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Review Paper

Making the case for a 'fifth wave' in public Health

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SUMMARY

This paper will argue that the UK has seen several phases of public health improvement since the Industrial Revolution, and that each of these can be linked to major shifts in thinking about the nature of society and health itself. The authors are not, however, attempting to delineate firm sequences of events (or imply causality) as this would require a level of analysis of the relationship between economy, society and culture which is beyond the scope of this paper. Rather, it is suggested that each phase of health improvement can be thought of in metaphorical terms as a 'wave'. The first wave is associated with great public works and other developments arising from social responses to the profound disruptions which followed the Industrial Revolution. The second wave saw the emergence of medicine as science. The third wave involved the redesign of our social institutions during the 20th Century and gave birth to the welfare state. The fourth wave has been dominated by efforts to combat disease risk factors and the emergence of systems thinking. Although a trough of public health activity continues from each wave, none exerts the same impact as when it first emerged. This paper will discuss the complex challenges of obesity, inequality and loss of wellbeing, together with the broader problems of exponential growth in population, money creation and energy usage. As exponential growth is unsustainable on a finite planet, inevitable change looms. Taken together, these analyses suggest that a fifth wave of public health development is now needed; one which will need to differ radically from its forerunners. The authors invite others to join them in envisioning its nature and in furthering the debate about future public health.

Introduction

In the first section of this discussion paper we suggest that the UK has seen several phases of public health improvement since the Industrial Revolution, each of which emerged from major shifts in thinking about the nature of society and health itself.[1] We are not attempting to delineate firm sequences of events or imply causality, as this would require a level of analysis of the relationship between economy, society and culture which is beyond the scope of this paper. Rather we suggest that each phase of improvement can be conceptualised, in metaphorical terms, as a 'wave'. In this metaphor, each wave rises rapidly out of its forerunner and maximum impact is experienced during this period. Inevitably, the wave reaches its peak, breaks and declines in intensity. A trough of activity from each wave continues and

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remains important to population health, but no wave exerts the same impact as when it first emerged. Again, it is not our purpose to argue for a precise number of waves or to locate these with pinpoint historical accuracy. The important point is that one can trace relationships between the waves and emerging ideas about society, health and well-being. The waves of health improvement can be understood as cumulative and interactive, if not entirely smooth. Overall health and social progress has been maintained by a new wave starting while an established wave is *still rising*.

In the second section of the paper we turn to the issue of current and emerging public health challenges, in light of the above analysis. We focus in particular on obesity, inequalities, and the loss of wellbeing and argue that these are not amenable to earlier or current strategies, despite our best efforts. The third section of the paper describes a pattern of exponential growth in a number of key systems, which points to the probability of inevitable and involuntary change for which we may be ill-prepared. Our conclusion is that a 'fifth wave' of development is now necessary, but this will need to differ radically from its forerunners in order to have any chance of tackling the roots of such problems. The final section of the paper begins, tentatively, to envision the nature of a 'fifth wave' and invites others to contribute to this debate.

The first wave

In the UK, the first wave of public health efforts to improve population health lay in the broader context of responses to social disruption caused by the industrial revolution. Overcrowding, lack of clean water or sanitation, poor nutrition and a dire built environment created the ideal milieu for many forms of infection. At the same time, recorded levels of alcohol consumption, crime and illegitimacy (to quote just three indices) were so high that they suggest real strains on psychological wellbeing and social ties.[2] The public health challenges of this period (roughly 1830–1900) were initially seen as moral problems associated with the perceived fecklessness of the poor[3] but this began to change following the work of early pioneers in the field of social medicine[4,5] and Chadwick's landmark report,[6] which demonstrated the relationship between unsanitary living conditions and patterns of illness and disease.

Great Public Works can be traced to this period: the creation of reservoirs for major cities in the UK brought clean water to the urban population and the building of sewers was equally important. The growth of municipal power and influence also brought improvements in housing, living and working conditions and reductions in diseases before their causes were even discovered. Co-operative societies,[7] modern police forces,[8] health visitors,[9] orphanages[10] and much else first emerged at this time.[11] The new public health infrastructure therefore grew up around new governance structures: the development of municipal authorities, embryonic emergency services, and an emergent voluntary and charity sector.[4] The first wave can thus be characterised as the early appliance of science (when miasmic theories of disease were beginning to be seriously questioned if not discredited) and the development of rational social order, liberalism and the extension of the franchise.

The second wave

A second wave of public health, roughly spanning 1890–1950, was partly precipitated by the discovery of poor health in Boer War recruits. The second wave can be characterised by the rise of scientific rationalism, an approach also found in manufacturing, medicine, engineering, transport, municipalism and the development of hospitals. This wave is thus based on the refinement of the appliance of science which had occurred in the intervening period. Scientific discovery suggested new approaches based, for example, on the shift from miasmic to germ based theories of disease. The ideas informing all these changes can reasonably be traced to the rationalist philosophies of the Enlightenment period. The concept of the 'expert', a specialist in a particular and narrow field, is integral to how ideas unfolded in this context and gave rise to paternalist approaches to health care. The genesis of modern emergency services is also to be found in this period. During this period health became associated with the perception of the body as a machine – ideas which are still with us today. If reformers were key figures in the first wave, scientists like Koch and Pasteur were integral to the second.

The third wave

A third UK public health wave proved necessary following the Second World War as the five 'giants'[e] identified by Beveridge[12] had not been vanquished either by material progress or previous public health developments. Intellectually, this wave was influenced by the materialist philosophies of Hegel, Marx and Engels, who argued that material changes drive history and that society's institutions and modes of operation are shaped by the structure of class relations.[13] Health was thus seen as the result of the conditions of everyday life. Such ideas can be seen in late 19th century developments and throughout the 20th century, in the UK and elsewhere. Examples include the idea of universal education,[14] the welfare reforms of the UK 1908 Liberal Government, the Wheatley Housing Act of 1923, the post-Second World War settlement of the Attlee government which established the National Health Service, the National Assistance Act, large-scale social housing and other welfare benefits. All of these had second wave roots. The key figures of the third wave were neither reformers nor scientists but politicians like Aneurin Bevan, the first UK Minister of Health.

The fourth wave

By the 1960s the results of the first three waves were clear: each had built upon its predecessor(s) and death rates continued to decline throughout most of the 20th century.[15,16] At the core of the first three waves lay the idea that improved housing, education and health care, distributed fairly by a just government, would help cure society's ills. However, in the last decades of the 20th century, organisations that delivered these public health measures faced increasingly complex challenges for which they were not designed and were not well suited. The UK became part of a rapid process of change that affected North America, Europe and parts of Asia. Many industrialised areas underwent a transition to become part of

[e] Want, Ignorance, Disease, Squalour and Idleness.

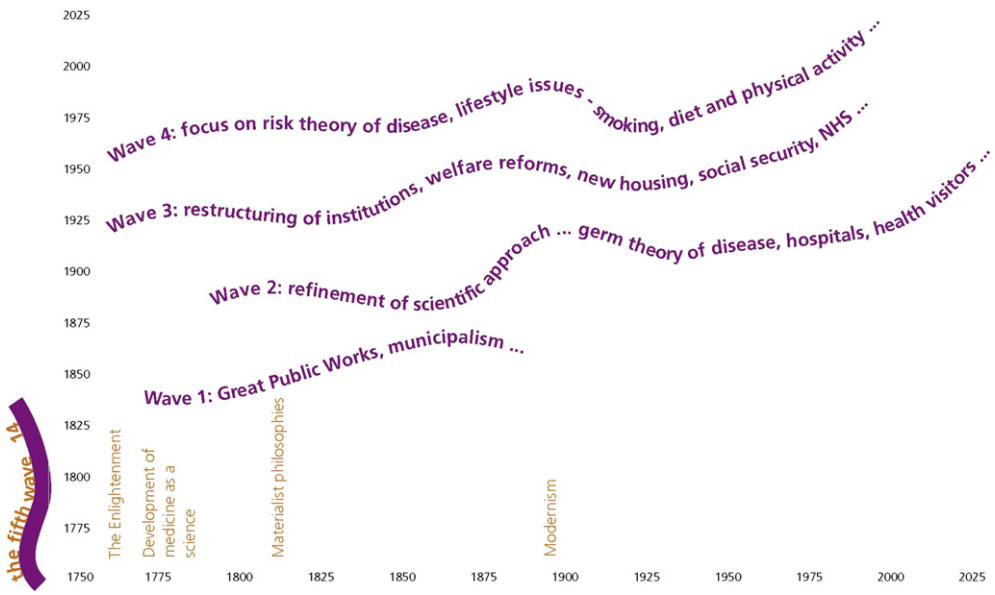

Fig. 1 – Conceptualising four waves of public health improvement. Reproduced from: Lyon A. *The Fifth Wave*. Edinburgh: Scottish Council Foundation; 2003.

the post-industrial society predicted by Bell.[17] Service industries replaced manufacturing and a new knowledge economy emerged. Consumer choice exploded, fertility rates fell, divorce soared and out-of-marriage child bearing increased.[14] Trust and confidence in institutions declined whilst mutual ties between people became weaker and less permanent.[18] Work and gender roles changed dramatically: greater control of fertility enabled women to seek activities beyond traditional child rearing and home making. The knowledge economy had less use for the physical strengths of men: in some communities a large cohort of younger men found themselves without a meaningful role at home or in work, and many lacked the education or social skills to remedy the situation. During this time, there were absolute increases in death rates in younger men from accidents, drugs and violence,[19] and suicide.[20]

Medical interventions may have been responsible for much of the decline in mortality in the last quarter of the 20th century but they provided few solutions to emergent social pathologies. In such a complex context the fourth wave became partly characterised by a concern for risky behaviours in relation to major disease patterns: issues such as diet, exercise, tobacco, alcohol and illegal drug consumption all loomed large in the conversation about what makes health.[21] Such risk concerns have also been extended to the area of mental health, where the emphasis is still mainly upon what makes individuals mentally ill and not on what supports mental wellbeing for the whole population. From about 1990 onwards, concerns about health also became influenced by systems thinking.[22] Policy interventions called for more integration between services and for them to relate their combined effects to health outcomes. The key figures of the fourth wave thus range from Sir Richard Doll, who first established the link between smoking and lung cancer, to Sir Michael Marmot, one of the key figures in the health inequalities research field. These and many others provided evidence for the public health response needed.[23]

Fig. 1 below represents the emergence of the waves across time, their uneven rather than flawlessly smooth progress, and their roots in some key developments in society, i.e. the Enlightenment; the science of medicine; the influence of materialist philosophies; and the emergence of 'modern' society.

Table 1 provides a brief summary of the four waves, with approximate dates for their 'peak' of effectiveness and impact.

Table 1 – Summarising four waves of public health.

The first wave	The second wave	The third wave	The fourth wave
Approximately 1830–1900: Classical public health interventions, such as water and sanitation etc; concerns with civil and social order.	Approximately 1890–1950: Scientific rationalism provides breakthroughs in many fields – manufacturing, medicine, engineering, transport, and communications etc.	Approximately 1940–1980: Emergence of the welfare state and the post-war consensus: the National Health Service, social security, social housing and universal education etc.	Approximately 1960–2000: Effective health care interventions help to prolong life. Risk factors and lifestyle become of central concern to public health. Emergence of nascent concerns with social inequalities in health.

Wave accumulation and interaction

As Fig. 2 below suggests, the effect of each wave is cumulative and interactive: much of what was developed through these four waves is still with us today. The developments of the first wave (for example, clean water and sewerage) remain vital to population health. The development of hospitals and associated professions which began in the second wave still continues and remains essential to the treatment of illness and important for actions to improve health. Increasingly, elements of the fourth wave (especially risk factors and the behaviour of individuals) have been integrated into these structures.

Why a fifth wave?

Each wave arises as a response to historically, geographically and culturally defined needs, drawing upon emerging ideas in science and society.[24] And each wave's power diminishes in the face of new challenges that need new responses. What new challenges do we face? Of many, three current problems suggest themselves as particularly pertinent: obesity, inequality and loss of wellbeing.

Obesity

In 2006, the number of obese and overweight people in the world overtook the numbers who are malnourished and underweight.[25] In industrialised countries like the UK and USA, obesity is a population-wide problem: the weight distribution of almost the entire population is shifting upwards.[26] It has been observed that humans are obesogenic organisms who for the first time in their history find themselves in an obesogenic environment.[27] This analysis suggests that we can either choose to treat an almost exponential rise in secondary clinical consequences of obesity and the underlying obesity in a soaring number of people, or we can choose to reverse the social and commercial changes of the past two hundred years which have conspired to make overweight/obesity more 'normal'. The first choice is theoretically achievable but would be enormously expensive and would not solve the fundamental problem. The second choice is the only plausible solution but its implementation seems improbable because it would require an entirely new mindset in modern society.

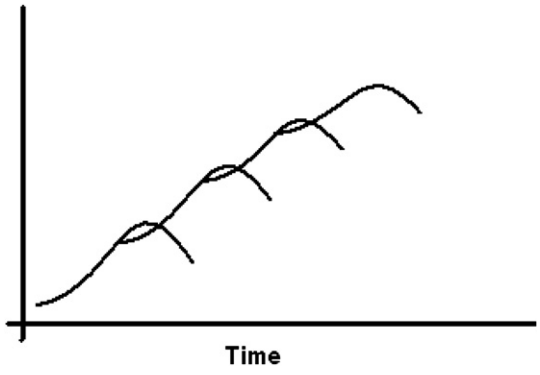

Fig. 2 – The four waves – cumulative and interactive.

Social inequalities in health

Social inequalities in health constitute another challenge for which we need a new approach.[28] Global economic activity has quintupled in the last 40 years[29] yet by 2004 the income of the richest 10% of the world's population was around the same as the income of the bottom 50%.[30] Historically, public health advocates have suggested that inequalities will be combated by levelling up the circumstances of the poor to those of the rich. What is now clear is that such a strategy, if it were to succeed globally, would require a level of resource consumption that is not available. The UK's high consumption lifestyles are only possible because the rest of the world supports it with large supplies of natural resources. According to the New Economics Foundation, forty years ago, if the whole world wanted to copy the UK, the Earth could just have supported the demand on its ecosystem.[31] Today, if everyone consumed as much as the average UK citizen, we would need more than three Earth-like planets to support them. In short, inequalities in health are profound and widening; despite all that they accomplish, current public health interventions are not solving the problem.[32,33] Even if they were to succeed in their own terms, they are ecologically unsustainable.

Loss of wellbeing

Moving to our third chosen disease in contemporary society, the rise in levels of depression and anxiety and the associated loss of mental and emotional wellbeing provide strong evidence of the degree to which modern populations are feeling overwhelmed. Depression and anxiety are becoming a far more significant cause of disability and chronic ill health than in previous centuries: it has been predicted by the World Health Organisation that depression will soon be one of the leading global causes of disability.[34] Some of this rise may be due to better detection and some to modern protocol-driven diagnostic techniques.[35] However, since the mid-1970s increased economic growth in the USA, Europe and Australasia has not been accompanied by improvements in well-being,[36–38] which may now be declining.[39]

There are various hypotheses linking this stasis or decline in well-being to the effects of economic growth and the underlying consumerist society.[40] Again, neither current nor historical approaches to public health offer ways to meet these needs. Antidepressants are being prescribed in unprecedented numbers but fail to address root causes. Improved material circumstances or welfare provision can help some dimensions of mental health but the rise of these problems in the face of widely increasing affluence suggests that we need different solutions.

Facing inevitable change

Will our societies change radically to combat obesity, inequality or loss of wellbeing? Whilst evidence to date suggests not, a series of influences make such change inevitable. Several parameters are currently growing exponentially: because it is impossible to maintain exponential growth in a finite system, change is inevitable. For example, human

population has risen from around a billion in about 1830 to approximately 6.5 billion currently, and projections suggest that there will be around 9 billion by 2050.[41] When combined with several other aspects of human related systems and their interaction with each other and the biosphere, population growth becomes a significant challenge.

Two further systems currently in a period of exponential increase are energy use and money. For energy (oil, gas, uranium etc), the problem comes when production peaks whilst the remaining resource is more difficult and thus more expensive to extract. This is becoming increasingly recognised as a threat and opportunity for public health.[25] The link between the exponential growth of money and health is less well recognised. Money is created by debt, and continuing growth of money is built into the current system.[42,43] In the years leading up to the 'credit crunch', we experienced an exponential growth in credit. As long as the supply of credit keeps growing, loans (with their attendant interest) can be paid off. But if there is a major default or the money supply stops growing then the whole system collapses. Preventing collapse is why governments have recapitalised banks and bought up bad debts. More subtly, we have seen a related increase in cultural values of individualism, materialism and consumerism: these are inextricably intertwined with unsustainable energy usage and economic growth in affluent societies, and thus underpin the emergence of anthropogenic climate change.[25,40]

In short, our current phase of development is fuelled by exponential rises which are not sustainable. The current pattern of growth will have to come to an end sooner or later.[44] The question is whether we can make a transition to a more stable state without undergoing a major collapse. The end of growth may take a variety of forms. It could occur as collapse or uncontrolled decline. Alternatively, it could occur as a smooth adaptation of the human footprint to the carrying capacity of the globe. It is not possible for the current growth in many systems to continue uninterrupted, without generating a crash that could make the pubic health impact associated with the collapse of Soviet communism look small by comparison.

In sum, public health faces a series of challenges that are not amenable to current strategies despite our best efforts, and for some of which we are ill-prepared. This suggests that a new approach is needed. Those working in other spheres are coming to similar conclusions: that the challenges we face converge, intertwine, and often remain largely beyond our understanding.[45] 'Tectonic stresses' in modern society include population stresses arising from differences in the population growth rates between rich and poor countries; energy stresses; environmental stresses; climate stresses; and economic stresses.[46] As a species we have released forces that are neither managed nor manageable, resulting in an 'ingenuity gap': the disparity between the need for ideas to solve complex problems, and their actual supply. This analysis suggests that the newest wave is unlikely to emerge from accumulated traditions of previous waves because, although those still have their place, they are inadequate in the face of current and emerging challenges.

A legacy of the biomechanical approach to health is the idea that a cure can be found for every disease, given time and resources The difficulty is that, in our rapidly changing and complex world, we now see diminishing returns from formerly successful approaches. Another key characteristic of the four earlier waves of public health intervention is the relative unimportance of the individual and the human spirit. In the modern world we have created, we appear to behave as if organisations do the work, regardless of human capacities, consciousness, energy, passion and effort. The existing change model might be summarised as: get the organisations and programmes right and change will happen. Much public happiness may be diminished for a lack of care, attention and understanding, as increasingly ineffective bureaucratic arrangements enter a round of tighter and tighter regulation/re-organisation in futile attempts to effectively manage an increasingly complex world. A sense of unease and dissatisfaction is pervasive. Calls for an ecological public health[47] also illustrate pervasive ecological concerns. Although this 'new' public health could successfully fuse traditional approaches with the sustainability agenda, it is unlikely to be a sufficient response.

One of the founders of the Positive Psychology movement argues that, in order both to survive as a species and grow in complexity, humanity must adopt a new image of what it means to be human.[48] This will involve rediscovering a reward system beyond the material as the comfortable environments that we have created, believing that this will improve our lives, now undermine the essence of what makes life worth living. Recent re-conceptualisations of what it means to be human express awareness that greed and sex are not the only human characteristics necessary for survival: we need, and can demonstrate, cooperation, altruism, and even spiritual empathy with the universe at large.[49] Such arguments suggest that the challenges we experience and need to confront in public health resonate elsewhere. Although the broad argument is based on the case of the UK, its principles may well be relevant to other parts of the world, even if timing and detail differ.

The form of the fifth wave

The question is what will or should be the defining qualities of the fifth wave? We try to capture some of these below, suggesting a possible direction of travel rather than a set of dichotomous options:

Emergent qualities of a fifth wave

1. Recognise that the public health community is dealing not with simple systems that can be predicted and controlled, but complex adaptive systems with multiple points of equilibrium that are unpredictably sensitive to small changes within the system.
2. Rebalance our mindset: from 'anti' (antibiotics, war on drugs, combating inequalities) to 'pro' (wellbeing, balance, integration), and from dominion and independence (through specialist knowledge and expertise) to greater interdependence and cooperation (the capacity to learn from and with others).

3. Rebalance our models: from a mechanistic understanding of the world and of ourselves as mechanics who diagnose and fix what is wrong with individual human bodies or communities, to organic metaphors where we understand ourselves as gardeners, enabling the growth of what nourishes human life and spirit, and supporting life's own capacity for healing and health creation.
4. Rebalance our orientation: integrate the objective (measurement of biological and social processes) with the subjective (lived experience, inner transformation) and inter-subjective (shared symbols, meanings, values, beliefs and aspirations).
5. Develop a future consciousness to inform the present, enabling innovation to feed the future rather than prop up the current unsustainable situation.[50] Develop different forms of growth beyond the economic to promote high levels of human welfare.
6. Iterate and scale up through learning – a design process where we try things out, learn and share this learning. The major challenge of 'scaling up', which requires us to develop promising new approaches, should be taken as a natural process of growth, driven by a desire to adapt and learn, rather than a mechanistic process that managers in large bureaucracies have responsibility for rolling out.

It is important to stress that this approach to the fifth wave is not in conflict with earlier waves. Rather, it seeks to include and transcend them. We have merely begun – tentatively – the task of envisioning the kinds of qualities and enabling conditions that a new wave will require and hope others will be stimulated to join this debate about the future public health.

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