

# ReFresh

## Recent Findings of Research in Economic & Social History

Finding satisfactory explanations for the improvement in health that occurred in England from the 1860s has led to historical controversy. Proponents of the mid-nineteenth-century 'Sanitary Revolution' thesis have clashed with those who favour the longer-term 'Silent Revolution' effected by improved living standards and better nutrition. Here Dr Simon Szreter argues persuasively that we should pay more attention to the later nineteenth century, and more specifically to the impact of preventative and public health reforms at the local level.

## Mortality and Public Health, 1815-1914

In the middle of the century that lies between the Napoleonic and the Great Wars there occurred an important turning-point of improvement in the nation's health. From the late 1860s onwards can be dated a continuous national trend of falling mortality levels; the modern mortality decline. Mortality among older children and younger adults fell first. National expectation of life at birth (see box) rose significantly above 40 years - probably for the first time ever - reaching 45 years for males and 49 years for females by 1901. Finally, from the first year of the new century onwards, even the stubbornly high national infant mortality rate also commenced a steep and sustained fall: from 150 per thousand to 110 per thousand by 1910-1912, and then to 80 per thousand by 1920-1922. As one might expect with something commanding such universal approbation as a sustained nationwide improvement in health and freedom from diseases - decidedly a 'good thing' in the parlance of *1066 and All That* - there has been much keen debate over exactly how this improvement occurred and who or what deserves the praise.

### The McKeown thesis

The most important body of hard evidence to answer these questions lies in the continuous series of demographic records kept by the General Register Office (G.R.O.) since its creation in 1837. Thomas McKeown, late Professor of Social Medicine at Birmingham University, published in 1976 a summary analysis of this data in the light of modern medical knowledge.<sup>[6]</sup> 'The McKeown, thesis' shocked an overconfident medical establishment. It showed that medical science had remarkable little to do with the modern mortality decline: most of the fatal diseases afflicting early Victorian Britain had all but disappeared long before the arrival of chemotherapies, antibiotics or immunisation programmes (see Figures 1 and 2).

McKeown argued that the single main cause of mortality decline was a generally rising 'standard of living', especially an improved nutritional intake made available by rising real wages. In coming to this conclusion McKeown's reclassification of the

various fatal diseases recorded in the G.R.O.'s data played a vital role. His classification was essentially tripartite:

- (1) infectious diseases spread through the air (mainly in water vapour): respiratory tuberculosis; bronchitis, 'flu, pneumonia; whooping cough; measles; scarlet fever; diphtheria; smallpox
- (2) infectious diseases spread through water or on food: cholera; diarrhoea, dysentery; typhoid
- (3) all other diseases: both contagious and degenerative (and including a large 'unknown' or unattributable section).

McKeown showed that almost one half of the reduction in deaths occurring from the beginning of the G.R.O.'s records down to 1901 was due to a reduction in category (1), with the remainder split roughly evenly between (2) and the residual (3). While nothing specific could be inferred from category (3), McKeown acknowledged that a fall in category (2) provided a good index of the probable successes of public health and sanitation measures in protecting the population from exposure to harmful water- and food-borne microorganisms. But McKeown chose to emphasise in particular the quantitative significance of category (1) and a supposedly very early decline in respiratory tuberculosis. He argued that there was no means available in the nineteenth century to prevent exposure to airborne micro-organisms. Any reduction in the incidence of these deaths could only be attributed to the human hosts' increased capacity to survive attack (with the sole exception of scarlet fever, where a spontaneous decline in its virulence was probable). Modern medical science indicated that the most likely cause of a general rise in a population's capacity to resist a range of such diseases was an

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improvement in its nutritional status. Thus, McKeown concluded that the much larger and earlier reduction in the airborne category of diseases showed that a general rise in the population's nutritional status was the primary cause of the modern mortality decline, public health measures a secondary factor.

The McKeown thesis certainly seems to receive broad support from historical research on the aggregate real wage index. This is particularly appropriate as a measure of McKeown's concept of 'living standards' since it measures changes over time in money wage-rates deflated by a cost of living estimate. Here changing food prices play a major role. Rising real wages mean more food can be purchased for the same proportionate outlay from the average family's weekly budget. Although economic historians remain divided upon the exact course of real wages during the latter half of the eighteenth century, there is a strong consensus that from the 1820s onwards the aggregate trend of real wages has been broadly upward.

**Nutritional status** – the state of the body as it balances growth, work and the defeat of disease with the intake of nutrients.

**Expectation of life at birth** – expresses the number of years a child will live at prevailing age-specific mortality rates.

**Age-specific mortality** – number of deaths per year at a given age per 1000 people of that age.

**Infant mortality rate** – number of deaths per thousand of infants under one year old per year.

**Birth cohort** – group of people born in a given year or period.

## Re-interpretation and new evidence

It has recently been shown that McKeown's interpretation of his own epidemiological data (i.e. his information on diseases), was flawed in a number of respects. [71 Firstly, both smallpox and diphtheria are diseases whose eradication is recognised to be directly attributable to preventive health measures. For the purposes of the argument which McKeown wished to make, their contribution to the mortality decline should not only be subtracted from category (1), like scarlet fever, but also *added* to category (2), as further evidence of the successes of public health action. Respiratory tuberculosis was, indeed, the single most lethal disease in the mid-nineteenth century and its incidence had fallen by over 50 per cent by 1901. But chronologically it did not lead the mortality decline, as McKeown alleged. His data shows no unambiguous trend decline in tuberculosis until after 1866/7. If any major affliction was clearly the first to fall, then it was smallpox. [101 Finally, in claiming that category (1) accounted for almost half the reduction in deaths before 1901, McKeown failed to adjust this for the off-setting, substantial rise in the bronchitis/pneumonia/flu composite, which by 1901 had almost reached the absolute level of lethality that tuberculosis had exhibited half a century earlier! By contrast, the only three diseases which had been positively eradicated before the Great War – cholera, typhoid and smallpox – were all accounted for by preventive health measures. When all these qualifications are properly allowed for, the epidemiological evidence in fact suggests that public health measures played the most decisive and quantitatively most important role in the early stages of the mortality decline.

Furthermore, since McKeown's work was completed two significant new forms of relevant quantitative evidence have appeared, which cast great doubt on the 'living standards'/nutrition hypothesis. The historical demographic work of Wrigley and

Schofield [9] shows that the period 1815-1914 in fact encompasses not just one, but two turning points in the national index for expectation of life at birth. First, in the 1820s a secular trend of steady improvement, which had been in train since the 1730s, came to a grinding halt. During 'the long eighteenth century' expectation of life at birth had steadily risen from about 33 years to about 41 years by the 1820s. But from then, until the second turning point of the late 1860s, there was no further significant improvement.

Secondly, the anthropometric evidence analysed by Floud *et al.* [4] broadly confirms these phases in mortality. Cohorts of children born in each successive decade during the late eighteenth and early nineteenth centuries exhibited a trend of increasing average height attainment, a pattern consistent with a trend of improving nutritional status. But those children born during each decade from the 1820s to the 1850s (inclusive) revealed an actual fall in height attainments relative to their predecessors. From the birth cohort of the 1860s onwards, this negative trend was gradually reversed so that the cohort born in the first decade of the twentieth century probably equalled the height attainments of those born nearly a century before.

Thus, far from conforming to the McKeown thesis, the first half century of the period under review here seems to confirm its opposite. As real wages began to rise generally, so overall mortality rates ceased their previous trajectory of improvement. If rising real wages commanded an enhanced diet, apparently this was not

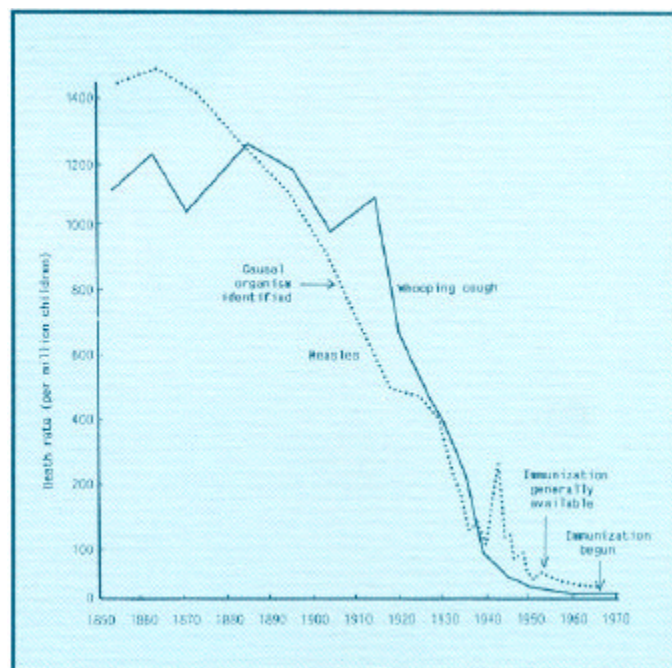


Figure 1 Death rates of children under 15 from measles and whooping cough. England and Wales  
Source [6]

expressing itself in healthier, better-nourished children. The growing provincial cities, where real wages had been rising most and for the longest period of time, were precisely those places where mortality was highest and where children were most underdeveloped (Floud *et al.* found that deterioration in heights between 1820 and 1860 was particularly evident among the samples drawn from the fast-growing industrial cities). [12]

The obvious explanation for this paradox is that the health-threatening effects of the unsanitary conditions created in the crowded, mushrooming centres of industrial growth must have overwhelmed the health benefits to be derived from higher wages and greater food consumption. Health improvements for the multiplying workforce could not be won by bread alone. Serious efforts and considerable economic resources would have to be devoted to the sanitary and preventive health needs of towns and villages which were chaotically swelling into cities. Those efforts constitute the history of the public health movement.

## A new perspective on the public health movement

At first sight the claims of the Victorian public health movement appear to be no more convincing than that of rising real wages, in terms of simple chronological correlation. It has generally been considered that this movement's 'heroic age' consisted of two periods of activism between 1840 and 1875, both of which ended in ultimate nemesis. Edwin Chadwick's perseverance was the main driving force during the 1840s, culminating in the nation's first Public Health Act in 1848.[2] But a political nation of greater and lesser landlords, jealous of their local autonomy and suspicious of any 'Bonapartist' extensions of central control, had hounded Chadwick out of office by 1854. A subsequent 'sanitary revival' is recognised to have started in the mid-1860s, resulting in the Royal Sanitary Commission of 1869-71 and culminating in the consolidating Public Health Act of 1875. The principle of local self-government was maintained but certain compulsory responsibilities were laid upon local authorities, supervised by the new Local Government Board (L.G.B.). However, the protest resignation in 1875 of Sir John Simon, the L.G.B.'s Chief Medical Officer, has been taken as the death-knell of public health progress, now strait-jacketed within an unsympathetic department, whose administrative secretariat was mostly recruited from the reactionary Poor Law Board.

However the apparent lack of correspondence between the timing of the public health movement's efforts to improve the urban environment and the fall in mortality over the last third of the nineteenth century is purely an illusion. It has been created by a whiggish post-N.H.S. historiography that has concentrated too exclusively upon a celebrated few and upon the obstructions that prevented them from achieving more. It is symptomatic that many of the most influential publications have been impressive biographical studies of figures such as Chadwick, Simon and Farr. However the chronology of public health activism is entirely reversed if, following the lead of A.S. Wohl [8], we choose to look instead at what was positively achieved: the tempo and volume of effective preventive health measures actually put into effect around the country. From this viewpoint, the three middle decades of the nineteenth century are those of sluggishness and small beginnings. It is in fact the last third of the century during which the public health movement increasingly became an even more forceful, better-funded and staffed reality throughout the cities and towns of the land.

This can be most readily demonstrated by a brief review of the timing of major preventive health innovations at the local level. First, provision of the basic sanitary facilities: an efficient waste disposal system and an adequate supply of clean water. Most cities muddled through the first two-thirds of the century with a combination of cesspools and ash-pits. A few water-closets in the houses of the wealthy emptied directly into local brooks or rivers, often simultaneously a source of drinking water intermittently supplied by profit-seeking water companies. The two classic waterborne sanitation diseases, cholera and typhoid, unknown in Britain before the nineteenth century, became major killers under these circumstances. Not until 1865, with the commissioning of London's integrated mains sewer system, did any city actually enjoy the potential benefits of this engineering solution, championed over two decades earlier as Chadwick's great 'Sanitary Idea'. By 1871, the Royal Sanitary Commission found that most towns and cities were already following London's example. However, the Commission also found that as yet few homes were actually connected to the mains sewers, even in the leading city in this respect, Liverpool. After the 1875 Public Health Act, local authorities increasingly used the growing powers available to them to regulate housing standards through by-laws so that by the turn of the century a majority of households had connected water closets, though there were still some exceptions- notably Manchester.

Even more expensive than the building of sewers were the undertakings required of local authorities to ensure an adequate supply of clean water for their populations, one of the compulsory requirements of an earlier Public Health Act of 1872. As an important sweetener, the right which local authorities had enjoyed since 1848 to apply to the Exchequer for low-interest loans ('grants-in-aid') for various categories of activity, was now encouraged in respect of sanitary projects. Over the entire period 1848-72 local authorities had borrowed from central government only 11 million for sanitary purposes, and most of that since 1864. In the remaining eight years of the 1870s alone, the new L.G.B. sanctioned over 22 million in such loans; during the subsequent period, 1880-97 a further 62 million was loaned in this way (in a period of very low inflation, these figures represent genuine large increases). By 1879 already over 400 out of 944 urban local authorities had taken over control of their local water supply in order to comply with their statutory obligations. This number had grown by 1905 to over 750 out of the 1138 local authorities in existence.

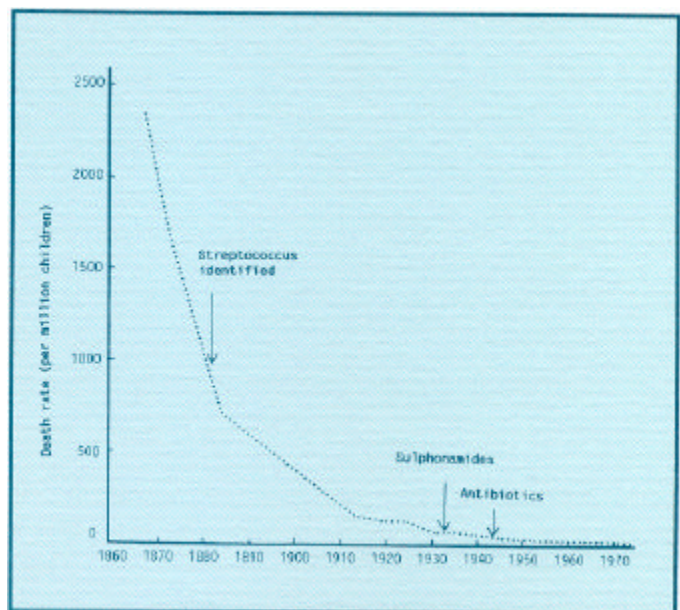


Figure 4 Death rates of children under 15 from scarlet fever. England and Wales. Source [6]

Another indicator of the increasing pace of public health activity during the last third of the century is provided by a brief review of the growth and professionalisation of the key personnel involved, the preventive health officials and their staff. Although the first Medical Officers of Health (M.O.H.) were appointed as early as the 1840s - in Liverpool and the City of London - by 1872 there were still only fifty such posts in England and Wales, and most of these were employed by London vestries. The Public Health Act of that year made it compulsory for every statutory sanitary authority to appoint an M.O.H.. By 1875 1,206 M.O.H.s had been appointed and by 1899 there were 1,770. Their own national journal, *Public Health*, was launched in 1888. The introduction during the 1870s of the Diploma in Public Health ensured successful adaptation of practices to the powerful new, contagionist principles of bacteriological science. This cadre of specially trained public health doctors steadily grew: 263 held the D.P.H. by 1886; nearly 700 by the end of the century. They were also joined by increasing number, of public analysts, appointed by local authorities to oversee the often dubious quality of local foodstuffs. The seven analysts of 1872 had become a national Society, 126 strong by 1877; 224 by 1882. All other locally appointed health officials such as sanitary engineers and surveyors, sanitary inspectors and housing inspectors also grew dramatically in numbers, and in professional Organisation and training during the last third of the century. This was followed in the Edwardian period with the professionalisation of yet further categories of



In this *Punch* cartoon of June 1848, Lord Morpeth, First Commissioner of the Board of Works, is depicted throwing legislative pearls before unappreciative local aldermen, happily wallowing in the mire of uncleaned streets. The reference is to the Public Health Bill of 1848, then being emasculated in Parliament by vested interests. This permitted local authorities to establish boards with extensive powers including the management of sewerage, the establishment of clean water supplies, and the removal of sanitary nuisance.

health officials: midwives, health visitors and School Medical Inspectors.

Finally, recent research has detected an important shift in popular attitudes towards both personal hygiene and cooperation with preventive health agencies, occurring among London's working-class communities during the 1880s and 1890s. [1] J Partly this can be attributed to their education by health workers and also through the curriculum of the now compulsory elementary schools, but equally it was the result of the education of the governing classes themselves. In the light of experience and the urgings of health professionals, key elements of personal medical treatment were legislatively removed from their previously intimate association with the hated poor law, principally by the Medical Relief (Disqualification Removal) Act of 1885. With illness and its treatment no longer stigmatised as something which threatened the family with pauper status, a more positive attitude could therefore emerge.

Thus the period from 1865 to 1914 witnessed a growing momentum in the weight, volume and density of financial, administrative and human professional energies devoted to public health measures. Central government provided some important prods and exhortations, in the form of statutory requirements, the availability of loans, and the G.R.O.'s regular publication of a league table of mortality levels in the largest towns and cities. The latter seas effective ammunition for the shaming of a laggard local authority at the hands of its local press. But virtually all of this public health activists was constrained to work with, and through, local opinion and local government structures.

## Conclusions

The first half of our period, 1815-65, speaks volumes for the limitations of a rising 'standard of living' thesis, alone, to produce health improvements. In the absence of collective political decisions, at both local and national level, specifically aimed at utilising the population's increased wealth for explicitly health-promoting objectives, economic growth in itself had no inherently health enhancing properties.

Conversely, the second half of this period, 1865-1914, demonstrates what really could be done to promote a nation's health in a society possessing the necessary economic resources but also and much more significantly- acquiring the necessary ideological and scientific means, political will and administrative organisation to undertake enormously expensive enterprises - lacking any

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Immediate economic payoff- which were required to promote collective health in an urban society.

Although McKeown's demolition of the bogus historical claims of 'high tech' medicine remains broadly valid, the lower status, preventive and public health branch of medicine deserves to inherit much of the praise for bringing about the modern mortality decline. Since the sphere of operation was at the local government level, only meticulous local research, exemplified in the work of Buchanan [1] and Hardy [5], can show precisely how individual diseases were combatted by the specific actions of public health agencies. There is a need for more research of this kind to explore more fully the true scope and *modus operandi* of the public health movement.

Finally, a balancing *caveat*. There can be no doubt that adequate nutrition and a good diet are essential for a population to achieve the historically high levels of health enjoyed in Britain today. In emphasising the importance of public health measures in bringing about the late-Victorian turnaround in the new urban society's health prospects, rising living standards and better nutrition are not to be

considered unimportant. Without rising real wages, mortality would probably have been even worse during the early nineteenth century and improvements, when they came, would have been even slower. However, it must also be remembered that rising living standards and better nutrition were themselves socially negotiated and constructed aims, not an economic given. On the one hand it required continual perseverance and hard bargaining by organised workers with their employers over hours, conditions and rates of pay. On the other hand, only the increasing vigilance of public health and local government officials, (over such matters as the quality of foodstuffs and the standard of amenity in working class housing), ensured that increased wages could buy something that was worth having from a health point of view.

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