hasn't gone away and we now have the problem of drug resistance to face.

Sexual health is perhaps an area that has seen the biggest changes – from the sexual liberation of the swinging sixties to the spectre of AIDS and the link between the wart virus and cervical cancer in the 1980s.

Smoking was ubiquitous in the 1960s and, although far fewer people smoke now, it remains the only legal product which if used according to the manufacturer's instructions, will kill half of its users.

Vaccines have become a mainstay of our prevention initiatives. They are one of the big success stories of modern medicine and more immunisation programmes are being introduced.

The final chapter looks at the combined impact of our health experience on life expectancy. We're living longer, but are we living those additional years in good health?

I hope you'll enjoy reading this report and my trip down memory lane.

Here's to the next 50 years!

Andrew Howe

Director of Public Health

Heart Disease

ALTHOUGH WE SHOULD CELEBRATE OUR SUCCESSES IT WOULD BE PREMATURE AND DANGEROUS TO REST ON OUR LAURELS. WE MUST CONTINUE TO TARGET INEQUALITIES WHERE THEY EXIST AND BUILD ON OUR WORK BY TACKLING THE ROOT CAUSES OF CORONARY HEART DISEASE THROUGHOUT THE POPULATION. PROFESSOR PETER WEISSBERG, MEDICAL DIRECTOR, BRITISH HEART FOUNDATION

Introduction

Heart disease is not a new phenomenon for human kind; in fact Pharaoh Merenptah, who ruled around 1200 B.C., had reportedly suffered from atherosclerosis. Drs Adel Allam and Gregory Thomas verified his condition in 2008. They examined Merenptah and fifteen other preserved representatives of the ancient Egyptian upper class¹ ranging from 2,000 to 3,500 years old of these fifteen; nine had evidence of blockages from atherosclerosis.

Despite, the evidence from the mummies we cannot conclusively state when mankind first became aware of coronary heart disease (CHD). The ancient Egyptians made many contributions to medicine including producing the world's first physicians who for millennia enjoyed the reputation of being the most skilled in the world, producing the world's first medical knowledge and literature, influencing Hippocrates and contributing to the Hippocratic tradition and the development of medicine in ancient Greece². The Ebers papyrus, one of the most important surviving, translated medical papyri, contains sections on the movement of the heart, the pulse and diagnostic percussion².

Observations about heart disease were made during the 16 and 1700s. Friedrich Hoffmann, chief professor of cardiology at the University of Halle, noted that coronary heart disease started with the "reduced passage of the blood within the coronary arteries." Angina, first described in 1768, was believed by many to have something

THE PUBLIC HEALTH IMPORTANCE

Heart disease or coronary heart disease (CHD) is the collective term that describes what happens when the heart's blood supply is blocked or interrupted by a build-up of fatty substances known as atheroma in the coronary arteries in a process known as atherosclerosis. Heart attack and angina (chest pain) are two manifestations of heart disease.

CHD is one of the main types of cardiovascular disease (CVD), the collective term for all diseases affecting the heart and blood vessels. CVD problems result in chronic conditions that develop or persist over a long period of time as well as acute events. Globally, CVD is the leading cause of death. The World Health Organization estimates that, by 2030 CHD will be the biggest cause of death worldwide.

CVD is also associated with a large burden of preventable illnesses. Public health initiatives focus on decreasing CVD by encouraging people to follow a healthy, balanced diet, avoid smoking, control their blood pressure, lower their blood cholesterol if necessary, exercise regularly and, if they are diabetic, maintain good control of blood glucose.

to do with blood circulating in the coronary arteries, though others thought it to be a harmless condition. Cardiologist William Osler worked extensively on angina, and was one of the first to indicate that it was a syndrome rather than a disease in itself³.

The need to understand what caused or contributed to the development of heart disease led to a flurry of research papers during the latter half of the 20th century. Many of these came from the Framingham Heart study which was the first major research project to help identify risk factors for heart disease^{4,5,6}. The research project introduced a new vocabulary around heart disease contributing the term “atherosclerosis” (known as “atherosclerosis” today) to the International Classification of Diseases[†]. In the 1950s, it was believed that clogging of arteries (atherosclerosis) and narrowing of arteries (arteriosclerosis) was a normal part of aging and occurred universally as people became older. Further information on the risk factors associated with heart disease came when University of California researcher John Gofman and associates identified two cholesterol types: “bad” low-density lipoprotein (LDL) and “good” high-density lipoprotein (HDL). Gofman and colleagues discovered that men who developed atherosclerosis had elevated levels of LDL and low levels of HDL³. The American scientist Ancel Keys documented that the incidence and mortality rates of coronary heart disease varied as much as tenfold across countries, with the lowest rates in Crete. The work from this study provided some hints about the culprit behind this vast disparity. Keys found that saturated fat consumption was strongly associated with regional rates of heart disease, but that total fat intake was not. He suggested that it was the type of fat, as well as the Mediterranean diet in general, that predicted the difference in heart disease risk⁷.

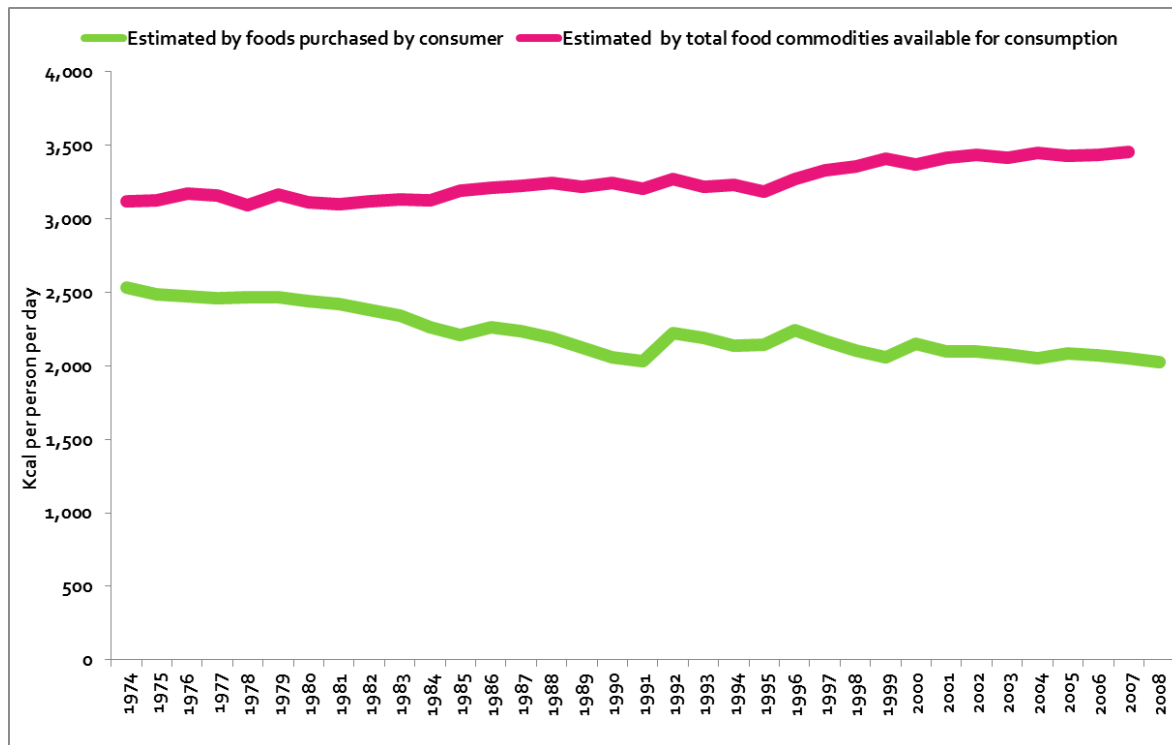
1964 - 2014

By 1965, the British Heart Foundation published a report listing the eight risk factors for heart disease which were compiled by the World Health Organization. The risk factors were high blood fat, high blood pressure, smoking; physical inactivity, genetics, diabetes, nervous stress and increased body weight, each of these risk factors would be explored to great success over the coming decades. There were countless other studies building on the work of Keys and colleagues and focusing on the specific types of fat. A conclusion was drawn that different types of dietary fat had varying effects on blood cholesterol levels and that different types of cholesterol had varying effects on heart disease. Unsaturated fats, especially polyunsaturated fats such as those found in walnuts, decrease the LDL cholesterol and raise the HDL cholesterol. While trans fats - liquid vegetable oils transformed into shelf-stable solids – 10-20% of which were found in margarines until the 1980s and small amounts of which naturally occur in dairy products, beef, lamb and mutton – were associated with greater risk of heart disease and a double metabolic whammy of increasing LDL and decreasing HDL. Simultaneously, researchers globally showed that saturated fat – the kind found in butter

[†] A health care classification, providing a system of diagnostic codes for classifying disease including nuanced classifications of a wide variety of signs, symptoms, abnormal findings, complaints, social circumstances, and external causes of injury or disease.

and lard – increases both LDL and HDL cholesterol, making it similar to carbohydrates overall but not as beneficial to health as polyunsaturated fats from nuts and vegetables.

FIGURE 1 TOTAL ENERGY INTAKE, COMPARISON OF TWO MEASURES, UNITED KINGDOM



Source: British Heart Foundation (2011) Trends in coronary heart disease, 1961 – 2011

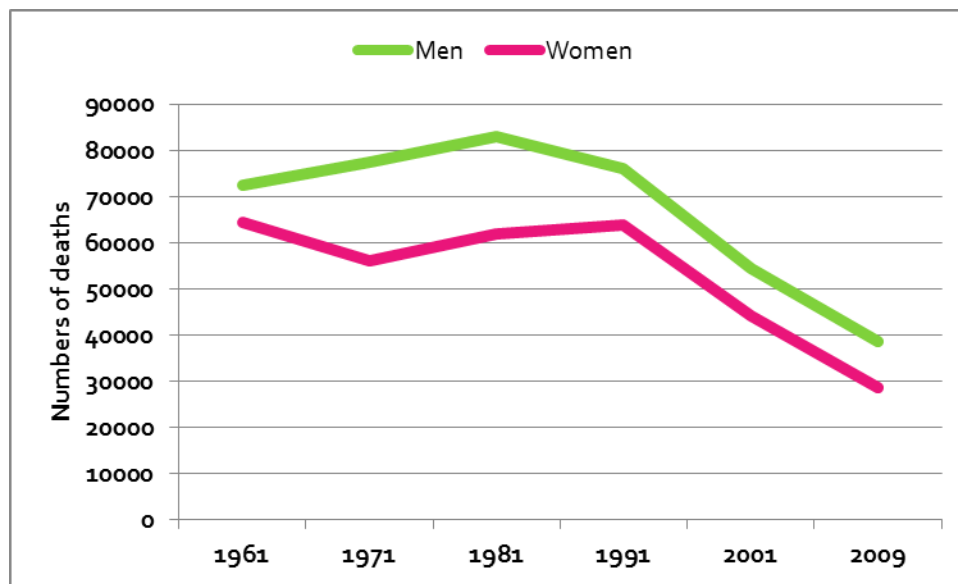
Overall, the quality of British diets has improved in some aspects since the 1970s; for example, saturated fat and sugar intake has considerably decreased. However, trends in total energy intake vary according to the method of measurement. When using household expenditure data, consumption of calories appears to have steadily decreased since 1961. Nevertheless, this does not take into account expenditure on food for consumption outside of the home. When energy intake is measured using food availability data (a measure of the food commodities available for human consumption in the UK, derived from import and export data), total energy intake increased between 1974 and 2007 (figure 1). The decrease in saturated fat levels in the British diet is reflected in trends in the types of foods we eat. In 1964, the majority of milk consumed came from whole milk; however this has changed over the past 50 years, so that by the early 1990s, the majority of our milk intake came from skimmed milk. A similar trend is seen in the types of oils and fats we eat. Butter, margarine and lard were the predominant types of fats eaten in the early sixties, but these have now been replaced by low fat spreads and vegetable oils, which are much lower in saturated fat.

During the 1980s and 90s amid nuanced research results, conventional wisdom and national guidelines shifted the spotlight to reducing total fat: the complicated message – that some fats are good and others are bad-

became over simplified. And so began our fixation with eliminating or reducing fat from our diets. The general public lived the mantra and the food industry jumped on board, removing fat from food and replacing it with sugar and carbohydrates and storing up further problems in the decades to come.

The proportion of deaths attributed to cardiovascular disease has fallen among both men and women from approximately half of all deaths in Great Britain in 1964; 48% among men and 54% among women, to about a third of all deaths among men (30%) and women (28%) in 2011.

FIGURE 2 ALL AGE CORONARY HEART DISEASE DEATHS, ENGLAND 1961 - 2009



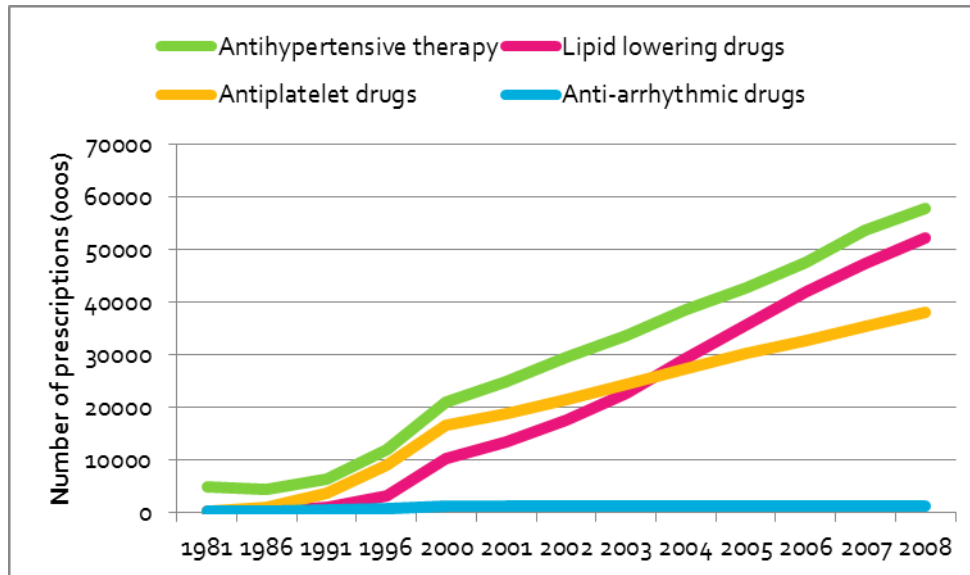
Source: British Heart Foundation (2011) Trends in coronary heart disease, 1961 – 2011

The numbers of men and women dying from heart disease have also fallen since 1961, with the most accelerated decline made since 1991 (figure 2). The decline was probably the result of a combination of factors including the impact of rationing during World War II - the frugal wartime regime had left the population healthier despite the food shortages – and medical innovation, a broad range of drugs became available for the treatment and prevention of cardiovascular diseases. A good thing considering that in the early 1960s the concept of preventing disease rather than treating it had yet to take hold. The four classes of drugs shown in figure four are evidence based therapy recommended by the National Institute for Health and Care Excellence (NICE) for the treatment of cardiovascular disease; anti-arrhythmics have been shown to reduce mortality following a heart attack and antiplatelet drugs are used as a secondary line of defense against the progression of heart disease.

More people have benefitted from life-saving lipid lowering drugs, the number of prescriptions made each year exploded from 295,000 to over 50 million between 1981 and 2008; operations to treat arteriosclerotic

heart disease have also increased from 700 in 1962 to 920 five years later. And by the mid 1970s, the surgery classification had changed to include all heart and intrathoracic vessels surgeries – resulting in a sharp increase from nearly 17,000 in 1974 to over 22,000 in 1976.

FIGURE 3 PRESCRIPTIONS USED IN THE PREVENTION AND TREATMENT OF CVD, ENGLAND 1981 – 2008



Source: Office for National Statistics (2009). Prescription cost analysis 2008. The Information Centre: Leeds

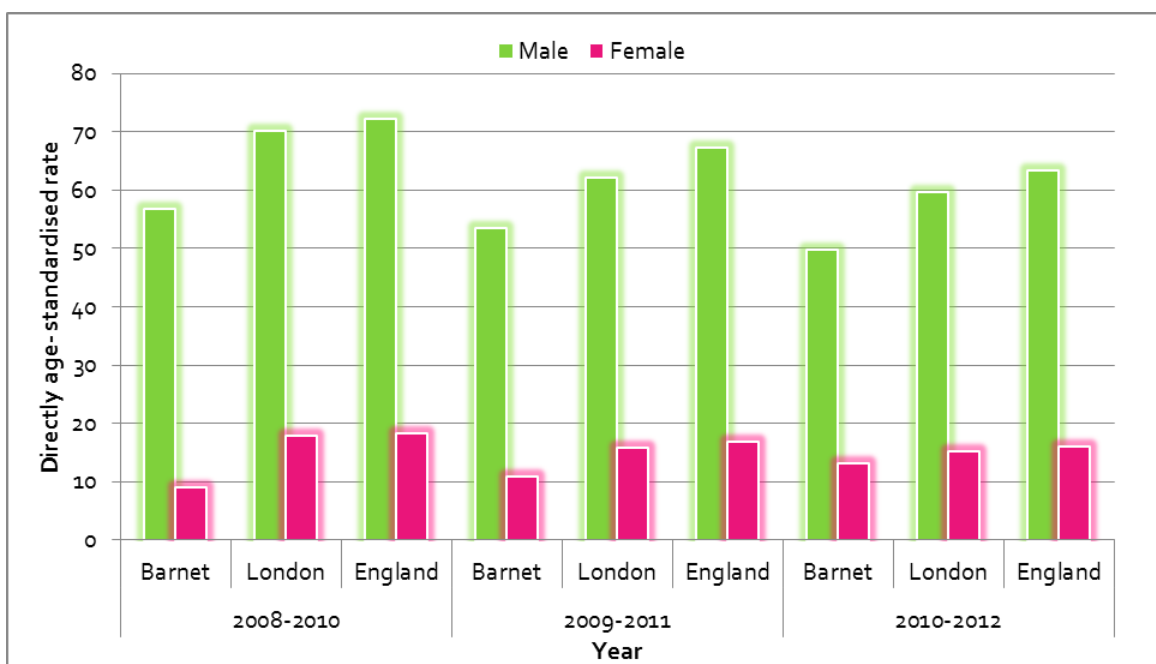
Analysis of mortality rates around the time of the 1971 census revealed that some ethnic minorities in the UK, particularly people of South Asian origin, bore a heavier burden of heart and circulatory disease than the rest of the population⁸. Indian-born men living in the UK were shown to have a 15% higher rate of death from heart disease compared to the population of England and Wales as a whole, and by the time the 1981 census data was analysed the difference has increased to 50%⁹. The increased risk of heart disease within these communities was recognized in the government's National Service Framework for heart disease published in 2000.

Between 2002 and 2012, the largest fall in age-standardised death rates for men and women (44% and 43% respectively) in England and Wales occurred in those dying from cardiovascular diseases.

Of the 499,331 registered deaths in England and Wales in 2012, 28% were a result of cardiovascular diseases such as heart disease and strokes, currently it is the second most common cause of death after cancer (29% of all registered deaths). Approximately 23% of all deaths registered in England and Wales in 2012 were classified as deaths from potentially avoidable causes. Heart disease was the leading cause of avoidable death in men which represented 22% of all avoidable male deaths while lung cancer in women, accounted for 15% of all female avoidable deaths¹⁰.

Heart disease is relatively uncommon below the ages of 35 years; over 75 years of age there may be more of a problem in diagnostic accuracy since there are likely to be multiple contributors to death. Consequently, most of the analysis is concentrated on ages 35 – 74. These years are often thought of as the most economically and socially productive years of adult life and so in public health terms we often look at years of life lost (YLL). The number of YLL is calculated by summing the number of deaths at each age between 1-74 years, multiplied by the number of years of life remaining up to the age of 75 years, this number provides a summary measure of premature mortality and is used in public health to compare the relative importance of different causes of premature deaths within a given population, to set priorities for prevention, and to compare the premature mortality experience between populations.

FIGURE 4 RATES OF YEARS OF LIFE LOST TO CORONARY HEART DISEASE, 2008 – 2012



Source: *Compendium of Clinical and Health Indicators, National Centre for Health Outcomes Development* www.nchod.nhs.uk

The three year average rates of YLL for heart disease among men and women in Barnet have been consistently lower than both London and England since 2008 (figure 4). The higher rates in men compared to women can be explained by the fact that women tend to live longer than men therefore even though heart disease death rates in older men are higher than in older women there are many more older women who suffer from heart disease.

Among female residents in Harrow, the three year average rate for years of life lost to heart disease has been consistently lower than the rate observed nationally and regionally (figure 5). However, during the period 2010-2012, the rate of years of life lost to heart disease for men living in Harrow was for the first

time since 2008, higher than the rates observed in London and England, suggesting a greater proportion of premature death among men in Harrow compared with London and England.

What do we need to do now

The findings from the ancient Egyptian mummies mentioned at the beginning of this chapter should not be taken to mean that modern risk factors have no bearing on heart disease. The preserved representatives

FIGURE 5 RATES OF YEARS OF LIFE LOST TO CORONARY HEART DISEASE, 2008-2012



Source: *Compendium of Clinical and Health Indicators, National Centre for Health Outcomes Development* www.nchod.nhs.uk

studied would have had diets high in salt which was used for food preservation and would have enjoyed the pampered lifestyle of the wealthy, so even these ancient people would have had risk factors similar to those of modern man.

Tackling Risk Factors

Much of the research around the risk factors associated with heart disease has informed a range of policies, strategies and health messages. Recent initiatives, like the Department of Health's 'Change4life campaign' which began in 2009 have helped to improve people's health through better diet and lifestyle advice. In addition, the British Heart Foundation and other voluntary sector campaigns have highlighted the benefits of taking regular exercise, eating a healthy diet, encouraging children to be heart healthy and being aware of dangers such as smoking, drinking, high blood pressure, and stress for long term heart health. More recently

the Department of Health's 'Healthy Lives, Healthy People' strategy for England included a tobacco control plan and a call to action to reduce obesity and sugar consumption in England.

In terms of diet and heart disease, researchers have highlighted the importance of focusing on healthy dietary patterns, rather than glorifying or demonizing specific nutrients. A healthy diet includes lots of fresh fruits and vegetables, whole grains, nuts, legumes, poultry and fish. An unhealthy diet contains plenty of processed meat, mounds of chips, lots of white bread and potatoes and processed breakfast cereals, large sugary drinks and packaged cakes for dessert. When it comes to fats in our diets – the latest advice is:



Foods rich in mono-and polyunsaturated fats (like olive oil, soybean oil, peanut oil, and canola oil) will lower your heart disease risk. Foods high in saturated fats (such as lard and animal fats like well-marbled meat) will not lower heart disease risk and research indicates they increase your risk of heart disease.

Don't replace foods rich in saturated fats with processed foods of refined carbohydrates (such as white bread and pastry).



Choose minimally processed foods with healthy fats – including nuts such as walnuts and peanuts, and fish such as salmon.

Given the diversity of the populations of Barnet and Harrow, the burden of cardiovascular disease within certain ethnic groups is an important consideration in terms of future progress. In addition to the higher rates of heart disease among South Asian Indians, men of South Asian origin are more likely to develop heart disease at a younger age and have higher rates of heart attacks, black African and Caribbean individuals have a higher risk of stroke and the highest death rates from stroke^{11, 12}. The reasons for increased cardiovascular risk in these ethnic groups remain poorly understood, although traditional cardiovascular risk factors are still recognised to play an important role, as well as cultural and lifestyle factors.

Locally, both Barnet and Harrow have a range of lifestyle projects and initiatives in place that support residents in reducing their risk of heart disease including, local change4life programmes, exercise on referral, stop smoking services and outdoor gyms.

Early Diagnosis and Risk Stratification

The Secretary of State for Health has prioritised reducing premature mortality and has a focus on improving prevention and early diagnosis; the NHS Health Check programme is a key deliverable in supporting this ambition. NHS Health Check is a national risk assessment and management programme for those aged 40 to

74 living in England, who do not have an existing vascular disease, and who are not currently being treated for certain risk factors. It is aimed at preventing heart disease, stroke, diabetes and kidney disease and raising awareness of dementia for those aged 65-74 and includes an alcohol risk assessment. The NHS Health Check should be offered every five years.

Both boroughs offer NHS Health Checks and follow-up intervention to the eligible population. These follow-up interventions have clear links to staying healthy initiatives and community development programmes and include lifestyle management advice and brief alcohol advice or referral.

Treatment

Effective treatment of heart disease saves lives; coronary heart disease can be successfully managed with a combination of lifestyle changes, medicine and in some cases, surgery. With the right treatment, the symptoms of heart disease can be reduced and the functioning of the heart improved.

The local CCG is responsible for the treatment of heart disease, although heart disease cannot be cured, treatment can help manage the symptoms and reduce the risk of further problems. A national review of heart disease services set out standards that define good heart disease care:

- ✓ Tackling factors that increase the risk of heart disease, such as smoking, poor diet and limited physical activity
- ✓ Preventing heart disease in high-risk patients and, where patients have heart disease, avoiding complications and tackling the progression of the disease
- ✓ Rapid treatment for heart attack, including the choice of angioplasty in a specialist cardiac centre
- ✓ Rapid diagnosis of heart disease and access to diagnostic tests
- ✓ Rapid access and choice of treatment centre for specialised cardiac care

Wider Determinants

Heart disease varies considerably across the social spectrum¹¹. Research suggests that between 2000 and 2007, while approximately half the substantial fall in deaths from heart disease in England was attributable to improved treatment uptake across all social groups (ranging from 50% in the most affluent quintile to 53% in the most deprived), consistent with the equitable nature of the NHS. Changes in risk factors, such as lifestyle, accounted for approximately a third fewer deaths in 2007 than occurred in 2000, but were responsible for a smaller proportion of deaths prevented in the most affluent quintile compared with the most deprived (approximately 29% versus 44%, respectively). However, the benefits of improvements in blood pressure, cholesterol, smoking and physical activity were partly negated by rises in body mass index (BMI) and diabetes, particularly in more deprived quintiles¹³.

The burden of CHD in the UK is immense and while much attention is attracted to the very visible and costly 200, 000+ hospital admissions annually the eightfold larger (approximately 1.6 million) mass of patients

living with chronic disease in the community remains largely hidden. These community patients will have a reduced life expectancy, impaired quality of life with all the services and costs associated with this including, disability benefits for those not working and higher rates of lost productivity for those who are working¹⁴.

Prevention is key to further reducing the number of deaths from heart disease in the UK and while the majority of individuals know what they can do to prevent heart disease, they need to be supported at the macro level by minimising influences towards unhealthy behaviours and ensuring that healthy choices are the default option. Other countries have implemented effective, evidence-based interventions to tackle lifestyle risk factors such as substantial dietary reductions in salt, saturated fats, trans-fats and sugars concealed in processed food, fast-food takeaways and sweetened drinks; the most powerful measures involve legislation, regulation, taxation or subsidies, all of which tend to be equitable. Such measures would effectively tackle persistent inequalities in deaths due to heart disease¹⁵⁻¹⁸.

References

1. Allam AH, Thompson RC, Wann LS, Miyamoto MI, Thomas GS. Computed tomographic assessment of atherosclerosis in ancient Egyptian mummies. *Journal of the American Medical Association*. 2009;302(19):2091-2094. Doi:10.1001/jama.2009.1641.
2. Newsome F. Black Contributions to the early history of western medicine: Lack of recognition as a cause of black under-representation in US medical schools. *Journal of the National Medical Association*. 1979;71(2):189-193
3. Story C, Krucik G. The History of Heart Disease. Available from <http://www.healthline.com/health/heart-disease/history> (Accessed May 2014)
4. Castelli WP. Cholesterol and lipids in the risk of coronary artery disease--the Framingham Heart Study. *Canadian Journal of Cardiology* 1988; 4 Suppl A:5A-10A
5. Kannel WB. Habitual level of physical activity and risk of coronary heart disease: The Framingham Study. *Canadian Medical Association Journal* 1967; 96(12):811-812.
6. Strully KW, Fowler JH, Murabito JM, Benjamin EJ, Levy D, Christakis NA. Aspirin use and cardiovascular events in social networks. *Social Science Medicine*. 2012;74(7):1125-1129.
7. Keys A, Aravanis C, Blackburn HW, Van Buchem FS, BUzina R, Djordjević BD, Dontas AS, Fidanza F, Karvonen MJ, Kimura N, Lekos D, Monti M, Puddu V, Taylor HL. Epidemiological studies related to coronary heart disease: characteristics of men aged 40-59 in seven countries. *Acta Med Scand Suppl*. 1996; 460:1-392
8. Marmot MG, Adelstein AM, Bulusu L, Shukla V. Immigrant mortality in England and Wales 1970-78. (OPCS Studies on Population and Medical Subjects: No.47). London: HMSO, 1984.
9. Balarajan R. Ethnic differences in mortality from ischaemic heart disease and cerebrovascular disease in England and Wales. *BMJ* 1991; 302:560-564

10. ONS. Avoidable mortality in England and Wales, 2012. Statistical Bulletin available from: http://www.ons.gov.uk/ons/dcp171778_362295.pdf
11. Connolly S, Brown A, Clements S-J, Yates C, Kotseva K on behalf of Westminster My Action teams. Delivering the My Action programme in different populations: NHS Westminster, London. *British Journal of Cardiology* 2013;20(suppl 3):S1-A19
12. National Cardiovascular Intelligence Network. Cardiovascular Disease Strategic Clinical Network Health Profile, London. Available from <http://www.sepho.org.uk/CVDProfiles.aspx> (Accessed June 2014)
13. Bajekal M, Scholes S, Love H, Hawkins N, O'Flaherty M, Raine R, Capewell. Analysing Recent Socioeconomic Trends in Coronary Heart Disease Mortality in England, 2000-2007: A Population Modelling Study. *PloS Med* 9(6): e10001237. Doi:10.1371/journal.pmed.1001237
14. Pearson-Stuttard J, Bajekal M, Scholes S, O'Flaherty M, Hawkins NM, Raine R, Capewell S. Recent UK Trends in the Unequal Burden of Coronary Heart Disease. *Heart*. 2012;98:1573-1582. doi: 10.1136/heartjnl-2012-302435
15. Barton P, Andronis L. Prevention of Cardiovascular Disease at Population Level: Modelling Strategies for Primary Prevention of Cardiovascular Disease. London: National Institute for Health and Clinical Excellence, 2010.
16. O'Flaherty M, Flores-Mateos G, Nnoaham K, et al. Potential cardiovascular mortality reductions with stricter food policies in the United Kingdom *WHO Bulletin* 2012. 2012;90:522e531.
17. Capewell S, O'Flaherty M. Rapid mortality falls after risk-factor changes in populations. *Lancet* 2011;378:752e3.
18. National Institute for Health and Care Excellence. Prevention of Cardiovascular Disease: Evidence Update January 2014 <https://www.evidence.nhs.uk/evidence-update-50> (Accessed June 2014)

Tuberculosis

FEW DISEASES POSSESS SUCH SAD INTEREST FOR HUMANITY AS CONSUMPTION [TB], BOTH ON ACCOUNT OF ITS WIDESPREAD PREVALENCE AND IT DESTRUCTIVE EFFECTS, PARTICULARLY AMONG THE YOUNG.

DR J O AFFLECK, UNIVERSITY OF EDINBURGH, SCOTLAND (1885)

Introduction

Much like heart disease tuberculosis (TB) has plagued humans since ancient times and has had a variety of names through the ages including phthisis pulmonaris, the white plague and consumption. Tuberculosis is caused by the tubercle bacillus *Mycobacterium tuberculosis*, these bacteria are slow growing and can survive in the body for many years in a dormant or inactive state whereby people are infected but show no signs of TB disease. When the bacilli are awake and dividing people are said to have 'active TB'. During the 18th century it was known as the white plague due to the extreme pallor in those infected while in the 19th and early 20th centuries it was more commonly known as consumption because of severe weight loss as the disease appeared to "consume" those infected¹.

TB reached near epidemic proportions during the 18th and 19th centuries, largely due to the rapidly urbanising and industrialising societies of Europe, with high mortality rates even among the prominent; the poet John Keats and all three of the Brontë sisters (Charlotte, Emily and Anne) are all thought to have died of TB². Robert Koch isolated the *Mycobacterium tuberculosis* bacteria in 1882 paving the way for greater understanding of the organism which spreads via the droplets coughed and sneezed out of the throat and lungs of people with the active disease. In 1913, it became a legal requirement to notify of cases of the disease and, by the mid-1930s over 50,000 cases of TB were diagnosed each year (figure 6).

THE PUBLIC HEALTH IMPORTANCE

Tuberculosis is a disease of immense public health importance. It is the leading cause of death among curable infectious diseases and was declared a global emergency in 1993.

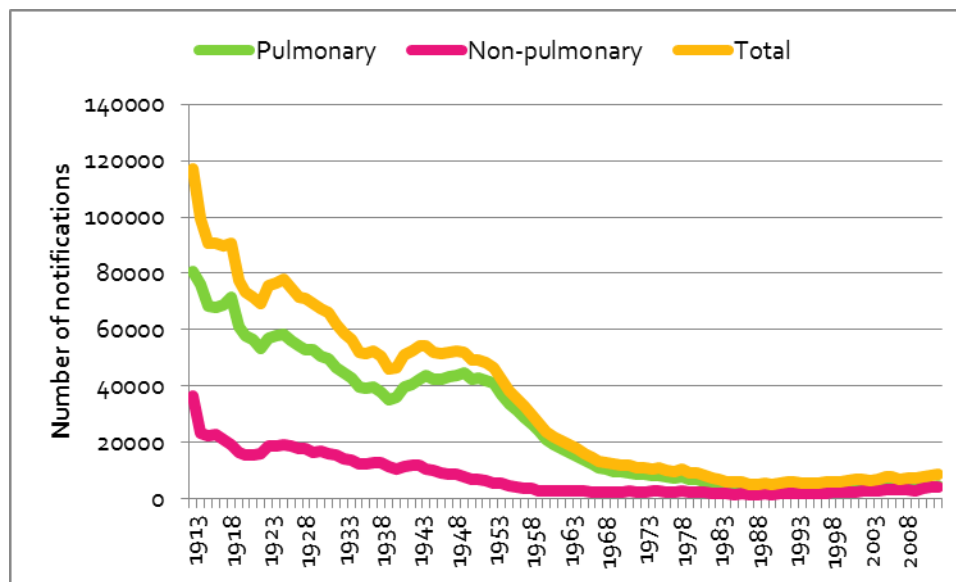
TB can affect any part of the body but is most common in the lungs and lymph glands. The disease develops slowly in the body, and it usually takes several months for symptoms to appear.

Around 9000 cases of TB are currently reported each year in the United Kingdom with most cases occurring in major cities, particularly in London.

The rate in Barnet is lower than the London average, while the rate in Harrow is significantly higher than the London average.

By 1921, a temporary reprieve was issued in the form of the BCG vaccine developed by Albert Calmette and Camille Guérin, leading to large numbers of children being vaccinated following World War I. Prior to the advent of penicillin, TB was so deeply feared that patients were sent to remote sanatoria where they were nursed for years while the defensive properties of their bodies dealt with the disease. Some recovered, and although they still carried the disease, they were healthy enough to work and survive. Many others were less fortunate, either dying from the disease or suffering from poor health for the rest of their lives. Since the 1940s, antibiotics have reduced the span of treatment from years to months and in 1952, a great advance was made when the antibiotic, Isoniazid, was found to work effectively against TB, fundamentally changing the prognosis of those infected, enabling those with TB to be effectively treated and cured of the disease.

FIGURE 6 TUBERCULOSIS NOTIFICATIONS BY SITE OF DISEASE, ENGLAND AND WALES 1913-2012



Source: *Statutory Notifications of Infectious Disease (NOIDs) 1913-1982; 2010-2012 Enhanced Tuberculosis Surveillance (ETS), Centre for Infectious Disease Surveillance and Control, Public Health England*

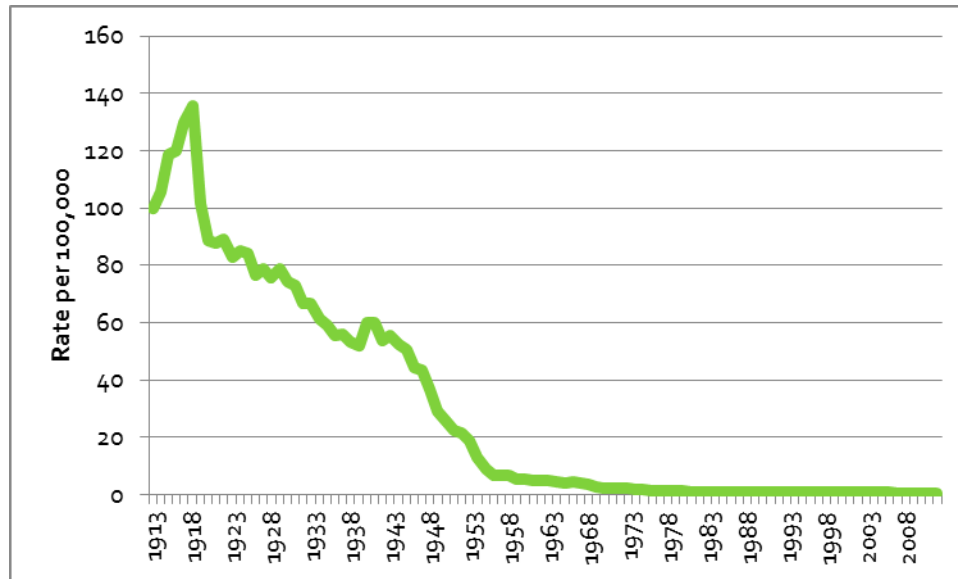
1964 - 2014

The Madras experiment in the early 1950s had provided the evidence that people with TB could be safely treated at home and so there was no need for sanatoria. TB sanatoria started closing or changing their remit in the 1960s as people were no longer sent away for treatment. The success of the new drugs meant that the mortality rate steadily declined (figure 7).

Other drugs were brought to market through the 1960s, by this time England was already seeing the health benefits of economic improvement, better sanitation, more widespread education, and particularly the

establishment of public health practice including specific measures for tuberculosis control. By the end of the 60's, TB was thought of as a disease of the past, poverty, and the developing world.

FIGURE 7 TUBERCULOSIS MORTALITY RATE, ENGLAND AND WALES, 1913 - 2012



Source: Centre for Infectious Disease Surveillance and Control, Public Health England

However, by the mid-1980s TB was making a resurgence. This in part was attributed to complacency due to the faith people had stored in the now standard TB drugs. There was also increased migration of people from nations where the disease was prevalent and by the late 1980s, the spread of HIV provided a new group of people at a high risk of catching TB.

Standard anti-TB drugs (isoniazid, rifampin, pyrazinamide and ethambutol) were used for decades but resistance to the medicines increased; the primary cause of resistance, inappropriate treatment. TB is not a quick fix disease. The nature of the bacteria means that some are killed by the medicines while others go dormant. People with TB need to take their medication for 6 to 12 months to make sure all of the disease is eradicated. However, people with TB often feel much better with a few weeks of starting treatment and may not appreciate the need to continue taking the tablets.

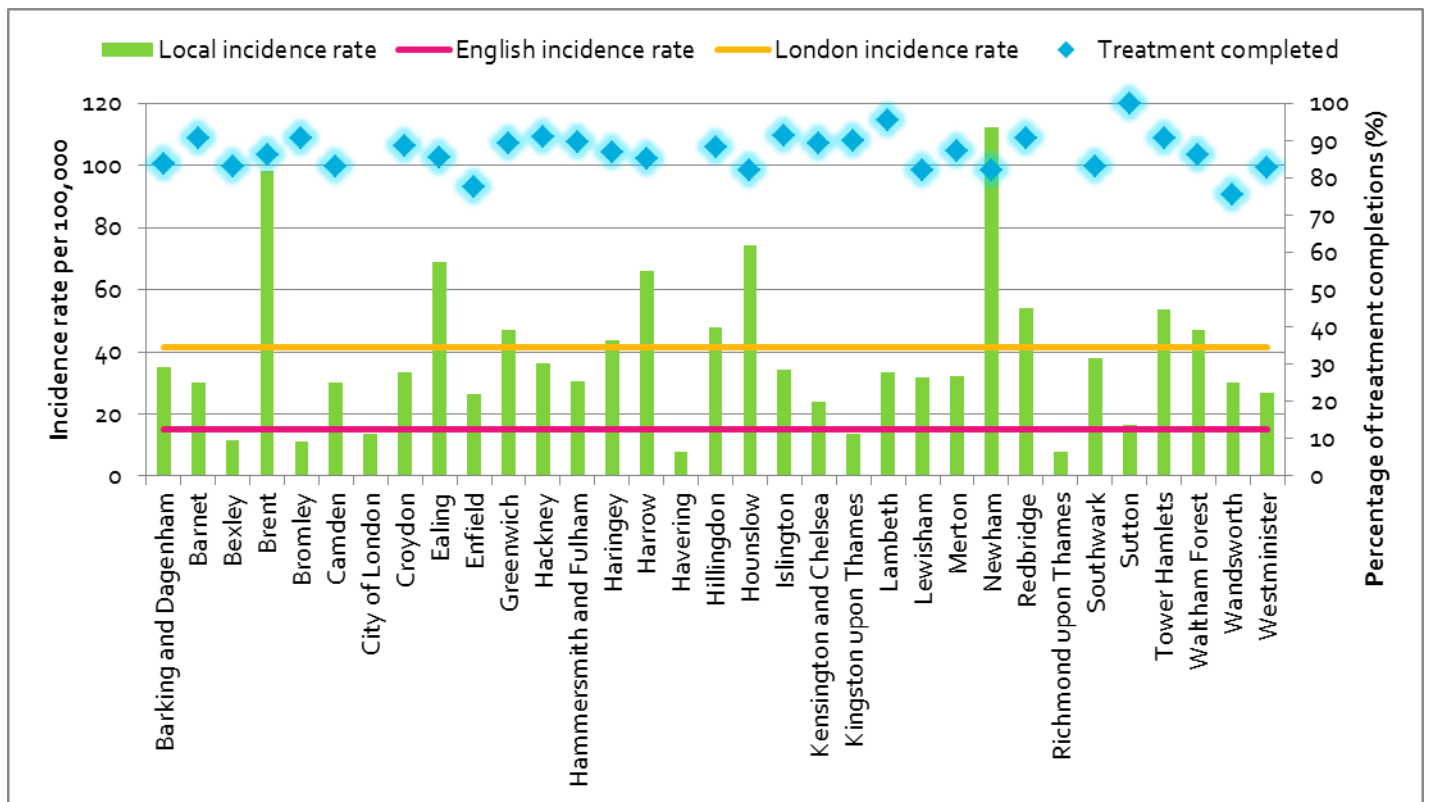
Disease strains that are resistant to a single anti-TB drug have now been documented in every country surveyed³. Multiple drug-resistant TB (MDR-TB) is a form of TB caused by bacteria that do not respond to isoniazid and rifampicin -- the two most powerful, first-line anti-TB drugs. MDR-TB is treatable and curable with the use of second-line drugs. However second-line treatment options are limited and the recommended medicines are not always available. The extensive antibiotic treatment required for MDR-TB (up to two years of treatment) is more costly and can produce severe adverse drug reactions in patients.

In some cases, more severe drug resistance can develop. Extensively drug-resistant TB (XDR-TB) is a form of MDR-TB that responds to even fewer available medicines, including the most effective second-line therapies. XDR-TB is resistant to the drugs classed as fluoroquinolones and at least one of three injectable second-line anti-TB medications (capreomycin, kanamycin or amikacin).

Whilst the goal had been to eliminate TB in the way that smallpox was eradicated in 1980s, success has been thwarted due to the challenges described above.

In 2010, there were 8,483 reported cases of tuberculosis (TB) in England – an incidence of 13.6 cases per 100,000 people, with 73% of cases among people born outside the UK. Almost two fifths (39%) were reported in London, a significantly higher proportion than any other UK region, consequently the region has been a focus of TB control.

FIGURE 8 INCIDENCE RATE OF TB, 2010-2012 AND PERCENTAGE OF PEOPLE COMPLETING TREATMENT*, 2012



Source: Public Health Outcomes Framework www.phoutcomes.info

* The percentage of people completing treatment for TB within 12 months prior to 31st December.

NB Data on the percentage of people completing treatment in the City of London, Havering and Richmond Upon Thames could not be calculated as the number of cases is too small.

The latest available data released by Public Health England (PHE) suggests that new TB notifications in London residents may have stabilised: in 2013 there were 3,020 new notifications compared with 3,426 in 2012. The overall TB rate for London was 36.3 per 100,000 people in 2013 down slightly from 41 per 100,000 people in 2012. The resurgence of TB in parts of the UK is associated with changing patterns in its determinants and distribution. In the last half century, the disease has moved from one occurring throughout the total population to one occurring predominantly in specific population subgroups⁴. TB rates remain stubbornly high in northwest and northeast London (figure 8) the rates of TB have remained twice the London average for over a decade⁵.

The TB rate in Barnet (30 per 100,000) remains slightly below the London average (41 per 100,000). Although patients were more often men a larger than usual proportion were made up of women aged 20-29 years. The majority of patients were born abroad: 16% were recent migrants (entered within the previous two years), while almost three in ten had been in the UK for more than ten years before diagnosis. Most patients were of Indian origin with the majority being born in India, the next most common group were those classified as “mixed/other”, reflecting individuals from a range of backgrounds. A third of patients in Barnet with pulmonary disease had a delay of more than three months before diagnosis and the levels of drug resistance in the borough were above the London average. Fewer patients had social risk factors, such as homelessness, imprisonment and drug and alcohol misuse, than elsewhere in London⁶.

The TB rate in Harrow has increased since 2004, and is one of the highest in London at 76 per 100,000, between 2011 (153) and 2012 (185) the numbers of cases increased by 21%. While the most common age group of diagnoses was 20-39 years, children aged less than ten were also diagnosed with TB. Almost all of the TB cases in Harrow were among those born abroad, 11% of whom had entered the UK within the previous two years however, the time since entry was not reported in 31% of cases. The majority of patients were of Indian ethnicity, mostly born in India, although some were from East Africa. Levels of drug resistance were similar to the London average, with very few patients having social risk factors. Treatment completion among patients with pulmonary TB was below the London average, in addition to this 8% of patients were lost to follow up, 10% died, among these patients TB caused or contributed to half of these deaths⁶.

What do we need to do now

TB was, and remains, a stigmatised disease — a disease of the poor. The disease and conditions of poverty are inter-related: one cannot be successfully addressed without the addressing the other. The high burden of TB is set against a background of national guidance, policy and recent reorganisation within the healthcare system. Implementation of some of these measures has contributed to stabilising the rate of TB but has failed to reverse the upward trend.

Improving Housing Conditions

Local authorities can work to reduce TB transmission by addressing some of the contributory social factors that fall within their remit: e.g. overcrowding, poor housing, homelessness, and access to healthcare. Making improvements across these areas will help to reduce inequalities and TB transmission and improve general health outcomes⁹.

Higher rates of disease are found in inner city areas, in communities with particular connections to higher-prevalence world regions, and in communities with high rates of homelessness and/or alcohol or substance misuse. This is because these factors and poverty are linked to conditions of overcrowding, poor ventilation, and poor nutrition, all of which provides fertile ground for the spread of TB. Both Harrow and Barnet have been identified as areas with the highest levels of fuel poverty in London, providing an exacerbation of all of the housing risk factors associated with TB. Since TB requires an airborne route for disease transmission, ensuring adequate ventilation and limiting close contact with people with active disease helps to eliminate the spread of TB to others⁷.

People with diagnosed TB need to be considered as a high priority group in terms of housing support needs. This group is at a high risk of not completing their treatment due to an erratic lifestyle. Housing teams should be invited to case reviews where necessary.

Identifying and Treating TB Effectively

Effective local implementation of detection and treatment strategies can reduce the burden of disease from both a human and economic standpoint, minimising the risk of on-going transmission. Improving and supporting the basic elements of TB control are crucial. Prompt identification of active cases of disease, supporting patients to successfully complete treatment, and preventing new cases of disease occurring are critical components of any actions to reduce the spread of this disease⁸. Active TB is relatively inexpensive and straightforward to treat and cure when identified early⁵.

The Clinical Commissioning Group (CCG), as commissioners of treatment services, need to ensure that the services are adequate for the local burden of disease. Rapid access clinics; enhanced case management; effective and comprehensive contact tracing; and supported housing for those with erratic lifestyles who are in treatment are all important elements of an effective TB service.

Reducing barriers to diagnosis and treatment and supporting people to complete their medication regimen will help to ensure that this disease is conquered in the coming half century.

Latent TB

Having a high treatment completion rate for people with TB is good but that is not sufficient to break the cycle. Steps must be taken to identify people with latent TB to ensure that they receive the antibiotics necessary to prevent their latent disease converting to active disease. Application of national guidance has been inconsistent in some parts of London and there is no systematic approach to detecting and treating latent

TB⁵. PHE are currently running a test programme in Harrow to identify latent disease. The results of this pilot will not be known for some months.

Raising Awareness of TB

Raising awareness in the community is vital. There are a few key messages to get across that will go a long way to reducing the social stigma associated with this disease: While the main message is that TB is preventable, treatable and curable. We also need to ensure that people know about the symptoms of TB – especially if they are visiting or being visited by someone from a high prevalence country; that they should seek treatment as early as possible to prevent onward transmission to their family and friends; that treatment takes a long time – 6 months or more – to be completely effective.

The conditions prevalent in many less developed countries and the rise in the number of people living with compromised immune systems has given rise to a situation where this disease, after thousands of years, remains a global public health problem. Additionally, the rapid increase in international travel has enabled people to travel widely, helping to spread the disease. Public health and medical science have come a long way in understanding and treating this disease in the past five decades but in order to eliminate the disease from our history we need to ensure it is controlled in both developed and developing nations.

References

1. Daniel TM. The history of tuberculosis. *Respiratory Medicine* 2006 100;1862-1870. doi:10.1016/j.rmed.2006.08.006
2. Encyclopedia Britannica. Tuberculosis (TB) Available from <http://www.britannica.com/EBchecked/topic/608235/tuberculosis-TB/253299/Tuberculosis-through-history> (Accessed June 2014).
3. World Health Organization. Tuberculosis. Factsheet No 104. Available from <http://www.who.int/mediacentre/factsheets/who104/en/print.html> Accessed June 2014
4. Public Health England. Tuberculosis in the UK: Annual Report on Tuberculosis Surveillance in the UK. August 2013. Available from http://www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1317139689583 (Accessed July 2014)
5. London TB Service Specification 2013/14. November 2013
6. Public Health England. Appendix D: Local authority TB profiles (2012 data): Barking & Dagenham to Havering. Available from http://www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1317140109940 (Accessed June 2014)
7. National Institute of Allergy and Infectious Diseases. Tuberculosis. Available from <http://www.niaid.nih.gov/topics/tuberculosis/understanding/pages/prevention.aspx> (Accessed January 2014)

8. Public Health England. Tuberculosis in London: Annual Review (2012 data): Data from 1999 to 2012. Available from http://www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1317140109893 (Accessed February 2014)
9. NICE Local Government Briefing. Tuberculosis in Vulnerable Groups. What Local Authorities can achieve. September 2013. Available from <http://publications.nice.org.uk/tuberculosis-in-vulnerable-groups-lgb11/what-can-local-authorities-achieve-by-tackling-tb-in-vulnerable-groups> (Accessed March 2014)

Sexually Transmitted Infections

THERE WERE THOSE WHO SAID THE ADVERTS INCREASED FEAR MORE THAN UNDERSTANDING. I THINK THEY DID BOTH. THEY STOPPED A LOT OF PEOPLE FROM HAVING SEX AT ALL FOR QUITE SOME TIME, BUT ONE UPSIDE WAS THAT THEY GOT EVERYBODY TALKING ABOUT SEX AND SAFER SEX
LORD FOWLER, HEALTH AND SOCIAL SECURITY SECRETARY, 1987

Introduction

For an activity that ensures the continuation of the human race, sex can be risky business. The intimate nature of contact provides the ideal opportunity for the spread of a number and range of organisms. Prior to the advent of modern medicine, the population's lack of awareness and understanding of sexually transmitted infections (STIs) contributed to its widespread transmission while few or no treatments were available to treat the conditions.

During the medieval period, syphilis and gonorrhoea were two of the most prevalent venereal diseases (VD) in Europe. The appearance of syphilis in Europe at the end of the 1400s heralded decades of death as the disease ravaged the continent. The first well recorded European outbreak of syphilis occurred in 1494 among French troops besieging Naples. From there it swept across Europe, killing more than five million people¹. Huge primary ulcers, violent bone pains, headaches and impaired vision all came in rapid succession and often proved fatal in a short time as there was no effective treatment. By the 18th and 19th centuries, mercury, arsenic and sulphur were commonly used as VD treatments: all of which had distressing side effects and were of limited effectiveness.

THE PUBLIC HEALTH IMPORTANCE

STIs are a major public health concern. This is because they place a significant burden on healthcare resources both directly, through individuals seeking treatment and care, and indirectly, resulting from management of the complications of untreated infections which can lead to infertility, cervical cancer and ectopic pregnancy. STIs also increase the likelihood of HIV transmission.

The distribution of STIs in the population is highly uneven, as they disproportionately affect men who have sex with men, young people aged under 25 years and some ethnic minorities.

The epidemiology of STIs in the UK has shown remarkable changes over the 20th and early 21st centuries, reflecting changes in sexual behaviour, new diagnostic techniques, changes in sexual health service delivery and the implementation of control programmes, in a context of social, economic and demographic shifts within society.

Founded in 1746, London Lock hospital was the first voluntary hospital for venereal diseases. These hospitals survived well into the twentieth century and played a role in the development of the departments of the Genito-Urinary Medicine (GUM) that exist today².

Venereal disease went hand in hand with considerable social stigma. Such was the shame, many sufferers hid their symptoms, while others carrying asymptomatic disease went unawares. So by the 1800s VD was endemic, carried by up to 10% of men. The spread of VD was linked to extramarital sex and prostitution. The first Contagious Disease Act in 1864 allowed the compulsory medical examination of any woman believed by police to be a prostitute. Its enforcement, in several towns where troops were stationed, was a direct response to the high levels of VD among troops during the Crimean War³.

In 1870, it was reported that a third of the outpatients attending St. Bartholomew's Hospital in London did so because of venereal disease². The Victorians, for whom all things related to sex were considered not fit for decent conversation, ensured that the conspiracy of silence was perpetuated. It was against this backdrop, that a few dedicated people strove in obscurity, and little if any encouragement, to understand these infections. Philippe Ricord demonstrated that syphilis and gonorrhoea were different diseases and described the various stages of syphilis. Albert Neisser isolated the organism responsible for gonorrhoea (*Neisseria gonorrhoeae*), while Fritz Schaudin and Eric Hoffman isolated the causative agent of syphilis, *Treponema pallidum* in 1905². The first proven cure for syphilis, Salvarsan, was developed in 1910 by Paul Ehrlich. It remained the standard treatment until the arrival of penicillin during the Second World War (1939-1945) despite its serious side effects.

The early years of the twentieth century saw an awaking of the social conscience. A Royal Commission in 1913 sought to address the problem of venereal diseases. After three years, innumerable witnesses, and many hours of deliberation, they reached some definite conclusions. The Venereal Diseases Act of 1917 defined exactly which conditions came within the meaning of the Act; directed borough councils to provide free and confidential treatment and imposed legal penalties on any who failed to maintain confidentiality²; said that only authorised persons were to treat such conditions and made it a criminal offence for others to do so; and it forbade the commercial advertising of any drug or preparation claiming to treat the named diseases. The act didn't make everything better. As is the case now; some local authorities performed better than others; some were very progressive and engaged skilled staff and provided excellent facilities, some appointed staff but then gave little or no support, while others took the view that anything was

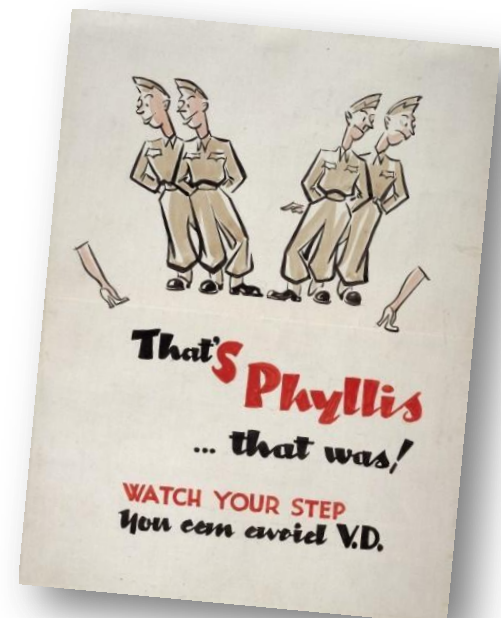
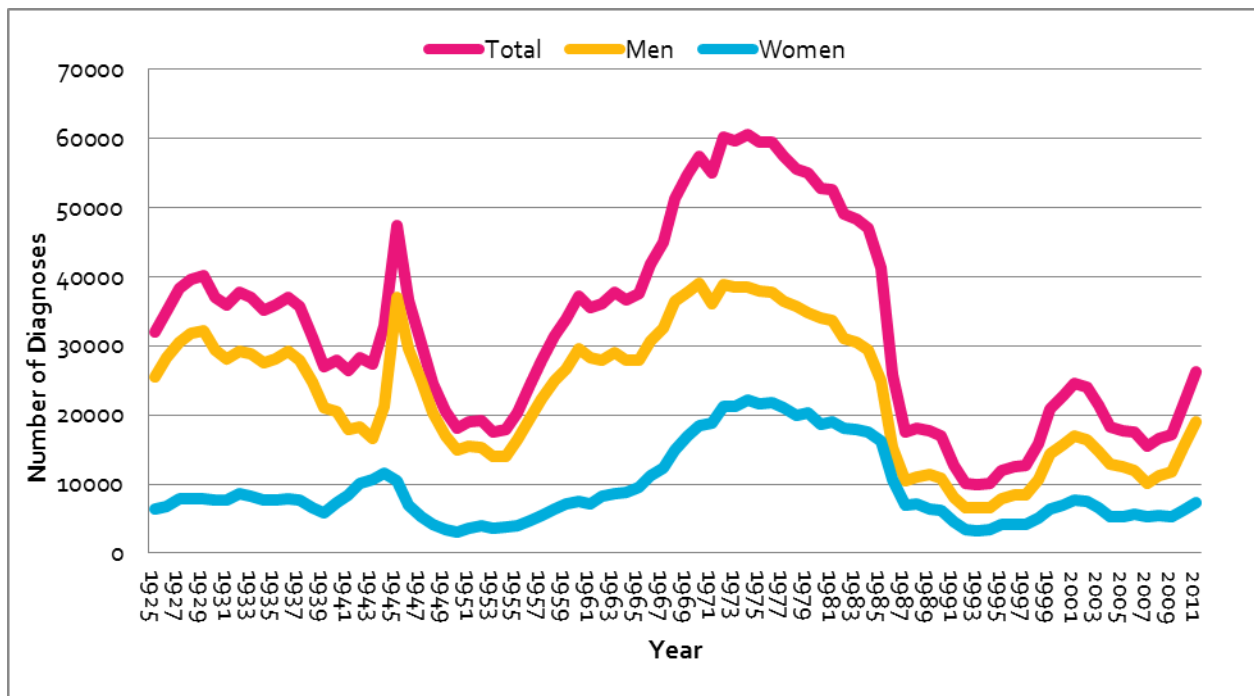


FIGURE 9 ANTI-VENEREAL DISEASE CAMPAIGN FOR ALLIED TROOPS IN ITALY 1943-1944

good enough for this sort of patient who ought to be grateful for the attic, basement or outhouse that was, not infrequently, offered.

Alongside laws, moral pressure remained key to fighting venereal disease. Few soldiers on active service in the 1900s were unaware of the possible physical and social consequences of sexual encounters, dangers that were often backed up with sickeningly graphic imagery. Not that it stopped them though. During the First World War (1914-1918) there were nearly half a million hospital admissions for venereal disease among British troops alone³. Every day thousands of men were unavailable for active service. This manpower wastage was not forgotten. During the Second World War preventative efforts intensified through films, lectures, posters, leaflets and greater availability of condoms (figure 9). Infection rates remained stubbornly high, but treatment times were drastically reduced with the arrival of penicillin⁴. Venereal disease cases even gained priority access to the drug if it meant a faster return to the front line. Diagnosis of syphilis and gonorrhoea in England, Scotland and Wales peaked in 1946, coinciding with the return of the armed forces after World War II¹. There was a sharp decline immediately thereafter, associated with the widespread availability of penicillin as well as the return to social stability (figure 10).

FIGURE 10 DIAGNOSES OF GONORRHOEA IN ENGLAND & WALES, 1925-2012



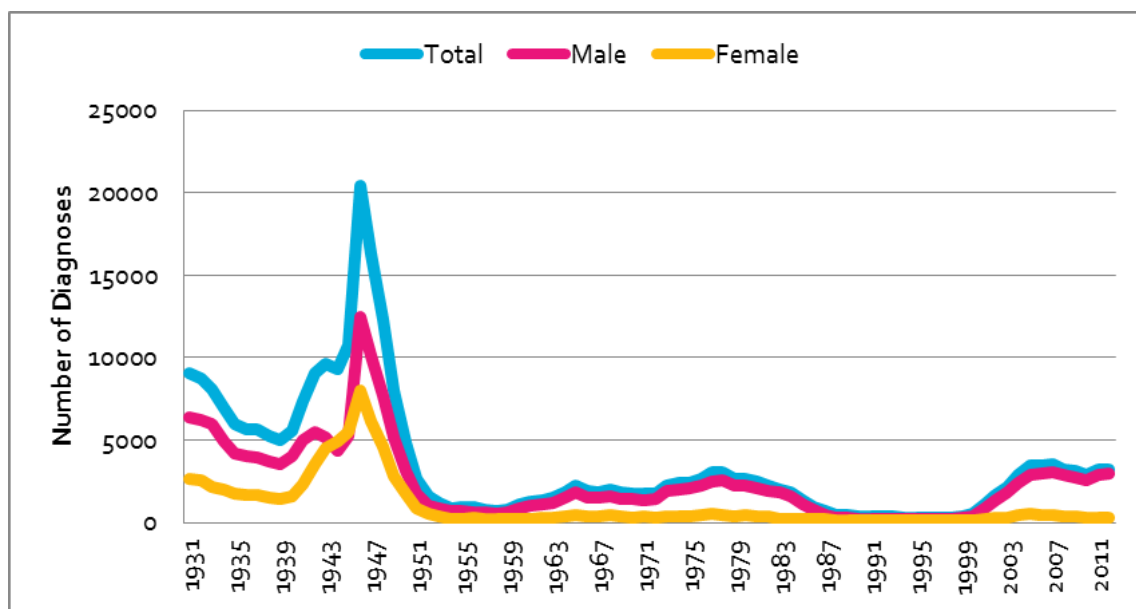
Source: Centre for Infectious Disease Surveillance and Control, Public Health England

1964 – 2014

The launch of the contraceptive pill played a major role in women's liberation and contributed to the sexual freedom of the so-called Swinging Sixties. Initially, the pill was only available to married women, but the law was relaxed in 1967. Between 1962 and 1969, the number of women taking the pill rises dramatically, from approximately 50,000 to 1 million. In addition, the use of penicillin and other antibiotics provided an effective cure of bacterial STIs leading the public to perceive these infections as less of a threat paving the way for more relaxed attitudes to sexual risk during the 1960s and 1970s.

Accordingly, there was a steady increase in diagnoses of STIs. Syphilis diagnoses in men increased, whereas the number of cases in women remained constant, suggesting that sex between men became the major route of acquisition of syphilis during this period (figure 11). However, diagnoses of gonorrhoea, and the viral STIs genital herpes and genital warts increased in both men and women, indicating that these infections were more commonly acquired through heterosexual sex. For some of these STIs, the increases may reflect greater public awareness and/or improved diagnostic sensitivity, in addition to increased incidence of infection⁴.

FIGURE 11 SYPHILIS (PRIMARY, SECONDARY AND EARLY LATENT) IN ENGLAND, WALES & SCOTLAND, 1931-2012



Source: Centre for Infectious Disease Surveillance and Control, Public Health England

When AIDS was first reported in America in 1981 it provoked reactions which echoed those that had accompanied syphilis for so long. That many of the earliest cases were among men who have sex with men created a climate of prejudice and moral panic. The emergence of HIV and AIDS in the early 1980s is now believed to have had a significant impact on the incidence of other acute STIs. Diagnoses of syphilis and gonorrhoea declined sharply in the early to mid-1980s, coinciding with extensive media coverage of AIDS,

national public health campaigns, and associated adoption of safer sex practices. Similarly, the number of diagnoses of genital herpes and genital warts, both of which had increased steadily since 1972, stabilised (and in the case of herpes, decreased briefly) during the mid-1980s. These changes are likely to be

associated with general population-level behavioural modification in response to the HIV/AIDS epidemic and in particular to the stark, unambiguous warnings of the world's first major government-sponsored national AIDS awareness campaign, and arguably the most successful (figure 12).

By the mid to late 1990s there was resurgence in diagnoses of many STIs, and the annual number of reported cases increased considerably from 1995: Complacency had once again set in, people infected with HIV were living longer and scientists were working



FIGURE 12 NATIONAL BILLBOARD ANTI-AIDS CAMPAIGN POSTER IN LONDON (CIRCA 1987)

hard on finding a cure.

In the last decade reported cases of many STIs have continued to increase. Almost half a million STIs are now diagnosed in the UK each year although much of this rise is associated with improved diagnosis, unsafe sexual behaviour is likely to be contributing in certain population groups since men who have sex with men, young people aged less than 25 years, and some ethnic minorities are disproportionately affected.

The patterns of maintenance and spread of STIs within populations differ for each type of STI, as they are influenced by multiple factors including individual susceptibility to infection, the likelihood of transmission, the capacity of the bacteria or viruses to cause disease and the duration of infection. Gonorrhoea has a high probability of transmission at each sex act but a low duration of infectiousness, and can only persist in population groups with more dense sexual networks and high rates of partner change, or where there is particularly poor access to treatment. At the other end of the spectrum, genital herpes simplex virus has a low probability of transmission at each sex act; however, because it is incurable and its infectiousness life-long, it can be maintained in populations with lower rates of partner change by multiple sex acts with the same partner⁵.

Since 1987, the number of new HIV diagnoses steadily increased to a peak of 7,844 in 2005. Current estimates suggest that there may be around 30,000 individuals in the UK who are unaware that they have HIV³. Presentation of HIV infections at a late stage of infection for treatment and care can considerably reduce the effectiveness of treatment and an individual's life expectancy. Although recent years have seen a small decrease in new infections each year, HIV rates in gay and bisexual men continue to remain at

worryingly high levels. In 2010, there were 3,080 new infections diagnosed in MSM – the highest ever annual total in this group.

London has the highest rates of acute STIs in England, 66% higher than England as a whole⁶. In 2012, nearly 110,000 (109,672) people were diagnosed with acute STIs. This represents a rate of 1,336.7 diagnoses per 100,000 adults compared with rate of 803.7 per 100,000 as the England average. There was a 5% rise in acute STI diagnoses in London GUM clinics in 2012 compared to 2011 and a 16% rise compared to 2003.

In Harrow, the acute STI rate was 1,529 per 100,000 in 2012 which was significantly higher than the England rate but lower than the London rate. The acute STI rate in Barnet in 2012 was 801.9 per 100,000 which is significantly lower than Harrow, London and slightly lower than England.

In 2013, rates of syphilis in London (19.8 per 100,000) were 70% higher than England (5.9 per 100,000), gonorrhoea rates were 66% higher (155.4 compared with 52.9 per 100,000), rates of genital warts were 19% higher (163.9 compared with 133.4 per 100,000) and there was a 35% difference in genital herpes (89.9 compared with 58.8 per 100,000).

Chlamydia is the most commonly diagnosed bacterial STI in the UK and is extremely widespread. Prevalence is highest in young adults aged less than 25 years and ranges from between 2% and 3% in the general population to between 9% and 10% in those attending healthcare settings for chlamydia screening. The risk of Chlamydia infection is linked to having unprotected sex and a higher number of sexual partnerships. Most infections are asymptomatic, and as a result may go untreated. Untreated infections can have serious health implications, including pelvic inflammatory disease (PID), infertility and ectopic pregnancy.

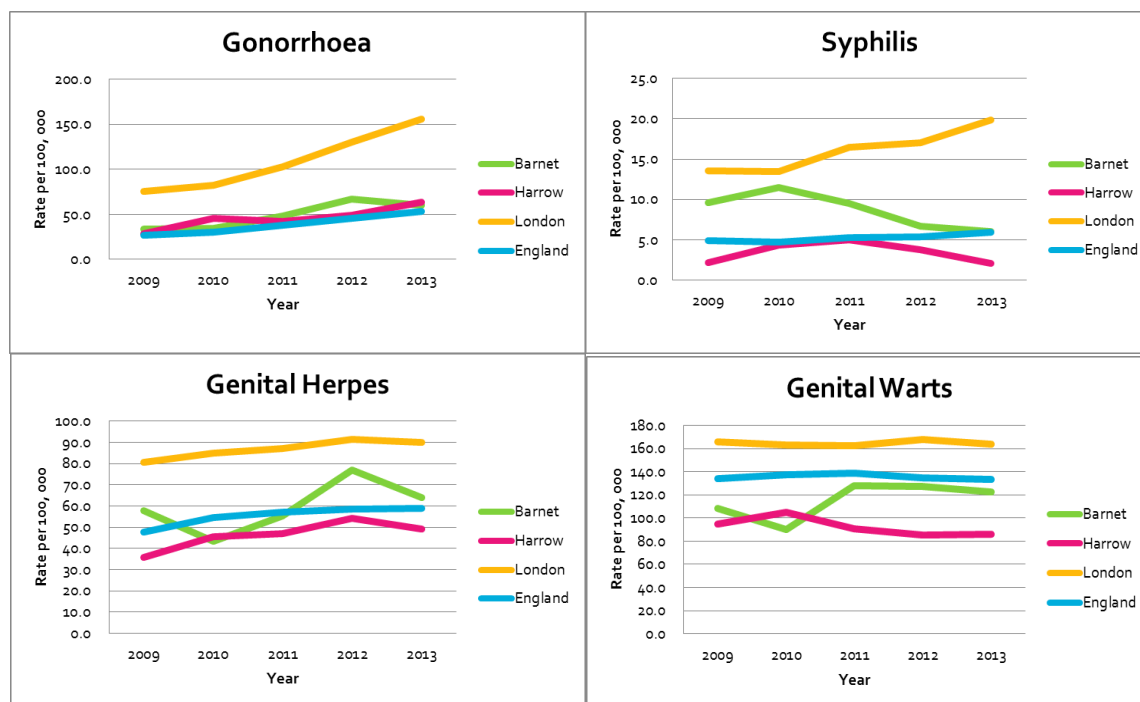
In 2013, the rate of chlamydia diagnosis among 15-24 year olds in both Barnet (1098 per 100,000) and Harrow (1087 per 100,000) was significantly lower than the rate in England (2016 per 100,000). The proportion of people screened within this age group was also significantly lower in both boroughs (16.0% in Barnet and 14.7% in Harrow) when compared to the England average (24.9%). PHE recommends that local areas should be working towards achieving a chlamydia diagnosis rate of at least 2,300 per 100,000 among young people (aged 15 to 24 years).

In 2013, the rates of syphilis, gonorrhoea, genital warts and herpes in Barnet were similar to the England average, while in Harrow the rates of syphilis and the viral infections (warts and herpes) were significantly better than England but the rate of gonorrhoea was significantly worse. Over the previous five years rates of these infections have remained consistently lower than the regional average (figure 13).

In 2013, HIV testing uptake among men who have sex with men (97.4%), women (86.0%) and heterosexual men (92.2%) in Barnet was significantly higher than the in England (94.8%, 75.8% and 84.9% respectively). In Harrow, uptake among men who have sex with men (96.2%) were similar to the England while the rates among men (90.8%) and women (86.0%) significantly higher. The proportion of people presenting with HIV at a late stage of infection for the period 2010-2012 can be seen in figure 14, there are issues with late

presentation in both boroughs; Harrow is in the top five and Barnet is in the top 10 of London boroughs with the highest proportion of adults who present late for HIV diagnosis and care.

FIGURE 13 SELECTED RATES OF SEXUALLY TRANSMITTED INFECTIONS DIAGNOSED IN BARNET HARROW, LONDON AND ENGLAND, 2009-2013



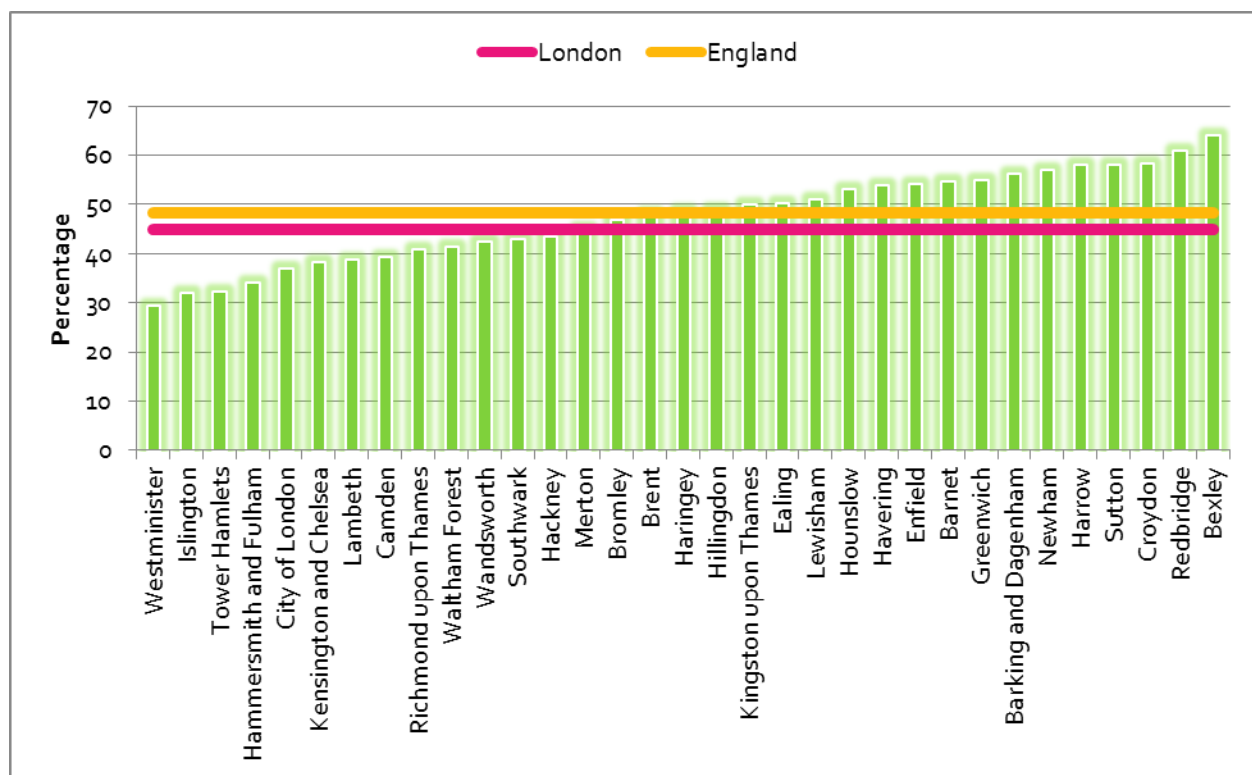
Source: Centre for Infectious Disease Surveillance and Control and Sexual and Reproductive Health profiles (<http://fingertips.phe.org.uk/profile/sexualhealth>), Public Health England

In areas with a high prevalence of diagnosed HIV infection (>2 per 1,000 population aged 15-59 years) UK national guidelines recommend expanding HIV testing among people admitted to hospital and new registrants to general practice⁷. In 2012, 64 of 326 (20%) local authorities (LAs) in England had a diagnosed prevalence above this threshold. And in London all but one of the 33 LAs had prevalence above this threshold. In 2013, the prevalence of diagnosed HIV infection among 15-59 years olds in Barnet was 3.00 per 1,000, while in Harrow it was 2.21 per 1,000.

A synthesis from eight testing pilot projects undertaken in hospital services and general practices across England demonstrated that the offer and recommendation of a routine HIV test was both feasible and acceptable to patients and staff⁸. In June 2012, an audit was undertaken among 40 sexual health commissioners for areas with higher diagnosed HIV prevalence. Findings indicated that 31% (11/35) had commissioned HIV testing for some new patient registrations in general practice, but only 14% (5/35) had commissioned routine HIV testing as part of general medical admissions to hospitals⁹.

A lot of attention is paid to sexually transmitted infections among young people; however there is increasing evidence that reminds us that sexual risk taking behavior is not just the preserve of the young. A cross sectional study showed that more than 80% of 50-90 year olds are sexually active with cases of sexually transmitted infections more than doubling in this age group in the past 10 years¹⁰. A 2008 study provided evidence of significant increases in attendance at GUM clinics among those aged 45 years and over¹¹. In a 2012 report from the HPA on HIV in the United Kingdom showed that 20% of adults accessing HIV care are older than 50, up from 11% in 2001. This is in part because of prolonged survival; however, new diagnoses in over 50s, doubled between 2000 and 2009 to account for 13% of the total.

FIGURE 14 PERCENTAGE OF ADULTS (AGED 15 OR ABOVE) NEWLY DIAGNOSED WITH HIV AND A CD4 CELL COUNT LESS THAN 350 MM³, 2010-2012



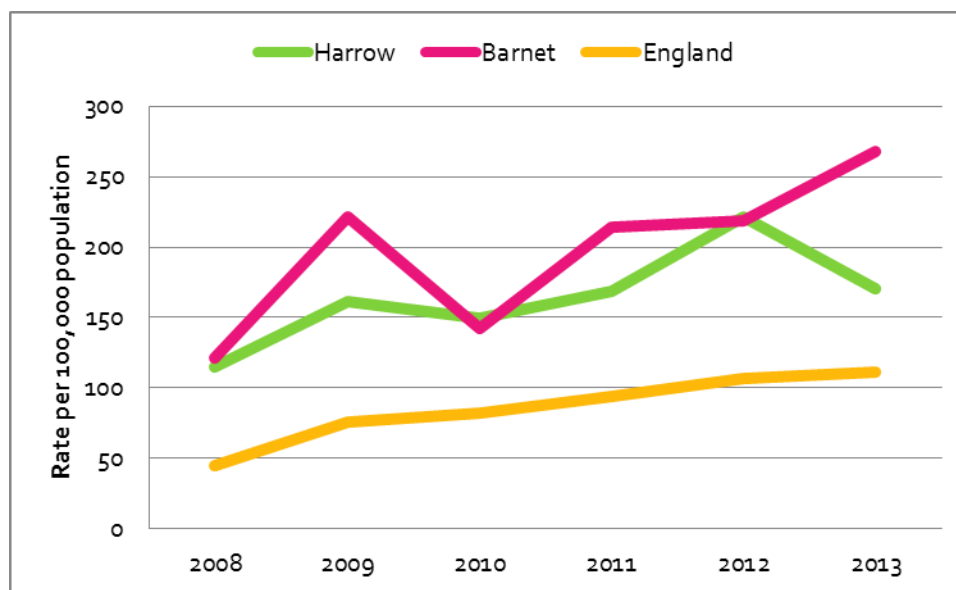
Source: Sexual and Reproductive Health Profiles, Public Health England <http://fingertips.phe.org.uk/profile/sexualhealth>

Since 2008, the rate of all STIs among over 45 – 64 year olds in Barnet and Harrow has consistently exceeded the England average. There was a 33% increase in the diagnosed rate among residents of Harrow and a 55% increase and clear upward trajectory among Barnet residents (figure 15).

One of the reasons for this increase in sexually transmitted infections in this age group may be the increased popularity of erectile dysfunction drugs that have made sex possible for millions of aging men. It could also possibly be the determination of baby boomers who ushered in the sexual revolution, to stay sexually active as they age. Or the low rate of condom use among older couples, who no longer worry about pregnancy and

may not think that they are at risk for sexually transmitted infections. The contribution of any or all of these factors to the rising STI rate in this age group is not clear largely because very few researchers have studied the issue in this population.

FIGURE 15 RATE OF ALL SEXUALLY TRANSMITTED INFECTIONS AMONG 45-64 YEAR OLDS, BARNET, HARROW AND ENGLAND



Source: Centre for Infectious Disease Surveillance and Control, Public Health England

There are a number of different factors which influence relationships and the practice of safer sex. These include, personal attitudes and beliefs, social norms, peer pressure, religious beliefs, culture, confidence and self-esteem, the misuse of drugs and alcohol and coercion and abuse. The third National Survey of Sexual Attitudes and Lifestyles (Natsal-3) was carried out in Britain between September 2010 and August 2012 (the first survey was undertaken in 1990-1991 and the second survey in 1999-2001). Over the 1990s the survey saw an increase in the average number of opposite-sex partners people reported, and more people reporting same-sex experience. Over the last decade the gender gap narrowed. The survey found further increases in the average number of opposite-sex partners increased for women only. Twenty nine percent of women and 31% of men aged 16-24 years at interview had reported having sexual intercourse with someone of the opposite sex before the age of 16 compare to 4% women and 15% of men aged 65-74 years at interview, highlight how dramatically the age at first intercourse has changed over the last 50 years¹².

Significant progress has already been made in improving sexual health at the national level – access to GUM services has improved by promoting rapid access to accessible services, high rates of coverage for antenatal screening for HIV, syphilis and hepatitis B have led to extremely low rates of mother-to-child transmission of HIV and congenital syphilis¹³, access to services has been improved through the expansion and integration of service delivery outside of specialist services, particularly in the community and general practice,

developments in diagnostic tests for STIs and HIV have increased screening outside of GUM clinics¹⁴ – but there is more that could be done as demonstrated by the following statistics:

- Almost half of adults newly diagnosed with HIV were diagnosed after the point of which they should have started treatment¹⁵
- Rates of infectious syphilis are at their highest since the 1950s¹⁶
- Gonorrhoea is becoming more difficult to treat, as it can quickly develop resistance to antibiotics¹⁷
- In England during 2011, one person was diagnosed with HIV every 90 minutes¹⁵
- In 2010, England was in the bottom third of 43 countries in the World Health Organization's European Region for condom use among sexually active young people; previously, England was in the top ten¹⁸

What do we need to do now

The control of STIs is rooted in decreasing the average number of secondary cases that an infected person will generate in a population. This can be achieved by reducing the duration of infectiousness of an affected individual, through early testing, reducing the number of susceptible individuals, through vaccination, and reducing the transmission of infections, through the rate of sexual partner change¹⁹. Effective local interventions can have a significant influence on the transmission of infections and therefore the control of STIs and there is evidence to suggest that the spending on sexual health interventions and services is cost effective⁵.

Sex and Relationships Education in Schools

More can and should be done to prioritise prevention, this can be achieved by building knowledge and resilience among young people, building an open and honest culture where everyone is able to make informed and responsible choices about relationships and sex and recognising that sexual ill health can affect all parts of society, often when it is least expected. Good sex and relationships education in schools is important if we are to improve the health of the next generation. The programmes to reduce teenage pregnancies have had a big impact and we shouldn't lose this impetus.

Prevention campaigns

Raising awareness in the general population of good sexual health is important. Promoting safer sex is an important intervention that is cost effective. We need to work with colleagues in Public Health England to ensure that these messages get across to our local population.

Access to good quality services

We need to ensure that information about local services is available in a range of formats, and is widely available from a range of outlets. As the responsibility for commissioning sexual health services has now come to public health in local authorities, we need to ensure that we commission these services based on a robust

assessment of local need. Services should be available at times and in settings which are convenient for people and should offer rapid access. We also need to ensure that there are robust care pathways between sexual health services and all other relevant services, particularly alcohol and drug misuse services and services for the victims of sexual exploitation, violence and assault.

Early diagnosis of HIV

Identifying HIV infection early is both clinically and cost effective. Modern drug treatments give people with HIV a near normal life expectancy if started early. Treatment of patients with late diagnosed HIV is more expensive and associated with multiple difficult to treat infections often requiring specialised hospital treatment. GPs should be encouraged to offer HIV testing as a routine part of new patient registration and of course all new patients attending sexual health services should also be offered an HIV test. We also need to raise awareness in the community of the importance of HIV testing and reduce the stigma associated with it.

References

1. Oriel, J.D. *The Scars of Venus: A history of Venereology*. London: Springer-Verlag 1994
2. Plumb B. *Sexually Transmitted Disease: An Historical Retrospect*. Available from <http://www.evolve360.co.uk/Data/10/Docs/10/10Plumb.pdf> (Accessed July 2014)
3. Science Museum. *Brought to Life: Keeping it zipped: controlling sexually transmitted infections*. Available from <http://www.sciencemuseum.org.uk/broughttolife/themes/publichealth/sti.aspx> (Accessed July 2014)
4. Mandal A. *History of Sexually Transmitted Disease*. Available Online: <http://www.news-medical.net/health/History-of-Sexually-Transmitted-Disease.aspx>
5. Hughes G, Lowndes CM, "Epidemiology of sexually transmitted infections: UK *Medicine* 2014 Available from <http://dx.doi.org/10.1016/j.mpmed.2014.03.002>
6. Forde J, Sinclair C, Crook P, Mountford L *The epidemiology of sexually transmitted infections in London 2012 data*. Available from http://www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1317141171280 (Accessed July 2014)
7. British HIV Association, British Association for Sexual Health and HIV, British Infection Society. UK National Guidelines for HIV Testing 2008. London: British HIV Association; 2008
8. Health Protection Agency. *Time to Test for HIV: Review of expanded HIV testing in healthcare and community services in England*. London: Health Protection Agency 2011
9. Hartney T, Kennedy I, Crook P, Nardone A. Expanded HIV testing in high-prevalence areas in England: results of a 2012 audit of sexual health commissioners. *HIV Medicine* 2013doi:10.1111/hiv.12099
10. Von Simson R, Kulasegaram R. Sexual health and the older adult. *Student BMJ* 2012;20:e688

11. Bodley-Tickell AT, Olowokure B, Bhaduri S, White DJ, Ward D, Ross JDC, Smithe G, Duggal HV, Goold P on behalf of the West Midlands STI Surveillance Project. *Sexually Transmitted Infections* 2008;84:312-317. doi:10.1136/sti.2007.027847
12. Natsal. Sexual attitudes and lifestyle in Britain: Highlights from Natsal-3. Available from <http://www.natsal.ac.uk/media/823663/natsal%20infographic.pdf> (Accessed July 2014)
13. Health Protection Agency. Antenatal screening for infectious disease in England: summary report for 2011. *Health Protection Report* 2012;6(36)
14. Church K, Mayhew SH. Integration of STI and HIV prevention, care and treatment into family planning services: review of the literature. *Studies in Family Planning* 2009;40(3):171-186
15. Health Protection Agency. HIV in the United Kingdom: 2012 Report. Health Protection Agency: London
16. Health Protection Agency. Sexually Transmitted Infections in England 2011. Health Protection Agency: London
17. Health Protection Agency. GRASP Report 2011: The Gonococcal Resistance to Antimicrobial Surveillance Programme. 2012 Health Protection Agency: London
18. World Health Organization. Health Behaviour in School-Aged Children. 2012 World Health Organization: Geneva
19. de Souza-Thomas L. Gonorrhoea: Prevention, diagnosis and treatment. *British Journal of School Nursing* 2011;5(3):116-121

Tobacco Control

TOBACCO IS THE ONLY LAWFUL PRODUCT WHICH KILLS ITS CONSUMERS WHEN USED EXACTLY AS THE MANUFACTURERS INTEND. DESPITE OUR SUCCESS IN REDUCING SMOKING RATES, 80,000 PEOPLE IN ENGLAND ARE STILL DYING EVERY YEAR FROM SMOKING RELATED DISEASES, MORE THAN THE NEXT SIX CAUSES OF PREMATURE DEATH PUT TOGETHER **ACTION ON SMOKING AND HEALTH (ASH)**

Introduction

Tobacco has been used for more than 2,000 years but its history really begins with the arrival of Christopher Columbus in the Americas in 1492 when he was offered a dried leaf with a certain fragrance by the natives. The Spanish and Portuguese took the lead in the mass cultivation of tobacco for profit, which began in earnest in the 1530s and 40s and was made possible and economically viable through the forced labour of enslaved indigenous peoples and trafficked Africans. Sir Francis Drake brought it to England and introduced Sir Walter Raleigh to pipe smoking and he in turn introduced it to Queen Elizabeth I. At that time, tobacco was thought to have medicinal properties, curing everything from toothache to worms and halitosis to cancer.

Perhaps the earliest public health advocate was King James I of England. In 1605, his "counterblaste to Tobacco", said that smoking is a "*custome lothesome to the eye, hateful to the nose, harmful to the brain, dangerous to the lungs, and in the black and stinking fume thereof, nearest resembling the horrible stygian smoke of the pit that is bottomless*". He was the first to impose a heavy tax on tobacco. It is interesting to note that the Royal College of Physicians at that time dismissed the King's comments.

The earliest know advert for tobacco was in 1789 but tobacco advertising started in earnest in the late 19th century with the development of colour lithography and the inclusion of collectable tobacco cards. Adverts

THE PUBLIC HEALTH IMPORTANCE

Smokers under the age of 40 have a five times greater risk of a heart attack than non-smokers
Smoking causes

- around 80% of deaths from lung cancer,
- around 80% of deaths from bronchitis and emphysema, and
- about 17% of deaths from heart disease.

More than one quarter of all cancer deaths can be attributed to smoking. These include cancer of the lung, mouth, lip, throat, bladder, kidney, pancreas, stomach, liver and cervix.

On average, cigarette smokers die 10 years younger than non-smokers.

promoted health benefits and used celebrities and doctors to endorse their products. Marketing and advertising developed and by the end of the First World War advertising had become targeted at the new and untapped market – female smokers.

Tobacco took hold and by the early 1930s, the UK had the highest rates of male lung cancer in the world. In 1948, 82% of men and 41% of women were smokers. Although there were suggestions from some doctors that lung cancer was related to smoking in the late 19th and early 20th century, it was in 1951 that the first large-scale epidemiological study of the relationship between smoking and lung cancer was published by Richard Doll and Bradford Hill in the British Medical Journal. They interviewed 5,000 patients in British hospitals and found that of the 1,357 men with lung cancer, 99.5% were smokers.

1964-2014

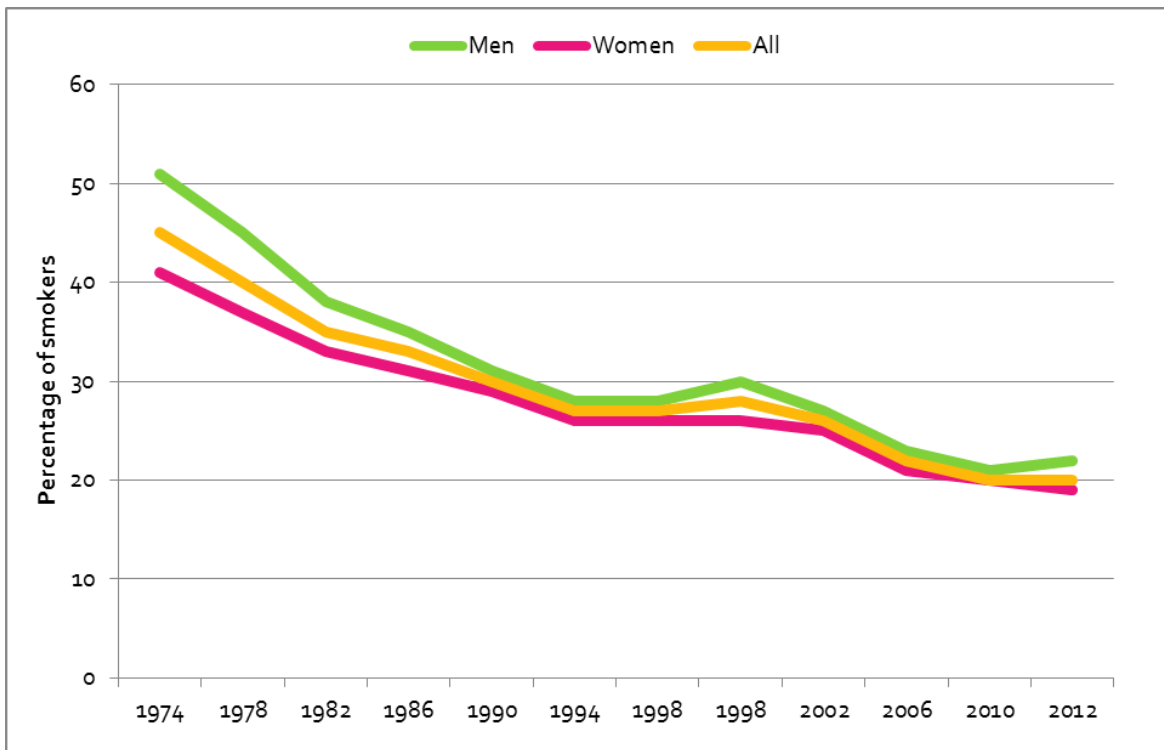
By the mid 1960s, the rates of smoking in men had dropped from their peak in 1948, but smoking rates in women continued to increase and peaked in the mid 1960's with 45% of the female population smoking. Cigarettes were pervasive throughout society, so much so that a popular brand of children's sweet in the 1960s included candy and chocolate cigarettes and "sweet tobacco", a coconut treat that looked like rolling tobacco. Tobacco companies sponsored television programmes in the USA and advertised their products during children's television programmes¹.

The first calls to restrict advertising came in 1962 from the Royal College of Physicians, who highlighted the health problems and recommended stricter laws on the sale and advertising of tobacco products.

In 1964, Doll and Hill published a report on the impact of giving up smoking. They followed a large cohort of doctors and found that the rates of lung cancer were far lower in those that had stopped smoking compared to those who continued. The 1st August 1965 saw the first advertising ban on cigarettes (although not cigars or loose tobacco) on UK television. Advertising was still allowed in other media.

In 1971, the first health warnings were added to all cigarette packaging as a result of an agreement between the government and the tobacco industry². These messages were basic and did not detract from the brand advertising significantly. Advertising through mediums other than television was still allowed, so there were film adverts in cinemas as well as those in print media and advertising hoardings.

FIGURE 16 SMOKING RATES 1974-2012



Source: Office for National Statistics

Also in 1971, a new survey was launched by the Office of Population Census and Surveys (now the Office for National Statistics). The General Household Survey asked people about their lives, their lifestyles and the way they lived. The survey reported in 1974 giving a robust picture of smoking in the population. It found that 51% of men and 41% of women smoked; that smoking varied by age, geographical area and socioeconomic status.

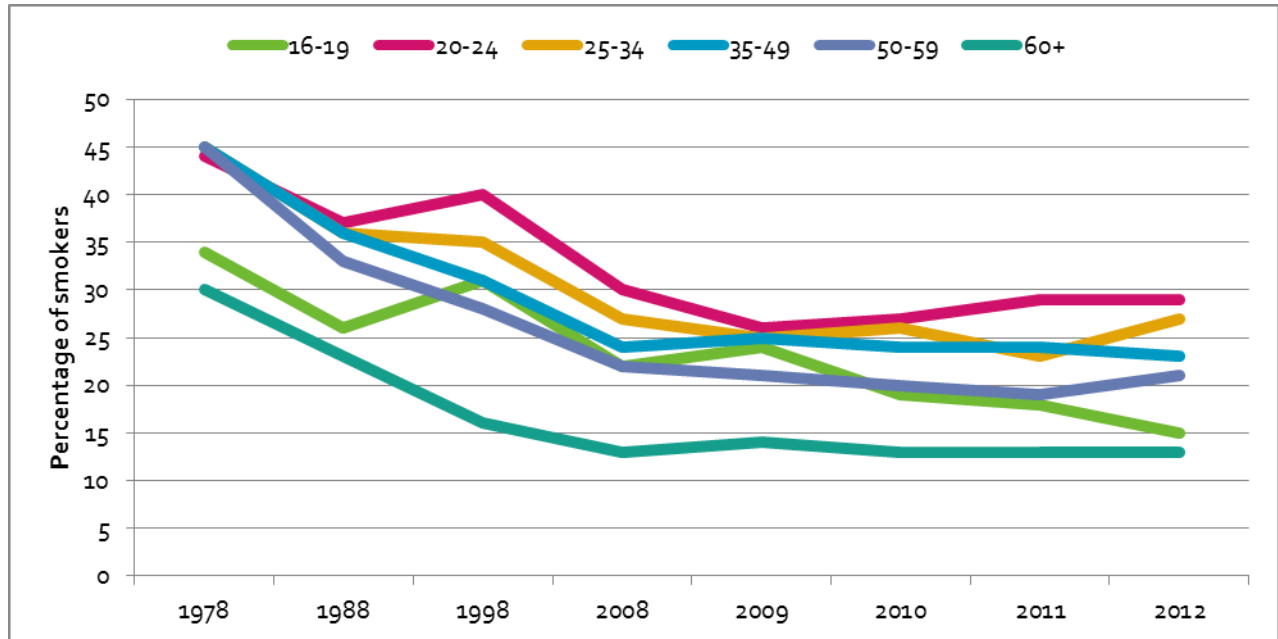
The campaigns to encourage people to stop smoking, which had been left to local activists, were brought together in the first national No Smoking Day on Ash Wednesday in 1983, when it was called “Quit for the day”. The campaign has been held annually and the materials and focus changes each year to help spur smokers into action.

In 1986, stricter guidelines on tobacco advertising were introduced which prohibited showing a person smoking in the advert. This resulted in more creative and abstract marketing campaigns that reinforced cigarette manufacturers brand identity. Sponsorship of sporting events was prominent and many small shops had signage and awnings sponsored by the tobacco industry.

Smoking rates were on the decline, particularly in men. In 1982, 38% of men smoked and by 1986 it was down to 35%. The decline in smoking among women was not as large as in men, with 33% smoking in 1982

and 31% by 1986 (figure 19). Rates of smoking varied with age and over time. People aged 60+ have the lowest rates and this is probably for two reasons – that the past smokers have either already died or have stopped due to smoking related diseases (figure 17).

FIGURE 17 SMOKING RATES BY AGE GROUP 1978-2012

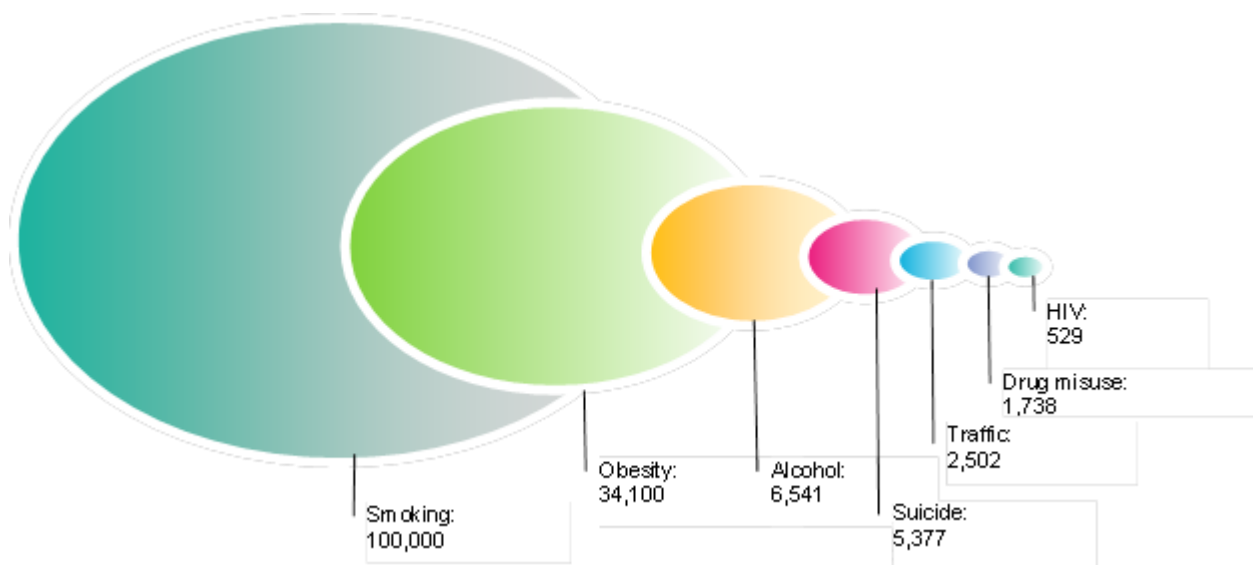


Source: Office for National Statistics

Smoking is the leading cause of preventable death and disease in the UK. About half of all life-long smokers will die prematurely, losing on average about 10 years of life. Smoking kills more people each year than the obesity, alcohol, suicide, road traffic accidents, the use of illegal drugs and HIV infection combined (figure 18).

The 1990s began with the implementation of the Television without Frontiers directive⁴ which banned television advertising of tobacco products across the European Union. This meant that there was finally a ban on TV advertising of cigars and loose tobacco in the UK - some 25 years after the ban on TV advertising of cigarettes.

FIGURE 18 DEATHS IN ENGLAND FROM EXTERNAL CAUSES



Source: ASH Factsheet on smoking statistics – illness and death

In 1997, the new Labour government pledged to ban all tobacco advertising. In December 1998 Smoking Kills – a White Paper on tobacco was released, which included targets for reducing the prevalence of cigarette smoking among adults in England to 24% by 2010.

The Tobacco Advertising and Promotion Act was introduced in 2002. Over the following years, a ban on tobacco advertising was phased in. General tobacco advertising was banned in February 2003 and promotional events, excluding sports, were banned in May of the same year. Sponsorship of sporting events in the UK was banned in July 2003 but non-UK based events, like F1 racing were still sponsored by the tobacco industry. To get around the ban, brand-sharing identities were used in UK events – i.e. using the colours and patterns associated with the tobacco brands.

In 2003, the European Union halted the branding of cigarettes as "light" or "mild", saying that this misleads consumers about the dangers of smoking. Stark health warnings such as "Smoking Kills" that cover at least 30 percent of the front of each packet and 40 percent of the back were introduced. In countries with more than one national language the messages have to cover an even greater area. The EU Television without Frontiers advertising ban was extended by the Tobacco Advertising Directive, which took effect in July 2005. This extended the ban on tobacco advertising to cover other forms of media such as the internet, print media, radio, and sports events like F1.

In 2004, the Department of Health (DH) approved a Public Service Agreement (PSA) which revised the target set in 1998 downwards with an aim to reduce the prevalence of cigarette smoking among adults in England to 21% or less by 2010.

In addition to the national No Smoking day campaigns, other campaigns have taken place to encourage people to quit with themes including the impact of smoking on arteries and on the addictive nature of smoking amongst others (figure 19).

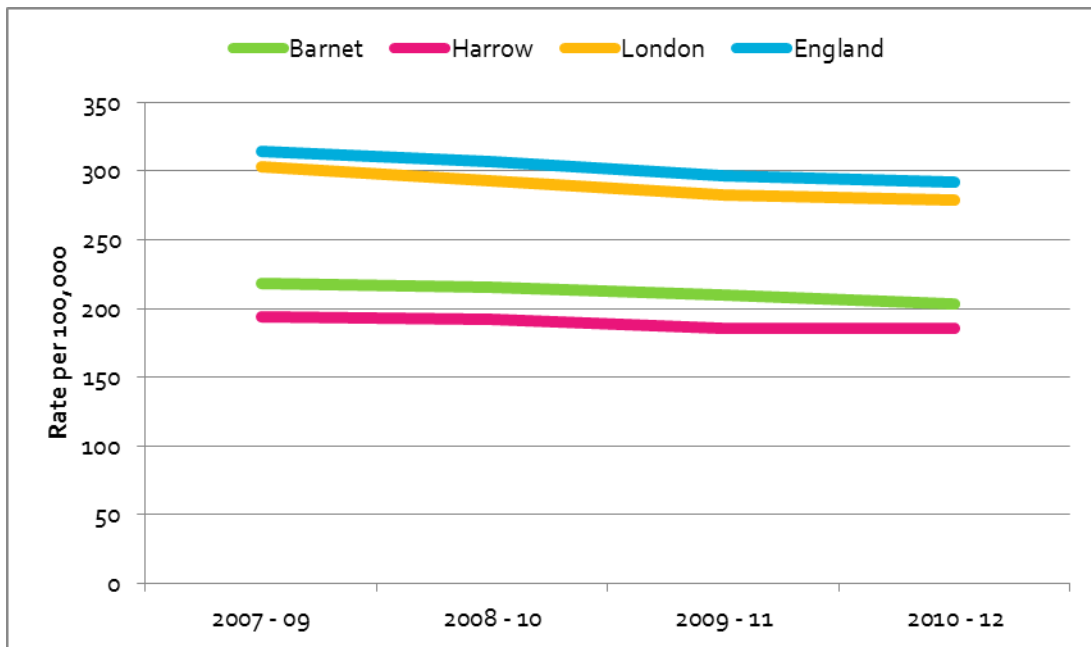
Perhaps the biggest impact on smoking in recent years has been as a result of the Smokefree law which came into effect in 2007 as part of the Health Act 2006. Smoking is no longer permitted in enclosed and “substantially enclosed” workplaces, as well as in work vehicles if they are used by more than one

person at any time. The law also applies to all public places that are fully enclosed or “substantially enclosed” and all forms of public transport. In 2010, the white paper *Healthy Lives, Healthy People* set out the Government’s long term policy for improving public health and in 2011 a new Tobacco Control Plan was published. The plan sets out national ambitions to reduce smoking prevalence in England.



FIGURE 19 GRAPHIC IMAGERY OF THE ADDICTIVE NATURE OF CIGARETTES, NHS CAMPAIGN

FIGURE 20 RECENT TRENDS IN DEATHS DUE TO SMOKING, 2007/09 – 2010/12



Source: *Tobacco Profiles, Public Health England*

Prior to October 2011, cigarette vending machines were still allowed in licensed premises but were only allowed to display a picture of what was available (one image per brand) and no advertisements could be

included on the machine. Cigarette vending machines were banned in public areas of all English, Welsh and Northern Irish pubs, clubs and restaurants in October 2011 and in Scotland in April 2013, with a fine of £2500 for non-compliance.

Although smoking rates have come down, across England, smoking causes more deaths than the next eight external causes put together.

Smoking related illnesses killed 204 people in Harrow and 384 people in Barnet in 2012⁵.

The rate of death from smoking reflects the past history of smoking. Both Barnet and Harrow have consistently had lower rates of smoking and thus the death rates from smoking are lower than those of London and England.

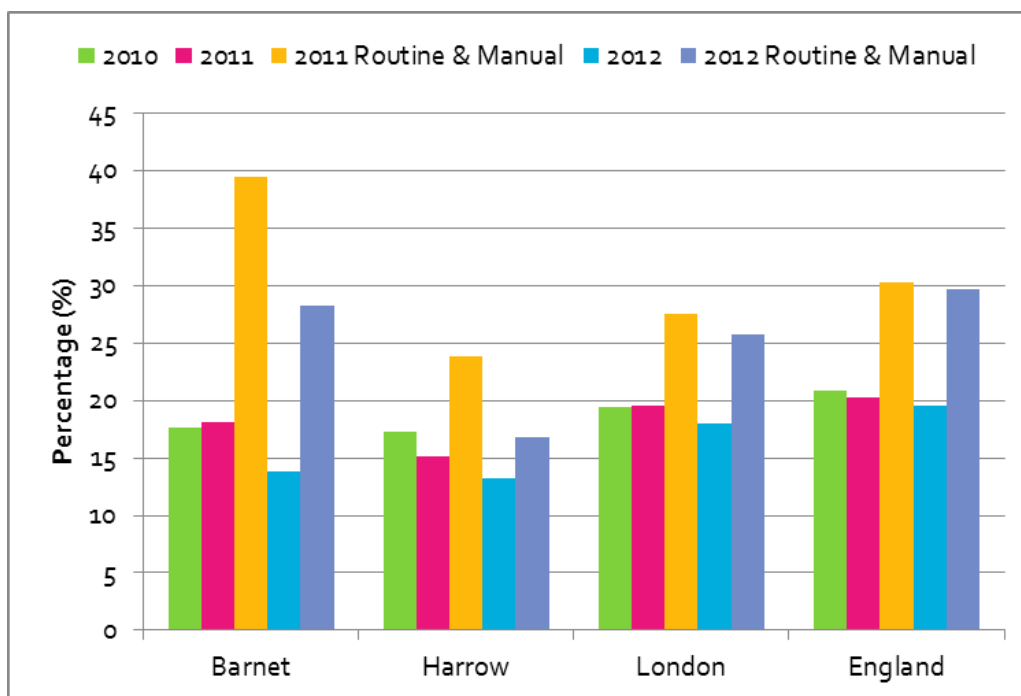
Deaths due to smoking are continuing to decrease in all areas (figure 20).

TABLE 1 THE COST OF SMOKING TO UK HOUSEHOLDS WITH DEPENDENTS

Percentage of household income spent on smoking (net)		
income	Both parents smoke 20 per day	One parent smokes 20 per day
£ 10,000.00	51%	26%
£ 15,000.00	34%	17%
£ 20,000.00	26%	13%
£ 21,000.00	24%	12%
£ 25,000.00	20%	10%
£ 30,000.00	17%	9%
£ 40,000.00	13%	6%
£ 50,000.00	10%	5%

Source: ASH

FIGURE 21 SMOKING PREVALENCE IN WHOLE POPULATION AND IN ROUTINE AND MANUAL (RM) GROUPS



Source: Tobacco profiles, Public Health England

Smoking rates in both Harrow and Barnet have decreased considerably in the past two years according to the Integrated Household Survey. In 2010, almost 18% of people in Barnet smoked and this has reduced to just under 14%. In Harrow, just over 17% of adults smoked in 2010 which has reduced to just over 13% in 2012. Smoking remains an issue of inequalities. Smoking prevalence in people in routine and manual occupations remains higher than the average smoking prevalence at any point in time but it is falling in the same way that the total rate is falling (figure 21).

As well as being more likely to smoke, those in routine and manual occupations also earn less. Smokers in lower income households spend a greater proportion of their household income on cigarettes and this has an impact on child poverty (Table 1).

What do we need to do now

The drop in smoking rates doesn't mean we can be complacent about smoking. Smoking related hospital admissions cost the equivalent of £32.43 for every person in Barnet and £26.36 for every person in Harrow. This of course doesn't include social care costs, the costs to businesses of employing smokers who take more time off due to ill health, the costs of smoking related fires or the cost of cleaning up smoking related waste.

There are four elements of tobacco control that we need to focus on:

- **Stopping Young People from starting to smoke:**

To maintain the profits from cigarettes, the tobacco industry must attract young smokers to replace the smokers who have died. We must provide young people with the knowledge and skills to make the choice to say no to tobacco. Our local Cut Films projects do just this. Schools, colleges and youth groups across the boroughs took part in the film making competition and some were successful in winning national awards (figure 22).

- **Helping people to quit:**

Stopping smoking is not easy. Our local services are provided through a specialist service and by Pharmacists, GPs, practice nurses, health care assistants, midwives and community psychiatric staff. The services provide an evidence based stop smoking service with excellent quit rates. Smokers quitting with pharmacological and behavioural support are four times more likely to quit than if they go it alone.



FIGURE 22 THE ARTY FILMS GROUP FROM BARNET, WINNERS OF THE NATIONAL CUT FILM AWARDS 2014

- **Ensuring compliance with legislation and considering local legislation**

Smokefree legislation has been in place for the past seven years. There has been a high level of compliance although there have been recent issues in both boroughs centered around shisha bars breaking smokefree laws. There are other things that could be considered in terms of local legislation, for instance, making certain outdoor public spaces that are controlled or owned by the council smokefree. More radical ideas might include requiring all shops selling tobacco to be registered. This would mean that any smuggled or illicit tobacco sales would be automatically outside the law.

- **Monitoring and addressing up and coming risks**

As already mentioned shisha, also known as bubble pipe or hookah, is an emerging trend in both boroughs. There are concerns about the lack of knowledge about the harmful effects, about the normalisation of smoking shisha in some groups and lack of awareness about the legislation around supplying tobacco in this form. A campaign is planned to address these issues.

One of the more recent introductions has been that of “e-cigarettes”. There have been calls for a ban on advertising of these products on the grounds that they could normalise smoking behaviour for young people and encourage them to take up smoking tobacco. This is a topic that we will have to keep an eye on in future.

References

1. Stanford University, School of Medicine. Tobacco Advertising Resources Available from: http://tobacco.stanford.edu/tobacco_main/links.php (accessed July 2014)
2. Action on Smoking and Health (ASH). Key dates in the history of anti-tobacco campaigning (accessed June 2014)
3. Doll R, Peto R, Boreham J, Sutherland I. Mortality in relation to smoking: 50 years' observations on male British doctors. *BMJ* 2004; 328:1519
4. European Union. DIRECTIVE 89/552/EEC - "Television without Frontiers", OJ L 298 of 17.10.1989
5. Tobacco Profiles 2014, Public Health England

Vaccine Preventable Infections

IT IS ESSENTIAL THAT WE GET AHEAD OF MEASLES AND THE ONLY WAY TO DO THIS IS TO PROTECT PEOPLE BEFORE MEASLES CATCHES THEM. THE SAFETY RECORD OF MMR IS NOT IN DOUBT AND THE BEST THING THAT PARENTS CAN DO, IF THEIR CHILDREN HAVE NOT HAD TWO DOSES OF MMR, IS TO MAKE AN APPOINTMENT WITH THE GP NOW.

PROFESSOR DAVID SALISBURY, DIRECTOR OF IMMUNISATION, DEPARTMENT OF HEALTH

Introduction

One of the key tenets of public health is to prevent disease; one way of achieving this is through vaccination. Second only to clean water, vaccination is the most successful public health intervention in terms of preventing morbidity and mortality.

Vaccination is the process of protecting individuals from infection by administering an inactivated or weakened form of a disease (or a related product) without the risk of getting the disease. Most vaccines usually confer long term, so called 'active immunity' but there are also special antibody vaccines available which provide immediate short-term protection (passive immunity) against some diseases¹.

The practice of trying to protect people from infectious disease through inoculation is very ancient and started with a technique known as variolation – the process of inoculating smallpox lesions into the skin or mucus membranes of others probably started in the East around 1000 AD². By 1700, the practice of variolation had spread to India, Africa and the Ottoman Empire. Two different methods of variolation emerged. In contrast to Asians and Africans who inoculated through blowing dried smallpox scabs up the nose (in the same way that people took snuff), Europeans and Americans tended to inoculate through puncture in the skin. Variolation was introduced into America by Onesimus, an enslaved African. In a letter to the London's Royal Society in 1716, Mather proposed 'ye Method of Inoculation' as the best means of curing

THE PUBLIC HEALTH IMPORTANCE

Few medical interventions compete with vaccines for their cumulative impact on health and wellbeing of entire populations. Vaccination has greatly reduced the burden of infectious disease.

Paradoxically, a vociferous anti-vaccine lobby thrives today in spite of undeniable success of vaccination programmes against formerly fearsome diseases that are now rare in developed countries.

Understandably, vaccine safety gets more public attention than vaccination effectiveness, but independent experts and WHO have shown that vaccines are far safer than therapeutic medicines.

Vaccinations offer a range of disease control benefits including, eradication (smallpox), elimination (polio), and mitigation of disease severity (rotavirus disease), prevention of infection (human papillomavirus (HPV) and the control of mortality, morbidity and complications at the individual and societal levels.

Efficacious vaccines not only protect the vaccinated, but can also reduce disease among unvaccinated individuals in the community through "indirect effects" or "herd protection".

smallpox and noted that he had learned of this process from 'my Negro-Man Onesimus, who is a pretty intelligent fellow'. Mather revealed how Onesimus had³:

"...undergone an Operation, which had given him something of ye Small-Pox, and would forever preserve him from it, adding, that it was often used among [Africans] and whoever had ye Courage to use it, was forever free from ye Fear of the Contagion. He described ye Operation to me, and showed me in his arm ye Scar"

EXCERPT FROM A DESTROYING ANGEL: THE CONQUEST OF SMALLPOX IN COLONIAL BOSTON (1974)

The first person to introduce variolation to England was Lady Mary Wortley Montagu, wife of the British Ambassador to Constantinople, she became fascinated with the Turkish practice of inoculating healthy children with a weakened strain of the smallpox (engrafting) to confer immunity from the more virulent strains of the disease. Lady Mary brought the method to the attention of the London College of Physicians and to Charles Maitland, surgeon to the British Embassy, who successfully carried out experimental inoculations on six condemned prisoners in 1723. Unfortunately, the trend in inoculation and the enthusiasm was brief. Edward Jenner would eventually be given the credit for the smallpox vaccine despite Lady Mary's efforts to embed the technique².

Jenner was assigned his place in history by exploring the 18th century folklore that cowmen and dairy maids who had cowpox lesions on their hands did not seem to catch smallpox. In 1796, a dairy maid, Sarah Nelmes, consulted Jenner about a rash on her hand. He diagnosed cowpox rather than smallpox. Jenner realised that this was his opportunity to test the protective properties of cowpox and he chose James Phipps, the 8 year old son of his gardener on whom to perform his first vaccination. On 14th May 1796 he made a few scratches on one of James arms and rubbed into them some material from one of the pocks on Sarah's hand. Within days James became mildly ill with cowpox, the next step was to test whether cowpox would now protect James from smallpox. On 1st July Jenner variolated the boy; as predicted James did not develop smallpox

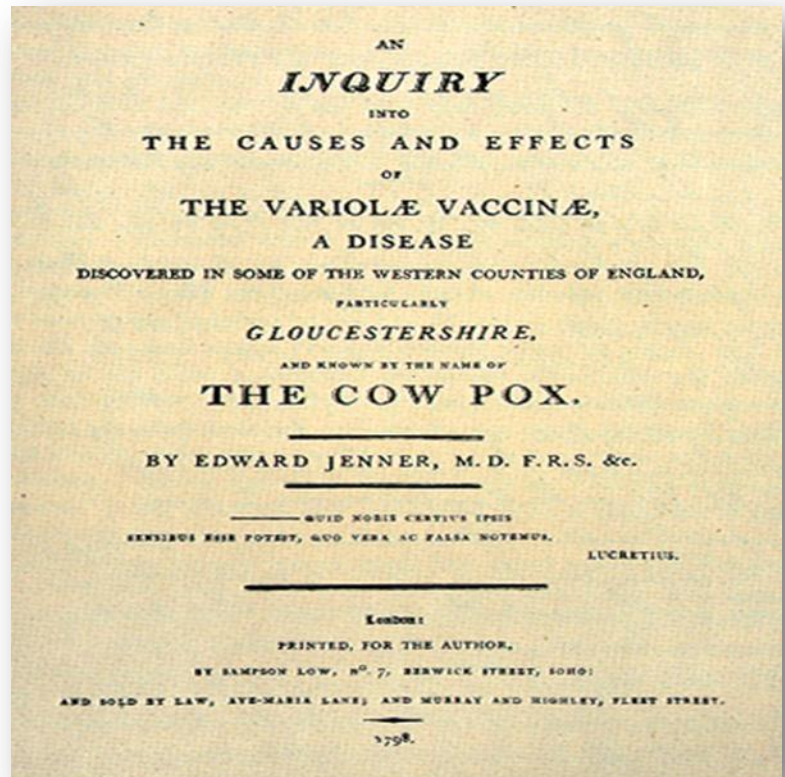


FIGURE 23 JENNER PUBLISHED HIS WORK AN ENQUIRY INTO THE CAUSES AND EFFECTS OF VARIOLAE VACCINAE IN 1798

either on this occasion or on the many subsequent ones when his immunity was tested again.

In the 50 years following Jenner's first inoculation the number of deaths from smallpox fell from about 23,000 to 5,000 a year. Vaccination against smallpox for infants within four months of birth was made compulsory in 1853. This led to opposition from those who demanded freedom of choice. The term 'conscientious objector' entered English law in 1898 to describe those who risked fines and imprisonment by refusing vaccination for their children⁴.

The next major advance took place thanks to the work of Louis Pasteur. Pasteur worked on the attenuation[‡] of chicken cholera vaccine in the late 1870s he drew on concepts that had been developing for at least 40 years. At the end of the 19th century killed vaccines for anthrax (1880), rabies (1880), typhoid (1896) plague (1897) and cholera were produced.

More advances emerged in the 20th century; Calmette and Guerin developed the Bacille Calmette Guerin (BCG) vaccine from a strain of bovine mycobacteria. It was the first live vaccine for humans to be produced since the rabies vaccine. The chemical inactivation of diphtheria and other bacterial toxins led to the development of the first toxoids: diphtheria and tetanus. Wilson Smith and colleagues isolated the Influenza A virus in ferrets in 1933. In 1937, Anatol Smorodintsev and colleagues in the Soviet Union reported on the administration of the Wilson Smith strain to humans, this is considered to be the first live human influenza virus vaccine. Other vaccine developments included Yellow fever (1935), Pertussis (1926), Typhus (1938) Diphtheria (1923), and Tetanus (1927). After World War II, most of the other vaccinations familiar from the vaccination schedule were developed. The first licensed polio vaccine using the cell culture technique was the trivalent formalin inactivated polio vaccine of Jonas Salk licensed in 1955. About six years later live polio virus vaccines grown in monkey kidney cell cultures by Albert Sabin (1962) came into wide use.

1964 - 2014

By 1971, the world's first vaccination –for smallpox- was discontinued in the UK and by 1980 the disease was eradicated worldwide.

During the 1970s and 80s several bacterial vaccines consisting of purified capsular polysaccharides were developed e.g. Pneumococcal (1992), meningococcal (1992), and Haemophilus influenza type b (Hib) (1992). A plasma derived Hepatitis B vaccine was developed in 1981. This was replaced by a recombinant vaccine grown in yeast cells in 1986 replacing the need to use a blood derived product. The vaccines that were developed during this period were measles (1960), rubella (1962), mumps (1967), hepatitis A (1992), Men C conjugate (1999), PCV, Rotavirus and HPV (2006)².

[‡] Attenuation takes an infectious agent and alters it so that it becomes harmless or less virulent, but are still viable

TABLE 2 THE UK IMMUNISATION SCHEDULE 2013-2014

Routine Vaccination Schedule	
When to immunise	Diseases Protected Against
Two months old	Diphtheria, tetanus, pertussis (whooping cough), polio and Haemophilus influenzae type b (Hib) Pneumococcal disease Rotavirus
Three months old	Diphtheria, tetanus, pertussis, polio and Hib Meningococcal group C disease (MenC) Rotavirus
Four months old	Diphtheria, tetanus, pertussis, polio and Hib Pneumococcal disease
Between 12 and 13 months old – within a month of the first birthday	Hib/MenC Pneumococcal disease Measles, mumps and rubella (German measles)
Two and three years old	Influenza (from September)
Three years four months old or soon after	Diphtheria, tetanus, pertussis and polio Measles, mumps and rubella
Girls aged 12 to 13 years old	Cervical cancer caused by human papillomavirus types 16 and 18 (and genital warts caused by types 6 and 11)
Around 14 years old	Tetanus, diphtheria and polio MenC
65 years old	Pneumococcal disease
65 years of age and older	Influenza
70 years old	Shingles
Immunisations for those at Risk	
When to immunise	Diseases Protected Against
At birth, 1 month old, 2 months old and 12 months old	Hepatitis B
At birth	Tuberculosis
Six months up to two years	Influenza
Two years up to under 65 years	Pneumococcal disease
Over two up to less than 18 years	Influenza
18 up to under 65 years	Influenza
From 28 weeks of pregnancy	Pertussis

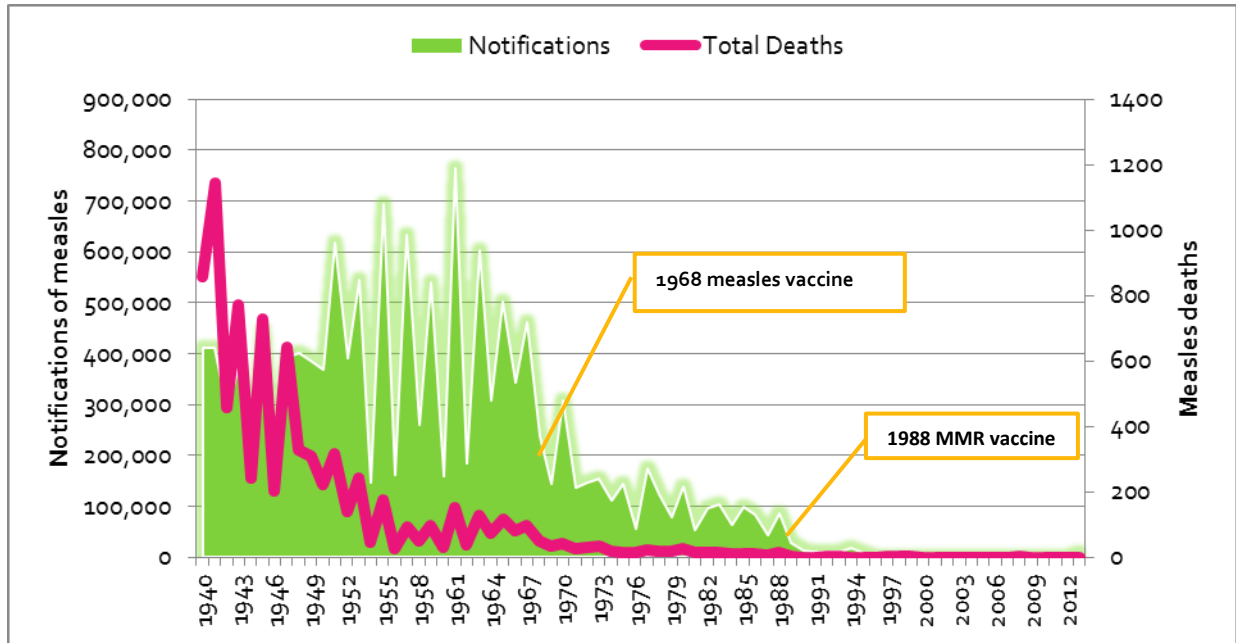
Source: Public Health England,

(https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/227651/8515_DoH_Complete_Imm_schedule_A_4_2013_09.pdf)

Today, vaccinations are a mainstay of the NHS. Table 2 lists the various vaccines currently available through the national immunisation program. This comprises routine childhood and adult vaccinations, as well as vaccines recommended for certain subsets of the general population deemed to have an increased susceptibility to infection. In addition to the routine vaccinations, there are also specific vaccines made available for people working in certain occupational settings and travel vaccinations to protect against infections abroad.

Children are more at risk from infections and environmental hazards and suffer more from health inequalities than the rest of the population. The role of vaccines in reducing disease is an important part of work to improve the health of children.

FIGURE 24 NOTIFICATIONS AND DEATHS FROM MEASLES IN ENGLAND & WALES, 1940-2013*



Source: Registrar General's annual returns, Office for National Statistics, Centre for Infectious Disease Surveillance and Control, Public Health England.

* Provisional data

The HPV vaccine prevents infection by the two human papillomaviruses types (types 16 and 18) that cause over 70% of cervical cancers. The vaccine does not protect against all of the other cancer-causing types, so it's vital that women still go for routine cervical screening tests when they are older. The HPV vaccine is contentious, largely because it is offered only to girls and they are below the age of consent at the time of the offer. The vaccine is only offered to girls to protect them from cervical cancer; obviously boys do not get this type of cancer. By protecting girls against the two most common causes of cervical cancer eventually there will be fewer viruses circulating and so the risk for boys will decrease as there will be fewer opportunities of them coming into contact with these virus types, and passing them on. While most girls don't start having sex until they are 16 or older, it is recommended that they have the vaccination at 12 to 13 years to get the most benefit from the vaccine. If the vaccine is given after a young woman becomes sexually active, it is possible that she may already have been infected by a HPV type that the vaccine can protect against.

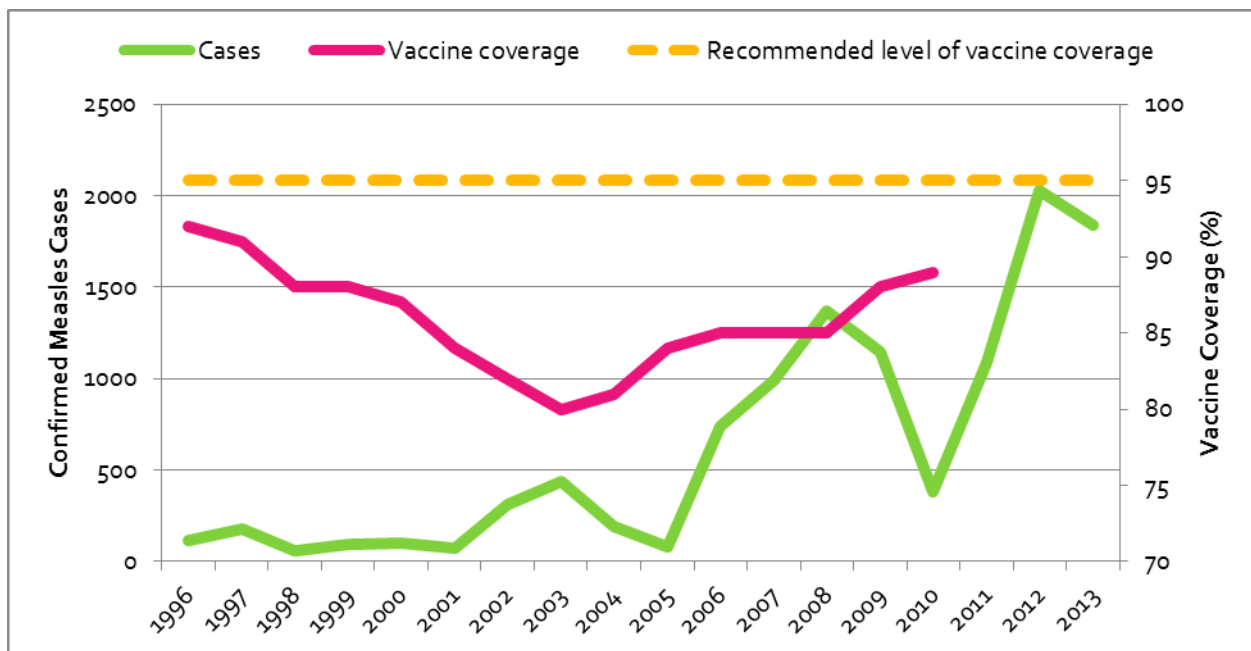
Some vaccinations in the schedule are given singularly and other preparations come as a combined formulation such as MMR. Sometimes one dose is sufficient to give long-lasting immunity, whereas in other cases booster doses are needed at intervals to maintain immunity. The mode of delivery of vaccination can be done via subcutaneous or intra-muscular injections, orally or intra-nasally.

Vaccinated individuals are not only protected from the disease but they are less likely to be a source of infection to others, particularly those who cannot or do not receive vaccinations. This level of protection conferred upon non immunised people is termed 'herd immunity'. However, for herd immunity to work properly there must be certain level of vaccine coverage within a population⁵. When the vaccine coverage is low the diseases of the past return.

The case for vaccination

Measles is an extremely contagious disease caught through direct contact with an infected person, or through the air from coughs or sneezes. Measles is usually a childhood infection. It is most common in the one to four year old age group in children who have not been immunized. However, you can catch measles at any age if you haven't been vaccinated or haven't had the disease in the past. It is estimated that around one in every 5,000 people with measles will die as a result of a serious complication. However, it is now uncommon in the UK because of the effectiveness of the MMR vaccination.

FIGURE 25 LABORATORY CONFIRMED CASES OF MEASLES AND VACCINE COVERAGE IN ENGLAND AND WALES, 1996 - 2013



Source: Centre for Infectious Disease Surveillance and Control, Public Health England

The available measles vaccine is highly effective, with the first dose given at 12-15 months and a second dose at four to five years. The measles vaccine is a live vaccine. It contains a strain of the measles virus that has been attenuated in order to stimulate an immune response to natural measles virus but will only produce very mild symptoms of measles if any at all.

Prior to the introduction of measles vaccine in 1968 there were between 150,000 and 600,000 cases notified each year in England and Wales (Figure 24). Prior to 2006, the last death from acute measles was in 1992. In 2006, there was one measles death in a 13 year old boy who had an underlying lung condition and was taking immunosuppressive drugs.

Another death in 2008 was also due to acute measles in an unvaccinated child with congenital immunodeficiency. In 2013, one death was reported in a 25 year old man following acute pneumonia as a complication of measles. All other measles deaths since 1992 shown in figure 15 are in older individuals and were caused by the late effects of measles. These infections were acquired during the 1980s or earlier, when epidemics of measles occurred.

The MMR vaccine has received a lot of public attention in recent years, much of it adverse. The controversy started when Andrew Wakefield published a study in *The Lancet* in 1998, reporting on an association between MMR vaccine and the development of inflammatory bowel disease and autism⁶. Uptake of the vaccine amongst two-year-olds in the UK declined from around 92% in early 1995 to around 84% in the first quarter of 2002 (figure 25). The World Health Organization recommends vaccination coverage of around 95% to prevent outbreaks of disease. The research was retracted after the study was found to be flawed and that there was no evidence to support the claims expressed⁷. However, the negative publicity generated and fuelled by adverse media reports led to some parents becoming concerned about the potential side effects of MMR. Many became reluctant to have their children vaccinated. Uptake of the vaccine amongst two-year-olds in the UK declined from around 92% in early 1995 to around 80% in the 2003/04, although the numbers are now gradually improving, particularly following vaccination catch-up campaigns.

Because of the poor uptake of MMR, there was an increase in the incidence of measles, mumps and rubella cases in the UK, with hotspots of disease occurring in some parts of London and in Wales. The numbers of confirmed measles cases in England hit the highest levels since 1996 in 2012 with 1912 confirmed cases reported. A successful national catch up campaign was introduced in April 2013 to ensure that at least 95% of all 10-16 year olds had received at least one dose of a measles containing vaccine⁸.

What do we need to do now

While vaccinations are an important public health intervention, they are the responsibility of NHS England as commissioners of the immunisation programme. Outlined below are three components that form an effective strategy for increasing vaccine uptake¹⁰:

Implementation of immunisation programmes

Immunisation programmes should be multifaceted and coordinated across different settings this should increase timely immunisations among groups with low or partial uptake. This programme should form part of local child and older adult health strategies. Along with an identified healthcare professional within every GP practice who is responsible and provides leadership for the local immunisation programme, there should be a guarantee that access to immunisations services are improved, where necessary, this may take the form of extending clinic times so there are more appointments available, sending tailored invitations, reminders and recall invitations and introducing home visits for those failing to attend after recall invitations in order to discuss any concerns about the immunisation process.

Contributions from educational settings

The school nursing team should check the immunisation records of all children up to the age of 5 when the child joins a nursery, nursery school, playgroup, Sure Start children's centre or when they start primary school. The checks should be carried out in conjunction with parents and other healthcare professionals. Immunisation coordinators should work with educational staff and parents to encourage schools to become venues for vaccination.

Targeting groups at risk of not being fully immunised

In order to increase uptake in this group there should be an understanding of what is preventing these individuals from being fully immunised. Once this has been established these barriers can and should be dismantled. Barriers to immunisation may relate to transport, language, communication difficulties and physical or learning disabilities. This may be alleviated by providing longer appointment times, walk-in vaccination clinics, translation services, mobile, home or outreach services. Immunisations coordinators should also consider using retail outlets, places of worship and other community venues to disseminate accurate, up-to-date information on immunisations or hold immunisation sessions

At present, the greatest threat to vaccination is resistance, given the backdrop of declining prevalence of many infectious disease and heightened fears over vaccine safety. Reassuring the public that vaccines are safe, necessitates the effective detection of vaccine-related side-effects and rigorous investigation of any safety concerns.

References

1. Public Health England, Department of Health. Immunisation against infectious disease (The Green Book) Chapter 1: immunity and how vaccines work. Available from: www.gov.uk/government/publications/immunity-and-how-vaccines-work-the-green-book-chapter-1
Accessed May 2014

2. Health Protection Agency. History of vaccination: From antiquity to the present day. Available from: www.hpa.org.uk/webc/hpawebfile/hpaweb_c/1279889314367 Accessed July 2014
3. Winslow, O. A Destroying Angel: The conquest of smallpox in Colonial Boston (1974)
4. Wolfe R, Sharp L. Anti-vaccinationists past and present. *British Medical Journal* 2002;325:430. doi: <http://dx.doi.org/10.1136/bmj.325.7361.430>
5. Fenner F, Henderson DA, Arita I, Jezek Z, Ladnyi ID. Smallpox and its Eradication. 1988 WHO: Geneva
6. Wakefield AJ, Murch SH, Anthony A, Linnell J, Casson DH, Malik M, Berelowitz M, Dhillon AP, Thomson MA, Harvey P, Valentine A, Davies SE, Walker-Smith JA. RETRACTED: Ileal-lymphoid-nodular hyperplasia, non-specific colitis, and pervasive developmental disorder in children. *Lancet* 1998;351(9103):637-641. doi:10.1016/S0140-6736(97)11096-0
7. Murch SH, Anthony A, Casson DH, Malik M, Berelowitz M, Dhillon AP, Thomson MA, Valentine A, Davies SE, Walker-Smith JA. Retraction of an interpretation. *The Lancet* 2004;363(9411):750 doi:10.1016/S0140-6736(04)15715-2
8. Public Health England. National MMR vaccination catch-up programme announced in response to increase in measles cases (press release) Available from: www.gov.uk/government/news/national-mmr-vaccination-catch-up-programme-announced-in-response-to-increase-in-measles-cases (Accessed April 2014)
9. Wise J. Meningitis B vaccine to be introduced in UK after U turn on its cost effectiveness. *British Medical Journal* 2014;348:g2327 doi: <http://dx.doi.org/10.1136/bmj.g2327>
10. NICE. Reducing differences in the uptake of immunisations (PH21) September 2009 Available from: <http://www.nice.org.uk/guidance/ph21/resources/guidance-reducing-differences-in-the-uptake-of-immunisations-pdf> (accessed September 2014)

Healthy Life Expectancy

“IF WE ARE NOT CAREFUL WE WILL JUST END UP IN A SITUATION WHERE INSTEAD OF PEOPLE RETIRING THERE WILL JUST BE MORE ON INCAPACITY BENEFIT.”
PROF. LES MAYHEW, CASS BUSINESS SCHOOL

Introduction

For a long time, public health professionals have solely focused on helping people to live longer, with little thought to the quality of those additional years of life. Probably, unsurprising given that in order to investigate, improve and protect health we have largely focused on what kills people. But improving the public's health requires more than simply delaying death or increasing life expectancy at birth, it necessitates an awareness and understanding of disease and levels of functioning.

At its simplest, life expectancy (LE) is an estimate of how long the average person might be expected to live¹. LE is most often quoted for an entire lifetime; LE at birth is the number of years that a newborn baby would live if they experienced the death rates of the local population at the time of their birth, throughout their life. It is a theoretical measure rather than a true prediction of life expectancy, since death rates may increase or decrease during a person's lifetime, and people may move to areas with different mortality risks.

LE can also be calculated for other ages. For example, LE at age 65 indicates the number of further years that a 65-year-old might be expected to live. As a person who reaches 65 has already survived many years, their LE when added to their current age (65) will generally be greater than the corresponding estimate of a baby's LE at birth. For example, a 65-year-old man might have a LE of 15 years, meaning that he might be expected to live until the age 80; whereas a boy's LE at birth might only be 73 years.

THE PUBLIC HEALTH IMPORTANCE

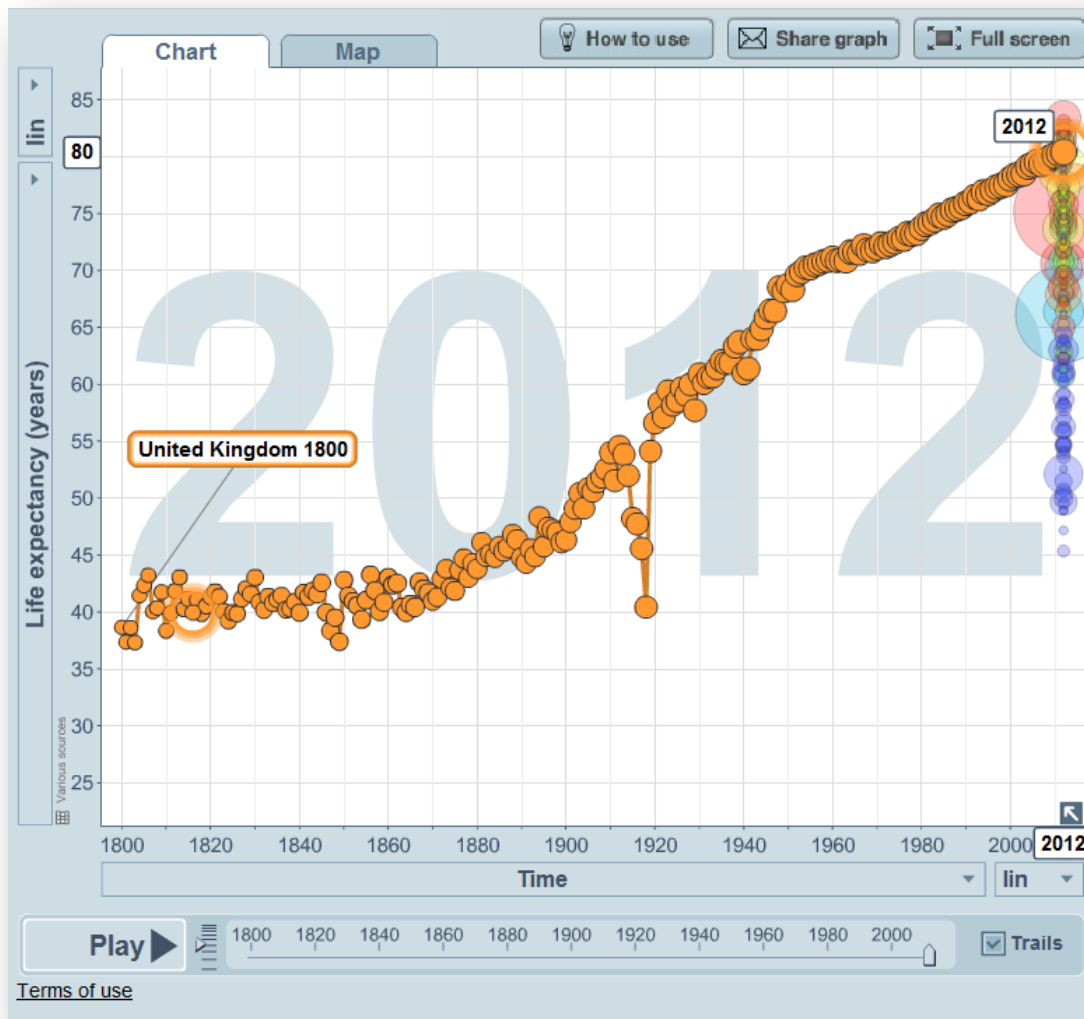
The importance of healthy life expectancy as a summary measure of population health is reflected in its inclusion in the two high-level outcomes in Public Health England's Public Health Outcomes Framework.

It is necessary to track healthy life expectancy and life expectancy by area deprivation as life expectancy increases, to see whether these years of additional life are equally distributed across the population and how many are spent in states of good health or in poor health and disability.

This is also relevant to the recent changes to the state pension age in the UK where people are expected to extend their working lives to take account of improvements in life expectancy.

Back in the 1800s, LE in the United Kingdom was 39 years, by 1964 it had increased to 72 years and in 2012 the average life expectancy was 80 years (figure 26) 79.2 years for men and 83.3 years for women. With the exception of the World War I and the flu pandemic of 1918 life expectancy has steadily increased in the UK. Improvement in water and sanitation supplies inspired by the 1848 Public Health Act, nutrition and the control of infectious diseases have supported the increase in life expectancy between the late 1800s and 2012.

FIGURE 26 LIFE EXPECTANCY IN THE UNITED KINGDOM 1800 – 2012



Source: Gapminder.org (Caveat: data before 1900 is highly uncertain)

By 2032, life expectancy is expected to rise to 83.3 years (an increase of 4.1 years) for men and to 86.8 years (an increase of 3.8 years) for women². That being said there were 13,350 centenarians (aged 100+)

in the UK in 2012 and principal projections suggest that around 1 in 3 babies born in 2013 will live to celebrate their 100th birthdays providing a projected rise from 14,000 in 2013 to 111,000 in 2037³. But living longer doesn't necessarily mean living in good health as Abraham Lincoln so aptly stated "in the end it's not the years in your life that counts. It's the life in your years".

1964-2014

In the early 1970s Daniel Sullivan developed a method to account for both illness and death in a single index capturing the expected years of survival free of disability⁴. Healthy life expectancy (HLE) is a summary measure of population health that has evolved from Sullivan's method⁵; it is an estimate of the years of life that will be spent in good health, and by extension the quality of life.

Like LE, HLE is most often expressed for an entire lifetime but it can also be expressed from age 65. HLE at birth is the number of years that a newborn baby would live in 'healthy' health if they experienced the death rates and levels of general health of the local population at the time of their birth, throughout their life¹. This measure is used to look at health trends over time and compare the health of different populations and population sub-groups. It is a measure that is useful in resource allocation, planning of health and other services, and evaluation of health outcomes.

A recent study of trends in HLE at birth across 187 countries and over 20 years, estimated that global HLE has increased by about four years from 1990 to 2010⁶. The increase in HLE in the UK among men was 3.7 years and among women 2.7 years (table 3). The gains in HLE over this period are mainly thought to have occurred through reductions of child and adult mortality rather than reduction in the prevalence of disability. A large component of this disability comes from mental and behavioural disorders, such as major depression, anxiety, and alcohol and drug use disorders. Other major contributions to the prevalence of disability come from musculoskeletal disorders including low back pain, neck pain and osteoarthritis

TABLE 3 LIFE EXPECTANCY AND HEALTHY LIFE EXPECTANCY AT BIRTH IN 1990 AND 2010

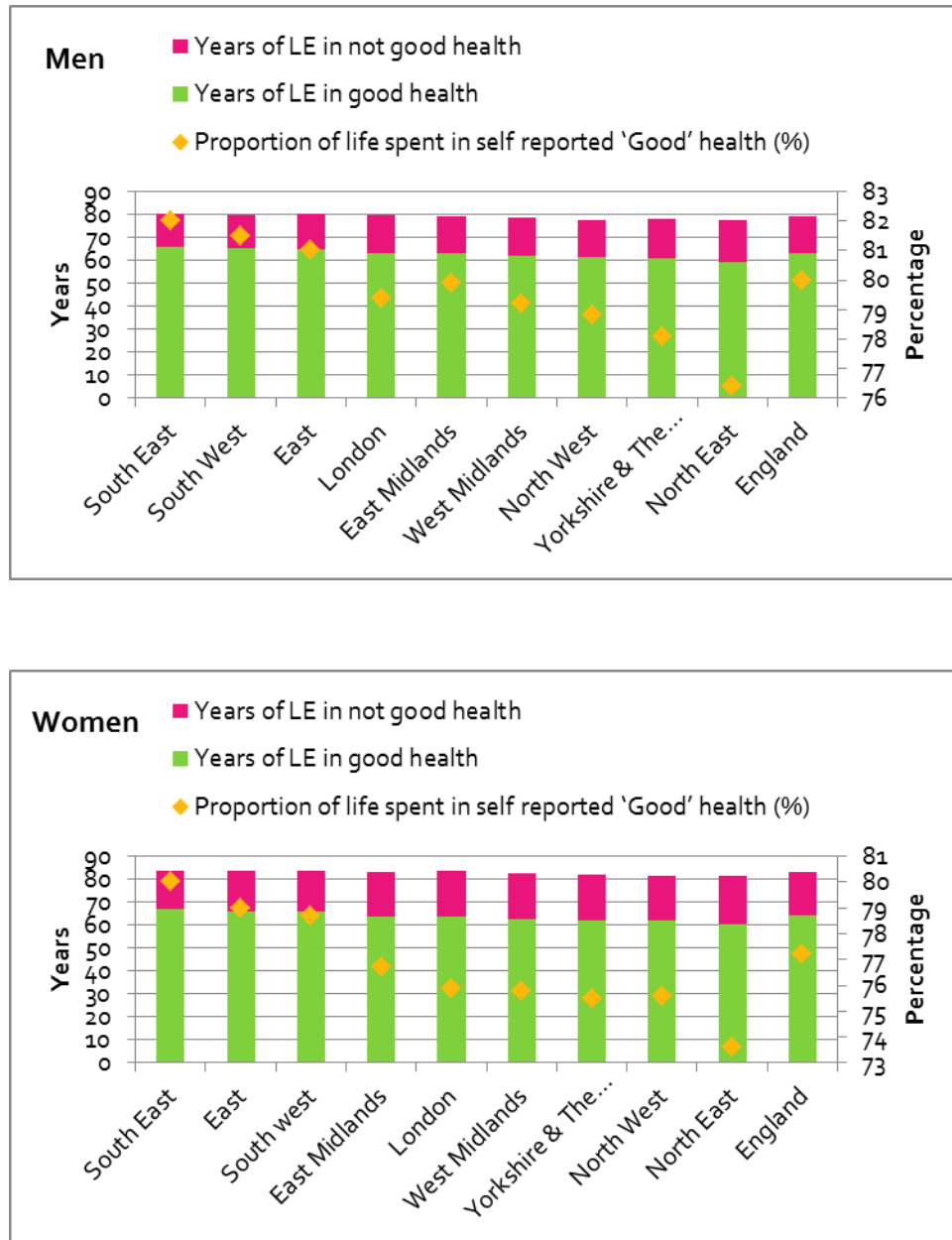
	1990		2010	
	Life expectancy	Healthy life expectancy	Life expectancy	Healthy life expectancy
Men	72.9	63.4	77.8	67.1
Women	78.3	67.4	81.9	70.1

Source: Salomon JA et al. 2012

Between 2010 and 2012, HLE at birth in England was 63.4 years for men and 64.1 years for women. A clear North-South divide was observed with regions in the South East, South West and East of England all have significantly higher HLE than the England average (figure 27). The West Midlands, North West, North East and Yorkshire and The Humber all had significantly lower HLE than the England average. HLE for men in

London and some other regions was significantly below the state pension age of 65 for men. When women were assessed against the same state pension age of 65, which is where it will be by 2018, the same is true.

FIGURE 27 LIFE EXPECTANCY (LE) AND HEALTHY LIFE EXPECTANCY (HLE) FOR MEN AND WOMEN AT BIRTH* BY REGION** 2010-2012



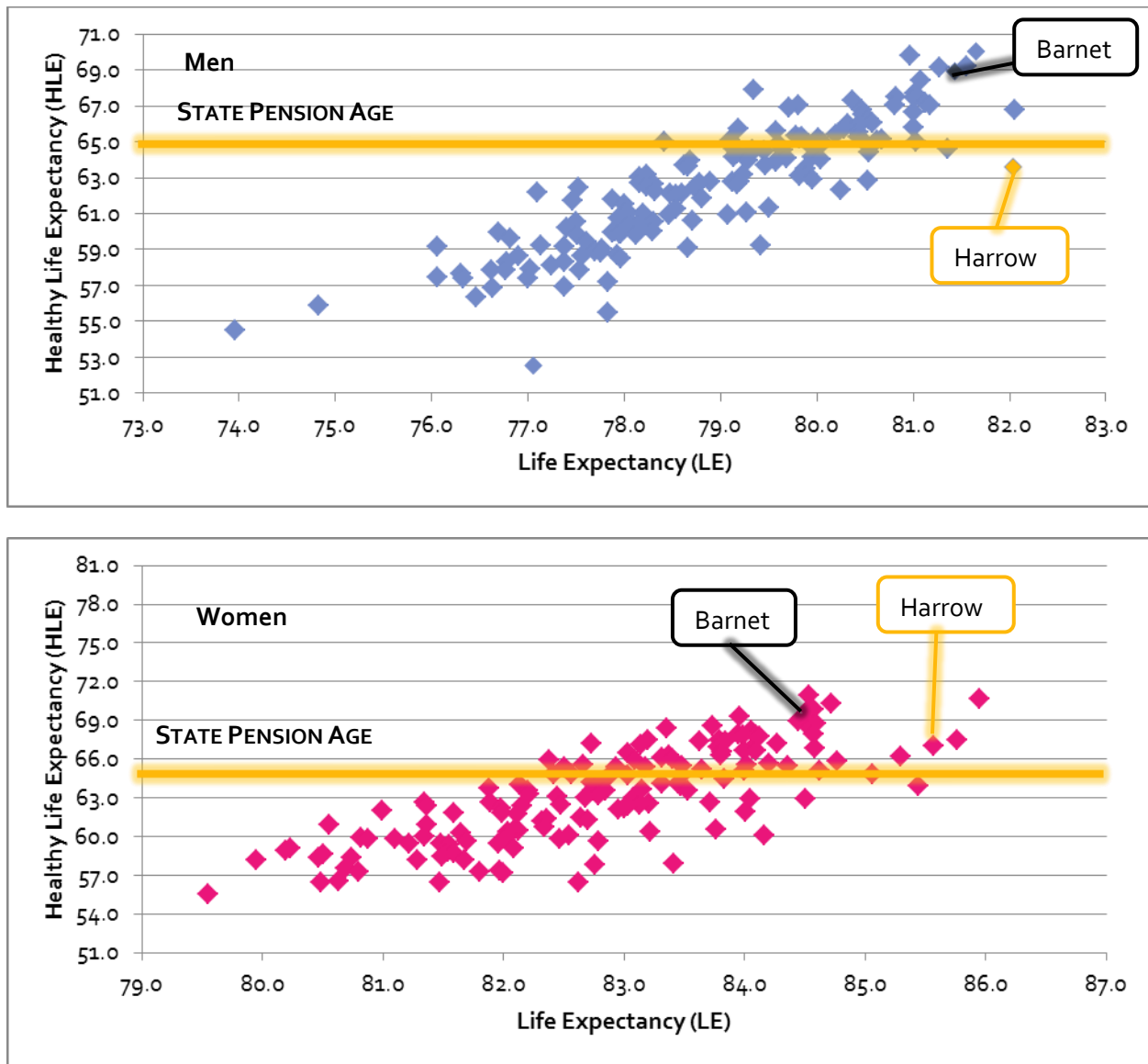
Source: Office for National Statistics (ONS)

* Excludes residents of communal establishments except NHS housing and students in halls of residence where inclusion takes place at their parents' address.

** Regions are presented by gender sorted by HLE

Using the state pension age to give context to HLE, Barnet residents of both genders have a HLE above the state pension age (68.9 years for men and 69.9 years for women) suggesting that the average resident would be in relatively good health at and after pensionable age. On the other hand, male residents in Harrow have a HLE which is lower than the current state pension age (63.6 for men compared with 67.1 for women) (figure 28).

FIGURE 28 LIFE EXPECTANCY AND HEALTHY LIFE EXPECTANCY AT BIRTH FOR MEN AND WOMEN 2010-2012



Source: Office for National Statistics (ONS)

* The State Pension Age will be 65 for women by 2018

Healthy life expectancy was lowest in Tower Hamlets (55.7 years for men, 54.1 years for women) and highest in Richmond upon Thames (70.3 years for men, 72.1 years for women), leading to an inequality gap in healthy life expectancy between London boroughs of 14.6 years for men and 18.0 years for women; this is much greater than the gap in life expectancy itself.

The calculation of LE, HLE and the difference between the two – which can be interpreted as the average number of years of healthy life lost to poor health – provides a direct and simple method to assess the relation between changes in mortality and morbidity.

In the most deprived 10% of Lower Super Output Areas (LSOA) in England (known as decile one), healthy life expectancy was 18.4 years lower for men and 19.0 years lower for women than the least deprived 10% of LSOAs (decile ten). This inequality is almost twice as wide as the difference seen in life expectancy at 9.2 years for men; for women it is almost three times wider than the difference in life expectancy at 6.8 years. When assessing life expectancy with the same measure it is 9.4 years for men and 6.9 years for women, suggesting greater inequality exists in the prevalence of self-assessed 'Good' general health than mortality.

Men in decile ten (least deprived) can expect to spend 12.2 years in 'Not Good' general health, despite having longer lives. Those in the most deprived areas can expect to spend 21.4 years of their already short life in 'Not Good' health. For women these figures are 14.2 years in 'Not Good' health in the least deprived decile and 26.4 years in the most deprived decile (figure 29). Therefore a major public health objective is to increase HLE so that it comes closer to LE, thus reducing the gap or period of ill-health.

An area has a higher deprivation score than another if the proportion of people living there, who are classed as deprived is higher. Using the indices of multiple deprivation, three LSOAs in Harrow fall within the top 20% most deprived in England; they are in the wards of Hatch End, Stanmore Park and Roxbourne. No LSOAs fall into the top 10% of the most deprived nationally. Twenty-three Harrow LSOAs are in the least deprived 20% in the country, eight (in the wards of Pinner, Hatch End, Pinner South and Headstone North) of which are in the least deprived 10%. Like Harrow, Barnet do not have any LSOAs that fall within the top 10% most deprived and seven – East Finchley, Colindale, Edgware, West Hendon, Golders Green, Burnt Oak and Underhill - which fall within the top 20% most deprived LSOAs in the country.

The difference in healthy life expectancy between adjacent deciles is not equal. Not only do those in the most deprived areas suffer worse health outcomes: across both genders they also have the biggest difference between themselves and their neighbouring more advantaged decile, implying that they would need to make bigger improvements to achieve the healthy life expectancy of the decile above them. The biggest differences are seen between decile one and two for men at 3.8 years and decile one and two and two and three for women, both at 3.6 years (figure 30). Conversely, the smallest difference between adjacent deciles was observed between seven and eight and eight and nine for men and seven and eight for women all at 0.8 years. Interestingly, the gap widens again for both genders between nine and ten, where men see the

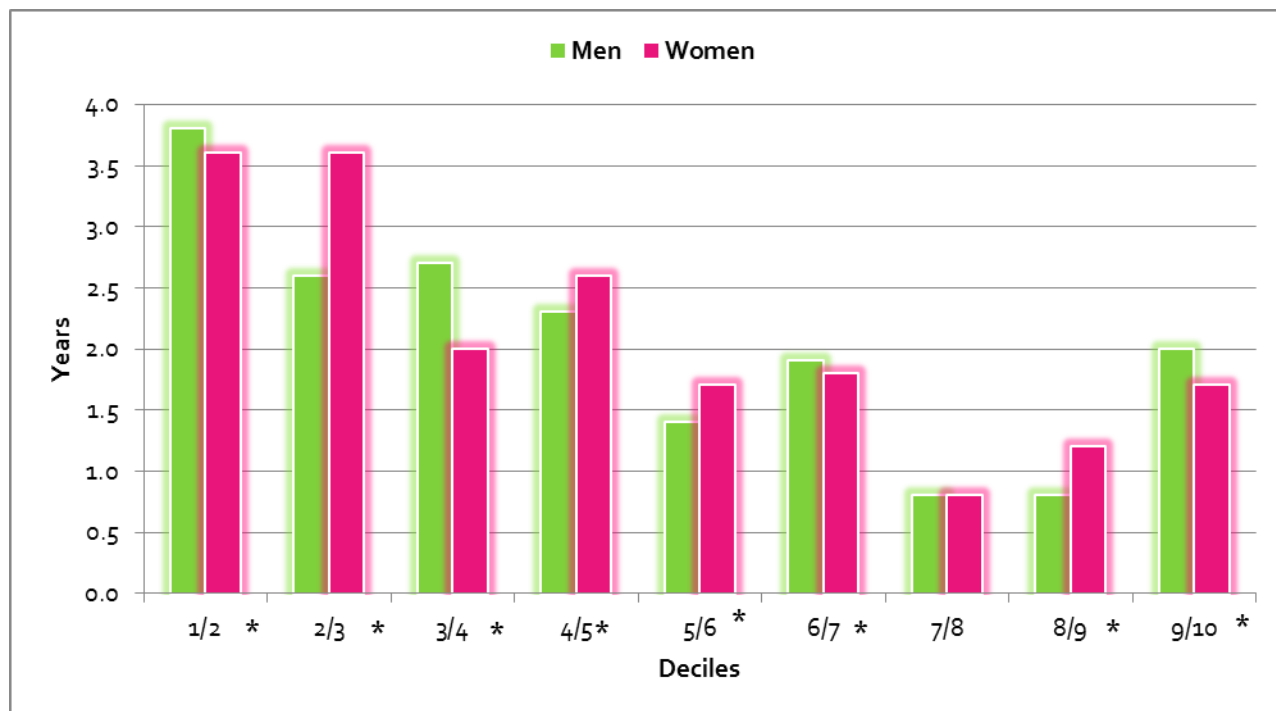
difference increase to 2.0 years and women see a 1.7 year increase. For women the difference between deciles nine and ten is the same as between deciles five and six ⁷.

FIGURE 29 LIFE EXPECTANCY AND HEALTHY LIFE EXPECTANCY BY DECILES OF DEPRIVATION FOR MEN AND WOMEN, ENGLAND 2009-2011



Source: Annual Population Survey (APS) – Office for National Statistics

FIGURE 30 DIFFERENCE IN HEALTHY LIFE EXPECTANCY BETWEEN ADJACENT DECILES FOR MEN AND WOMEN, 2009-11



Source: Annual Population Survey (APS) – Office for National Statistics

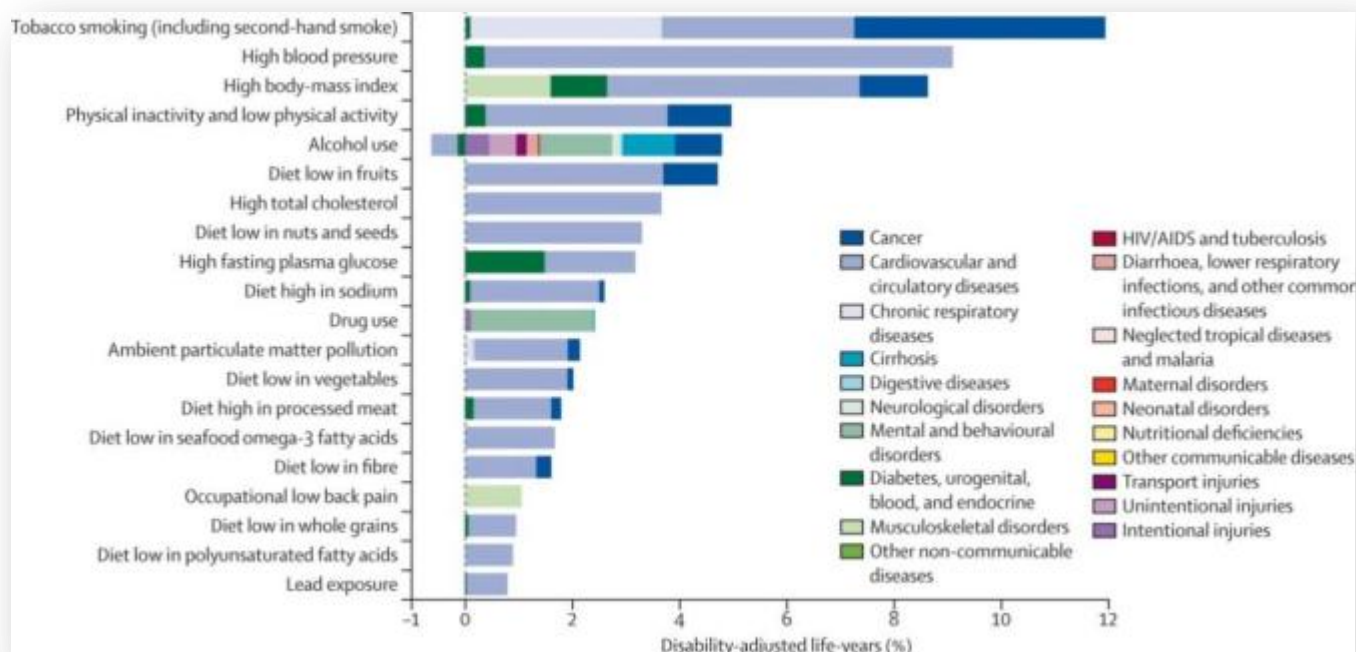
* Denotes significant difference between the two deciles for men and women respectively

With the exception of the difference between deciles eight and nine for men and seven and eight for women, the difference between all other adjacent deciles was found to be statistically significant, indicating that the differences between the most and least deprived deciles, are not occurring by chance

This difference between deciles may indicate an ‘access to resources’ effect, where the least deprived decile of the private household population hold 44% of the total aggregate wealth⁷, this may account for the greater increase in healthy life expectancy observed between decile nine and ten; on the other hand falling below a “resource threshold” may present a disproportionate risk to health, as observed in the greater declines in healthy life expectancy occurring between decile two and decile one. It is worth noting, however, that it is not the area itself which is deprived but the circumstances and lifestyles of those residing in the area that affects an area’s deprivation score relative to another area. This means that not all residents of a deprived area are deprived, and conversely, not all deprived people live in deprived areas.

These differences in access to resources between the most and least deprived deciles are also evident in the level of physical activity, level of wellbeing, prevalence of mental ill health and reporting of health problems⁸.

FIGURE 31 BURDEN OF DISEASE ATTRIBUTABLE* TO 20 LEADING RISK FACTORS FOR BOTH GENDERS IN 2010**



Source: Murray CJL et al. 2013

* Expressed as a percentage of UK disability-adjusted life-years

** The negative percentage for alcohol is the protective effect of mild alcohol use on ischaemic heart disease and diabetes

Using data from the Global Burden of Disease, Injuries and Risk Factors Study 2010 (GBD 2010) to establish some of the leading preventable risks that explain the patterns of health loss in the UK between 1990 and 2010, tobacco smoking (including second hand smoke) was found to be the leading factor for disease⁹, despite falling rates of smoking among both men and women. High blood pressure and high body mass index, or being overweight, each caused about 9% of the burden of disease in 2010 (figure 31).

Work carried out by the King’s Fund found that current lifestyles present a serious threat to population health, particularly amongst more disadvantaged groups, while there have been some improvements in lifestyle risks across the population; the greatest improvements are in higher socio-economic and educational groups where there have been significant reductions in the



“...We have learned not to try too hard to be middle-class. It never works out well and always makes you feel worse for having tried and failed yet again. Better not to try. It makes more sense to get food that you know will be palatable and cheap and that keeps well. Junk food is a pleasure that we are allowed to have; why would we give that up? We have very few of them.”

Linda Tirado



proportion with three of four unhealthy behaviours (smoking, excessive alcohol use, poor diet and low levels of



“I smoke. It’s expensive. It’s also the best option. You see I am always, always exhausted. It’s a stimulant. When I am too tired to walk one more step, I can smoke and go for another hour. When I am enraged and beaten down and incapable of accomplishing one more thing, I can smoke and feel a little better, just for a minute. It is the only relaxation I am allowed. It is not a good decision, but it is the only one that I have access to. It is the only thing I have found that keeps me from collapsing and exploding.”

Linda Tirado



physical activity). This has not been replicated among unskilled groups – individuals with no qualifications were more than five times as likely as those with higher education to engage in all four unhealthy behaviours in 2008, compared with only three times as likely in 2003¹⁰.

Importantly, more than 60% of the population has a negative or fatalistic attitude towards their own health, this is particularly prevalent in more disadvantaged groups; if current attitudes continue rates of avoidable ill-health and health inequalities are likely to increase¹.

So why are these four unhealthy behaviours so pervasive in disadvantage groups when public health messages advising the adoption of healthier lifestyles are ubiquitous? A number of explanations have been put forward including the affordability of healthy and unhealthy foods¹¹ and the relative ease of access to alcohol^{12, 13}, but to some extent these are downstream problems for disadvantaged individuals. People living in deprived circumstances must manage sporadic income, juggle expenses and make difficult tradeoffs and even when decisions have no financial bearing these recurrent preoccupations can be ever present and distracting. Our brains have limited cognitive capacity and these preoccupations leave fewer cognitive resources available to guide choice and action¹⁴. People living in deprived circumstances make decisions which at face value are objectively damaging but at the time and given the circumstances make sense, the powerful excerpt below goes some way to explaining the decisions made while living in poverty.

“..We know that the very act of being poor guarantees that we will never not be poor. It doesn’t give us much reason to improve ourselves... Poverty is bleak and cuts off your long-term brain... I make a lot of poor financial decisions. None of them matter in the long term. I will never not be poor, so what does it matter if I don’t pay a thing and a half this week instead of just one thing? It’s not like the sacrifice will result in improved circumstances the thing holding me back... [is] that now that I have proven that I am a Poor Person that is all that I am or ever will be. It is not worth it to me to live a bleak life devoid of small pleasures so that one day I can make a single large purchase. I will never have large pleasures to hold on to. There’s a certain pull to live what bits of life you can while there’s

money in your pocket, because no matter how responsible you are you will be broke in three days anyway. When you never have enough money it ceases to have meaning... You grab a bit of connection wherever you can to survive. You have no idea how strong the pull to feel worthwhile is. It's more basic than food... Whatever happens in a month is probably going to be just about as indifferent as whatever happened today or last week. None of it matters. We don't plan long-term because if we do we'll just get our hearts broken. It's best not to hope. You just take what you can get as you spot it."

LINDA TIRADO "THIS IS WHY POOR PEOPLE'S BAD DECISIONS MAKE PERFECT SENSE" HUFF POST NOVEMBER 22ND 2013

What do we need to do now

In a nation where free universal health care and public health programmes have been the norm for more than five decades, one would not expect to observe the inequalities in healthy life expectancy described above. Increasing healthy life expectancy is important at both the individual and population level. At the individual level living longer in better health is preferable to a longevity marred by disease and disability; it allows people to enjoy their later years and reduces social isolation and loneliness. At the population level, increasing healthy life expectancy means that fewer people are claiming incapacity benefits, more are able to continue to work for longer which could encourage economic growth¹⁵ and fewer people need to rely on already stretched health and social care services. It is unlikely that increasing spending on services will solve the healthy life expectancy issue. Resources are scarce and both the NHS and local authorities are under immense pressure from constrained budgets and increasing demand. We need a new approach.

Wider Determinants

The circumstances in which we live our lives have an impact on our health; they impact on the opportunities we have to make healthy choices. Greater attention should also be paid to the determinants that collectively influence health and wellbeing – physiological risk, psychosocial risks, risk conditions as well as behavioural risks, in other words the root causes of ill health underscored in the Marmot Review¹⁶. The constant strain of poverty, low paid work, un- and underemployment, poor or insecure housing and debt leads to a lack of control, poor environments, emotional distress, social isolation and physiological impacts on blood pressure, stress hormones and cholesterol all of which impact not only lifestyles choices but our vulnerability to mental and physical illness.

The new approach needs to find effective ways to support people in lower socioeconomic groups; the ability to live a meaningful life should exist in a reasonable amount for all. This could be achieved by supporting community finance initiatives, controlling payday lenders, providing debt counselling and benefits advice, integrating support across the public sector to improve employment prospects, developing a locally integrated system that joins up schools, vocational training, apprenticeships, employers and employment support to ensure

young people are given the best chance to develop skills needed to get a good job and support out of work adults into employment, increase the quality of high quality housing, implement and regulate the living wage at local authority level and work with local businesses to promote the living wage through recognition schemes¹⁷.

Prevention priorities

Public health prevention priorities should be holistic in nature and with a comprehensive understanding of the population served and their social and health needs. Efforts to improve and protect health, prevent disease and injury, and deliver high-quality healthcare to the population must be tailored to address the risks and causes associated with the greatest burden, in addition to improving the quality of life of disadvantaged groups if overall health performance is to improve⁹, as such, diet, alcohol physical inactivity and smoking have been and will remain part of the public health agenda.

Since the prevalence of many chronic disease conditions rises steadily with age, a longer life span will inevitably lead to more years spent with disability. Principal among the causes of chronic disability are musculoskeletal disorders, mental health disorders, substance misuse and falls, all of which garner comparatively less policy attention. To address these, concerted public health and high quality medical care strategies should be systematically implemented⁹.

References

1. King's Fund. Time to think differently. Available from: <http://www.kingsfund.org.uk/time-to-think-differently/trends/demography/life-expectancy> (accessed July 2014)
2. ONS (2009). Statistical Bulletin. Period expectation of life, England, 1981-2032 (uses 2008-based population projections)
3. ONS. One third of babies born in 2013 are expected to live to 100. Available from: <http://www.ons.gov.uk/ons/rel/lifetables/historic-and-projected-data-from-the-period-and-cohort-life-tables/2012-based/sty-babies-living-to-100.html> (accessed July 2014)
4. Sullivan DF. A single index of mortality and morbidity. HSMHA Health Rep 1971;86:347-354
5. Stiefel MC, Perla RJ, Zell BL. A healthy bottom line: healthy life expectancy as an outcome measure for health improvement efforts. Milbank Q 2010;88:30-53
6. Salomon JA, Wang H, Freeman MK, Vos T, Flaxman AD, Lopez AD, Murray CJL. Healthy life expectancy for 187 countries, 1990-2010: a systematic analysis for the Global Burden Disease Study 2010.

7. ONS. Inequality in healthy life expectancy at birth by national deciles of area deprivation: England, 2009-2011. Statistical Bulletin. Available from: http://www.ons.gov.uk/ons/dcp171778_356031.pdf (accessed July 2014)
8. Health & Social Care Information Centre (HSCIC). Health Survey for England 2012. 2013 Available from: <http://www.hscic.gov.uk/searchcatalogue?productid=13887&returnid=1685> (accessed April 2014)
9. Murray CJ et al.. UK health performance: findings of the Global Burden of Disease Study 2010. Lancet 2013;381:9971020
10. Buck D, Frosini F. Clustering of unhealthy behaviours over time: implications for policy and practice. The Kings Fund. 2012 Available from: http://www.kingsfund.org.uk/sites/files/kf/field/field_publication_file/clustering-of-unhealthy-behaviours-over-time-aug-2012.pdf (accessed July 2014)
11. Jones NRV, Conklin AI, Suhrcke M, Monsivais P. The growing price gap between more and less healthy foods: analysis of a novel longitudinal UK dataset. PLoS ONE 2014;9(10):e109343
12. Fone DL, Farewell DM, White J, Lyons RA, Dunstan FD. Socioeconomic patterning of excess alcohol consumption and binge drinking: a cross-sectional study of multilevel associations with neighbourhood deprivation. BMJ Open 2013;3:e002337.
13. Faculty of Public Health. Alcohol & public health: position paper. Available from http://www.fph.org.uk/uploads/ps_alcohol.pdf (accessed September 2014)
14. Mani A, Mullainathan S, Shafir E, Zhao J. Poverty impedes cognitive function. Science 2013; 341:976-980
15. BBC. The importance of 'healthy life expectancy'. Available from: <http://www.bbc.co.uk/news/health-23411975> (accessed June 2014)
16. Marmot M. Fair society, healthy lives: the Marmot Review: strategic review of health inequalities in England post 2010
17. Inquiry Panel on Health Equity for the North of England. Due North: The report of the Inquiry on health equity for the North. Available at: <http://www.cles.org.uk/wp-content/uploads/2014/09/Due-North-Report-of-the-Inquiry-on-Health-Equity-in-the-North-final1.pdf> (accessed October 2014).