

Now and Then: 160 Years of the Public's Health

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Introduction

160 years ago, when the Society of Public Health was established, momentous change was afoot. Indeed, the very ground beneath Londoner's feet was about to shift. In 1856, Joseph Bazalgette was appointed as chief engineer to the metropolitan board of works with a brief to do something about the city's foul air and water. Bazalgette oversaw the construction of a network of sewers and embankments (many of which survive to this day) to flush away London's waste. By 1866, most of the capital was connected to the sewer network. 150 years later, as plans for a new 'super sewer' appear to be encountering a blockage, much has changed.¹ Public health in Britain is endangered less by dirty water or polluted air, and more by fast food, cigarettes and alcohol. How did we get to where we are today? What was different about public health and the challenges it faced in the nineteenth century when compared to the twenty first? But also, what has stayed the same?

In this paper we aim to survey a 160 years of continuity and change in public health in Britain. Honing in on the leading causes of death at three key points, 1856, 1936 and 2016, (or rather 2014, the most recent date for which we have figures) we suggest that at the beginning of the period, most people died from infectious disease. However, as improvements were made in public health (like the construction of Bazalgette's sewers) infectious disease gradually began to decline. By the middle of our period, 1936, more people were dying from non-communicable conditions like heart disease. Towards the end of the twentieth century, infectious disease as a cause of death in Britain seemed to have almost disappeared, but the arrival of HIV/AIDS suggested that infection was far from over. We explore how and why changes in mortality took place over the lifetime of the RSPH, and point to some on-going implications for public health today.

1. Public Health 1856-1936

The arrival of public health practice in Britain effectively began in 1856, with the appointment of Medical Officers of Health to London's civil vestries – then the local authority districts of the capital. Charged with responsibility for monitoring the presence of infectious disease in their local areas, and with the duty of seeking out and remedying the causes of such disease, London's MOHs set such a good example that similar appointments

¹ Gill Plimmer, 'London's "super sewer" faces funding probe', *Financial Times*, 28 August 2016. <https://www.ft.com/content/0ceb9b58-6d00-11e6-9ac1-1055824ca907> Accessed 28.10.16.

were made mandatory across the rest of England and Wales in 1872, and it was mandatory in Scotland from 1889. This concern over infectious deaths was entirely justified. Of the top ten causes of death for England and Wales, six were infectious, and at very nearly 54,000 deaths in that year, respiratory tuberculosis topped the list, well ahead of the second runner, typhus with nearly 16,000 deaths. Scarlet fever, infant diarrhoea, whooping cough and measles made up the infectious tally. Violence came third in the overall list, dropsy at number seven, and cancer, almost entirely among women, came in tenth, with some 5,800 deaths. 1856 was not an epidemic year – cholera and smallpox, the big infectious killers of the period, were largely absent. Smallpox, indeed, partially checked by inoculation and vaccination, was then in a mild phase: it was to resurge in virulent form in 1870, after which vaccination and its effectiveness became a hot political and public health issue across the country as a whole.

Table 1: Ten Top Causes of Death, England and Wales, 1856

Rank	Cause of Death	Number
1	Phthisis (Respiratory TB)	53,950
2	Typhus	15,950
3	Violence	14,912
4	Scarlet fever	14,160
5	Diarrhoea	13,815
6	Whooping cough	9,225
7	Dropsy	8,213
8	Hydrocephalus	7,299
9	Measles	7,124
10	Cancer	5,859

Source: Registrar-General's Annual Report 1856, pp. 120, 121

Although infection was recognised as vehicle of disease transmission in the 1850s – smallpox was well known to be communicable – the main culprit in generating these so-called zymotic diseases was thought to be the bad odours – miasmas – caused by decomposing organic matter. And London, like all other British urban settlements of whatever size at this period, was chock full of it. The city's household rubbish was stored in huge timber vats in the streets, which were more or less messily and regularly emptied on a variable time basis. Urban transport was very highly horse dependent, so that horse dropping added an extra savoury dimension to the mud of the city's streets. In districts like Marylebone, where there were many private hospitals, straw laid down in the streets to deaden the sound of traffic added to the noisome organic brew. In these years before the city's mains drainage system was put in place, open sewers and over-flowing cesspits added to the gaiety of this atmospheric symphony, while the river Thames also contributed – most notably in the very hot summer of 1858, the year of the Great Stink. Coal dust was everywhere, and those who could sealed their houses as best they might against the incursion of black dust, far more obtrusive than that we currently experience from diesel car emissions. Medical Officers in these years freely attributed the high tuberculosis rates to the

indoor lives of women and children who subsisted on 're-breathed air' in these stifling houses.

Public health strategies across the country therefore began with urban environmental clean-up, with the battles for clean water supply, properly cleaned streets, for drains and sewers and modern water-closets, for modern lidded dustbins, and decent housing. Domestic overcrowding among the poor was tackled under the Housing Acts, and water companies obliged by law to filter their water supplies, and extend constant supplies of running water to all users. The high death rates among children from the various infectious diseases meant that in the years after 1870, many towns and cities provided themselves with isolation hospitals in which to nurse infectious cases, whether of smallpox or scarlet fever. The Education Act 1870, by which all children were required to attend school from the age of five, offered another means of sanitary education and health monitoring. Outbreaks of scarlet fever and measles were quickly recognised to be school-related, but knowledge of where scholars lived provided further means to educate families in responsible social behaviours. In the 1920s, the Medical Officer for London, William Hamer, credited the schools with a transformative influence on cleanliness and responsible social behaviour across the decades, comparing the condition of new generations of school-children brought up by those who had first entered the system with that of their forebears.

By 1900, the Medical Officers were doing more than simply implementing legislation – they were beginning to take initiatives to extend the effectiveness of their mission. In the 1890s they were instrumental in getting local authorities to appoint women sanitary inspectors. In 1902, the MOH for St Pancras instituted a weekly meeting for mothers and babies which combined socialising with advice on child-care and matters domestic. The example was quickly followed by colleagues, and maternal and child health joined the portfolio of local public health activities. By the 1920s many local authorities were operating VD (sexual health) clinics in a parallel concern not simply for adult sexual health but also to address the distressing issue of babies born to mothers infected with syphilis. By the mid-1930s, public health had moved a long way from concern over drains and water supplies.

The virtual disappearance of the infectious diseases as killers was recorded in the Registrar-General's report for 1936, the chronological half-way point in this history, but also in a decade which knew very well that the country's health and mortality profile had radically changed in the previous eighty years. Although respiratory tuberculosis still figured in the top ten, its mortality had halved. Infant diarrhoea had all but disappeared as a killer, and deaths from other childhood infections had been significantly reduced: measles and diphtheria together totalled under 6,000 deaths – some 200 fewer in that year than influenza. (Diphtheria, it should be noted, was first reported in England in autumn, 1857, imported from France.) The great killers were now what might be termed lifestyle diseases – circulatory diseases, diseases of the digestive system, and bronchitis and pneumonia. This change in the nature of cause of death changed perceptions of what was needed in public health administration, and prefigured changes to that system, which would be implemented in the years after World War II. The collection of domestic refuse, and the cleaning of streets (made so much easier by the advent of motorized transport and the disappearance

of the urban horse) had become routine, and even if there were continuing problems with housing, most houses now enjoyed more or less modern plumbing and constant water supply. Health concerns were changing away from infections and crowd diseases towards the escalating problems of chronic and systemic disease.

Table 2: Top Ten Causes of Death, England and Wales, 1936

Rank	Cause of Death	Number
1	Heart disease	126,584
2	Disease of myocardium	80,921
3	Respiratory (bronchitis & pneumonia)	50,338
4	Cancer of digestive system	35,893
5	Digestive system	25,166
6	Genito-urinary (non VD)	23,893
7	Respiratory TB	23,801
8	Arteriosclerosis	23,673
9	Violence	22,594
10	Cerebral haemorrhage	18,241

Source: Registrar-General's Statistical Review of England and Wales 1936, tables, part 1

2. Public Health 1946-2016

Public health in Britain underwent significant change in the period after World War II. This took the form of both changes in health service provision and administration, and in response to the main threats to public health. During the war, hospital services had been brought together under the Emergency Medical Service (EMS) to deal with casualties from the Blitz.² The EMS in some ways pre-figured the establishment of the National Health Service in 1948, but public health was not part of the early NHS. Instead, public health remained the responsibility of local government under the control of the MOH. However, many of the duties of the MOH shifted to General Practitioners, with GPs taking on much of the MOH's clinical work as well as developing a role in disease prevention and health education.³

In the immediate post-war period, MOsH continued to focus on issues surrounding cleanliness and the environment. Encouraging the public to practice good hygiene in the kitchen was essential at a time when few homes had a refrigerator. Although there were

² Geoffrey Rivett, *The Development of the London Hospital System, Emergency Medical Services, 1939-45*, http://www.nhshistory.net/ems_1939-1945.htm. Accessed 28.10.16.

³ Martin Gorsky, 'Local Leadership in Public Health: The Role of the Medical Officer of Health in Britain, 1872-1974', *Journal of Epidemiology and Community Health*, 61.6 (2007), 468-72.

relatively few deaths from food poisoning, it did seem to be on the rise. The Chief Medical Officer noted in 1948 that the number of reported outbreaks of bacterial food poisoning had risen from 422 in 1945 to 962 in 1948.⁴ Sickness resulted in time off work, thus posing a threat to the fragile post-war economy. Moreover, interest in hygiene fitted with the MOsH's remit and view of the public's health and the challenges it faced.

Elsewhere, however, ideas about what constituted the most serious threats to public health were changing. The increase in deaths from heart disease and other non-communicable diseases like cancer prompted epidemiologists to search for the causes of such conditions. In 1950, Richard Doll and Austin Bradford Hill published a study in the *British Medical Journal* that demonstrated that there was a link between smoking and lung cancer.⁵ Around the same time, other work showed that there were connections between individual behaviour and heart disease. In a study of London bus drivers and conductors, the epidemiologist Jerry Morris found that rates of heart disease were higher amongst the sedentary bus drivers than they were in the conductors, who spent their days running up and down stairs collecting tickets.⁶ A connection between exercise and heart health was thus established. In the US, the Framingham cohort study pointed to a relationship between diet and heart disease, with saturated fat being blamed for a rise in coronary heart disease throughout the Western world.⁷ Diet, exercise and smoking were all 'risk factors' (the Framingham study was the first to use this term) that increased an individual's chances of developing, and later dying of, a chronic illness.⁸

This focus on individual behaviour as a causal factor in the development of disease resulted in significant changes in public health policy and practice. By the late 1960s and early 1970s, public health was increasingly concerned with disease prevention. Mass media campaigns designed to encourage people to give up smoking, take more exercise, drink less alcohol and eat more healthily, proliferated.⁹ Borrowing tactics from the commercial world of advertising, these campaigns were designed to appeal to the individual and get him or her to take responsibility for their own health. Some success could be claimed. The percentage of the population that smoked dropped from 45% in 1974 to 35% by 1982 and 27% by 1994,

⁴ See Anne Hardy, *Salmonella Infections, Networks of Knowledge, and Public Health in Britain, 1880-1975* (Oxford: Oxford University Press, 2014).

⁵ Richard Doll and Austin Bradford Hill, 'Smoking and carcinoma of the lung', *British Medical Journal*, (1950) 2(4682): 739–748.

⁶ JN Morris, Heady JA, Raffle PAB, et al. 'Coronary heart disease and physical activity of work', *Lancet* 1953;265(6795):1053-1057.

⁷ Gerald M. Oppenheimer, 'Becoming the Framingham Study 1947-1950', *American Journal of Public Health*, 95.4 (2005), 602–10.

⁸ William G. Rothstein, *Public Health and the Risk Factor: A History of an Uneven Medical Revolution* (Rochester, NY: University of Rochester Press, 2003).

⁹ Virginia Berridge and Kelly Loughlin, 'Smoking and the New Health Education in Britain 1950s-1970s', *American Journal of Public Health*, 95.6 (2005), 956–64; Alex Mold, "'Everybody likes a drink. Nobody likes a drunk". Alcohol, Health Education and the Public in 1970s Britain', *Social History of Medicine*, (forthcoming).

resulting in a gradual reduction in the number of deaths from lung cancer.¹⁰ But, the decline in smoking was uneven. People in lower socio-economic categories were more likely to continue smoking, something that suggested a connection between social status and health. Indeed, structural factors and social inequality did not disappear entirely from the public health agenda, despite the focus on individual lifestyle. In 1980, the Black Report on Social Inequalities and Health demonstrated that poorer people died younger and suffered worse health than those who were more wealthy.¹¹

The 1980s, however, came to be dominated by a new public health emergency. The appearance of an infectious disease with no known cure, HIV/AIDS, seemed to pose a significant threat to the population.¹² Although deaths from AIDS did not reach the apocalyptic levels predicted initially, and the development of effective forms of treatment meant that by the late 1990s and early 2000s HIV/AIDS could be managed more like a chronic condition, HIV/AIDS represented a powerful return for communicable disease as a focus of concern for public health. More recently, conditions like SARS, MERS and swine flu have also prompted a strong public health response. Some chronic conditions, like certain forms of cancer, have been shown to be caused by bacterial or viral infections. Indeed, as the causes of death statistics for 2014 demonstrate, infectious disease has not gone away. Seasonal flu and pneumonia still kill in large numbers, albeit most often within an older population group. Diseases associated with aging, whether they be infectious or chronic, are now the leading killers. Heart disease, stroke and cancer all figure highly in the top ten causes of death, and although these are often connected to individual behaviour, they are also diseases of degeneration associated with the aging process. Intriguingly, dementia and Alzheimer's disease are listed as the second biggest causes of death, even though these conditions do not kill in quite the same way, as say, a heart attack. Most deaths due to dementia are caused by complications of the condition, such as pneumonia, once more muddying the waters between deaths caused by infection, and deaths caused by chronic conditions.

Table 3: Top Ten Causes of Death, England and Wales, 2014

Rank	Cause of Death	Number
1	Ischaemic heart diseases	60,509
2	Dementia and Alzheimer disease	51,498
3	Cerebrovascular diseases	34,157

¹⁰ Figures quoted in Virginia Berridge, *Marketing Health: Smoking and the Discourse of Public Health in Britain, 1945-2000* (Oxford: Oxford University Press, 2007).

¹¹ Peter Townsend and Nick Davidson, *Inequalities in Health: The Black Report* (London: Pelican Books, 1982).

¹² Virginia Berridge, *AIDS in the UK: The Making of Policy, 1981-1994* (Oxford: Oxford University Press, 1996).

4	Malignant neoplasm of trachea, bronchus and lung	30,868
5	Chronic lower respiratory diseases	29,032
6	Influenza and pneumonia	25,454
7	Malignant neoplasm of colon, sigmoid, rectum and anus	14,287
8	Malignant neoplasms, stated or presumed to primary of lymphoid, haematopoietic and related tissue	11,479
9	Malignant neoplasm of prostate	10,153
10	Malignant neoplasms of female breast	10,097

Source: Deaths Registered in England and Wales, Office of National Statistics, 2015

The inclusion of dementia and Alzheimer's in the causes of death statistics also hints at a much larger issue. Focusing only on mortality as an indication of how public health has changed over the last 160 years, as we have done in this paper, gives us only part of the picture. Patterns of morbidity are much harder to chart and define. Non-communicable diseases existed alongside communicable diseases and resulted in ill health in 1856 just as infectious conditions continue to be an issue in 2016. But, as we now live longer, chronic conditions and the diseases of aging are more of an issue for public health irrespective of whether or not they are directly responsible for deaths. Death is now often preceded by a long period of declining health which poses challenges to both the individual and to public health.

Conclusion

So what can we learn from 160 years of public health history? Taking the long view allows us to see continuities as well as changes. Focusing on variations in the mortality statistics tells us that infection was undoubtedly the biggest killer in 1856. Technical and environmental developments, such as the building of sewers and the introduction of vaccination, together with general improvements in living conditions, helped to reduce the burden of infectious disease. By the turn of the twentieth century, and certainly by our mid-point of 1936, infectious disease was no longer responsible for most deaths. Heart disease and various forms of cancer took over as the leading killers, but infection, and violence, had not entirely gone away as significant causes of death. By 2016 (or at least 2014, the most recent year for which we have statistics) cardiovascular disease, including coronary conditions and strokes, was the most common cause of death.

By living longer, we are able to develop the diseases of old-age, but our fates are determined both by individual behaviour and the social conditions in which we find ourselves. The disappearance of violence as a leading cause of death suggests that whilst we may live in a more peaceful society, it is not necessarily a more equal one. Patterns of death and disease can still be mapped on to the social gradient, with poorer people suffering worse health and dying younger than the more affluent. Caution must also be exercised about our apparent victory over infectious disease. The appearance of AIDS in the 1980s demonstrated that 'new' infections may yet still pose a significant danger to public health. Moreover, the rise of anti-microbial resistance could herald a return to infections we long thought all but defeated.

The past is not always an accurate predictor of the future, and it would be a brave historian who dared to forecast what the next 160 years of public health will look like. But what does seem certain is that we will continue to need organisations like the Royal Society of Public Health to help generate better health for us all. Here's to another 160 years!