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SECTION 1 A HISTORICAL PERSPECTIVE

Introduction

As has been made clear in earlier editions of Clay’s, the history and development of what we now call environmental health is long and complex. As Western societies developed (what would now be classified as the high-income countries) so the stressors on human health increased; indeed perhaps we can ignore the notion of ‘Western’ as there would have been both environmental and health impacts from the moment fire was discovered and wherever human groupings existed. The history and development of what we now call ‘environmental health’, however, are closely allied to the social history of the UK.

In the UK there were great economic, social and environmental changes in the eighteenth and nineteenth centuries, when urbanisation and industrialisation brought millions of people together in crowded, sprawling and insanitary settlements. In response, society underwent a period of rapid change particularly motivated when the effects of the insanitary conditions spread to the middle and upper classes and the causes of cholera and typhoid were identified.

New models for the delivery of public services to protect public health and maintain both a healthier workforce and reduce the strain on the Poor Law Commission (and later Board) and Parishes were introduced. The municipal corporations of the 1830s and the new Boards of Health were largely conceived to deal with outbreaks of communicable disease and to afford basic measures of health protection. Subsequently, a new concept of health arose: the idea of public health. New philosophies for the delivery of education and other public services began to take shape, and a new form of democracy evolved – extended suffrage, which became universal in the early twentieth century.

Environmental health as we know it has often been related to public health issues, and sometimes the impacts of different stressors. There are of course practitioners in the UK who qualified as Public Health Inspectors and remain proud of that. Given that the real concern is with the impact of environmental stressors on human health it is understandable why many prefer the term public health particularly when the focus is on those stressors that are a consequence of human activity. It remains true that environmental health practitioners are part of the public health workforce.

Impacts are not always the same as issues; whether an impact becomes an issue can depend on the public response, which is often linked to how the media report an impact. So a public health issue...
reflects public or political pressure. An easy way to think of the development of environmental health is in the context of different developments in the legal framework, but that is also to think in very narrow terms of environmental health. This section of this first chapter looks at some environmental or public health issues over time and how they influenced the legal landscape at that time. However, environmental health is more than just a subject that relies on legislation and the implementation of those laws for its existence. Environmental health could exist without any legislation, which provides only one means of addressing problems.

This section of the chapter looks at how environmental health as it is generally perceived has developed in the British Isles. However, if one considers the range of practitioners around the world who consider themselves to be environmental health practitioners, then we can see that even now there are slightly different interpretations or indeed specialities within the overall concept.

Historically many of the concerns were with the effects of waste on health and, as Mellanby [1] has said, quoting archaeologist Jacquetta Hawkes, ‘waste disposal by human beings may be said to have begun when hunters of the earliest Stone Age tossed their gnawed bones over their shoulders’, indeed to such an extent that caves became so reduced in size that they could no longer be occupied, and their occupants were certainly not ‘cave-proud’. Until the nineteenth century waste disposal and sewerage systems and sewage treatment in the cities of Britain were very ineffective although through the centuries the great houses and monasteries may have had better organized (and healthier) systems for dealing with waste. Yet in many towns refuse was allowed to rot in the streets, and there was no concern with contamination of water supplies.

Environmental health was concerned initially with those factors that were easily identifiable as affecting human health, but as the interaction of the environment with human health became better understood the role of environmental health expanded. In some cases this was also accidental as environmental health included a cadre of people able to deal with issues (and legislation) that had no obvious body to implement control measures.

Earlier editions of this book sought to divide the evolution of environmental health into eras. This historical perspective does not intend to replicate that approach, rather to provide some pointers and key issues in this evolution that have helped to define environmental health.

The 20th edition had limited historical references, as it sought to look forward with broader horizons, but since then a number of works (listed in further reading) have perhaps underscored a point made in the 19th edition that a historical perspective can make it easier to understand the current position. There is admittedly always the possibility that mistakes and tragedies of the past will be repeated, and not necessarily as farce (to paraphrase Marx). This is true in the UK if as is possible public expenditure as a proportion of gross domestic product (GDP) is reduced to 1930s levels. Much of this historical perspective is linked to economic and social development.

The agricultural revolution

The agricultural revolution is taken as being the period from 1700 to the early eighteenth century and also led to movement from the country into towns. The likes of Charles Townsend, Thomas Coke, Jethro Tull, Robert Bakewell and others introduced improvements in animal husbandry and arable farming. The Enclosure Acts allowed those with the wealth to purchase public fields and push out small-scale farmers, causing a migration of men looking for wage labour in cities.

New patterns of crop rotation and livestock utilisation paved the way for better crop yields, a greater diversity of wheat and vegetables and the ability to support more livestock. These changes also impacted society so that workers’ diets improved a little and contributed to a slow decline in the rural death rate. Those who remained as farm workers had a low living standard in damp and crowded housing. Working on the land throughout the year, whatever the weather, and poor living conditions still contributed to a low life expectancy.

These social changes and growth of towns made it increasingly difficult to provide a consistent and satisfactory food supply for those living in the urban areas. The increased productivity of the rural
context, philosophy and principles of EH

Economy did not lead to improved quality, indeed the conditions were ripe for fraudulent substitution, and for food to be adulterated.

The industrial revolution

The industrial revolution did not follow the agricultural revolution, rather they overlapped considerably; for example, Abram Darby first smelted local iron ore with coke made from Coalbrookdale coal in 1709, and in the coming decades Shropshire became a centre for industry due to the low price of fuel from local mines. The Iron Bridge, a bridge that crosses the River Severn, which was used as a major transport system, opened in 1781. It was the first arch bridge in the world to be made of cast iron, and was greatly celebrated after construction owing to its use of the new material.

Water power was essential for increasing mechanisation. The Derwent valley, upstream from Derby on the southern edge of the Pennines, contains a series of eighteenth- and nineteenth-century cotton mills and an industrial landscape of high historical and technological significance. It began with the construction of the Silk Mill in Derby in 1721 for the brothers John and Thomas Lombe, which housed machinery for throwing silk, based on an Italian design. The scale, output and number of workers employed were without precedent. However, it was not until Richard Arkwright constructed a water-powered cotton spinning mill at Cromford in 1771, and a second, larger mill in 1776–77 that the ‘Arkwright System’ was established. In terms of industrial buildings, the Derwent Valley mills may be considered to be the first of what was to become the model for factories throughout the world in subsequent centuries.

As the result of changes to the rural economy and the development of industry (often in small towns and villages in relatively rural areas) people were moving in to more urban or industrial areas. The pace of industrialisation quickened with the development of the steam engine, which enabled more factories, and especially textile mills, to be set up in favourable locations. These developments were accompanied by environmental evils as the amount of waste increased and became increasingly complex.

Machinery enabled production to be vastly increased with economies of scale to be grasped. As factories increased in size and complexity, they also needed more workers, who had to be housed nearby because, in the absence of public transport, they had to be able to walk to work. The need to house workers close to the factories resulted in street after street of small, poorly constructed houses. There was little provision for drainage or refuse disposal; water supplies were inadequate and usually grossly polluted. To add to these unfavourable conditions, tall factories overshadowed the houses where the factory workers lived. They were polluted by smoke, grit and dust from both the factory furnaces and domestic fires emitting smoke at low levels, as chimney heights were only sufficient for combustion.

For many workers, factory practices involved working with dangerous machinery, and fatal or disabling accidents to workers were common. If the adult workers suffered from bad working conditions the lot of the children was even worse. Child labour was often considered an essential factor in production. There was always work a child could do. Children started to work at an early age and in the textile industry particularly they formed part of a team cleaning under looms and spinning machines for example. Adults who could not take a child with them might find work hard to get and, where the shortage of children was acute, mill owners imported children from Poor Law institutions as apprentices. The general social and economic conditions in the early nineteenth century have to be viewed initially against a background of an unreformed Parliament, an inadequate local government system, and a political philosophy that permitted almost anything in the name of individual liberty. Because of the political and economic views current at the time, there was no political will to make deliberate attempts to ameliorate the conditions endured by most urban workers and their families. Following the French Revolution and the end of the Napoleonic Wars, however, there was considerable political pressure urging change, although rarely successful. The social changes brought about by the agricultural and industrial revolutions, however, brought working people together, along with recognition of their exploitation by the political
Stephen Battersby

and factory- and farm-owning classes, which meant that pressure for change in their employment and everyday life grew.

Not all those in the upper classes were immune to the plight of the working classes. Some politicians and philanthropists adopted causes with which they sympathised, and fought for changes using their social and political connections. In the more urban areas, groups of people emerged who became interested in the welfare of their fellows, and they supported inquiries and investigations. Physicians, such as Thomas Perceval of Manchester and James Currie of Liverpool, visited slum areas and reported what they had found. Environmental disadvantage was not uniformly spread. Some districts were comparatively pleasant, even though few adequate sanitary amenities were available. Some more prosperous boroughs spent money to improve parts of their areas. In many instances these changes were carried out by improvement commissioners who were appointed to implement environmental improvements in particular localities and specifically authorised by a private Act of Parliament. The cost of the works was then being recouped by a ‘rate’ levied on the householders in that area. In 1795, a contagious disease swept through children working at a mill near Manchester, and the local justices of the peace took what action they could to prevent a recurrence. Early in the nineteenth century there was the first move towards improving the conditions of some juvenile workers. Sir Robert Peel, himself a mill owner, introduced a bill that became the Health and Morals of Apprentices Act 1802.

Chartism and other movements

Chartism was a working-class movement for political reform in Britain active from 1838 to 1858. It took its name from the People’s Charter of 1838 and was a national protest movement, with particular strongholds of support in the north of England, the east Midlands, the Potteries, the Black Country and south Wales. Support for the movement was at its highest in 1839, 1842 and 1848 when petitions signed by millions of working people were presented to the House of Commons. The strategy adopted was to use the massive scale of support that the petitions and mass meetings showed to put pressure on politicians to concede manhood suffrage. Chartism relied on constitutional but direct methods to secure its aims, though there were some who became involved in more robust activities, notably in south Wales and Yorkshire.

The People’s Charter called for six reforms to make the political system more democratic:

- A vote for every man of 21 years of age.
- The Secret Ballot – to protect the elector in the exercise of his vote.
- No Property Qualification for Members of Parliament – thus enabling the constituencies to return the man of their choice, be he rich or poor.
- Payment of Members, which would enable a tradesperson or others to serve a constituency and not lose out financially by having to give up his business.
- Equal Constituencies, securing the same amount of representation for the same number of electors, instead of allowing small constituencies to swamp the votes of large ones.
- Annual Elections for Parliament, as a means of stopping bribery and intimidation (a constituency might be bought once in seven years but no one could buy a constituency under a system of universal suffrage every year). Members elected annually would be less able to betray their constituents.

Chartism can be interpreted as a continuation of the eighteenth-century fight against corruption and for democracy in an industrial society but it attracted considerably more support than some more radical groups because of wage cuts and unemployment.

Trades unions and the Tolpuddle martyrs

Skilled workers in Britain had begun organizing themselves into trade unions in the seventeenth century following on the model of the medieval guilds. During the eighteenth century, when the industrial revolution prompted a wave of new trade disputes, the government introduced measures to prevent collective action on the part of workers. The Combination Acts, passed in 1799 and 1800,
during the Napoleonic Wars, made any sort of strike action illegal – and workmen could receive up to three months’ imprisonment or two months’ hard labour if they broke these new laws. Unions in Britain were subject to severe repression until 1824, but despite this were widespread in cities such as London. After violent Luddite protests in 1811 and 1812, Parliament repealed the Combination Acts in 1824 and 1825. Trade unions were legalised in 1824, where growing numbers of factory workers joined these associations in their efforts to achieve better wages and working conditions.

In the 1830s, life in villages like Tolpuddle in Dorset was hard and getting worse. Farm workers could not bear yet more cuts to their pay. Some fought back by smashing the new threshing machines but this brought harsh punishments. In 1834, farm workers in west Dorset formed a trade union so that by combining together they could be more effective at pressuring employers to act reasonably. Unions were actually lawful and growing fast but six leaders of the union were arrested and sentenced to seven years’ transportation for taking an oath of secrecy. George Loveless and five fellow workers – his brother James, James Hammett, James Brine, Thomas Standfield and Thomas’s son John – were charged with having taken an illegal oath. But their real crime in the eyes of the establishment was to have formed a trade union to protest about their meagre pay of six shillings (30p) a week.

The French Revolution and the Swing Rebellion were fresh in the minds of the British establishment. The Swing Rebellion had been started in August 1830, in east Kent, when angry labourers destroyed a threshing machine. This was the start of a revolt that spread across the south involving machine breaking, arson and assaults on overseers and justices. The actions often followed threatening letters sent by Captain Swing, who was a fictitious character. Incidents in Puddletown and other Dorset villages probably involved farm workers who were later to join the Tolpuddle union, so landowners were determined to stamp out any form of organized protests.

**Poor Laws**

From its beginnings in the fourteenth century, up to the inauguration of the National Health Service (NHS) in 1948, the evolution of England’s Poor Laws is a strand running through its social history that impacted on the health of the population. It also is important in the context of the development of local government, as local authorities eventually replaced the ‘Vestries’, the governing body of the parishes. The parish had been the basic unit of local government since at least the fourteenth century, although Parliament imposed few if any civic functions on parishes before the sixteenth century.

The history of the Poor Laws has two elements: the ‘Old Poor Law’ primarily in the 1601 Act for the Relief of the Poor, and the new Poor Law brought in by the Poor Law Amendment Act of 1834.

The old Poor Law is characterised as being parish-centred, haphazardly implemented and locally enforced, with the operation of workhouses – one of its more notorious aspects – being completely voluntary. The new Poor Law, based on a new administrative unit of the Poor Law Union, aimed to introduce a rigorously implemented, centrally enforced, standard system that was to be imposed on all and was centred on the workhouse. The idea was that life in the workhouse should be so bad as to provide an incentive to do anything to keep out of it.

The new system introduced in 1834 was very similar to that existing before except for the manner in which Poor Law relief was administered. The grouping of parishes into unions, the workhouse as deterrent and the workhouse test had all existed under the old Poor Law. The new Poor Law saw a fundamental change in the way that the poor were viewed by many of their ‘betters’. The traditional attitude had been one of poverty being inevitable (exemplified by the oft-quoted biblical text ‘For the poor always ye have with you’): the poor essentially were victims of their situation and their relief was a Christian duty. The 1834 Act was guided by a growing view that the poor were largely responsible for their own situation which they could change if they chose to do so.

The 1834 Act was welcomed by those who believed it would reduce the cost of looking after the poor, take beggars off the streets and encourage poor people to work hard to support themselves. The new Poor Law ensured that the poor were housed in workhouses, clothed and fed. Children
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who entered the workhouse would receive some schooling. In return for this care, all workhouse paupers would have to work for several hours each day. However, not all Victorians shared this point of view. Some people spoke out against the new Poor Law, calling the workhouses ‘Prisons for the Poor’. The poor themselves hated and feared the threat of the workhouse so much that there were riots in northern towns.

One important and complex piece of Poor Law legislation which originated in 1662, and which did not finally disappear until 1948, was the Settlement Act (otherwise known as the Poor Relief Act 1662). It gave a newcomer to a parish the right to a ‘settlement’ and the right to poor relief in any place where he had lived unchallenged for 40 days. During this period, following complaint to the churchwardens, he could be ordered back to his place of last settlement, unless he was renting a property worth £10 a year. It may be difficult to believe but parts of the 1601 Poor Law Act were not finally repealed until 1967. However, some of the attitudes then can be seen in more recent approaches by governments.

Under the Poor Laws the poor were divided into three groups: able-bodied adults; children; and the old or non-able-bodied (impotent). Overseers were instructed to put the able-bodied to work; to give apprenticeships to poor children; and to provide ‘competent sums of money’ to relieve the impotent.

**Poor Law Commissioners**

The increase in spending on poor relief in the late eighteenth and early nineteenth centuries, combined with the attacks on the Poor Laws by Thomas Malthus and other political economists and the Captain Swing riots, led the government in 1832 to appoint the Royal Commission to Investigate the Poor Laws. The Commission published its report, written by Nassau Senior and Edwin Chadwick, in March 1834. The report, described by the historian R. H. Tawney [2] as ‘brilliant, influential and wildly unhistorical’, called for sweeping reforms of the Poor Law, including the grouping of parishes into Poor Law Unions, the abolition of outdoor relief for the able-bodied and their families, and the appointment of a centralised Poor Law Commission to direct the administration of poor relief.

Soon after the report was published Parliament adopted the Poor Law Amendment Act 1834, which implemented some of the report’s recommendations and left others, like the regulation of outdoor relief, to the three newly appointed Poor Law Commissioners. Edwin Chadwick had hoped to be one of them but was appointed Secretary to the Commission.

Relief expenditures were financed by a tax levied on all parishioners whose property value exceeded a minimum level. A rural parish’s taxpayers could be divided into two groups, the labour-hiring farmers and the non-labour-hiring taxpayers such as family farmers (landed gentry), shopkeepers and artisans. In grain-producing areas, where there were large seasonal variations in the demand for labour, labour-hiring farmers were able to reduce costs by laying off unneeded workers during quiet seasons (during the winter and between sowing and harvest) and having them collect poor relief. Larger-scale farmers used their political power to tailor the administration of poor relief so as to lower their labour costs. In the early nineteenth century poor relief represented a subsidy to labour-hiring farmers rather than a transfer from farmers and other taxpayers to agricultural labourers. In some respect benefits in Britain, many of which go to those in work, can be seen as subsidising employers who pay low wages. In livestock farming areas, where demand for labour was constant, it was not in farmers’ interests to shed labour during the winter, and the number of able-bodied labourers receiving casual relief was smaller.

The Poor Law Amendment Act 1834 reduced the political power of labour-hiring farmers.

An interesting insight from the Economic History Association (USA) [3] in a paper by George Boyer of Cornell University is the increase in the number of able-bodied males on relief during the late seventeenth and eighteenth centuries. In the second half of the eighteenth century, a large share of rural households in southern England suffered significant declines in real income. Farm-level data has shown real wages in the south-east declined by 13 per cent from 1770/79 to 1800/09, and remained low until the 1820s [4]. Boyer
suggests the effect of late eighteenth-century enclosures on agricultural labourers’ living standards might have been overstated, although those labourers who had common rights must have been hurt by enclosures.

In some parts of the south and east, women and children were employed in wool spinning, lace making, straw plaiting and other cottage industries. Employment opportunities in wool spinning, the largest cottage industry, declined in the late eighteenth century, and employment in the other cottage industries declined in the early nineteenth century [3] [5] [6]. The decline of cottage industry reduced the ability of women and children to contribute to household income. This, in combination with the decline in agricultural labourers’ wage rates and, in some villages, the loss of common rights, caused many rural household’s incomes in southern England to fall dangerously close to subsistence by 1795.

The situation was different in the north and Midlands. The real wages of day labourers in agriculture remained roughly constant from 1770 to 1810, and then increased sharply, so that by the 1820s wages were about 50 per cent higher than they were in 1770 [4]. Moreover, while some parts of the north and Midlands experienced a decline in cottage industry, in Lancashire and the West Riding of Yorkshire the concentration of textile production and the industrial revolution led to increased employment opportunities for women and children.

A comparison of English poor relief with poor relief on the European continent reveals a puzzle: from 1795 to 1834 relief expenditures per capita, and expenditures as a share of national product, were significantly higher in England than on the continent. However, differences in spending between England and the continent were relatively small before 1795 and after 1834 [7]. It has been argued that simple economic explanations cannot account for the different patterns of English and continental relief.

It seems the increase in relief spending in the late eighteenth and early nineteenth centuries was partly a result of politically dominant farmers taking advantage of the poor relief system to shift some of their labour costs onto other taxpayers [6]. Most rural parish vestries were dominated by labour-hiring farmers as a result of ‘the principle of weighting the right to vote according to the amount of property occupied’.

So it can be understood why the Poor Law Commissioners were not popular with the parishes. The Commission had the power to issue directives but there was no way to make parishes do what the Commission wanted them to do. It did have powers over diets in the workhouses and could veto appointments to the Boards of Guardians. Chadwick had wanted the 1834 Act to be implemented in the north of England first where, at that time, there were fewer economic problems, employment was high and food was plentiful.

It is interesting to read quotes from the Poor Law Commissioners’ Report of 1834:

The Out-door Relief of the Able-bodied, when given in kind, consists rarely of food, rather less unfrequently of fuel, and still less unfrequently of clothes, particularly shoes; but its most usual form is that of relieving the applicants, either wholly or partially, from the expense of obtaining house-room.

Indoors Relief, that which is given within the walls of the Poor-house, or as it is usually, but very seldom, properly denominated the Workhouse, is also subject to great mal-administration.

But it will be seen that the process of dispauperising the able-bodied is in its ultimate effects a process which elevates the condition of the great mass of society.

The principle adopted in the parish of Cookham, Berkshire, is thus stated:

As regards the able-bodied labourers who apply for relief, giving them hard work at low wages by the piece, and exacting more work at a lower price than is paid for any other labour in the parish. In short, to adopt the maxim of Mr. Whately, to let the labourer find that the parish is the hardest taskmaster and the worst paymaster he can find, and thus induce him to make his application to the parish his last and not his first resource.

By 1839 the vast majority of rural parishes had been grouped into Poor Law Unions, and most
of these had built or were building workhouses. On the other hand, the Commission met with strong opposition when it attempted in 1837 to set up Poor Law Unions in the industrial north, and the implementation of the new Poor Law was delayed in several industrial cities. In an attempt to regulate the granting of relief to able-bodied males, the Commission, and its replacement in 1847, the Poor Law Board, issued several orders to selected Poor Law Unions. The Outdoor Labour Test Order of 1842, sent to unions without workhouses or where the workhouse test was deemed unenforceable, said that able-bodied males could be given outdoor relief only if they were set to work by the union. The Outdoor Relief Prohibitory Order of 1844 prohibited outdoor relief for both able-bodied males and females except on account of sickness or ‘sudden and urgent necessity’. The Outdoor Relief Regulation Order of 1852 extended the labour test for those relieved outside of workhouses.

The share of the population on relief fell sharply from 1871 to 1876, and then continued to decline until 1914. Real per capita relief expenditures increased from 1876 to 1914, largely because the Poor Law provided increasing amounts of medical care for the poor. The role played by the Poor Law declined due to an increase in the availability of alternative sources of assistance. There was a sharp increase in the second half of the nineteenth century in philanthropy, increased membership of friendly societies (mutual help associations), the cooperative movement, and of trade unions providing mutual insurance policies. The benefits provided workers and their families with some protection against income loss, and few who belonged to friendly societies or unions providing ‘friendly’ benefits ever needed to apply to the Poor Law for assistance.

Between 1906 and 1911 Parliament passed several pieces of social welfare legislation collectively known as the Liberal welfare reforms. These laws provided free meals and medical inspections (later treatment) for needy school children (1906, 1907, 1912) and weekly pensions for poor persons over age 70 (1908), and established national sickness and unemployment insurance (1911). The Liberal reforms purposely reduced the role played by poor relief, and paved the way for the abolition of the Poor Law.

**Sanitary movement**

Parkinson [8] refers to the period that began in 1834 with the Poor Law Commission Report and ended with the passing of the 1848 Public Health Act as being ‘the Public Health Agitation’. It was the start of the era of ‘sanitary reform’ that shaped the genesis and evolution of the environmental health practitioner. The ‘agitators’ were influential individuals and voluntary movements that helped to change the prevailing attitude and approach to public health from ‘laissez-faire’ to ‘interventionist’, and furthered the social and political acceptance of the institution and ideology of ‘inspection’. The most celebrated individual within the movement was Edwin Chadwick (who was knighted in 1889). Chadwick’s best known work, *The Sanitary Condition of the Labouring Population of Great Britain*, published in 1842, followed inaction to reform the Poor Laws. Due to political pressures, he had been instructed to drop his work and the report. With a change of political control he was required to complete it but again there was political interference and, on the grounds that it would cause offence, the government refused to publish it as a government report. Chadwick was allowed to print it under his own name as his personal view and at his own expense.

Chadwick had looked at the causes of poverty, and from his investigations into the living conditions of the working population in England and Wales he recognised the connection between poverty and ill-health and an insanitary environment.

Chadwick was also a follower of Jeremy Bentham (he was his secretary for a time from 1830), who founded the theory of utilitarianism and was leader of a group known as the Philosophical Radicals. The basis of this philosophy was that actions were right if they tended to produce ‘the greatest happiness for the greatest number of people’. Bentham argued that the idea of rights was ‘nonsense’ and the idea of natural rights was ‘nonsense on stilts’. Bentham wanted to abolish all legislation that did not bring about the ‘greatest happiness for the greatest number of people’.
Bentham's ideas were applied to the 1834 Act but at this time ‘people’ were considered to be only those who had the vote. To give the ‘greatest happiness to the greatest number of people’ meant cutting the poor rates. Consequently the poor suffered and his ideas of utilitarianism were called ‘Brutilitarianism’ by the working classes. However Bentham was a law reformer and his followers in stages brought about penal reform, extension of suffrage and an improvement in the sanitary conditions of the poor.

The most celebrated voluntary organisation was the Health of Towns Association (HTA). Indeed, Parkinson [8] has argued that ‘after 1844, agitation was mainly carried on through the medium of the Health of Towns Association’ and the inaugural meeting of the HTA organized by Dr Thomas Southwood Smith, a friend and colleague of Chadwick's, took place in December 1844 at Exeter Hall, in the Strand, London. This venue was strongly associated with reform movements such as the Anti-Slavery Society, the Reformation Society, the Royal Humane Society, and the Anti-Corn Law League which all met there. This was an age of radicals, evangelists and reform. For more on the HTA see Parkinson [8].

Their efforts produced an improvement in the public health. One of the recommendations in Chadwick's The Sanitary Condition of the Labouring Population of Great Britain was that for the prevention of disease it would be ‘good economy’ to appoint a district medical officer of health independent of private practice. Chadwick was also of the view that it made more economic sense to have a healthier workforce that would be more productive. His thinking was not based on altruism or human rights.

A Royal Commission was established to examine the problem, arguably to delay action. The Royal Commission on the Health of Towns was appointed in 1843 to investigate the sanitary arrangements of 50 English towns. Its findings confirmed Chadwick's and it recognised and insisted that the state must take responsibility for public health, and resulted in the Public Health Act 1848.

To consider the development of the sanitary movement in practice, it is useful to consider what happened in Liverpool and was reflected across the country. Liverpool as a mercantile port grew rapidly in the early eighteenth century. The growth of global trade involved construction of many new docks and buildings and the city population increased with unskilled labour as well as more prosperous business classes (for example, many of the best known insurance companies were founded in the city). Unlike other industrial towns there was little or no skilled working class and no control over construction until 1842. Liverpool with a large proportion of casual labourers suffered even more from a low standard of living and insanitary housing than other major cities. Unlike many towns Liverpool had a large proportion of people living in cellars. Until the Liverpool Improvement Act 1842 there was no control over cellar dwellings. The local council, however, was active and wanted to improve conditions further. In 1845 the mayor convened a meeting to establish a Health of Towns Association, and under the Liverpool Sanitary Act 1846 Dr William Duncan was appointed Liverpool's (and Britain's) first Medical Officer of Health (MOH). Prior to this the Health of Towns Committee had appointed Thomas Fresh as the Inspector of Nuisances in September 1844 [9] and in 1847 he was appointed the Inspector of Nuisances under the 1846 Liverpool Act. Of all the officers in charge of separate departments it is said that the one most closely in touch with Dr Duncan was the Inspector of Nuisances [10].

Fresh not only acted under the Liverpool Sanitary Act 1846, but subsequently the Nuisances Removal and Diseases Prevention Act 1848 and the Nuisances Removal and Diseases Prevention Amendment Act 1849. Frazer [10] also records how there was daily communication and cooperation among the town clerk, MOH, borough engineer, building surveyor, water engineer, the head constable and the inspector of nuisances. The aim was to promote ‘unity of action in all departments under the Health Committee’.

The office of ‘inspector of nuisances’ and then ‘sanitary inspector’ featured nationally for the first time in the Town Improvement Clauses Act 1847 and was subsequently confirmed by the more comprehensive, though still permissive, Public Health Act 1848, which also established the General Board of Health. The office was made compulsory, as was
that of Medical Officer of Health by the Public Health Act 1872 [11].

Hamlin [11] reports that by the end of the 1880s the inspector of nuisances was a fixture in every town, a member of a subordinate profession whose domain, skills and responsibilities were exactly demarcated. Inspectors were identifying and abating hundreds, even thousands, of nuisances per year even in towns of modest size. Hamlin provides a comprehensive analysis of the role of the inspector of nuisances. Anybody wishing to consider the development of the environmental health practitioner would do well to read his paper. There are also a number of parallels with the present situation. As Crook [12] has said, ‘inspection is widely recognised as a defining feature of the modern British state and the 19th Century is really where it started with the establishment of a range of inspectorates’.

Crook has argued that ‘it is surprising, in fact, that sanitary inspectors should have received relatively scant attention. Not only were they more numerous than central inspectors, they were also more engaged with members of the public, and at a point of intense sensitivity: private property’. By the start of the twentieth century he records that hundreds of thousands of sanitary inspections were taking place each year in Britain’s towns and cities. Furthermore, it is recorded that other contemporaries were impressed by the powers they possessed.

Hamlin [11] also argues that in the domain of nuisances, inspection is important in a number of contexts. First is the history of urban public health. Then, however, the inspector of nuisances was the bottom layer of local public health administration. Too often historians encounter their work only through the filter of the medical officer who digests mundane detection and remediation into columns in an annual report. The 1872 Public Health Act made inspectors underlings to medical officers. While they exercised professional discretion, they were not part of a professional class. In letters to complainants or offenders, inspectors did not discuss standards, agendas or the greater good. They merely set out what they had found, dictated remedies and set deadlines. By the 1970s it was argued that Public Health Inspectors should be known as Environmental Health Officers, and should not be subservient to Medical Officers of Health, as they were a profession (by education, role and to some extent the ability to use discretion) and members of such a profession should not be subordinate to medically qualified practitioners.

Inspectors of nuisances also reflected the growth of a comprehensive and sometimes intrusive state in response to the growth of nuisances — or did the growth of the inspectorate increase the number of identified nuisances? Hamlin [11] argues that while town dwellers might wish to avoid the police they did not avoid the inspector. By the 1880s many towns had instituted systematic inspections of dwellings. Nuisance inspection may be seen as in part creating and maintaining bourgeois communities, and provided a means of mediating local conflict. It was (and is now) a hybrid inspectorate belonging both to the local sphere and to the central state.

The sanitary movement, as has been pointed out [11], also brought ‘nuisances’ into the realm of policing, and transferred it from an allegation that could be contested, and subject to civil action, to summary judgement and the criminal. It also represented the ascendancy of public nuisance, that is, something affecting the population in general. Public nuisance as a Common Law tort and related to property rights was largely replaced by Statutory Nuisances as set out in Acts of Parliament and to address defined circumstances.4

Crook [12] has also said that sanitary inspection was a means of surveillance and a means of intervention, and is better understood as a mode of liberal surveillance and as part of a liberal culture of governance. That is a broad culture of governance committed to both actively securing a moralised, pluralistic and healthy society and respecting society’s capacity to govern itself, free of intervention. Liberal governance must also have inherent tensions and antagonisms, such as those between state and society, local and central. In the modern context, this can be seen in the tension between having control of certain activities in a deregulatory environment, hence perhaps the ‘better regulation’ agenda. Crook suggests that these antagonisms are internal to the practice of liberal governance, which does not resolve or overcome these tensions and antagonisms, but rather keeps them in play, as a recurrent form of political struggle and critique.
Public diplomacy was crucial to the work of the inspectors of nuisances and sanitary inspectors. The public had to be worked with, through the educational role, sometimes making the job relatively easy, at other times slow and confrontational. This public dimension made sanitary inspection a political and an ethical art [12]. As a matter of intervention it was a reflection of an interventionist state even when economically it was more laissez-faire. That state (at the local and national level) was also publicly accountable and the tension again meant the job of the inspector of nuisances or sanitary inspector could be fraught when employed by a local authority the elected members of which could have vested interests.

The best example of inspector-as-social worker was in overcrowding. This had been a matter for medieval courts more for economic rather than health-related reasons because refugees and beggars would lower local wages and demand alms. Lodging-house inspection had been an important part of the early sanitary law. Although ostensibly the prime concern was disease it was also political (Chartist subversives) and moral (promiscuous bed-sharing). The 1855 Nuisances Removal Act allowed action against overcrowding and gave rise to much discussion of the minimum volume for healthy living. Hamlin [11] reports that the figure settled on in the Sanitary Act 1866 was 300 cubic feet per person, with children counting as half persons and cows as five person-equivalents. It was overcrowding that led to night inspections, which caused considerable problems. Many also saw the concentration of bodies and breath as the most proximate cause of typhus. And there were moral concerns in the Victorian age, although many insisted that morals were not the business of sanitary inspection. Inspectors confronted overcrowding as a key site of public outrage, but it was a problem they could not solve at the individual level. Some in authority when a case highlighted the problem took the view that the nuisance inspector could not be properly exercising his duty. Reference has been made [11] to how an inspector of nuisance might often identify overcrowding but rarely acted. It was obvious to them that chasing persons into the street did not increase housing stock or augment the ability to afford more space.

It was a continuing dilemma that those evicted from one place only crowded another. While it might be difficult to argue for a better solution at the local level (rather than treating a symptom of the underlying problem), the call for a professional association was that using evidence from the local inspector it was possible to argue at the national level for change.

As well as and overlapping with complaint-based regulation by inspectors they also had to inspect problematic industries such as public slaughtering and other offensive trades, bakeries and food markets. They also had to enforce other legislative initiatives, like child labour laws, wharfs and canal boat-dwellers. Such programmes of inspection involved their own paperwork, ‘by the end of the century one senses that, for many inspectors, form, particularly the filling out of forms, has overtaken substance’ [11]. When it came to professional development, inspectors of nuisances (and sanitary inspectors) were often drawn from trades (which in itself could cause conflict) and indeed some of the elected members of the local authorities could have vested interests as they would be drawn from both business and landlords. The pecuniary interests of elected councillors could be at odds with public health. Councils and the Local Government Board could limit the actions of inspectors by requiring enforcement of by-laws and statutes, which then limited discretionary freedom or judgement (professionalism) and could overwhelm them with work. Endless filling up of returns drove out flexibility, and bureaucratic transparency displaced discretion [11]. More subtle but perhaps more profound according to Hamlin [11] was the intrusion of form letters for the conduct of routine business. By the 1870s, Knight and Company, publishers for the Local Government Board, had cornered the market both for commentaries on local government law (with towns buying multiple copies to educate their staff) and form letters for particular purposes. These included all types of nuisance and might be customised but often cited the act or by-law authorising the inspector’s involvement, and only needed name, address, nuisance and deadline to be filled in. Earlier, enforcement had often been a delicate dance, involving power, deference, cajoling
and negotiation. Inspectors had to ‘wait on’ landowners whose consent they sought. Form letters (and busy work) made officials officious. Interestingly in modern times officers want standard forms even when there are no ‘prescribed forms’.

Hamlin [11] refers to the professionalisation of sanitary inspectors but still with subordination to medical officers. This expansion in the number of sanitary inspectors was accompanied by a growing sense of professional identity and collective interest. The first national gathering of sanitary inspectors was held in 1876 as part of the inaugural congress of the Sanitary Institute of Great Britain. As career paths became national rather than local, inspectors began their own professional organisation, the Association of Public Sanitary Inspectors, in 1883.5 Hamlin argues the enterprise flourished only through acknowledgement of its subordinate status to the newly professionalising medical officers of the British Institute of Public Health (eligible only to those with both medical and public health qualifications) who had overall control. Yet they also encouraged and supported the inspectors too.

Crook [12] has suggested that sanitary inspection was only in part about the bureaucratic application of scientific reasoning. In practice, the situation was more nuanced and complex and the inspectors’ work took account of science, elements of probability, interpersonal relationships and civility. As such, sanitary inspections turned upon a rationality that was flexible and could vary with particular circumstances. Its nature was partly a product of the constraints intrinsic to practice, but it was also a product of the fact that sanitary inspection was based on the notion of what he calls the liberal culture of governance. Central to this was the maintenance of a civilised, respectable public sphere, free of sources of disgust and disquiet and committed to the integrity and enjoyment of property. It is suggested that in the role of an inspector, although science played a part, the task involved a commitment to empiricism. Also it could be argued that sanitary inspection was both a political and ethical task. Interestingly Crook suggests that sanitary inspectors were encouraged even then to develop a ‘habit of close observation’ in the manner of the natural scientist. The MOH for Birkenhead [13] urged inspectors to simulate a meticulous attention to detail, the sort of which had informed the work of Lyell, Darwin and Pasteur. Any given inspection involved a thoroughgoing examination of any potential ‘nuisance’. In the case of private houses, it was said that every ‘facet of design should be carefully scrutinised, including pipes, joints, traps and chimneys, and even features like wallpaper’. This empiricism required the use of all the senses in carrying out an inspection, and this remains true today. Empirical observation and publication of findings can be the basis of research, something that is inherent in a ‘profession’, and yet something that even today, with inspectors that are ever better educated, can be problematic to achieve and difficult to get practitioners to undertake.

The main function of the meetings of the association appears to have been to reflect on precisely the ways in which this independence was thwarted in practice, although other matters from pay and pensions, to qualifications and tenure were part of the deliberations. Inspectors had to negotiate a number of tensions. On the one hand, they were empowered in the name of the public: they were public servants charged with promoting public well-being. On the other hand, they were accountable to the public and its representatives, both locally and nationally. In essence inspectors inspected the public and in turn the inspectors were accountable to the public and its representatives on the council and in Parliament. As now, there were also complaints about rulings in the Courts and how the interpretation of the law by lawyers could limit the inspectors’ ability to deal with problems that may have been highlighted by the public.

The birth of epidemiology and a more scientific approach

Cholera first reached Britain from continental Europe in October 1831 and during the subsequent year resulted in over 30,000 deaths. This clearly had a major impact and caused concerns to society not least because it could affect those other than the poor. It caused considerable consternation to the authorities as to what were the causes. It is often thought Dr John Snow solved the problem and frequent mention is made of his removal of the Broad Street pump handle. Snow’s
1855 book, ‘On the Mode of Communication of Cholera’, is held up as a demonstration of the ‘epidemiological imagination’. Snow’s contribution and the context in which he worked is covered in detail in a paper by Smith [14]. As is usually the case with any discovery, the person making the discovery has built on the works of others and also has to counter alternative theories, in this case the ‘miasma theory’ which held that transmission was airborne and associated with bad smells. As Smith [14] points out, Snow’s work ‘appeared amidst a veritable spate of speculation, experiment, investigation and recommendations regarding cholera, and some of these less celebrated (at least now) contributions remain instructive’. In addition Dr John Sutherland’s report for the General Board of Health on the 1848–49 British cholera epidemic included his investigation of the effect of water source on cholera risk in Salford, Manchester. As Smith reports [14], Sutherland found a strong association between household water supply and the occurrence of cholera. Diarrhoea showed a similar, but less marked, association with water supply. Sutherland concluded that with respect to water obtained from wells into which the contents of sewers or privies had escaped the ‘predisposition occasioned by the continued use of such water is perhaps the most fatal of all’.

Snow, in his work, demonstrated an attack rate many times higher in those receiving water from the Southwark and Vauxhall company than those receiving it from the Lambeth company. However, others pointed out that those parts of London which had high overall mortality in the years before the cholera epidemic tended to have high death rates from cholera during the epidemic, and attributed this to environmental factors which increased the risk of both cholera and other causes of death. By tracking the cases Snow was also able to identify a focus of infection.

When considering the cholera outbreak in Golden Square, Broad Street, London, in 1854, the Reverend Henry Whitehead who tracked the cases over time formed the view that when Snow removed the pump handle the epidemic was already waning and he argued it appeared to have had no effect, although he did concede that the closure of the pump may have prevented recurrence of the epidemic. Snow accepted that the mortality rate was diminished even though he had not been able to identify the causative organism via microscopic examination or any chemical pollutant so was not able to conclusively prove its danger. However, he indicated that the reduction in cases might have been because much of the population moved away, which started soon after the outbreak. He conceded that it was impossible to decide whether the well still contained the cholera poison in an active state, or whether for whatever reason the water had become free from the cause.

One aspect that helped Snow and his investigation were several unexplained deaths from cholera that did not at first appear to be linked to the Broad Street pump water. In particular a widow living in Hampstead had died of cholera in early September, and her niece, who lived in Islington, had succumbed with the same symptoms the following day. Neither of these women had been near Broad Street for a long time. Snow was intrigued so he visited and interviewed the widow’s son. He discovered from him that she had once lived in Broad Street and liked the taste of the water from the pump in Broad Street so much that she sent her servant down every day to bring back a large bottle of it for her by cart. The last bottle of water, which her niece had also drunk from, had been brought in late August at the very start of the epidemic.

It was discovered later that the public well serving the pump had been dug only 0.9 m from an old cesspit that had begun to leak faecal bacteria. A baby who had contracted cholera from another source had its nappies washed into this cesspit, the opening of which was under a nearby house.

Smith [14] refers also to Snow’s criticism of Chadwick’s policy of flushing the sewers and draining cesspools; Snow maintained this increased the contamination of drinking water. Chadwick defended his action, on the basis that a small increase in the pollution of the Thames was better than allowing the sewers to continue giving off the pestilent exhalations into the atmosphere as he was a supporter of the miasma theory.

It was also common to blame not only poverty but drunkenness for cholera. Snow attributed the lack of cholera in brewery workers near Broad
Street to the fact that they drank only beer, and the brewery had a different water source.

In mid-nineteenth century Britain, cholera was seen to be a disease of the poor. This was an attitude shared by those who thought cholera was caused by a specific agent and those who saw it as a consequence of more general environmental causes. Smith [14] says that it was also common to think that cholera in poor communities represented a threat to the health of the wealthier classes. The thought that the disease could spread from epicentres in poor areas to the better-off areas led to a fear of the poor and to calls that something must be done to improve their circumstances.

Interestingly Smith [14] refers to these concerns as having some similarities to some current thinking on the role of income inequality in health. He highlights the work of Wilkinson [15] who has argued that higher levels of inequality within societies are not just associated with worse health amongst the poor, but with overall worse health, affecting the poor and rich alike in highly unequal societies.

In this instance it is argued that where the needs of the poor are ignored this translates into worse health for the rich for psychosocial reasons. In the Victorian era there were more material reasons for these concerns. Yet the descriptions of miasmas from the nineteenth century share some similarities with modern accounts of adverse psychosocial environments. Smith [14] gives an example of how unfairness to one’s fellows could be rewarded by ill-health as reported by Snow. He documented the case of a landlord whose tenants complained that drainage from cesspools was entering their water supply. The landlord’s agent maintained there was no problem, but the tenants still complained. So the landlord went himself, and said he could not see anything wrong and drank a glass of it. This was a Wednesday, on returning home he was taken ill with the cholera, and died the following Saturday. There was no cholera in the vicinity of where the landlord lived.

Crook [12] has also argued that the greater significance assumed by epidemiological science and detailed legal norms led in time to the formal provision of vocational qualifications for sanitary inspectors. Initially drawn from the ranks of tradesmen, police officers and even soldiers, by the late Victorian period there was a growing consensus that inspectors required technical instruction. The first exams were carried out in 1877 under the auspices of the Sanitary Institute of Great Britain. Only those appointed in London were required to have any certification. In 1899 a Local Government Board approved the formation of the Sanitary Inspectors’ Examination Board to regulate the provision of training. To pass, a candidate required a basic grasp of the various facets of ‘sanitary science’. Most exams covered four topics: elementary physics, and chemistry; elementary statistical methods; practices of municipal hygiene [12].

Sanitary inspection was seen as an observational, fact-based exercise incorporating a scientific ethos. Its relation to the science of epidemiology and evolving theories of disease transmission is more complex, however. There were many professional journals; Crook [12] refers to The Sanitary Record, Public Health and the Journal of State Medicine which ensured that sanitary inspectors could be informed of all the latest innovations in the theory and practice of disease prevention. Again as now it was seen as important to be well informed and up to date, what became continuing professional development. This was also referred to in the Operating Guidance of the Housing Health and Safety Rating System.

This section by taking a historical perspective has to some extent conjured up different images of ‘public health’ (some not necessarily coinciding with the modern image of practitioners) and this will be of further relevance in the remainder of the chapter (and through the handbook). These images are well summarised by Geoff Rayner and Tim Lang [16] as:

1. People constructing knowledge-based interventions
2. Public health as state intervention – people in uniforms
3. Public health as responding to pandemic disease
4. Public health as rescue, saving individual lives
5. Focusing on individuals shaped by wider determinants
6. Health as the operation of systems
7. Public health as interactions and transitions
8. Public health as social movements and causes
9. Public health as nanny or Big Brother.
Section 1 Notes

1 The World Bank classifies economies based on estimates of gross national income (GNI) per capita, so that as of 2014 a low-income country is one where the GNI per capita is $1,045 or less, for middle-income economies it is $1,045 to $12,746, and a high-income economy GNI per capita is currently $12,746 or more. Lower middle-income economies and upper middle-income economies are separated at a GNI per capita of $4,125. See http://data.worldbank.org/news/2015-country-classifications
2 See: http://eh.net/
3 In 1844 the Rochdale Pioneers founded the modern Cooperative Movement, to provide an affordable alternative to poor-quality and adulterated food and provisions, using any surplus to benefit the community.
4 Interestingly criminal public nuisance is an either way offence and as a Common Law (see Chapter 6) and not a statutory offence there is no limit to the sentence that can be imposed provided it is not ‘inordinate’. Police therefore have the power to arrest for the crime of public nuisance using their general arrest powers in s24(1)(b) Police and Criminal Evidence Act 1984. Conspiracy to commit a public nuisance is also an offence contrary to section 1(1) of the Criminal Law Act 1977.
5 For one review of the historical development of environmental health in the UK, and the professional body, see Reginald Johnson (1983) A Century of Progress – History of the Institution of Environmental Health Officers, 1883–1983, CIEH...

Section 1 References


Legislative history of environmental health

An easy way to consider or to visualise the historical perspective is to consider the history of key pieces of legislation to address some of the social ills that arose in the eighteenth and nineteenth centuries and continued from then. Table 1.1 sets out a chronology of some key provisions since the 1846 Nuisances Removal and Diseases Prevention Act.

Table 1.1 sets out Acts only; much of the legislation relevant to environmental health practitioners in the UK, particularly in the twentieth century, is often contained in secondary legislation made under the primary legislation (Act). This is a relatively brief way of illustrating the development of environmental health, and legislation is often a reaction to campaigns by individuals or organisations or particular events and may lag behind public concerns. Indeed legislation may be seen as the minimum action Parliament (and the Government as the Executive) think they can do in the circumstances, so that legislative standards tend to be the minimum not the optimum for public health.
<table>
<thead>
<tr>
<th>Year</th>
<th>Legislation</th>
<th>Purpose</th>
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<tbody>
<tr>
<td>1846</td>
<td>Nuisances Removal and Diseases Prevention Act</td>
<td>Temporary legislation to help address the spread of cholera, setting out procedures for the removal of ‘nuisances’. The Privy Council given power to make regulations for the prevention of infectious disease</td>
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<tr>
<td>1848</td>
<td>Public Health Act</td>
<td>Provisions of a sanitary code and administrative machine to give it effect, the General Board of Health, plus a permissive power to establish local boards of health (local boards) who would have responsibility for all sewers</td>
</tr>
<tr>
<td>1848</td>
<td>Nuisances Removal and Diseases Prevention Act</td>
<td>A further response to the threat of cholera and to provide for the speedier removal of certain nuisances and the ‘prevention of contagious and epidemic diseases’</td>
</tr>
<tr>
<td>1851</td>
<td>Common Lodging Houses Act</td>
<td>Control over common lodging houses used by the poor where many families shared</td>
</tr>
<tr>
<td>1851</td>
<td>Labouring Classes Lodging Act</td>
<td>Gave local boards (local authorities) powers to establish lodging houses for the homeless</td>
</tr>
<tr>
<td>1855</td>
<td>Nuisances Removal Act</td>
<td>For the first time included ‘statutory nuisances’ such as ‘premises in such a state as to be a nuisance or injurious to health’ and a number of others that still exist</td>
</tr>
<tr>
<td>1858</td>
<td>Local Government Act</td>
<td>Made changes to the procedure for constituting a local board and gave them some additional powers. There was also a change in nomenclature: the authorities created by the 1858 Act were simply entitled ‘Local Boards’ and their areas as ‘Local Government Districts’</td>
</tr>
<tr>
<td>1860</td>
<td>Adulteration of Food Act</td>
<td>Limited responses to the increasing problem of food adulteration, allowed for the appointment of public analysts but no sampling powers</td>
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<tr>
<td>1863</td>
<td>Alkali Act</td>
<td>Created the Alkali Inspectorate to control emissions to air (noxious vapours) from certain processes</td>
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<tr>
<td>1866</td>
<td>Sanitary Act</td>
<td>Local authorities to supply water supply and sewerage system and also to control smoke</td>
</tr>
<tr>
<td>1866</td>
<td>Labouring Classes Dwellings Act</td>
<td>Empowered Public Works Loan Commissioners to lend money to councils for the provision of housing</td>
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<tr>
<td>1867</td>
<td>Factory Act</td>
<td>This brought any workplace employing more than 50 persons in manufacture under the Factory Acts</td>
</tr>
<tr>
<td>1867</td>
<td>Workshop Regulation Act</td>
<td>Workplaces with less than 50 persons were prevented from employing children under 8 years old. Children aged 8 to 13 were restricted to half-time working</td>
</tr>
<tr>
<td>1868</td>
<td>Artisans and Labourers’ Dwellings Improvement Act (Torrens Act)</td>
<td>Provided for the demolition or improvement of unsanitary dwellings</td>
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<tr>
<td>1871</td>
<td>Factories Act</td>
<td>A reaction to the failure of local authorities to enforce the law and creating duties to enforce on the inspectors of factories</td>
</tr>
<tr>
<td>1872</td>
<td>Public Health Act</td>
<td>Local government board made a series of orders prescribing qualifications, appointment, salaries and tenure of office of medical officers of health and inspectors of nuisances and also created sanitary authorities. Local government board could approve the establishment of Port Sanitary Authorities</td>
</tr>
<tr>
<td>1872</td>
<td>Adulteration of Food, Drink, and Drugs Act</td>
<td>Made it an offence to sell food, drink or drugs that were not of the ‘nature, substance or quality’ demanded by the purchaser</td>
</tr>
<tr>
<td>1875</td>
<td>Sale of Food and Drugs Act</td>
<td>Extended and amended the 1872 Act</td>
</tr>
<tr>
<td>1875</td>
<td>Public Health Act</td>
<td>Gave wide-ranging powers to local authorities (created urban and rural sanitary authorities), from dealing with unfit food, to sewers, from statutory nuisances, to building by-laws</td>
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<tr>
<td>Year</td>
<td>Legislation</td>
<td>Purpose</td>
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<tr>
<td>1875</td>
<td>Artisans’ and Labourers’ Dwellings Improvement Act (Cross Act)</td>
<td>Allowed councils to deal with unhealthy houses by buying the land and buildings for the purpose of improvement. Councils were allowed to build houses (named after Richard Cross, Home Secretary)</td>
</tr>
<tr>
<td>1879</td>
<td>Artisans’ and Labourers’ Dwellings Improvement Act</td>
<td>Changes that enabled local authorities to deal with individual insanitary houses. Useful powers, but did not permit authorities to deal with areas of bad housing</td>
</tr>
<tr>
<td>1882</td>
<td>Artisans’ Dwellings Act</td>
<td>Extended provisions in earlier Acts to all urban sanitary districts and allowed demolition of obstructive buildings when dealing with unhealthy or unfit housing</td>
</tr>
<tr>
<td>1882</td>
<td>Municipal Corporations Act</td>
<td>Created a modernised form of municipal borough</td>
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<tr>
<td>1885</td>
<td>Housing of the Working Classes Act</td>
<td>Required local authorities to use the powers they already had with regard to insanitary housing and amended the Artisans’ and Labourers’ Dwellings Improvement Acts and Artisans’ Dwellings Acts</td>
</tr>
<tr>
<td>1886</td>
<td>Shop Hours Act</td>
<td>Limited the working hours of young people to 74 per week including meal times</td>
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<tr>
<td>1888</td>
<td>Local Government Act</td>
<td>Established county councils and county boroughs and also created the London County Council, and metropolitan boroughs replaced a mixture of local authorities</td>
</tr>
<tr>
<td>1889</td>
<td>Infectious Diseases Notification Act</td>
<td>Allowed local authorities to adopt powers to require notification</td>
</tr>
<tr>
<td>1890</td>
<td>Housing of the Working Classes Act</td>
<td>A consolidation Act but which was also the first area-based rehabilitation legislation with provisions for gradual renewal and environmental improvements</td>
</tr>
<tr>
<td>1891</td>
<td>Factory Act</td>
<td>Local authorities made responsible for sanitary conveniences in factories, and for cleanliness, ventilation, overcrowding and lime washing in workshops</td>
</tr>
<tr>
<td>1892</td>
<td>Shop Hours Act</td>
<td>To regulate the employment of shop assistants</td>
</tr>
<tr>
<td>1894</td>
<td>Local Government Act</td>
<td>Urban District and Rural District Councils replaced urban and rural sanitary districts</td>
</tr>
<tr>
<td>1899</td>
<td>Infectious Diseases Act (Extension) Act</td>
<td>Required all sanitary authorities to adopt the 1889 Act (it had been a power not a duty)</td>
</tr>
<tr>
<td>1901</td>
<td>Factory and Workshops Act</td>
<td>Consolidation and extension of previous provisions</td>
</tr>
<tr>
<td>1909</td>
<td>Housing and Town Planning Act</td>
<td>Provided permissive powers to control land use</td>
</tr>
<tr>
<td>1912</td>
<td>Shops Act</td>
<td>Extension of protection to shop workers</td>
</tr>
<tr>
<td>1919</td>
<td>Housing and Town Planning Act (Addison Act)</td>
<td>Followed the 1917 Tudor Walters Committee Report, and to stimulate house building with subsidies to local authorities to build</td>
</tr>
<tr>
<td>1921</td>
<td>Public Health (Officers) Act</td>
<td>Set conditions of office and tenure of medical officers and sanitary inspectors and required that their dismissal could only be with the consent of the minister, and it also required that the term ‘inspector of nuisances’ be replaced with the designation ‘sanitary inspector’</td>
</tr>
<tr>
<td>1924</td>
<td>Housing Act (Wheatley Act)</td>
<td>Consolidation of Acts to stimulate house building and to deal with repair, maintenance and sanitary condition of housing, including subsidy for the clearance of unhealthy housing</td>
</tr>
<tr>
<td>1925</td>
<td>Public Health Act</td>
<td>First powers to deal with food premises and extended to water and washing facilities and cleanliness</td>
</tr>
</tbody>
</table>

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### Table 1.1 (continued)

<table>
<thead>
<tr>
<th>Year</th>
<th>Legislation</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>1926</td>
<td>Housing (Rural Workers) Act</td>
<td>The first national legislation to provide discretionary improvement grants in rural areas (maximum £100) and half the grant provided by the Exchequer</td>
</tr>
<tr>
<td>1926</td>
<td>Public Health (Smoke Abatement) Act</td>
<td>Was the first attempt to deal with visible air pollution, after many years of campaigning</td>
</tr>
<tr>
<td>1928</td>
<td>Food and Drugs (Adulteration) Act 1928</td>
<td>Contained provisions with regard to the sampling and analysis of food</td>
</tr>
<tr>
<td>1930</td>
<td>Housing Act (Greenwood Act)</td>
<td>Reformed nineteenth-century legislation and provision for the clearance of insanitary housing (slum clearance) with compulsory purchase and clearance area procedures with subsidies for rehousing displaced families. There was little scope for authorities to ignore the provisions as five-year programmes were required</td>
</tr>
<tr>
<td>1934</td>
<td>Shops Act</td>
<td>Controlled hours of work for those under 18 years of age and introduced health and welfare provisions for shop and office workers</td>
</tr>
<tr>
<td>1935</td>
<td>Housing Act</td>
<td>Amended procedures for slum clearance and introduced new powers to deal with overcrowding including a statutory definition of overcrowding (still in force in 2015)</td>
</tr>
<tr>
<td>1936</td>
<td>Public Health Act</td>
<td>Consolidated previous provisions, extended statutory nuisance powers and required compulsory notification of specified communicable diseases and was the basis of many environmental health interventions until replaced by specific later legislation</td>
</tr>
<tr>
<td>1937</td>
<td>Public Health (Drainage of Trade Premises) Act</td>
<td>Sought to control non-domestic discharges to public sewers</td>
</tr>
<tr>
<td>1938</td>
<td>Food and Drugs Act</td>
<td>Provision on protection of food supplies, control of certain foods, on inspection of food and control of some food premises, also included provisions on infectious diseases</td>
</tr>
<tr>
<td>1949</td>
<td>Housing Act</td>
<td>Extended the grant provisions in the 1926 Act to urban areas particularly for the installation of the basic amenities. Local authorities could acquire housing for improvement</td>
</tr>
<tr>
<td>1949</td>
<td>Prevention of Damage by Pests Act</td>
<td>Provisions on the control of rats and mice primarily to protect food from damage</td>
</tr>
<tr>
<td>1950</td>
<td>Shops Act</td>
<td>A consolidating measure</td>
</tr>
<tr>
<td>1951</td>
<td>Factory Act</td>
<td>A consolidating measure</td>
</tr>
<tr>
<td>1954</td>
<td>Housing Rents and Repairs Act</td>
<td>Required local authorities to survey all houses in their district to determine which were unfit (for the first time a fitness standard was defined), included provision for the clearance and redevelopment of areas of unfit housing, for securing or promoting the reconditioning and maintenance of houses via improvement grants, and to amend the law relating to housing and the exercise of certain powers relating to land, and rent control</td>
</tr>
<tr>
<td>1955</td>
<td>Sanitary Inspectors (Change of Designation) Act</td>
<td>Sanitary Inspectors were designated Public Health Inspectors</td>
</tr>
<tr>
<td>1955</td>
<td>Food and Drugs Act</td>
<td>Updating of controls on food and food premises including regulation-making powers, such as food hygiene regulations</td>
</tr>
<tr>
<td>1956</td>
<td>Agriculture (Safety, Health and Welfare Provisions) Act</td>
<td>Enforcement was entrusted mainly to the Agricultural Inspectorate and not to local authorities, whose role was equated with their, then, limited duties under factory legislation</td>
</tr>
<tr>
<td>1956</td>
<td>Clean Air Act</td>
<td>Following the killer London smogs and the Beaver Committee, led to action to reduce domestic smoke emissions via smoke control areas and increased monitoring and action to reduce smoke emissions</td>
</tr>
<tr>
<td>Year</td>
<td>Legislation</td>
<td>Purpose</td>
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<tr>
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<tr>
<td>1957</td>
<td>Housing Act</td>
<td>Fundamental restatement of housing law with changes to the law on repair and clearance</td>
</tr>
<tr>
<td>1959</td>
<td>House Purchase and Housing Act</td>
<td>Introduced the first mandatory grant aid (standard grant) for owners of eligible housing (including landlords) and relaxed discretionary grant conditions</td>
</tr>
<tr>
<td>1961</td>
<td>Clean Air Act</td>
<td>Extended provisions on smoke control including controls on chimney heights</td>
</tr>
<tr>
<td>1963</td>
<td>Offices, Shops and Railway Premises Act</td>
<td>Applied occupational health and safety matters to largely non-industrial workers such as those in offices, wholesale and retail premises. Under this Act, regulations were made prescribing health and safety standards. Most enforcement duties were assigned to local authorities and whose role was entrusted to EHPs. Inspectors of Factories had oversight over local authority work</td>
</tr>
<tr>
<td>1964</td>
<td>Housing Act</td>
<td>Dealt with grant aid for water supply and provision of the standard amenities as well as area improvement</td>
</tr>
<tr>
<td>1969</td>
<td>Housing Act</td>
<td>Followed the Dennington Committee Report (Older Homes – a call for action) and introduced provisions to support housing renewal taking account of bad external arrangement</td>
</tr>
<tr>
<td>1972</td>
<td>Local Government Act</td>
<td>Reformed local government structures in England and Wales, created two-tier structure. The 1300+ councils in England and Wales were reduced to about 400 shire districts. (Scotland had its own Act in 1973 to restructure local government)</td>
</tr>
<tr>
<td>1973</td>
<td>Water Act</td>
<td>Created ten Regional Water Authorities that took over water functions from local authorities, with regulation based on river basin management</td>
</tr>
<tr>
<td>1974</td>
<td>Health and Safety at Work etc. Act</td>
<td>Following on from the Robens Committee it provided new duties on employers and employees to protect health and safety at work. Created Health and Safety Executive and new powers for local authorities, enforcement provisions same for local authorities and HSE but applied to different classes of different premises. Powers to make regulations and for HSE to issue Codes of Practice</td>
</tr>
<tr>
<td>1974</td>
<td>Housing Act</td>
<td>Introduced Housing Action Areas and changes to grant provisions with a new range of grants to secure a 30-year life</td>
</tr>
<tr>
<td>1974</td>
<td>Control of Pollution Act</td>
<td>Included provisions on smoke pollution, noise</td>
</tr>
<tr>
<td>1976</td>
<td>Food and Drugs (Amendment) Act</td>
<td>Introduced powers to close insanitary food premises</td>
</tr>
<tr>
<td>1984</td>
<td>Food Act</td>
<td>Consolidation Act</td>
</tr>
<tr>
<td>1984</td>
<td>Public Health (Control of Disease) Act</td>
<td>Established Port Health Authorities, made provisions on control of disease and to regulate common lodging houses and canal boats</td>
</tr>
<tr>
<td>1985</td>
<td>Housing Act</td>
<td>Consolidation Act</td>
</tr>
<tr>
<td>1989</td>
<td>Water Act</td>
<td>Privatised the water industry; until 1974 public water supplies had been a local authority function then passed to Regional Water Authorities. Also created National Rivers Authority to deal with water pollution</td>
</tr>
<tr>
<td>1989</td>
<td>Local Government and Housing Act</td>
<td>Introduced first update of the Fitness Standard since 1957 (included the basic amenities for the first time) and mandatory grants for owner occupiers of unfit houses and no upper limit to grant but subject to means testing. Group Repair, Minor Works Assistance and Disabled Facilities Grants introduced</td>
</tr>
<tr>
<td>1991</td>
<td>Water Resources Act</td>
<td>Introduced new provisions to control discharges to water and also allowed for water quality standards</td>
</tr>
<tr>
<td>1991</td>
<td>Water Industry Act</td>
<td>Among other things sought to update regulation of industrial discharges to sewers previously covered by the 1937 Act</td>
</tr>
</tbody>
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SECTION 2 THE TWENTY-FIRST CENTURY, AND THE PRINCIPLES OF ENVIRONMENTAL HEALTH

Introduction

Having looked at some of the history – where environmental health came from – we now turn to the second decade of the twenty-first century and the many challenges (not always so different in nature) facing environmental health and indeed societies generally around the globe. These challenges are both economic and environmental (and

<table>
<thead>
<tr>
<th>Year</th>
<th>Legislation</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>Food Safety Act</td>
<td>Updating of the law and increasing powers to deal with unsafe food and unhygienic premises</td>
</tr>
<tr>
<td>1990</td>
<td>Environmental Protection Act</td>
<td>Introduced new powers to deal with industrial emissions not just visible pollutants giving local authorities powers similar to that of the central inspectorate, new regulation of waste, and updated statutory nuisance provisions and later included provisions on contaminated land</td>
</tr>
<tr>
<td>1995</td>
<td>Environment Act</td>
<td>Created the Environment Agency which became the central pollution control agency among other functions, dealing with waste, water and air emissions as well as flood control and environmental protection. Revised provisions in the 1990 Act including on contaminated land</td>
</tr>
<tr>
<td>1996</td>
<td>Housing Grants, Construction and Regeneration Act</td>
<td>Limits to renovation grants for unfit houses</td>
</tr>
<tr>
<td>1996</td>
<td>Housing Act</td>
<td>Introduced new provisions on registration schemes for houses in multiple occupation (HMOs)</td>
</tr>
<tr>
<td>2000</td>
<td>Local Government Act</td>
<td>Power of local authorities to promote well-being (as defined in the Act)</td>
</tr>
<tr>
<td>2003</td>
<td>Water Act</td>
<td>Included provisions on contaminated land and water pollution and on changes to drainage law</td>
</tr>
<tr>
<td>2004</td>
<td>Housing Act</td>
<td>Introduced powers to deal with hazards (the Housing Health and Safety Rating System introduced by regulations made under the Act) plus HMO licensing introduced</td>
</tr>
<tr>
<td>2005</td>
<td>Clean Neighbourhoods and Environment Act</td>
<td>Added to the list of statutory nuisances, and provisions on litter, noise, waste management and control of dogs</td>
</tr>
<tr>
<td>2007</td>
<td>Local Government and Public Involvement in Health Act</td>
<td>Introduced local area agreements and community strategies</td>
</tr>
<tr>
<td>2007</td>
<td>Sustainable Communities Act (Amended 2010)</td>
<td>Provisions to promote the sustainability of local communities</td>
</tr>
<tr>
<td>2010</td>
<td>Flood and Water Management Act</td>
<td>Includes provisions on sustainable drainage</td>
</tr>
<tr>
<td>2011</td>
<td>Localism Act</td>
<td>Introduced changes to planning, repealed requirement for regional strategies and some changes to housing law</td>
</tr>
<tr>
<td>2015</td>
<td>Deregulation Act</td>
<td>Repealed a number of provisions, such as duty to prepare sustainable community strategies and local area agreements; decriminalised some offences, e.g. on household waste; made changes to health and safety at work legislation and also changes to licensing law</td>
</tr>
</tbody>
</table>
Context, philosophy and principles of EH

there remain parallels with the nineteenth century
given the widespread acceptance of neoliberal eco-
nomics). It can be argued that unless solutions to
economic problems take account fully of the envi-
ronmental imperative presented by climate change
(and the fundamental risks to public health), then
the responses will be inadequate. Again recent
work has shown that more unequal societies are
also unhealthier. The issue of climate change
should actually dictate how economic problems
are resolved. However such challenges are tackled,
fundamental to the philosophy underpinning envi-
ronmental health is the notion of equity or fairness,
and in particular equity in health.

Equity in health means that there should be no
disparities in health as the result of social systems
between social groups that have an underlying social
advantage or disadvantage (as the result of eco-
nomic wealth or power). Equally there should be
no disparities as the result of the major social deter-
minants of health. Inequities in health come about
when society puts groups of people who are already
disadvantaged, as the result of poverty, gender, race
or sexual orientation or are otherwise disenfran-
chised, at further disadvantage with respect to their
health. Equity is an ethical principle; it also reflects
and is closely related to human rights principles. So
it should be recognised that climate change and the
economic crisis could actually increase inequity, and
that the further down the social ladder one is (that
is the less wealth one has), the greater will be the
adverse effects, and this applies as much between
countries as within countries.

One problem is that the main indicator of a
country’s economic performance is its GDP and
this is used to measure ‘progress’. However, this is
a crude measure of total economic activity, and as
such is a poor reflection of health and well-being.
For example, expenditure on tobacco appears in
GDP, as would money spent on food that has little
nutritional benefit, and in the UK and some other
countries even the sale of illegal drugs and prosto-
tution are included. So one might ask, for exam-
ple, in such an economic situation where should
the effort be put to achieve more in environ-
mental health terms; more food safety inspections
or actions to achieve healthier eating and better
diets for those on lower incomes which could also
reduce obesity? Or, should we spend money on
drugs and treatment for those living in damp and
cold homes or in improving those unhealthy and
unsafe homes? From a public health rather than
merely consumer protection or ‘service’ perspec-
tive, in both cases the upstream intervention (pre-
vention) would be the obvious course.

The reality is that the effects of economic
growth have made us worse off in health terms.
The GDP measure takes no account of increasing
inequality, pollution or damage to people’s health
and the environment. Indeed it also treats crime,
divorce and other elements of social breakdown as
economic gains. This model will always undermine
the notion of sustainable development (considered
in Annex 1.1 at the end of this chapter), and as
such it cheats other countries, future generations
and ourselves. We do need to redefine progress, and
replace GDP with new indicators of progress; how-
ever, it will be brave politicians that take this on as
there are so many vested interests. There are two
problems: first, many government finance depart-
ments (Treasuries) take a short-term approach and
don’t want to lead. Second, despite the science,
there are too many ‘climate change deniers’ in such
departments (who are in hock to vested interests in
the form of business), so change will come about
only when catastrophe is at the door, as climate
change will ultimately force a new approach.

Interestingly, Jackson [1] has considered what
prosperity looks like in a finite world with lim-
ited resources, and whether prosperity is possible
without ‘growth’. He undermines the notion that
prosperity is the same as conventional economic
growth as measured by GDP. Indeed prosper-
ity ‘isn’t obviously synonymous with income or
wealth’ and ‘rising prosperity isn’t self-evidently
the same thing as economic growth’. An alternative
such as an Index of Sustainable Economic Welfare
(ISEW) takes account of damage to the environ-
ment and public health and would be a better way
of reflecting economic performance, but that is not
for this book. However, this does put into context
the issues facing environmental health and why
inequality is such an important issue in environ-
mental health.

As the earlier section of this chapter has shown,
environmental health (even if we did not always
call it that) has seen similar momentous changes and crucial moments in history to those we now face. In the first quarter of the twenty-first century, we are at a comparable watershed. For many countries particularly in the Northern Hemisphere (or ‘the West’), urbanisation and industrialisation are largely behind us; we live in post-industrial economies.

Our horizons now are increasingly global, not merely national. We deal, typically, in symbols and abstractions, in information rather than in manufactured objects. Engineered solutions in themselves can no longer be the answer and where they still have a role to play they need to be managed and those affected need to be involved in the solutions. The problems themselves have assumed less tractable, more qualitative dimensions to do with ‘lifestyles’, quality of life and psychological (mental) health and well-being. More importantly, perhaps, the manageable, predominantly urban concept of public health that was developed in the nineteenth century has been replaced by a much bigger concept, that of the global biosphere. As a result, we are grappling with the much bigger issue of the future of life and health on Earth, a question that rarely occurred to the Victorians.

As we have seen, environmental health came about as part of the sanitary movement in the nineteenth century, but needs always to be reinvented or at least to be reassessed. For example, the work by the World Health Organization (WHO) Commission on Social Determinants of Health in its final report *Closing the Gap in a Generation: Health Equity through Action on the Social Determinants of Health* [2] highlighted the inequalities or inequity that exist within and between countries and indeed between generations (an issue that as we have seen was in part recognised in the eighteenth century by some more enlightened thinkers). These inequalities in health, avoidable health inequalities, arise because of the circumstances in which people grow, live, work and age, and the systems put in place to deal with illness. The issue of inequalities in health were further highlighted in the Marmot Review undertaken for the Department of Health by a Commission chaired by Michael Marmot [3].

Although many of the new threats are global, the problem, the response, will often be regional or local reflecting cultural differences, even individual. Without change and political leadership there will be increased inequity in health, continuing environmental degradation, a decaying family and community fabric, increasing stress and the deterioration of the state into a kind of reactive, coping mechanism. Against such a background, the emphasis within environmental health could be on cure (a sticking plaster approach) rather than prevention, hard technological solutions rather than a ‘softer’ people-based response. This approach would lead to professional compartmentalisation rather than integration, since the former may appear to offer more certain career gains to individuals. This can be reflected in a purely mechanical regulatory non-strategic approach to soften the edges of adverse health impacts from activities and policies.

Yet advocates of environmental health emphasise the preventive approach, and that environmental health practitioners have a strong overview of the risks to public health as the result of the breadth of knowledge (if not always depth).

Many diseases of the modern way of life, such as cardiovascular disease, obesity and cancer, will take much longer to conquer if prevention, or upstream interventions, remains a low priority and integrated planning and delivery of services is compromised by demands for quick fixes. For example, the research needed to understand them will be slower to materialise and this provides an opportunity for powerful rearguard actions by well-organized vested interests including industrial lobbies. There is, however, a further complexity to consider: when prevention does become a higher priority it is often in the context of finite or limited resources. This is where some hard decisions may have to be made about the shifting of resources from treatment and care to prevention and all the ethical issues that this entails. A review of National Health Service expenditure in 2002 [4] highlighted the economic benefits of upstream investment and the potential contribution of public health measures in reducing the burden of disease. However, there has often been a lack of solid evidence on which measures to use and indeed on outcomes of those measures.

Success requires ‘full engagement’, that is, increased, or better directed, spending and high public engagement to achieve improved health status and
increased healthy life expectancy across the whole of society. In recent years, while those lower on the social scale have barely seen an increase in healthy life expectancy, at the top there has been a marked increase. This also has economic implications with an increase in the age for eligibility for state pension, if those on lower incomes are unfit to work from their early fifties. Disability-free life expectancy (DFLE) was found to be about 15 years between those in the most deprived neighbourhoods and those in the least deprived [3], who on average have a DFLE of 70 years (see also Annex 1.1).

The social determinants of health are the conditions in which people are born, grow, live, work and age, including the health system. These circumstances are shaped by the distribution of money, power and resources at global, national and local levels, which themselves are influenced by policy choices. The social determinants of health are mostly responsible for health inequities – the unfair and avoidable differences in health status seen within and between countries.

The environmental impact on health is an inevitable by-product of human activity, and it is therefore the nature of that activity, and the attitudes that go with it, that hold the key. So it will be to the soft technologies – the technologies of mind, reason and social organisation – that we must increasingly look for solutions. Hard ‘engineered’ technologies are at best a partial answer, at worst a diversion. The answers offered are much more difficult. They require vision, ambition and leadership; they also require debate, consensus and agreement. In the worst case scenarios described, these solutions will be more, not less, difficult to realise and they will need a new kind of environmental health practitioner to tackle them. The WHO has also contextualised environmental health into human rights: human rights cannot be secured in a degraded or polluted environment. The fundamental right to life is threatened by soil degradation and deforestation and by exposures to toxic chemicals, hazardous wastes and contaminated drinking water.

This is because social and environmental conditions determine the extent to which people enjoy their basic rights to life, health, adequate food and housing, and traditional livelihood and culture. It is time to recognise that those who pollute or destroy the natural environment (and indeed those who provide financial backing for such activities whether as investors or customers) are not just committing a crime against nature, but are violating human rights as well.

(Klaus Toepfer, Executive Director of the United Nations Environment Programme at the 57th Session of the Commission on Human Rights, Geneva, 2001)

To fulfil their future role environmental health practitioners need to have an understanding of the following:

- The definitions and principles of environmental health.
- The agenda with which they need to be engaged.
- The skills and expertise required of their professional practice.
- The objective of their environmental health activities.

The remainder of this section of the chapter provides guidance on these subjects.

What is environmental health?

In 1991 Dahlgren and Whitehead set out a famous and influential model on the social determinants of health [5], see Figure 1.1. It can be seen that what we now consider to be environmental health and areas of environmental health practice feature strongly. Environmental health practitioners are therefore clearly part of the public health workforce. From this perspective it is apparent that ‘environmental health’ is also a component of the public health movement and this becomes more apparent on the following pages.

Figure 1.2 reflects the wider concerns with global and economic issues affecting health and demonstrates even more fully how environmental health fits within society.

The term ‘environmental health’ is quite different from most other definitions as the meaning is so wide and means different things to different people and in different contexts. In many respects it
is this catch-all nature that creates unease and misunderstanding. By separating the two dimensions of environment and health we can illustrate the all-encompassing nature of the combined term: Albert Einstein noted that environment was ‘everything that's not me’, and WHO considers health to be a state of complete physical, mental and social well-being. Despite the broad challenge of these concepts, several definitions exist for environmental health. In 1989, the WHO defined it ‘as comprising of those aspects of human health and disease that are determined by factors in the environment. It also refers to the theory and practice of assessing and controlling factors in the environment that can potentially affect adversely the health of present and future generations’. This definition concludes that environmental health is in fact two things: first, certain aspects of human health; and second, a means by which to address these issues. Figure 1.3 demonstrates the interface of environmental health. It shows that it is a discipline concerned primarily with human health and notes that humans operate in different environments, giving the examples of the living environment, the home environment, the work environment and the recreational environment. Figure 1.3 also sets out the various stresses that can impact on any of these environments. It is from this perspective that a holistic view can be taken of human health and the environments in which people live. As a concept and as a means of delivering practical solutions, environmental health provides a strong basis upon which decision-makers can work towards sustainable development. It has been clearly recognised that environmental health is a wide-ranging discipline that relies upon intersectoral cooperation and action. It is therefore essential that all the potential contributors to the
The settlement health map: a tool for investigating the impacts of the natural and built environment on public health (Barton & Grant 2006) [6]. Based on a public health concept by Dahlgren & Whitehead [5].

Figure 1.3 The interface of environment health (Source: MacArthur, I. D. and Bonnefoy, X. (1998) [9])

development and implementation of environmental health programmes can recognise their role. Environmental Health Practitioners (EHPs) or Officers (EHOs) and other ‘environmental health’ professionals cannot deal with all aspects of environmental health. As a concept it extends beyond merely the role and practice of EHOs employed in local authorities.

Many professionals in the public and private sectors make invaluable contributions towards environmental health and protection or improvement of public health; they may not perceive themselves as environmental health professionals, but they nevertheless perform tasks that contribute to the whole. It is wholly consistent with this approach that socially responsible commercial
enterprises might want to employ their own cadre of EHPs. Also there are many people, for example, public health specialists, health visitors, practice nurses, general practitioners, occupational health and safety staff and technical specialists, who work within the broader public health movement and who can, and do, work with EHPs in a way that maximises the human resources available. Professionals whose work is on the periphery of environmental health work, for example urban planners, would also greatly benefit the system if they also understood the role of environmental health and could relate its principles to their work. It is important that they understand the principles of environmental health and how their diagnosis and subsequent action can assist in developing effective environmental health interventions. Furthermore, building capacities in environmental health should not be restricted to the public sector workforce, as there is an ever increasing number of practitioners employed in the private sector, and not just those in mainstream environmental management positions, who recognise and build the principal precautions of environmental health management into everyday business practices. In the same way EHPs can help build capacity within community groups.

The principles of environmental health

The development of the environmental health approach has grown organically rather than by design. However, it has demonstrated that it can bring rhetoric to life and adds considerable value to the process of improving human health and quality of life. In a world that is subject to constant and turbulent change, it is surely important to retain some sense of core values or principles as touchstones for our work. Environmental health and the mechanisms to deliver it are founded upon such fundamental principles. They do not apply simply to environmental health at the community level, where in the UK the main focus has been on local government. These principles apply to all levels of government and all sectors that contribute to environmental health. They relate to many government issues and depend upon the way in which governments at all levels relate and interact among themselves and with communities. This is a major challenge as many governments still fail to understand the true nature of environmental health, and therefore the significance and value of its approach.

Environmental health is relevant in three time phases. It must work to repair past damage, to identify and manage present risk and to prevent future problems. The emphasis given to each phase is determined by a complex formula of factors, depending largely on an assessment of the risks and resources available. It is of course important and correct to address the most pressing issues relating to environmental health urgently, but emphasis should also be given to addressing, and so avoiding, future problems. This is the basis of the precautionary principle, which has become widely accepted in many policies and programmes, although it is also under threat from neoliberal economic thinking. Adhering to the principle should however ensure that environmental health action remains at the leading edge of improving the quality of life.

**Principle 1**

The maintenance and improvement of the human condition is at the centre of all environmental health action. A similar principle was contained in *Agenda 21* [10] and in 2012 the UN Conference on Sustainable Development (Rio+20) reaffirmed their commitment to *Agenda 21* in ‘The Future We Want’. The principle is recognition that the main target of environmental action is the well-being of the human race and those factors in the environment, however wide, that may affect it. This principle is fundamental and all others link into it. It reflects both the complexity and the potential that environmental health exhibits in the local and global picture.
Principle 2

The groups within society whose health is most at risk are often those who have least control over their own lives having little economic power, living in the worst housing with poor environmental conditions, working in the most dangerous or insecure occupations, and with limited access to a wholesome and varied food supply. Those lower down the social scale, and those with less economic power bear a disproportionate share of the global burden of ill-health and suffering. They often live in unsafe and overcrowded housing, in under-served rural areas or periurban slums. They are more likely than the well-off to be exposed to pollution and other health risks at home, at work and in their communities. They are also more likely to consume insufficient food, and food of poor quality, to smoke tobacco, and to be exposed to other risks harmful to health. This undermines their ability to lead socially and economically productive lives [11]. The disadvantaged do not form a single homogeneous group: different people are at a disadvantage in different contexts. For example, low income households in northern European countries may be at risk of poor health because of damp and cold housing conditions, fuel poverty and/or inadequate nutrition; in parts of Africa it may be a lack of safe water and sanitation, or indoor pollution because of the fuel used for cooking and heating in the home.

This phenomenon has been clearly recognised by the WHO, which acknowledges that access to the appropriate medical technology cannot in itself offset the adverse effects of environmental degradation and that good health will remain unobtainable unless the environments in which people live are health promoting. A reduction in inequality or inequity requires equal access to environmental health services and an uptake of services that relates to need. The provision of high technology services should not be restricted to certain sections of the population because of social or economic disadvantage in the others, and services should be sensitive to the needs of minority groups. Equity is a core and primary element that underpins any action on environmental health. To achieve this, the more disadvantaged within the population will require particular assistance and attention to redress the imbalance.

As Marmot concluded, however, there is a social gradient in health [3] – the lower a person’s social position, the worse his or her health. Action should focus on reducing the gradient in health. Health inequalities (or health inequity) result from social inequalities. Action on health inequalities requires action across all the social determinants of health. It is argued that focusing only on the most disadvantaged members of society will not reduce health inequalities sufficiently. Action has to be universal to reduce the steepness of the social gradient in health but with a scale and intensity that is proportionate to the level of disadvantage. This has been described as ‘proportionate universalism’. As Wilkinson and Pickett [12] have pointed out also the health of a society (and almost everything else) is not affected by how wealthy that society is, but how equal. The bigger the gap between rich and poor, the worse it is for everyone in that society, including the well-off.

Principle 3

A range of governance issues that can be described as the conditions for civic engagement must be in place. The adoption of the democratic principles of government is the cornerstone to the effective management of environmental health. For example, the European Charter of Environment and Health [7] sets out the basic entitlements of individuals including the rights of full information, active consultation and genuine participation in environmental health decisions. Environmental health protection is based on a model of democracy in which experts and elected politicians make decisions
on behalf of the general public. This sometimes paternalistic and frequently closed style of decision-making is a legacy of the democratic system developed in the eighteenth and nineteenth centuries and strengthened throughout most of the twentieth. But times are changing and demands have increased for greater public participation in all aspects of society. Democratic principles also require a two-way exchange and the involvement of non-governmental organisations and an informed public in the decision-making process is both necessary and practicable. Recent developments in information technology including social networking make this easier. It is therefore important that decision-makers are not only held accountable, but that they owe their accountability to the public. Modernisation of local services requires that people are not merely represented but actively participate in the development and delivery of local policies, services and projects and in doing so they can ensure that these meet their priorities and needs. This power sharing agenda can feel challenging and there are a variety of skills that people working in environmental health need to develop to ensure that a broad cross-section of the community are engaged and not only the 'usual suspects'. This approach to work can take more time and will not happen overnight and it must be remembered that it will also be undertaken within other service areas. It is therefore important to join up and to communicate with others within a locality and ensure that partner agencies work together to plan for and focus on community engagement.

Many of the environmental and public health problems facing society can only be solved by communities acting together in concert, rather than as individuals. This is one of the key areas to challenge the traditional approach to solving environmental health problems. Environmental health practitioners do need to consider how well equipped they are for helping with the development of communities and indeed developing an advocacy role.

**Principle 4**

**Cooperation and partnership.** Isolated decisions and actions cannot normally solve problems in environmental health: an inter-sectoral approach is needed. The practice of cooperation and partnership in pursuit of improvements in environmental health, not only between the health and environment sectors, but also with economic sectors and with all social partners, is a crucial element, the origins of which can be traced back to the days of Edwin Chadwick. This is the principle that lies at the heart of effective environmental health management.

Inter-sectoral activity is at the core of good environmental health practice. Its usefulness, however, depends on how broadly it is interpreted and implemented. When inter-sectoral cooperation is understood to pertain only to the support of the programme of a particular sector, it fails. If properly interpreted and applied, inter-sectoral cooperation and coordination means that:

- the problems tackled are common ones in which all participants have a stake;
- not only governmental agencies but also all the public and private sector organisations and interests active in the sector are involved;
- policy-makers, technical and service staff and volunteers at both national and local levels have actual or potential functions to perform;
- various participants may play leading and supporting roles with respect to specific issues;
- cooperation consists not only of ratifying proposals, but also of participation in defining issues, prioritising needs, collecting and interpreting information, shaping and evaluating alternatives and building the capabilities necessary for implementation;
- stable cooperative mechanisms are established, nurtured and revised according to experience.
Principle 5

**Sustainable development or sustainability** (see also Annex 1.1). In a similar way to the term environmental health, this concept does not just encompass certain issues, but also requires particular ways of managing them. In the policy-making process relating to environmental health there are three particularly important threads that serve to confirm the overlapping nature of environmental health and sustainable development. They are:

- **Policy integration**: the bringing of environmental health considerations into all other areas of policy and the tying together of different policy fields and different levels of government;
- **Partnership**: consultation with and participation by all groups within society in the planning and implementation of sustainable development policies;
- **Appropriate scale**: the handling of policy at the level of government (from local to international) at which each environmental health issue itself occurs, with a bias or emphasis towards the subsidiarity principle.

Principle 6

**Environmental health issues are truly international in their character.** The ease of international communication and travel is making the world seem an ever smaller place. Environmental health professionals have long recognised the fragility and proportions of the planet, and that the contaminants in our environment do not respect national boundaries. The world of environmental health is also small. The worldwide community of professionals who dedicate their working lives to improving and protecting the places we live in to safeguard health are but a speck compared with those who work to exploit and deplete the world’s resources in pursuit of ‘wealth creation’ but which might be both short term and short-sighted. However, the diminutive character of the world’s environmental health community brings advantages. We can and must communicate with ease. Although our languages may be different and our heritage and culture places us in different systems, our problems and approaches are mutual. The common wealth of knowledge can provide us with an irresistible resource for solving many of the perplexing dichotomies facing practitioners in their daily work. International cooperation and collaboration, such as through the International Federation of Environmental Health (IFEH), is therefore a key principle for environmental health and is one that should not be overlooked, despite the distraction of our immediate surroundings and problems.

The agenda for environmental health

A significant influence on the subject of environmental health over the past 20 years has been the work carried out by the UK Commission on Environmental Health and its subsequent report *Agendas for Change* [13]. The Commission established by the Chartered Institute of Environmental Health (CIEH) in 1996 recognised that the famous names of public health had all reacted to the conditions of the industrial revolution, and the accompanying physical, economic and social changes, as well as increased pressures on the environment. The question was why should a system established in the 1800s, and developed on an ad hoc basis since, be suitable for today's – never mind tomorrow's – society, a society that still bears some physical hallmarks of the Victorian age but operates in a completely different, more complex manner and that changes more rapidly than any before it?
Against this background the CIEH took the decision to establish a wide-ranging Commission on Environmental Health with the following terms of reference:

- to consider the principles of environmental health and their application to the health of individuals and the pursuit of sustainable development of communities;
- to examine the relationship between environmental health and relevant socioeconomic factors;
- to recommend a framework for action in the UK to reinforce and take forward the principles of environmental health with the involvement of the whole community.

The Commission, consisting of individuals from fields related to environmental health and environmental health management, published their report [13]. This set out a new vision for environmental health that recognised the social, economic and environmental aspects of human activity and called for different approaches that move away from purely regulatory direction and control and towards cooperation, partnership and management as the tools for lasting solutions.

Figure 1.4 illustrates this approach, which recognised that many of the environmental health problems that face society today are created by society and can only be tackled by the whole of society taking action. It is relatively easy to get individuals to take action when it is a matter of individual health and self-interest. However, the new challenge is how to get whole communities to act, not for individual benefit but for the advantage of society as a whole or even a community. The example of road transport and air quality illustrates this point well, as it is only when a complete modal shift in transport patterns occurs that air quality has a chance of improving. Individuals acting in isolation and not using their cars will not make a significant difference to air quality and will ultimately simply mean greater inconvenience for those people. It will only be through working in partnership, in cooperation with the various stakeholders, that we can expect positive results. Managed solutions will be more sustainable. *Agendas for Change* [13] is a wide-ranging report that contains many themes and 21 recommendations specific to the UK situation. The Commission recognised, in particular, that

1. there is a strong need for the integration of public and environmental health;
2. there is a need for clear local accountability in service delivery;
3. many positive contributions were being made to environmental health under the heading of ‘Agenda 21’ and ‘Local Agenda 21’ (later termed ‘Local Action 21’);
4. sustainable development processes provide many of the elements of good environmental health and these elements need to be nurtured to ensure sustainable change.

Although it was published in 1997, *Agendas for Change* remains current. It is understood the CIEH is in the process of updating the document but it still has a resonance. The CIEH is going through a process to prepare ‘Environmental Health Futures’, a document for the profession in the UK, which if not seeking to achieve what *Agendas for Change* did, will seek to capture the current position of the environmental health profession and how best to address the challenging and changing times ahead, based on the best evidence available.

In considering its approach, the Commission identified several ways to carry out a root-and-branch assessment of what environmental health might mean towards the year 2020. It considered
the characteristics of ‘environmental health’, examining the agreed schedule of environmental health interests, and examining illnesses related to environmental deficiencies or pollution. However, the lack of a simple definition of environmental health, and the complicated interactions between environment, behaviour and biology, made the whole topic complex.

The majority of the forces that will shape and form how environmental health works in the twenty-first century come from beyond the worlds of the environmental or health professions. It was with this in mind that the Commission concentrated on the ‘agendas’ that drive change in environmental health. These forces included: a new interest in quality of life, rather than just length of life; social and health inequity; new attitudes to health, safety and risk; sustainable development; globalisation; economic management; the information revolution; and the notion of subsidiarity and the desire of direct public participation in policy-making and implementation. Although not considered directly by the Commission there is also a tension between individualism and individual responsibility (and being left alone) and an expectation of action by government at the different levels to protect and safeguard health.

These issues form the complex web that environmental health as a discipline must recognise and about which it must negotiate so that it continues to have added value in the years to come. The Commission’s view for 2020 assumed first and most importantly that healthy people and healthy environments go together and are interdependent. This may sound a truism, but if so it is not widely acknowledged. Science and technology, together with our capacity to create artificial environments, have contrived to obscure that message and to replace it with another: that we are somehow above nature; that we don’t need it and if it doesn’t suit us, we can change it. Events such as the volcanic ash cloud from Iceland may, at least in part, have dented that assumption.

The Commission identified five major principles as key components of environmental health, and these informed its approach:

- precautionary approach
- inter-sectoral collaboration
- addressing inequalities and inequities
- community participation
- sustainable development.

In addition, two themes featured in the 2020 vision, that if anything have taken on an even greater significance; these are inequality and sustainability. First, urgent attention needs to be paid to reducing the disparities in wealth between social classes that relate so closely to disparities in environmental quality and health. The 2020 vision was therefore of a society where goods, whether they are measured in terms of monetary income or quality of life and physical and mental well-being, are much more equitably distributed than at present. The Commission recognised that equality and efficiency go together. Even now at least, lip-service is being paid to inequalities being a problem for all. An unequal and divided society is a malfunctioning society, and malfunction carries a heavy and measurable penalty, in ill-health, in deteriorating environment and in the resulting social and financial burden. In this context the reader is referred to Wilkinson and Pickett [12], where an epidemiological approach has been taken and similar conclusions reached.

Second, is sustainability. Is it sufficient to rely on the assumption that if we inject health as well as the ‘green’ dimension into our planning, where this also involves managing our lifestyles better, this will be effective?

The skills and expertise of environmental health practitioners and their contribution to public health

In September 2002, the CIEH and the then Health Development Agency for England published a vision statement for the development of environmental health over the following ten years [18]. The report described the work of a project that explored the projected growth of the role of environmental health in improving the public’s health and reducing inequalities. The aim of the project was to support the environmental health profession in developing a strategic vision for its contribution to health development and well-being.
**Agendas for Change [13]**

**A healthy environment**

The fundamental message of the Commission’s report is that as human beings we can only be truly healthy in a healthy environment. It recognises that we cannot insulate ourselves from our surroundings – the air we breathe, the water we drink, the food we eat, the buildings and the landscapes we inhabit. Directly or indirectly, they will affect our health and well-being. These may seem unexceptional statements yet they carry implications for policy-making that are far from understood. They mean, for example, that we need a far more integrated and comprehensive approach to policy formulation, one that embraces health impacts even where they may not be obvious. The problem – and one of the reasons why this integrated approach does not yet exist – is that the target seems to be constantly shifting.

The relationship between environment and health is not simple, but only recently has the connection been better recognised. In the space of a generation our attitudes to the environment, and to the illness or improved health it may generate, have undergone a revolution. Our mindset – our expectations and attitudes – have changed fundamentally. We now think of the planet as our home and conceive of it more as a unity. Hence the global agenda, one that deals in both economic opportunities – the global market – and in environmental limits, and the costs that breaching these limits may entail. We are aware of human rootedness in the environment, that the health of the biosphere, of air and water and soil, is a vital determinant of human health and well-being. Human well-being is also a complex, variable and vulnerable state, encompassing physical, social and psychological factors that are not easily separated. That is also an argument for the prospective health equity assessment of policies.

**The holistic approach**

To express such thinking, we have begun to evolve a new terminology: speaking of interdependence and interconnectedness, of the importance of a holistic perspective. From professionals, this demands a flexibility of response that may run counter to specialisms. For the public, it can mean that patience with established procedures is lower and expectations much higher. People not only expect that their environment should not damage their health, they also increasingly expect that it should promote their health and well-being [14].

All these changes have occurred within the career-span of an individual, roughly the time it would have taken for a person to progress from professional education and training in environmental health to a senior position in the field. But this is not merely an issue for environmental health specialists, since the very nature of the changing agenda – the broadening of concerns, the perception of new links between previously separate areas – means that everybody working in the fields of environment and health is affected.

Most of us recognise these points in principle. Many professionals and policy-makers no doubt try to place their work in a wider context, but at some point they come up against obstacles. More often than not this is institutional, in the broadest sense: the fact that the administrative structure and framework for defining and delivering environmental health has not kept pace with the revolution in knowledge or attitudes. Where changes in the mechanism of delivery have occurred, they have often been piecemeal, inconsistent or driven by forces that have intrinsically little to do with the concept of a genuinely health-promoting environment: cost-effectiveness theories, for example, or laissez-faire governance or political expediency.
We are, in effect, driving an old vehicle into a new era. The question is therefore: do we leave it to creak along, attempting the odd roadside repair, or send it back to the design shop for a complete overhaul?

The agendas

The Commission started from the premise that quality of life is fundamental to health. Both health and quality of life are subject to serious inequalities (inequity), but both also raise questions of lifestyle, which carry important implications for the environment. In addressing the two sets of issues – individual health and the integrity of the environment – the argument starts in the particular and the personal, moves on to the environmental and the global, and ends in the social, economic, professional and organisational – the areas where solutions must ultimately be found. The agendas that draw from the principles of environmental health are listed below. Although presented as a list, any of these agendas could be the starting point: these are cross-cutting themes and each provides an entry point into a larger agenda as outlined below.

The agendas for change:

- Quality of life
- Inequality (Inequity)
- Lifestyle
- Globalisation
- Democracy
- Information
- Integration
- Sustainability

Quality of life

Discomfort, dysfunction and dissatisfaction are primary indicators of poor life quality and it has been long established that health relies upon quality of life as well as the absence of disease.

Quality of life is frequently seen only in terms of economic wealth (GDP has already been mentioned), but a different, though related, approach is the attempt to reformulate human and social goals in terms other than the purely economic. The emphasis on economic growth is largely a product of the later twentieth century. However, we have learnt that whatever its positive effects, a higher economic standard of living also carries a number of negative effects on quality of life. It does not necessarily bring greater equality; it tends to degrade environments; and it does not necessarily lead to greater contentment. In fact, an exclusive concentration on economic objectives may destroy the very things – family, community, the social fabric – on which our physical and mental health relies. We have to think of a broader concept of welfare (and this is not to use it in the often pejorative sense associated with state benefits or financial support) more synonymous with well-being.

A number of studies over the past two decades have shown that people feel better – less stressed, more content, less aggressive – in the presence of natural landscape features: greenery (open space), trees, water. Their mental performance improves, they feel refreshed, relaxed and reinvigorated, and with these feelings comes improved physical health. These elusive, qualitative issues probably underpin the movement of people from the cities in search of better health and quality of life. Of course, many more people do not have such choices.
In this context the environmental health practitioner should also consider the work of the Department of Health on public mental health; see for example Confident Communities, Brighter Futures – A Framework for Developing Well-being [15] which built on the evidence base for public mental health. It is no coincidence either that in the Housing Act 2004 in the context of housing hazards and the Housing Health and Safety Rating System health is defined to include mental health.

**Inequality (Inequity)**

Although often referred to as inequality, to a large extent what we are talking about is inequity, which is ‘a want of (social) justice’ and the fact or quality of being unfair. So that unlike the term inequality it is clear that differences in health outcomes are not wholly a matter of some immutable law of nature. By and large, those on lowest incomes and most vulnerable live in the unhealthiest housing, suffer the most degraded living environments, work in the worst jobs, have the lowest level of educational attainment and eat the least wholesome food (and pay proportionally more for it). Those higher up the social gradient will also have worse health than those further up the social gradient from themselves as Marmot has demonstrated. To say that poor environments and unhealthy lifestyles go together is not to say that they always go together and that individuals, through effort or initiative, cannot transcend them; but people born into such circumstances have the dice loaded against them. The equality issue – the gap between the haves, the have-less and the have-nots – emerged as one of the dominant themes of the 1990s. This is a gap that matters in human terms, and many examples exist of real health differentials, for example see the Acheson Report (*An Independent Inquiry into Inequalities in Health in England*, 1998) and many reports since. Growing social and environmental inequality exact an enormous toll on health and life prospects. Resolving these issues will require a political commitment.

Ultimately, the only way to remedy environmental and health indicators of relative deprivation is a conscious and sustained drive to reduce social inequalities in all policy areas. To prioritise it in health alone condemns the initiative to futility.

**Lifestyle**

There are two main components to the lifestyles agenda, both of which depend on the idea that there is such a thing as an identifiable Western lifestyle and that this carries implications for the health of individuals, society and the global environment. The first is that such lifestyles are unhealthy, and that they tend to reinforce social and environment inequality. The second is that they are unsustainable – that the Western oil-based lifestyle cannot be transferred wholesale to the rest of the world without enormous damage to the biosphere.

To many people, and understandably, consumerism represents a lifestyle that must be curbed if the environment is to be protected. Western lifestyles make heavy demands on energy and resources and thus carry far-reaching implications for environmental health. Green or ethical consumerism proved a powerful force for change from the late 1980s. As a result, many people in commerce have reconsidered how they do business and have injected the green dimension into purchasing and sales policies. Yet, although the marketplace has proved capable of reform, local and national governments have also been weakened by the power of the markets. What we have gained as consumers, we appear to have lost as citizens. A major theme of the Commission’s report is that to protect our health we have to protect the environment, and this will not happen unless people are prepared to become more actively involved. Healthy and sustainable lifestyles, like green consumerism, require knowledge and empowerment and an understanding of the consequences of choices made. It is not just a matter of being ‘energy efficient’ but overall of using and consuming less by those higher up the social scale.
However it is also very difficult for an individual to ‘make healthy choices’ when the economic pressures mean that keeping an inherently cold house warm could increase personal indebtedness.

**Globalisation**

At the same time as new information technology has compressed distances, the market economy is extending its reach. The global economy is dominated by transnational corporations and brand names that are recognised throughout the world. Its prevailing ideology is liberalisation and deregulation: free trade.

Contrasting strongly with the apparently unstoppable spread of globalism has been the rise in concern for the local that takes many forms. For example, there is a new interest in a sense of place and local distinctiveness. Environmentalism has bred a radical, often passionate, attachment to particular landscapes. The global and the local are increasingly at odds with each other, sometimes in open conflict. If there are sensible alternatives to the process of globalisation, they need to be explored as a matter of urgency.

**Democracy**

Several factors have prompted the search for a new democratic model. They include the loss of local control to the new global economy; the difficulty of reconciling long-term issues of sustainable development with short-term political preoccupations; and the development of local action around specifically local environmental or health issues [16, 17]. A widespread cynicism also attaches to politics and politicians. Local government has been emasculated: its powers and competencies have been undermined and funding reduced. At the same time there is an impatience with established procedures, particularly among younger people, and a new vogue for direct action. People are also, by and large, more educated, better informed and less deferential. Over the past three decades there has been a rapid expansion of civil society – the network of charities, voluntary organisations, and campaigning and pressure groups through which much political activity is focused and directed.

Cumulatively, such pressures point towards a new model for devolving power and involving people: a new model of community ownership. Although its likely shape remains unclear, there are many clues.

There is demand for greater participation, although not necessarily in existing forms of government. There is a search for what might be called appropriate decision-making technology, for decisions to be taken at the most appropriate level. This often turns out to be the lowest level – the one nearest to those whose lives will be affected – compatible with efficiency and a strategic view. Hence, in part, the growth of interest in subsidiarity. There is talk of stakeholders and empowerment and there is an emphasis being placed on community involvement. Yet, there are also tensions, with powerful ideological, bureaucratic and economic tendencies pushing in the opposite direction, towards centralisation when the local does not fit with the central government’s views.

All of these issues bear on environmental health, yet environmental health and environmental protection are still based on a model inherited from the Municipal Corporations and Boards of Health of the nineteenth century in which experts and elected politicians make decisions on behalf of the public. This Victorian model, often distant and lacking transparency, sometimes paternalistic, has been in need of an overhaul.

In the UK in 2010 the notion of a ‘big society’ was much vaunted by the then Coalition government with no clear definition except that the government clearly desired a smaller state. However, this provided an opportunity to consider how local government and EHPs working there could work
differently and better with other agencies, particularly communities and non-governmental organisations (NGOs) to help improve public and environmental health. Indeed EHPs should consider how they can work at the community level. The rolling back of the state has continued although whether this has led to greater community action and more imaginative approaches to improving public health is a moot point.

**Information**

One of the key features of modern society is the explosion in the volume and complexity of information and the difficulty we have in handling it. Developments in information technology – the Internet, computer databases, social networking and so on – while creating new opportunities for participation, are adding to this problem of management and interpretation that applies across the range of environmental health issues.

To make their own judgements, people need good quality information that is independently and expertly validated and clearly communicated. Education in environmental health is central to understanding the information and encouraging informed individual and community action. Without that education and good quality information (that is information that is understandable) the range of problems identified will grow more acute.

EHPs have therefore to make better use of the different methods of providing information, and in particular that will often relate to relative risks, one of the most difficult issues for the general public.

**Integration**

To meet the challenges of the outlines in the Commission’s vision will require new approaches to policy-making and implementation. These will stress flexibility, teamwork, partnership and cooperation. Within and between agencies, we will require new forms of cooperation. We need multidisciplinary and inter-sectoral partnerships and the involvement of the public. We need to develop local models of integration between different bodies that can then be disseminated by national government. Such local initiatives will need underpinning by enabling legislation, funding and resources.

Professional staff will need to be flexible in their approach and multidisciplinary in their skills: able to see the whole picture, to see how their own function dovetails with those of others and vice versa. They must also have the knowledge and the skills to be able to involve the public in the new forms of participatory structures suggested above. This means a move away from the ‘statute-led’ or mechanistic and technocratic nature of much of environmental health work.

**Sustainable development**

Of all the issues that have emerged in recent years, the challenge of climate change (and sustainability) is probably the most crucial, cutting across traditional professional boundaries, requiring new forms of management and posing questions that are fundamental to human health. Several key ideas underpin the sustainability agenda. There is the attempt to place local behaviour in a global context and to see how global concerns can be expressed locally. There is the precautionary principle, of acting where proof or certainty of harm may be lacking. There is the need to think as nature ‘thinks’, in other words like a living system, in cycles and not straight lines. And there is the need to operate across organisational or specialist boundaries because it is the impact of an activity on the environment – not the successful prosecution of a specialist function – that matters.
The challenge of sustainable development (and climate change) is enormous. It is not possible to talk about sustainable development without also talking about environmental health. In recent decades or so we have seen several international and national initiatives that try to bring together sustainability and health, for example, the WHO Health for All strategy and Healthy Cities project, the UK government’s approach to public health and the Local Agenda 21 process. One of the priorities in environmental health must be to recognise the links between these programmes and their successors and ensure that they are managed in an integrated way.

The need for this project arose because of the increasing importance that is being placed on the multidisciplinary delivery of public health and the recognition that environmental health has, for a variety of reasons, become disconnected from the public health agenda and the public health organisations. The Environmental Health 2012 vision captured the challenges, constraints and ideas from environmental health, public health and health improvement professionals from the various sectors and it incorporated the advice of key practitioners, professionals and academics from environmental health, local authorities, health services, voluntary and community groups.

Participants in the project reported that the mainstream practice of environmental health had become fixed on the delivery of a narrow agenda, and that a number of factors were preventing it from achieving its traditional involvement in addressing the wider determinants of health. They expressed concern about the fragmentation of environmental health services (which has become more marked since the report was published), and lack of clarity on the nature of future environmental health roles and their contribution to health improvement and tackling health inequalities. There was a reported lack of available resources to deliver the new approaches and initiatives called for by the modern public health agenda, or to participate fully in the new organisational structures for public health. In particular, the culture of performance management of specific enforcement targets has resulted in environmental health officers having to take on predominantly technical and enforcement roles. This trend has been at the expense of the effective practice of the wider principles of environmental health protection, and has had, and continues to have, the effect of deskilling many in the profession, leading to dissatisfaction among existing environmental health practitioners, certainly those in local government. This has perhaps also been reflected in the difficulties in securing placements for environmental health students and, as an example, the problem of both lack of skills and absence from the ‘top tables’ of policy and strategy development which was highlighted in the report of the CIEH Commission on Housing Renewal and Public Health.9 The Environmental Health 2012 project was carried out in England, but the findings have been relevant to all the countries within the UK and may have wider international application because similar issues have also been reported in other parts of the world, from America [19] to Australia [20].

An understanding of the role of environmental health in public health is also important. If public health is the ‘science and art of preventing disease, prolonging health through organised efforts and informed choices of society, organisations, public and private, communities and individuals’,10 then environmental health is a major part of public health and environmental health practitioners part of the wider public health workforce. The Environmental Health 2012 strategic vision reported that by addressing the wider determinants of health, including food, housing standards, occupational health and safety, air quality, noise and environmental issues generally (upstream interventions), environmental health makes a fundamental contribution to the maintenance and improvement of public health, improving the quality of life and well-being of individuals and communities.

In order to demonstrate the importance of these contributions it was necessary to describe the sphere of environmental health. Figure 1.5 takes as its starting point the interface of environmental health
shown previously in Figure 1.3 [9]. The original interface has been developed and extended so as to include the main areas of activity of environmental health in food, water, air, land and buildings. The stressors have also been extended and specified (see box on stressors).

**Figure 1.5** The 2012 vision model of environmental health
(Developed from: Burke *et al.* [18].)

### Environmental health stressors

Environmental health stressors are features of the environment that may induce harm in or damaging responses to a living system or organism.

**Biological stressors**

Those biological elements of the natural and human-made world which present a direct risk to human health through ingestion, inhalation, inoculation or physical contact, and those miscellaneous elements that may influence biological systems to the detriment of humans and their environments.

**Chemical stressors**

Those chemical entities (or their intermediates) which, through their presence in a particular environment, expose the human to risk through ingestion, inhalation, inoculation or absorption and/or which interfere in biological systems to the detriment of humans and their environments.

**Physical stressors**

Those measurable physical manifestations induced naturally or through human activity that may impact unfavourably on human health through their damaging effects on cells, tissues, organs and homeostatic systems, as well as their impact on mental and social well-being.
Social stressors
Those behaviours associated with human life that are a consequence of settlement in communities and habitation and which have impacts on health and well-being.

Psychosocial stressors
Those attitudes of mind and mental processes that may have an adverse impact on the health of a person or community.

It is interesting to note that in the context of housing (the home environment) and the Housing Health and Safety Rating System (HHSRS) that the hazards in the home environment have been grouped into Physiological Requirements, Psychological Requirements; Protection against Infection and Protection against Accidents, reflecting work of the American Public Health Association from before the Second World War.11

The contributions of the environmental health practitioner have been defined as assessing, correcting and preventing the impact of the stressors on the living environment. The operational skills required by the environmental health practitioner have been identified as assessing, consulting, advising, enforcing, training/educating, advocating, evaluating, researching and reporting (each of these is described in the box on operational skills).

The strategic vision for environmental health in 2012 [18] identified that environmental health officers (practitioners) had a unique contribution to make to public health throughout their prime focus of improving and maintaining health rather than curing illness. Their use of problem-solving skills, supported by legal powers, to intervene in the causes of ill-health in the home, workplace and community placed them in this unique role. Their actions can directly influence health determinants and maintain healthy environments for the benefit of both individuals and communities, while also

Operational skills of environmental health practitioners
These can be set out as an ability to:

Assess – be aware of, and able to practise, those analytical skills that form the basis of professional judgement.

Consult – be aware of, and able to practise, the full range of techniques for giving and receiving information.

Advise – be able to communicate technically correct information for the purpose of informing colleagues, clients, communities and others of the most appropriate course of action to be taken in a wide range of circumstances.

Enforce effectively (being smart in enforcement) – be aware of, and be able to use, the full range of mechanisms available for securing compliance with legislative provisions, statutory requirements and standards and good practice, commensurate with the perceived level of risk – that is also sorting the well-meaning but ignorant non-compliant operation from the wilfully (whether knowledgeable or ignorant) non-compliant individual or organisation and be less concerned with those who are knowledgeable compliant.
extending to the protection of the environment for future generations. The strategic vision envisages that environmental health practitioners will:

• play lead roles in local government community health and well-being strategies and actively contribute to the public health agenda;
• be key partners in protecting and improving the health and quality of life of individuals and communities and reducing health inequalities;
• tackle the wider determinants of population health by identifying, controlling and preventing current and future risks.

Curriculum for environmental health education and training

The environmental health profession is facing a period of intense examination and challenge; challenges can be seen as negative but challenge and changes in society also present an opportunity. It was said in 2011 that perhaps for the first time in almost 40 years, the profession has the opportunity to reassert its public health credentials and to put behind it years of marginalisation and confinement to narrow technical agendas.

Other work such as that mentioned above has influenced thinking and planning about the role of environmental health at a high level in the nations of the UK and Northern Ireland. In particular, the education and training for future environmental health practitioners has more recently been based on a curriculum that will properly equip future generations to fulfil their role.

The curriculum was developed over time, taking account of the circumstances and society’s needs and expectations from an EHP. The current curriculum is the result of reviews in 2007 and 2010. It remains fundamental that an environmental health practitioner understands that stressors are often interconnected, and can take an overview such that they also identify potential unintended consequences of different courses of action and reconcile differences. However, the costs associated with the education, training and development of EHPs are under intense scrutiny as is our future professional
role and the location of the services that we provide. Indeed, as Professor George Morris and Ruth Robertson said in their report commissioned by the Royal Environmental Health Institute of Scotland as long ago as November 2003:

the profession undoubtedly faces its own challenge, which can be seen as having two primary elements. One is about the need to re-energise a beleaguered profession, to propel it from its current dependent, reactive state to rival the most effective of modern professions. The second, and inter-related element is about rediscovering effectiveness as a force in public health. Much of the profession’s task is about seeing the world in a quite different way. There is a need to create a clear statement of identity and to nurture the skills and maturity to work effectively in the new networks forming at local level to address the Health Improvement Challenge. [21].

These challenges of both resources and identity are forcing both academic organisations and the CIEH alike to fundamentally rethink how to plan to produce the next generation of practitioners and support the development of the existing cadre. The purpose of such a fundamental examination is simple – the sustainability of the profession as a whole and those professionals within it are crucial; we must evolve in a way that effectively addresses the dynamic nature of these challenges and reappraises our professional priorities.

CIEH Curriculum 2011 (discussed further in Chapter 2) comprises a package of elements, central of which, for the purposes of accreditation, are the ‘Framework’ and ‘Synopsis’ which provide the professional aims and learning objectives of the curriculum. The most important change here is the expectation that graduates from programmes accredited in future will be expected to have undergone instruction in public health ahead of the practical application of these knowledge-based skills, and the acquisition of skills-based competencies, in training practice.12

The learning objectives of an accredited programme have been grouped under four headings:

1 Fundamental principles and underpinning knowledge
2 Intervention strategies and operational skills
3 Practice skills in each intervention field
4 Core competencies.

The detailed elements are set out further in Chapter 2.

In Australia in 2009 the final report of the enHealth Environmental Health Officer Skills, Knowledge and Experience Workforce Project was published and shows many similarities with what has already been considered above.13 This project was established and managed by the Victorian Department of Human Services (DHS) on behalf of the Environmental Health Committee (enHealth). Its purpose was to develop a skills and knowledge matrix that could underpin a national approach to managing environmental health workforce issues. Identifying the skills and knowledge to undertake environmental health roles was seen as a first step towards delivering a sustainable level of environmental workforce capability. It includes a description of the whole EHO role, not a specific EHO job; a statement of common EHO skills and knowledge; a statement of a minimum level of EHO skills and knowledge to perform the role competently; a statement of skills and knowledge required regardless of whether this is attained through formal education, training and/or experience; a description of skills and knowledge directly related to the environmental health role; and support for emerging roles based on reported developments in the field (anticipating developments in the role in the short to medium term).

A profile of the environmental health officer

The profile in Figure 1.6 was designed to produce practitioners capable of applying their core knowledge, skills and competencies to assess and monitor environments; to identify and quantify risks; to determine the most appropriate intervention to be exercised in order to secure improvements in public health and address issues of health equity. This may be based on legal compliance, but the legislation is but one way of identifying and dealing with issues of public health and indeed it has to be understood and interpreted correctly in the light of reputable advice and cases. In order to undertake these tasks, the practitioner operates within a framework of
professional attributes, ethics and an evidence base. The practitioner also engages in ‘dynamic updating’ by taking account of and working within relevant policies, current strategies and standards and topical and new health risks.

A consultation by the WHO on the Role, Functions and Training Requirements of Environmental Health Officers (Sanitarians) in Europe in 1978, concluded:

*Experience of those countries in the Region which have officers with specialised training in environmental health who are recognised as constituting a specific profession clearly demonstrates their value. Thus it would be to the advantage of all Member states to introduce into their environmental health service staff of this kind whom the consultation called in English environmental health officers.*

That conclusion was followed by a further series of considerations by the WHO, one of which looked at the development of environmental health manpower [22], and contained a professional profile of the environmental health officer (see the box), which may still be considered to provide a valid description.

As has been made clear, practitioners contributing to environmental health include more than those qualified as environmental practitioners. A report to the International Federation of Environmental Health Council, September 2010 [23] set out details of more broadly drawn baseline competencies to be displayed and maintained by those working within environmental health practice, irrespective of their professional background. It endeavoured to reconcile the requirements for those with environmental health practitioner qualifications and those who are qualified in related fields but operate in the broader spectrum of environmental health practice. It also provides a set of higher level discretionary competencies which could, additionally, be displayed as part of the environmental health professional profile. These remain valid.

All professionals working within environmental health practice should exhibit basic competencies. Discretionary competencies are more likely to be
The professional profile of the environmental health officer

The following outline is largely based on that in a WHO document [22].

1. The environmental health officer is concerned with administration, inspection, education and regulations in respect of environmental health.

2. The numbers of environmental health officers should be sufficient to exercise adequate surveillance over health-related environmental conditions; this surveillance should include necessary monitoring activities. They must have a close association with the people in their area and be readily accessible to them, providing professional advice and guidance, and thereby gaining the community’s confidence and encouraging its participation in improving environmental health. They should be members of multidisciplinary primary health care teams delivering comprehensive health care at community level.

3. Environmental health officers act as public arbiters of environmental health standards, maintaining close contact with the community. They must at all times be aware of the general environmental circumstances in their districts, and must know what industrial hazards to health may arise there and what resources are available in the event of an emergency.

4. They are professional officers capable of developing professional standards and applying them to their own work in relation to that of non-professionals involved in environmental health. Also, their role will obviously touch on aspects with which physicians, veterinarians, toxicologists, engineers, nurses and others deal in a more specialised manner.

5. One of their vital functions is to maintain effective liaison with other professional officers who have a contribution to make in the promotion of environmental health, for example, with regard to water resources management, waste management, housing, rodent, insect and other pest control and protection of the recreational environment.

6. Environmental health officers would carry out the well-established duties of sanitarians/sanitary inspectors, including inspection of housing and food hygiene, and also monitor and control the new hazards arising from intensive industrialisation, for example, pollution by chemical and physical agents, which could harm the health of a community.

7. Even greater emphasis than in the past should be placed on the preventive role of environmental health officers in relation to environmental hazards to health.

8. They will obviously not possess the expertise of physicians in personal health, of veterinarians in animal health, of microbiologists in microbiology or of sanitary engineers in the provision of water supplies. However, they will have sufficient background and practical knowledge of these areas to understand the principles involved, and may develop some specialist expertise. They will be able to work easily with the other professionals. Their wider experience will enable them to formulate an approach on a broader base, to contribute to the decisions to be made, or to make these decisions alone in cases where they have the necessary authority. They must understand the environmental aspects of the problems that are the concern of other professionals, so that they may contribute to their solution.

9. They must be able to plan and coordinate activities between different professional disciplines, official agencies and authorities. They need to have continuing links with other professionals involved in environmental and health-related work. The other professionals with whom liaison will be appropriate include physicians, physicists, microbiologists, chemists, civil/building/sanitary engineers, veterinarians and lawyers.

10. In some countries and situations, the environmental health officers will initiate the collaboration; in others, they will provide the information and advice that are sought. This liaison
role will extend beyond the other professionals to technicians and a range of other specialists, including those concerned with the public health laboratory services. While being able to act independently in both advisory and enforcement capacities, exercising self-reliance and initiative, they should also be able to function as members of a team with other professionals in implementing environmental health programmes.

11. In industry and commerce, environmental control specialists interpret legislation, promote and maintain standards, and solve the problems that may come to light through, for example, a system of internal control or 'self-inspection' (e.g. via self-regulation or earned autonomy).

12. An important part of their functions must be to acquaint themselves with actual or potential environmental hazards and to ensure that appropriate action is taken to deal with them, for example, to safeguard the public from the hazards associated with microbiological contamination of food and with chemical residues in food substances, and to monitor and control potential and existing environmental hazards, with the backing of strong legislation.

13. A combination of training in public health and toxicology should enable them to cope with such problems as soil pollution due to degradation-resistant agricultural pesticides, leachates from industrial wastes, fallout from the plumes of chemical works, liquid radioactive wastes from industry and research; chemical pollution of the work environment from solvents and from dust arising from processes using silica, asbestos and lead; pollution of the home environment due to such products as cosmetics, detergents, paints, pesticides and gas used as fuel; heavy contamination of water resources by mercury, antimony, barium, cobalt and other metals due to industrial wastes, pesticides used in agriculture, etc.; and new problems in food safety such as the irradiation of food.

14. Environmental health officers in the public service should have the following basic functions:

a) improving human health and protecting it from environmental hazards;
b) enforcing environmental legislation;
c) developing liaison between the inhabitants and the local authority, and between the local and higher levels of administration;
d) acting independently to provide advice on environmental matters;
e) initiating and implementing health education programmes to promote an understanding of environmental principles.

15. Because of the range of functions, environmental health officers will operate in a managerial capacity and in collaboration with other environmental agencies and services.

The increasing complexities of environmental health problems require a continuing development of expertise and an updating of knowledge. To maintain a leading role in dealing with environmentally related health problems, environmental health officers must be in a position to respond to challenges presented by new hazards in the environment, and exercise influence in promoting and regulating environmental health activities. Their training should equip them with the necessary expertise to act at any level – national, provincial (or intermediate) or local – or within any sector, private or public.

Thus environmental health officers (practitioners) have until now always been trained as generalists across the range of basic environmental health activities and have occupied a key position in the environmental health service. Nevertheless for all the changes an important part of their functions must be to acquaint themselves with actual or potential environmental hazards, and to ensure that appropriate action is taken to deal with them. They should see problems in context and utilise that breadth of knowledge to resolve the problems identified. In some cases, they may have the required authority...
demonstrated by those who are working at a high level within the environmental health field. They are not essential to be recognised as working with an environmental health profile. Additional competencies can be included which relate to specific local, regional or national circumstances and these may be very different in differing countries and continents, for example interventions dealing with impact of extreme heat or cold. These baseline and discretionary competencies are listed in the box.

**Baseline competencies**

- Be able to identify and articulate the range of actual and potential biological, chemical, physical, social and psychosocial stressors that may adversely impact upon human health and the environment.
- Be able to identify and articulate the points at which practitioners may intervene to prevent, control or mitigate the impact by applying the principles of risk management.
- Be able to identify and articulate the most appropriate interventions, having regard to the evidence available, and taking into account such other political, financial and technological factors that are likely to influence the decision-making process.
- Be able to communicate and engage with partner organisations, agencies, fellow professionals and others with whom appropriate intervention strategies might need to be formulated.
- Be able to design and manage the implementation of appropriate interventions.
- Be able to monitor, review and evaluate the effectiveness of the intervention strategy; altering or adapting it, where necessary, according to the actual or predicted outcome.
- Be able to display transferable skills such as personal and organisational management, communication skills, project management and critical thinking.

**Discretionary competencies**

- Design, develop and implement continuing education sessions for peers and other stakeholders on the success and challenges in delivering environmental health-related programmes.
- Design, implement and evaluate quality assurance processes for all programs, policies and best practice.
- Advocate and implement practice policies, legislation and standards designed to improve current levels of protection to human health and the environment.
- Be able to apply regulatory tools and enforcement options when non-compliance is observed.
- Gather evidence for publication of novel research, and disseminate good practice.
- Contribute to the development and actions of integrated multidisciplinary teams in pursuit of environmental health goals.
- Support the integration of environmental health practice goals within other areas of related professional practice.
- Monitor and review the effectiveness of the intervention strategy; altering or adapting it, where necessary, according to the actual or predicted outcome.
- Be able to advise on the strategic consequences of the interventions that are proposed.
An objective for environmental health

The aim of this first chapter has been to consider the history, philosophy, purpose and practice of environmental health. It is clearly the case that environmental health, whilst firmly rooted in the history of public health, needs to adapt and modernise in order to meet the demands and expectations of changing societies and new generations. It is more than the application of technical expertise whether as a generalist or specialist. Fundamentally and regardless of governments, or government policies, the modern practice of environmental health must be embedded within sustainable development in order to deliver the long-term and long-lasting improvements in both our public health and our environment.

Table 1.2. The main headings of the Public Health Outcomes Framework with examples of those areas where it is envisaged EHPs can contribute

1 **Improving the wider determinants of health**

   **Objective:**

   **Improvements against wider factors that affect health and well-being and health inequalities**

   - The percentage of the population affected by noise
   - Fuel poverty

2 **Health improvement**

   **Objective:**

   **People are helped to live healthy lifestyles, make healthy choices and reduce health inequalities**

   - Smoking status at time of delivery
   - Diet
   - Smoking prevalence – adult (over 18s)
   - Cancer diagnosed at stage 1 and 2
   - Falls and injuries in people aged 65 and over

3 **Health protection**

   **Objective:**

   **The population’s health is protected from major incidents and other threats, while reducing health inequalities**

   - Fraction of mortality attributable to particulate air pollution
   - Public sector organisations with board-approved sustainable development management plan
   - Comprehensive, agreed inter-agency plans for responding to health protection incidents and emergencies

4 **Healthcare public health and preventing premature mortality**

   **Objective:**

   **Reduced numbers of people living with preventable ill-health and people dying prematurely, while reducing the gap between communities**

   - Mortality from cancer
   - Mortality from respiratory diseases
   - Mortality from communicable diseases
   - Health-related quality of life for older people
   - Hip fractures in people aged 65 and over
   - Excess winter deaths

The acceptance of this and the incorporation of previous definitions offer a challenging objective for future environmental health practice. For example, until recently the role of environmental health in improving public mental health had hardly been considered but the report and underlying evidence base published by the Department of Health in 2010 demonstrates that mental health and well-being is as much a part of environmental health as accident prevention [15]. Social and health inequalities can both result in, and be caused by, mental ill-health. One in six of the adult population in the UK experiences mental ill-health at any one time, often as the result of, or exacerbated by, those factors and social determinants where the EHP can intervene.

Sometime EHPs fail to see their role in improving mental well-being which can be defined as ‘a dynamic state, in which the individual is able to develop their potential, work productively and creatively, build strong and positive relationships with others, and contribute to their community. It is enhanced when an individual is able to fulfil their personal and social goals and achieve a sense of purpose in society’ [24].

So the objective for environmental health can be set out as:

To achieve mediating strategies between people and their environments, synthesising personal choice and social responsibilities in health to prevent premature death and reduce disease, disability, dysfunction,
stigma, prejudice and discomfort and create supportive and sustainable environments to enable people to live healthy lives.

In England, outside the clinical arena, the key responsibility for improving the health of local populations, including reducing health inequalities, now rests with upper (county) tier and unitary local authorities. Unfortunately environmental health is a lower tier function in two-tier authorities. The Health and Social Care Act 2012 gave each unitary and upper tier local authority the duty to ‘take such steps as it considers appropriate for improving the health of the people in its area’. Local authorities set up statutory health and wellbeing boards to drive local commissioning and integration of all health services, based upon local needs, giving new opportunities to improve the health and well-being of local communities right across the life course. This arrangement provides an opportunity for EHPs to contribute ever more to improving public health, given their skills, knowledge and expertise.

The Public Health Outcomes Framework consists of two overarching outcomes that set the vision for the whole public health system (see Table 1.2). These outcomes are: increased healthy life expectancy, which takes account of the health quality as well as the length of life; and reduced differences in life expectancy and healthy life expectancy between communities (through greater improvements in more disadvantaged communities).

Figure 1.7 sets out what Rayner and Lang [25] have called the complex model of ecological public health and in this chapter an attempt has been made to show how EHPs can contribute to ecological public health (and be equipped to do so). Figure 1.7 represents how the flow of events can contribute to sustainable or unsustainable health outcomes. In that sense, anything that does not address and redress health inequalities must be an unsustainable health outcome. Environmental health practitioners are indeed part of a movement that seeks to improve public health by addressing those stressors that adversely impact on public health.

Readers can themselves consider the areas of work that can contribute to addressing these issues. This handbook provides pointers on how those contributions can be made. A wish to make a positive difference in people’s lives, to improve their health and to prevent exploitation by those with economic or other power that compromises this, is a common motive of environmental health practitioners. The authors hope that readers will accord with that, and rise to the challenges that this presents.

Section 2 Notes

7 See, for example, www.oecd.org/health/inequalities-in-health.htm
9 This can be seen at: www.cieh.org/uploadedFiles/Core/Policies/Publications_and_information_services/Policy_publications/Publications/Housing_renewal_report07.pdf
11 This can be seen in the Basic Principles of Healthful Housing. New York: American Public Health Association, 1938.
12 The CIEH has produced two documents, the framework of the 2011 Curriculum and the Synopsis, that can be found at: www.cieh.org/professional_development/curriculum-2011.html

Section 2 References

of Health’ has been revised in this version and was accessed on 22 June 2010: www.framtidsstudier.se/filebank/files/20080109$110739$fil$mZ8UVQv2wQFSmMRF6cuT.pdf


Other useful reading and sources of information


WHO Europe, www.euro.who.int/en/home


UNThe Future We Want, https://sustainabledevelopment.un.org/content/documents/733FutureWeWant.pdf

ANNEX 1.1 KEY CONCEPTS AND TERMS FURTHER DEVELOPED

Sustainable development

The World Commission on Environment and Development (WCED) (the Brundtland Commission) was convened by the United Nations in 1983 to address growing concern ‘about the accelerating deterioration of the human environment and natural resources and the consequences of that deterioration for economic and social development’. In its 1987 Report (Our Common Future)
Stephen Battersby

Living within environmental limits
Not depleting natural resources that cannot be replaced or renewed – keeping natural resources unimpaired for future generations.
Maintaining biodiversity and improving environmental quality.

Ensuring a strong, healthy and equitable society
Meeting the diverse needs of existing and future communities, promoting personal and community health and well-being and social cohesion. Ensuring activities contribute to good public mental health and well-being.

Achieving a Sustainable Economy
Building a stable and fair economy that does not lead to greater inequality and which provides for the well-being of individuals and communities with opportunities for all.
Contribute to environmental impairment, pay the full social costs (Polluter Pays) and that those who use resources with the principles of sustainable development are incentivised and rewarded.

Using Sound Science and Evidence
Ensuring public policy is developed and implemented on the basis of sound scientific evidence and current knowledge in the event of uncertainty. Recognizing that the Precautionary Principle should be applied. Properly researched public attitudes and values should also be taken into account.

Promoting Good Governance
Promoting individual and community participation in systems of governance and engaging with all people so that all members of society feel able to be involved and not isolated or ignored.
Capturing the creativity and energy and diversity within society.

Figure 1.8 One idea of the components of sustainable development

it defined sustainable development as ‘development that meets the needs of the present without compromising the ability of future generations to meet their own needs’. It introduced the notion of generational equity as well as equity within society being an issue. This also recognises that economic growth and consumption cannot continue at the present rate as planet Earth has finite resources.

The UK Commission on Sustainable Development (which had its funding withdrawn by the Coalition government after 2010) said that climate change resulting from carbon and greenhouse gas emissions poses potentially catastrophic risks to human health and threatens to widen health inequalities between rich and poor populations in the UK. It is therefore a fundamental consideration in achieving sustainable development. Unsustainable development is damaging to the natural environment, which increases risks to health for all social groups, with low-income groups being most vulnerable to its detrimental effects. Rising carbon emissions are linked to rising levels of affluence and consumption. Disadvantaged groups will suffer greater exposure to extreme weather risks, flooding and homelessness, whilst lacking insurance and other material resources to cope with the effects of climate change, and so sustainable development, health equity and climate change are all interconnected.

Matters that contribute to sustainable development such as active travel, promoting green spaces
and healthy eating (including consumption of less but better quality meat) will yield co-benefits for both health and carbon emissions. The provision of opportunities for healthy, low-carbon living distributed in ways that favour people with low incomes and so helps to reduce their vulnerability to ill-health is therefore clearly part of sustainable development and is inherent to the idea of sustainable communities.

In common with other notions of ‘development’ sustainable development is concerned with the improvement of the human condition, but the difference is that the emphasis is less on economic growth or production, rather it considers both environmental and social capital. Thus it is concerned that whatever is done to improve the quality of life of people should not lead to a degradation of the environment which should be interpreted in both the bio-physical sense and the socioeconomic sense (see Bell and Morse (2003) for more information).

The notion of sustainable development (or sustainability) relies on no longer treating the environment as a ‘free good’. A proper value has to be placed on the ‘services’ provided by the natural environment. The problem is that so often they have had a zero price because no ‘market’ existed in which the true value could be shown. For example, how was it possible to price access to clean water, or biological diversity? As has been shown since the late 1980s by environmental economists, it is possible. The economic principles underlying ‘proper’ pricing of goods and services and the environment and natural resources are the same. Prices should reflect the true social costs of production and use, and the true value of the environment and resources should be reflected in prices rather than have them as ‘free goods’. This is what has led to ‘green taxes’ and levies but there remains a great deal more to be done, and markets (and prices) can also be rigged.

In June 2012 at the UN Conference on Sustainable Development (Rio+20) a resolution committed governments to the sustainable development goals and adopted the outcome document entitled, ‘The Future We Want’. The UN is working with governments, civil society and other partners to shape a sustainable development framework to meet the needs of both people and planet, providing economic transformation and opportunity to lift people out of poverty, advancing social justice and protecting the environment. There is a considerable amount of information on the related websites.

**Risk, risk assessment and risk management**

Much in this book in later chapters will consider the idea of risk and risk management in the different contexts. Here is merely an introduction. No human activity is risk-free, and hazards are all around whether at home or at work or travelling between the two.

**Risk**

Risk is a combination of the probability or frequency of an occurrence of a defined hazard and the magnitude of the consequences of the occurrence. Thus risk can depend upon:

- the frequency of exposure
- precautions taken
- other relevant factors that affect the magnitude of the consequences.

The risk may depend upon the number potentially affected, or the severity of the harm. Thus the harm may be relatively minor but could potentially affect a large number of people. On the other hand the potential harm could be very severe such as death, but potentially there may only be a very small number of people affected.

**Risk assessment**

In the workplace (and in general) risk assessment is nothing more than a careful examination of what in the particular location or occupation could cause harm to you or others and is a means of helping you to weigh up whether adequate precautions are in place or should more be done to prevent harm. An accident is an unplanned and uncontrolled event leading to injury, damage, loss or error. Accidents do not always result in injury
or damage: there can be near-misses or dangerous occurrences. If these are reported then steps can be taken to prevent those near-misses becoming real accidents, and the information provided will inform future risk assessments. At its simplest a five-step process is involved.

1. Look for the hazards (a situation that could occur or some aspect of an operation that has the potential for harm, that is, human injury, damage to property or the environment)
2. Decide who might be harmed and how
3. Evaluate the risks and decide whether the existing precautions are adequate or whether more should be done (which is merging into risk management)
4. Record the findings
5. Review the assessment and revise it if necessary, in the light of experience or more information.

The assessment can produce a rating of the severity of risk which can be represented as:

Risk rating = likelihood × severity of harm

This formula assumes that the person undertaking the assessment is competent to do so. Indeed an assessor if not competent is unlikely to produce an assessment that is suitable and sufficient. This means that the assessor should be familiar with the environment being assessed and the operations there.

It is possible to assign a number from 1–3 to indicate the severity of harm or consequences of the hazard (this could also be a letter from A–C). A number from 1–3 can also be assigned to indicate the likelihood of the event causing the hazard to actually occur.

Using the chart below it is possible to produce a score and link it to action criteria.

Thus:

<table>
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<tr>
<th>Severity of hazard outcome or consequence</th>
<th>Severity of harm reducing</th>
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<tbody>
<tr>
<td>1 = death, major injury, major damage or loss to equipment or property</td>
<td>1</td>
</tr>
<tr>
<td>2 = &gt;3-day injury, damage to property or equipment</td>
<td>2</td>
</tr>
<tr>
<td>3 = minor injury, minor damage to property or equipment</td>
<td>3</td>
</tr>
</tbody>
</table>

**Implications:**

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Unacceptable: must receive immediate attention to remove or reduce risk</td>
</tr>
<tr>
<td>2</td>
<td>Urgent: must receive attention as soon as possible to reduce likelihood or hazard</td>
</tr>
<tr>
<td>3</td>
<td>Must receive attention to verify how hazard or likelihood can be reduced. Are satisfactory systems in place?</td>
</tr>
<tr>
<td>4</td>
<td>Should be given attention to ascertain if likelihood or hazard can be reduced and to check if adequate procedures are in place</td>
</tr>
<tr>
<td>6</td>
<td>Low priority</td>
</tr>
<tr>
<td>9</td>
<td>Low priority</td>
</tr>
</tbody>
</table>

**Figure 1.9 Risk rating chart**

The allocation of likelihood and severity will then produce a score using the risk rating formula (see Figure 1.9).

A simpler but similar method is shown in Figure 1.10.

**Risk management**

Although the whole process including the assessment can be seen as risk management, it is also the arrangements, works or precautions or other steps taken to reduce the likelihood of an occurrence that could cause harm. In some instances the management process might be designed to minimise the harm outcomes as well as prevent the occurrence. There may already be some precautions or arrangements in place but the assessment may have deemed them inadequate and so the precautions...
duties and powers for health and wellbeing boards in relation to Joint Strategic Needs Assessments (JSNAs) and Joint Health and Wellbeing Strategies (JHWSs). In 2013 the government issued statutory guidance on these.¹⁷

A JSNA is a tool that was intended to enable local authorities, Primary Care Trusts (PCTs) (now Clinical Commissioning Groups (CCGs)) and other local partners to coordinate in understanding the future health care and well-being needs of the local community. Environmental health practitioners need to be involved because much of their work can make a significant contribution to health improvement. Their understanding of JSNAs is therefore essential and it is apparent that until recently knowledge and involvement has been highly variable.

The 2007 Act specified that local authorities and PCTs must produce a Joint Strategic Needs Assessment (JSNA) of the health and well-being of the local community. The JSNA was intended to ‘identify the current and future health and well-being needs of a local population … and lead to agreed commissioning priorities that will improve outcomes and reduce health inequalities’. The JSNA process offered NHS and local authority partners an opportunity to strengthen partnership working and address key strategic challenges, including the demands of more personalised models of care and joint commissioning for investment in prevention and the wider determinants of health.

The 2007 Act (as amended by the 2012 Act) requires a ‘responsible local authority’ (the upper tier or unitary authority) and each of its partner CCGs to prepare JSNAs and JHWSs, and these functions are to be exercised by the health and wellbeing board established by the local authority.

The responsibility falls on the health and wellbeing board as a whole and so its quality and effectiveness will depend upon all members working together throughout the process. The duties apply across the health and wellbeing board so boards will need to discuss and agree their own arrangements for signing off the process and outputs; it is important that the board as a whole discharges these duties. Two or more health and wellbeing boards could choose to work together to produce JSNAs and JHWSs, covering their combined

---

<table>
<thead>
<tr>
<th>Risk</th>
<th>Hazard/Severities Decreasing priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A1 B1 C1</td>
</tr>
<tr>
<td>2</td>
<td>A2 B2 C2</td>
</tr>
<tr>
<td>3</td>
<td>A3 B3 C3</td>
</tr>
</tbody>
</table>

Risk here is used to mean chance or probability

**Implications:**
A1 Unacceptable; A2/B1 Urgent; A3/C1 Must receive attention; B2 Should receive attention; B3/C2 Low priority; C3 Very low priority

**Figure 1.10 Risk assessment matrix**

may be enhanced on the basis of that evaluation. These arrangements or precautions can be preventive measures, such as the use of mechanical lifting rather than manual handling of materials, or they can be protective measures, so that any harm is minimised, for example the use of smoke detection and alarm systems and protected escape routes or the use of domestic sprinkler systems in multi-occupied housing where the likelihood of a fire might be high (and remain high) but the harm can be minimised. This in the context of environmental health will often reflect how well the business is run. A well-run business will have identified the risks, and then assessed and managed them.

**Joint Strategic Needs Assessments (JSNA)**

Unlike the other concepts that are generic and applicable globally, Joint Strategic Needs Assessment is more localised to England and Wales. Nevertheless it is an important concept as despite the substantial changes to public health structures JSNAs remain an important part of public health. Indeed the Health and Social Care Act 2012 amended the Local Government and Public Involvement in Health Act 2007 to introduce
geographical area. Some health and wellbeing boards may collaborate with neighbouring areas where they share common problems as this can prove to be more cost-effective than working in isolation. Local authorities and health and wellbeing boards can also decide to include additional members on the board beyond the core members. These additional members could be other service providers (NHS, private or voluntary and community sector), health and care professionals, representatives of criminal justice agencies, fire and rescue services, local voluntary and community sector organisations, universities or representatives of military populations, who can bring expertise and knowledge of the local community to enhance JSNAs and JHWSs.

The JSNAs are assessments of the current and future health and social care needs of the local community. These are needs that could be met by the local authority, CCGs or the NHS. They are unique to each local area. The policy intention is for health and wellbeing boards to also consider wider factors that impact on their communities’ health and well-being, and local assets that can help to improve outcomes and reduce inequalities. Local areas are free to undertake JSNAs in a way best suited to their local circumstances – there is no template or format that must be used and no mandatory data set to be included.

A range of quantitative and qualitative evidence should be used in JSNAs. There are a number of data sources and tools that health and wellbeing boards may find useful for obtaining quantitative data. Qualitative information can be gained via a number of avenues, including but not limited to views collected by the local Healthwatch organisation or by local voluntary sector organisations, feedback given to local providers by service users; and views fed in as part of community participation within the JSNA and JHWS process. JSNAs can also be informed by more detailed local needs assessments such as at a district or ward level; looking at specific groups (such as those likely to have poor health outcomes); or on wider issues that affect health such as employment, crime, community safety, transport, planning or housing. Evidence of service outcomes collected where possible from local commissioners, providers or service users could also inform JSNAs. Boards will need to ensure that the staff who are supporting JSNAs have easy access to the evidence they need to undertake any analysis to support the board’s decisions.

Public Health England (PHE) is to support local authorities to deliver locally appropriate interventions and services by providing data, interpretation and evidence to enable local public health teams to improve the public’s health. PHE is also developing clear processes for stakeholders to be able to discuss their knowledge and intelligence support needs. Since 2013, public health professionals in PHE and the wider public health system in local authorities have access through a single portal to a suite of indicators, analyses and evidence to support decision-making. Through this portal local authorities are able to access the knowledge and information products currently available from PHE including the Public Health Observatories, National Treatment Agency, Cancer Registries and others. It is intended that PHE is a partner to support public health within local authorities, increasing capacity to identify local issues and make the best decisions (including prioritising local resources), to reduce inequalities and help improve the health and well-being outcomes of the local community, including vulnerable groups.

A survey for IDeA by Ipsos MORI (October 2009)\(^\text{18}\) (now Local Government Improvement and Development) found that managers in the NHS were more aware of the health implications of local authorities’ work than local authority top managers were themselves. This seemed to indicate that managers within local authorities were not highlighting the impact of their work on the health of the local community as well as they could. The new structures should help to overcome this knowledge gap.

JSNAs have a part to play in sustainable development and the original intention was that they be used to inform the priorities and targets in the Sustainable Community Strategy (SCS) and feed into commissioning decisions which aim to improve health and well-being outcomes. JSNAs should focus on reducing health inequalities as the intention is to look at communities not single services.
Context, philosophy and principles of EH

For example, the housing needs of the local community need to be identified and included.

Sustainable Community Strategies, when these were required, were prepared as a set of goals and actions which they, in representing the residential, business, statutory and voluntary interests of an area, wish to promote. This SCS was intended to inform the local development framework and act as an umbrella for all other strategies devised for the area.

As a JSNA sets out the health and well-being needs of the local population it should identify the needs of groups whose needs are not being met whether by their own means or the statutory and voluntary agencies. This will enable these needs to be considered when setting priorities and commissioning services. For example, this will include the housing needs of people living in poor condition private sector housing, whether owner occupiers or renters on low incomes whose needs have often been overlooked. Environmental health practitioners will hold information on housing conditions and actions, and also on other environmental health matters such as poor air quality. Data should be included for existing needs and projected needs for up to 10 years ahead recognising the impact of changing demographics with an increase in older people and the effects of climate change.

JSNAs should be seen as providing a framework within which to examine all factors that impact on health and well-being of local communities, including employment (and issues on occupational health and safety), education, housing and other environmental factors. Evidence on local housing conditions and their effect on health also need to be included.

The JSNA should also involve a mapping exercise to map local services relating to health and well-being and how they are used. This will facilitate a gap analysis for service and identify barriers to people accessing them to be highlighted and considered in commissioning decisions.

Local people and agencies including advice agencies and those who work with them can also provide information to support the quantitative data in the JSNA and they should be consulted throughout the process on the findings. Consultees need to include service users, carers, voluntary organisations and service providers, which can include private sector providers, and in the housing context this would include landlords. The following questions are examples that could be used in the consultation. What health inequalities or inequality need to be addressed? What client groups have unmet needs? What services need to be changed?

IDEA carried out a survey to assess the progress with JSNAs and found that the JSNA process and the output varied considerably. Some two-tier authorities were found to suffer as a result of arguments about relative need in their areas (as the result of different perspectives) and this hampered their development. Again, the new public health structures could in theory help overcome some of these problems, but it remains a concern that the lower tier authorities (or at least their EHPs) are not adequately engaged.

The final output of the JSNA is a high level strategic assessment of qualitative and quantitative data on the major health and well-being needs of an area. It is good practice for the findings to be made available in an accessible format that can be readily understood by the community affected and should include a list of key priorities or recommendations.

Quantifying the burden of disease from mortality and morbidity

There are a number of ways of quantifying the burden of disease or metrics used in health economics and to reflect the health status of countries, populations and communities.

Disability-adjusted Life Year

The Disability-adjusted Life Year (DALY) was developed as an input into the World Bank’s ‘World Development Report 1993: Investing in Health’ and has subsequently been adopted by the WHO as a measure of the ‘burden of disease’. It is not without its critics, however.

It is very much employed in assessing the Global Burden of Disease. The Global Burden of Disease analysis for WHO is intended to provide a comprehensive and comparable assessment of mortality and loss of health due to diseases, injuries and risk factors for all regions of the world. The overall
burden of disease is assessed using the DALY which is a time-based measure that combines years of life lost due to premature mortality and years of life lost due to time lived in states of less than full health. One DALY can be thought of as one lost year of ‘healthy’ life. The sum of the DALYs across the population, or the burden of disease, can be thought of as a measurement of the gap between current health status and an ideal health situation where the entire population lives to an advanced age, free of disease and disability. So the DALY measures the gap between the actual health status of a population and some ‘ideal’ or reference status, using time as the measure.

The World Bank suggested that environmental health is concerned with preventing disease, death and disability by reducing exposure to adverse environmental conditions and promoting behavioural change. It focuses on the direct and indirect causes of diseases and injuries, and takes into account and uses resources both inside and outside the scope of the health care system to help improve health outcomes. It has also suggested that many environmental health interventions are very cost-effective. A review of available evidence of the effectiveness of measures outside the health sector in achieving health improvements found a range of estimated costs per DALY saved.

The WHO said that ‘egalitarian principles’ are explicit in the DALY metric, and the global burden of disease studies apply these to all regions of the world. This is because the studies use the same ‘ideal’ life expectancy for all population subgroups and exclude all non-health characteristics (such as race, socioeconomic status or occupation) apart from age and sex from consideration in calculating lost years of healthy life. They use the same ‘disability weight’ for everyone living a year in a specified health state. The disability weight is a weighting factor that reflects the severity of the disease on a scale from 0 (perfect health) to 1 (dead). The basic formula for YLD is the following (without applying social preferences):

\[ YLD = I \times DW \times L \]

where:
I = number of incident cases
DW = disability weight
L = average duration of the case until remission or death (years).

**Quality-adjusted Life Year**

The Quality-adjusted Life Year (QALY) approach has been used to measure the health outcomes associated with different health care interventions. It is a relatively crude measure to provide an indication of the benefits gained from a variety of medical procedures in terms of quality of life and survival
for the patient. It is obviously relevant in making decisions on the allocation of resources. The assessment of outcomes from treatment and other influences on health have two essential elements, the quantity (time) and quality of life. Life expectancy is a traditional measure with few problems of comparison – people are either alive or dead so this approach takes account of the quality of life.

The QALY is therefore a measure of the state of health of a person or group in which the benefits, in terms of length of life, are adjusted to reflect the quality of life. One QALY is equal to 1 year of life in perfect health.

QALYs are calculated by estimating the years of life remaining for a patient following a particular treatment or intervention and weighting each year with a quality of life score (on a zero to 1 scale). It is often measured in terms of the person’s ability to perform the activities of daily life, freedom from pain and mental disturbance.

**Disability-free Life Expectancy**

Disability-free Life Expectancy (DFLE) is the average number of years an individual is expected to live free of disability if current patterns of mortality and disability continue to apply. This indicator has been developed in a number of OECD countries since the 1970s.

It is the average number of years a person aged ‘X’ would live disability-free (no limiting long-term illness) if he or she experienced the particular area’s age-specific mortality and health rates for 2001 throughout their life. They are estimates and are calculated by combining age and sex specific mortality rates, with age and sex specific rates on general health and limiting long-term illness from Census data.

In England the Office for National Statistics (ONS) also uses ‘healthy life expectancy’ (HLE) which is defined as the average number of years a person aged ‘X’ would live in good/fairly good health if he or she experiences the particular area’s age-specific mortality and health rates for 2001 throughout their life.

Health expectancies add a quality of life dimension to estimates of life expectancy (LE) by dividing expected lifespan into time spent in different states of health. The ONS routinely publish two types of health expectancies. The first is healthy life expectancy (HLE), which estimates lifetime spent in ‘Very good’ or ‘Good’ health based on how individuals perceive their general health. DFLE is the second, which estimates lifetime free from a limiting persistent illness or disability. This is based upon a self-rated assessment of how health limits an individual’s ability to carry out day-to-day activities.

Both health expectancies are summary measures of population health and important indicators of the well-being of society. The importance of HLE as a summary measure of population health is reflected in its inclusion in the two high level outcomes for the Public Health Outcomes Framework (PHOF). The first outcome is increased HLE, taking account of the quality as well as the length of life. The second is to reduce differences in LE and HLE between communities, through greater improvements in more disadvantaged communities. The HLE figures reported in the Statistical Bulletin in 2015 were a snapshot of the health status of the population(s) in England during 2011 to 2013. The health status and mortality rates of a population change year on year due to exposure to different risks and treatments affecting health, and also through inward and outward migration. Therefore, the estimates reported should not be interpreted as the actual number of years a person will live in ‘Good’ health. HLE figures are a likely estimate should the health status and mortality rates remain stable over the life course.

To illustrate how these measures are used it was reported in 2015 that:

- Males spend a higher proportion (80 per cent) of their lives in ‘Good’ health compared with females (77 per cent)
- The number of years people live in ‘Good’ health tended to be lower in the northern parts of England compared to the south
- Females in the North East had a lower healthy life expectancy (HLE) than males in any other part of the country
- Males in Wokingham could expect to live 17.8 years longer in ‘Good’ health than males in Tower Hamlets (71.4 years compared with 53.6 years)
- Females in Rutland could expect to live 15.8 years longer in ‘Good’ health than females in
Barking and Dagenham (71.3 years compared with 55.5 years)
• Between areas just 15–25 miles apart there is around a 16-year gap in the number of years people live in ‘Good’ health within London
• HLE was higher than the state pension age of 65 in a quarter of areas for males and a third of areas for females
• The largest difference in HLE between the sexes was in Camden, where females could expect to live 6.7 years longer in ‘Good’ general health compared with males.

Healthy Life Expectancy

The WHO uses Healthy Life Expectancy (HALE) and it is the average number of years that a person can expect to live in ‘full health’ by taking into account years lived in less than full health due to disease and/or injury. It is an indicator of the average number of years that an individual is expected to live in a healthy state. It is a summary measure that combines both quantity of life and quality of life. It combines mortality and morbidity experience into a single summary measure of population health. It can be used to measure the burden of disease and injury in the population, risk factors and the performance of public health efforts.

The reason HALE is used is that substantial resources are devoted to reducing the incidence, duration and severity of major diseases that cause morbidity but not mortality and to reducing their impact on people’s lives. It is seen important to capture both fatal and non-fatal health outcomes in a summary measure of average levels of population health. HALE at birth adds up expectation of life for different health states, adjusted for severity distribution making it sensitive to changes over time or differences between countries in the severity distribution of health states.

So, for example in Canada, low socioeconomic status is associated with a loss in health-adjusted life expectancy. In 2001, Canadian women and men in the top one-third income group had a health-adjusted life expectancy at birth of 72.3 years and 70.5 years, respectively. Being in the bottom one-third income group was associated with a loss of health-adjusted life expectancy at birth of 3.2 years for women and 4.7 years for men.

Potential Years of Life Lost

Potential Years of Life Lost (PYLL) is a measure related to HALE and DALY. It attempts to quantify the potential years of life lost by looking at average age of death from conditions compared to average life expectancy. PYLL can be expressed absolutely or as a rate relative to the population at risk.

The calculation for PYLL involves adding up deaths due to a particular cause or multiple causes at each age and multiplying this with the number of remaining years to live up to a selected age limit. The limit of 70 years is frequently chosen (sometimes 65).

This measure is used because deaths occurring early in life are considered a more serious loss than later deaths, so in comparing the impact of diseases it may be preferable to consider not only total numbers of deaths, but also the age at which they occur. ‘Premature’ can be defined in terms of the average life expectancy for a person of that sex, or an arbitrary value (such as 75 years) can be used for everyone. Hence, a person who dies from a myocardial infarction at age 55 would have lost 20 years of potential life.

These values could be summed over a population to indicate the impact (in terms of potential years of life lost) due to a particular disease in the population.

Notes

18 Healthy Communities Direction of Travel Survey 2009 – Summary Report at: www.idea.gov.uk/idk/aio/15197035
19 www.idea.gov.uk/idk/aio/9616139
20 www.who.int/healthinfo/global_burden_disease/ metrics_daly/en/
24 See: http://web.worldbank.org/archive/website/01213/WEB/0_CO-76.HTM#Section3