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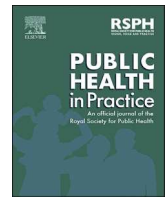
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Opening Editorial

Public health in practice in a time of change



Heraclitus, the Greek philosopher, once said that the only constant in life is change.

The past century has seen many momentous events and change: epidemics of influenza, HIV/AIDS and Ebola; World Wars and global conflict; mass industrialisation and globalisation; development of the social welfare state, health insurance and national health systems; the emergence of transnational industries; and the Age of the Internet. Numerous ground-breaking advances in medicine have had a significant impact on public health - advances in medical therapeutics mean many more medical conditions are treatable today compared to a century ago. The development of contraception alongside the emancipation of women have improved the life chances and health of women globally. And we are living longer and have healthier lives compared to our forebears.

The discovery of antibiotics has meant many once fatal infectious diseases are now curable. In the early years this fed an optimistic belief that the scourge of infectious diseases could be eliminated. However, the rise of antibiotic resistance in recent years has led to fears of the end of the antibiotic era [1,2]. Our microbial enemies have evolved and continue to pose an increasing threat. Similarly, there were early hopes that the development of vaccines could lead to the eradication of vaccine-preventable diseases. Thus far only smallpox has been eliminated whilst the eradication of other diseases has proven extremely challenging. Many developed countries, with well-established childhood vaccination programmes, have seen in recent decades a rise in anti-vaccination sentiment [3], driven in part by the emergence of social media - a new technology that did not exist a century before.

Technological advances have also created new threats - industrial pollutants, vehicular emissions, pesticides, microplastics, vaping, fracking to name a few. Many of these new threats have local as well as global effects. We have seen the impact of chlorofluorocarbons on the ozone layer and anthropogenic global warming caused by our carbon-based economies worldwide. Widespread global degradation of the environment and natural resources, coupled with exponential global population growth, has sparked concerns that we are living beyond what the planet can sustain. There is now growing cognizance of the idea of “planetary health” that encapsulates the intricate and complex links between the fate of the planet and humankind as we know it [4].

However, as the French novelist Jean-Baptiste Karr has been oft quoted, *plus ça change, plus c'est la même chose* - the more things change, the more they stay the same.

Climate change is a pressing concern now and is likely to remain a major environmental and public health anxiety for the foreseeable future. With the urbanisation of the global population, urban health issues will rise in prominence. Many of the public health threats of old persist, such as tuberculosis, malaria, dengue fever, measles and influenza. Chronic

diseases such as diabetes, cardiovascular diseases, emphysema and multimorbidity will continue to account for much population ill health especially when one considers the global obesity epidemic and aging populations worldwide. And nowhere is immune to natural disasters and their consequences.

There has also been greater awareness of the power of the wider determinants of health, from social conditions, cultural norms, macro-economic conditions, to government policy. ‘Twas ever thus - this was true of 1st Century Rome, 19th Century Britain, or indeed any country in the future. The distribution of wealth both within and between countries has considerable effects on public health outcomes [5]. The influence of other dominant actors such as the pharmaceutical industry, food and alcohol industry, transnational tobacco companies, also exert significant influence on population health. The industrial scale of the sale and use of tobacco products, for example, has led to the global epidemic of tobacco-related ill health and deaths in the past century [6]. Public health policy has always been and continues to be susceptible to the vested interests of powerful actors.

What then is the role of public health practitioners, academics and policymakers against this backdrop of global challenges? Public health is a scientific discipline rooted in evidence that seeks to promote and protect the health of populations. Technological advances provide new opportunities to do this. Developments in artificial intelligence allow “precision” public health where populations can be segmented and risk stratified, and tailored interventions can be targeted at these subgroups. Advances in genomics and genetic epidemiology have improved our understanding of these key biological determinants of health and disease, and research into gene editing and genetic manipulation offer potentially new interventions. Vaccine science has improved to such an extent that new vaccines can be developed in a fairly short time period, offering more timely response to disease outbreaks.

However, technological advances are not immune from bioethical concerns. The development of prenatal testing, for example, sparked concerns around the ethics of this technology with opponents seeing it as a form of eugenics [7]. High healthcare costs and resource constraints mean the age old debate between utilitarian and deontological viewpoints persist - do we intervene to maximise health benefit for the greatest number, or is our priority maximising health for those individuals with the greatest need? Health resource allocation dilemmas will persist as we continue to seek the optimal health system that is efficacious, equitable, efficient and affordable [8] - an illusory public health Nirvana that may not exist.

Public health practice is also an art [9] - on how to influence policy, develop strategy, implement interventions, and effect population behaviour change. Public health is often a political issue due to the scale

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of national resources and change required. Practitioners have to keep refining public health messages and honing their interventions to fit with population (and political) needs, expectations and demands. Neither is the application of public health evidence straightforward as context is all-important and the evidence has to be tailored to local settings.

In recognition of how contexts and public health practice continues to evolve, this new journal sets out address the need for more public health evidence in practice. Public health happens in the real world, beyond the ivory towers of academia. There is a role for 'high' evidence but we must not ignore the value and power of evidence that emerges out of public health practice, i.e. what happens in reality *in vivo*. There can be no rationale justification for ignoring insights from practice. We hope this journal addresses this need, and that you our readers will enjoy its contents. More importantly, we hope the insights published will help inform and shape public health practice, and lead to real impacts that benefit the public's health.

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