The future of public health research

Summary report of a workshop held 20-21 July 2017

The **Academy** *of* Medical Sciences

NHS
National Institute for Health Research

FACULTY OF PUBLIC HEALTH

The Academy of Medical Sciences

The Academy of Medical Sciences is the independent body in the UK representing the diversity of medical science. Our mission is to promote medical science and its translation into benefits for society. The Academy's elected Fellows are the United Kingdom's leading medical scientists from hospitals, academia, industry and the public service. We work with them to promote excellence, influence policy to improve health and wealth, nurture the next generation of medical researchers, link academia, industry and the NHS, seize international opportunities and encourage dialogue about the medical sciences.

Opinions expressed in this report do not necessarily represent the views of all participants at the event, the Academy of Medical Sciences or its Fellows, the NIHR, or the Faculty of Public Health.

All web references were accessed in August 2017.

The future of public health research

Report of a two-day workshop in July 2017

Contents

Executive summary

The public health research community must develop bold, ambitious goals for the health of the public. This is the best way to bring together experts from all the sectors and disciplines needed to produce evidence on how we can address the biggest health challenges of the future.

Participants at a two-day workshop in July 2017 agreed that whilst there have been major advances from UK public health research it is widely perceived, including by those in the field, as operating below its potential to effect change. Public health research is also less integrated with public health practice than it could be. The approach taken by the Millennium Development Goals in setting clear, ambitious challenges with political buy-in and measurable outcomes had been largely successful and this approach should potentially be emulated for public health in the UK, to help foster transdisciplinary research and policy coherence across different government departments. To start the process, delegates identified six major tractable policy challenges where public health research could contribute substantially:

- Improving public mental health.
- Maintaining a productive workforce and a sustainable economy.
- Reducing the burden of multimorbidities across the population.
- Tackling and reducing health inequalities.
- Addressing the obesity crisis.
- Improving quality of life and health life expectancy

These challenges are not exhaustive: throughout the workshop, attendees articulated a wide range of additional challenges, such as those associated with climate change and social cohesion as well as emergent infectious disease threats. Nor are they discrete, as they all have shared determinants and influence each other in a variety of ways. There are also thematic similarities between these challenges.

To meet these challenges, changes in how researchers interact with policymakers, the commercial sector, the public and each other are required, meaning a shared language must be developed. Public health researchers must work more closely with policy makers and practitioners at both the national and local level to set a research agenda that identifies key challenges and tractable, practical, questions for the research community. Research approaches that take account of the whole system in which these challenges occur are also needed. The challenges require new forms of evidence, generated with new methodologies, to underpin packages of interventions that decision-makers can act upon. They require a newly trained cohort of public health researchers and practitioners with the appropriate skills – qualitative, quantitative and involving a wider range of relevant disciplines – to generate evidence and translate it into societal benefit.

This report provides a summary of the health challenges discussed by participants, as well as the associated research gaps and overarching themes. As a next step, senior members of the public health community will consider this longlist of challenges and mechanisms for developing closer joint working.

Background

On 20-21 July 2017, the Academy of Medical Sciences, National Institute of Health Research (NIHR) and Faculty of Public Health (FPH) held a two-day workshop in London, convening senior leaders from a wide range of disciplines and sectors relevant to health of the public.

The meeting aimed to identify future health challenges that can be tackled through public health measures, as well as the associated research needs and the stakeholders who can address these needs. It built on initial findings from NIHR's 'Health Futures' 20 year forward view and the Academy's report on 'Improving the Health of the Public by 2040'. The latter outlines a comprehensive vision for population health and articulates future research objectives.[1] A list of attendees and an agenda can be seen at Annexes I and II, respectively. In groups, delegates produced a longlist of the most tractable future health challenges (which can be addressed through public health interventions), and identified several themes that run across them. Before this, four keynote presentations contextualised the discussions.

Keynote presentations

To ensure that participants' discussions built upon rather than replicated existing work, four keynote speakers gave an overview of ongoing efforts to improve public health research.

Professor Dame Anne Johnson DBE FMedSci FFPH
As Chair of the Academy's 'Health of the public in 2040' working group

Professor Johnson summarised the outcomes of the Academy's report on 'Improving the health of the public by 2040', updating delegates on the implementation of its recommendations. She informed them of plans to establish the recommended UK Strategic Coordinating Body for Health of the Public Research (SCHOPR) as a sub-group of the Office for Strategic Coordination of Health Research (OSCHR). This follows an implementation workshop held in January 2017, where those in attendance articulated the benefit of setting up SCHOPR within a reputable, existing structure with strong links to government departments.[2] She also informed participants that Public Health England (PHE) is committed to supporting the Regional Hubs of Engagement between practitioners and researchers, as recommended in the Academy's report to integrate health of the public research and health and social care delivery.

Professor Johnson outlined several developments following the report's recommendations on capacity building. These include a new grant scheme called 'Springboard - Health of the Public 2040', which the Academy has launched to help further the careers of newly independent researchers working in the health social sciences and medical humanities.[3] The Academy and Health Foundation are also establishing a taskforce to explore a fellowship scheme to build transdisciplinary capacity. Following the report's publication, the Medical Schools Council (MSC), Health Education England (HEE) and the General Medical Council (GMC) hosted a workshop on 'starting the transformation in educating the health professionals of the future', and the MSC and GMC have since agreed to explore setting up a workgroup to expand on

this. Finally, Professor Johnson noted that the FPH Education Committee, working with the Royal College of Physicians, will consider what should be included in a 'credential' in health of the public research – another recommendation made in the Academy's report.

Professor Chris Whitty CB FMedSci FFPH
As Head of NIHR/ Chief Scientific Adviser Department of Health

Professor Whitty emphasised the profound positive societal impact of public health research to date, which includes a significant drop in deaths attributed to diseases of the circulatory system in the last 15 years, the introduction of cervical cancer screening, HPV vaccination, and the falling numbers of smokers across all age groups. UK public health research has been some of the most influential in medical history. That said, we still face many complex population health challenges, such as those associated with rising obesity, rural-urban migration, multimorbidities and population growth. Professor Whitty noted a widespread perception that despite advances, current UK public health research is potentially underperforming relative to need. This has led to many (including those in the field) viewing public health research as relatively unambitious, often divorced from public health practice and not incorporating all of the necessary academic disciplines. He also noted the need for strong evidence for the implementation of state-level interventions, particularly in more controversial areas. It was felt that the higher up the level of the public health intervention, the stronger the evidence base has to be to carry the necessary public and political support.

Professor Whitty offered a brief outline of some of the themes emerging from NIHR's 'Health Futures' 20 year forward view: ageing, dementia, frailty and multimorbidity; the changing patterns of cancer, cardiovascular, diabetes prevalence; the changing geography of disease; threats to the NHS and social care system; environmental issues; and links between the economy, the commercial sector and health. He stressed, however, that the greatest insights will be found in the individual responses to the consultation, and urged all participants to read through them.

Following Professor Whitty's presentation, delegates agreed that developing bold, specific goals for public health in the UK – in line with the approach taken for the Millennium Development Goals – would be the best way to help people from all of the necessary disciplines and sectors to come together to address the biggest health challenges the UK will face. It will also enable discussion on the need for policy coherence across different government departments.

Professor Susan Michie FMedSci
As Chair of the Campaign for Science's project on 'The health of people'

Professor Michie gave a quick overview of the findings and recommendations of the Campaign for Social Science's report on 'The health of people', which explores how the social sciences can improve the health of the public.[4] She noted that much of the contribution that the social sciences can make to this endeavour remains untapped. The report aimed to demonstrate this contribution, and to help change environments, policies, practices and behaviours to prevent ill health, allow patients to manage conditions, and stimulate the delivery of high-quality care.

Professor Michie articulated the report's key messages: to challenge flawed assumptions about how people behave; to understand the systems within which change occurs; to provide methods for a more comprehensive approach that accounts for the interactions between people's environments and their motivations and capabilities; to evaluate interventions; and to foster the right social science expertise. The report's recommendations include setting up a body for strategically coordinating research, reviewing existing infrastructure for health research, establishing implementation laboratories, developing effective systems for data provision, and building capacity in social sciences for health.

Professor Carol Brayne FMedSci FFPH
As Chair of the Faculty of Public Health's Academic & Research Committee

Professor Brayne pointed out that FPH, which is the UK's standard-setting body for public health specialists, has substantial interest and engagement in global public health. She too suggested that public health research is often divorced from practice, politics and the public, and that implementing public health policy requires three crucial elements to be in place: evidence, public support and political support. She also noted that FPH is in full support of research to generate the evidence needed for the interventions most likely to have the largest health impact (which occur at the population level). However, in light of FPH's limited capacity, this support should be focused to provide the best possible contribution to national and international efforts in public health research, bearing in mind FPH's current priorities. These priorities are first, the impact of UK's withdrawal from the European Union, focusing on trade, consumer protection and ensuring that health is considered in all policies. The second priority is public health funding, with a focus on standards, equity, return on investment and workforce.

References

[1] Academy of Medical Sciences (2016). *Improving the health of the public by 2040*. https://acmedsci.ac.uk/file-download/41399-5807581429f81.pdf

[2] Academy of Medical Sciences (2017). *Improving the health of the public by 2040: next steps.* https://acmedsci.ac.uk/file-download/56798340

[3] https://acmedsci.ac.uk/grants-and-schemes/grant-schemes/springboard-health-of-the-public

[4] The Campaign for Social Sciences (2017). *The health of people: how the social sciences can improve population health. https://campaignforsocialscience.org.uk/wp-content/themes/cfss/assets/images/the_health_of_people.pdf*

Six future health challenges

Delegates identified six major health challenges that can be tackled through public health measures. These are outlined below, along with the associated research gaps and high-level goals that could be used to attract the various people necessary to address these challenges.

The list is not exhaustive, and several other challenges were discussed, such as the changing nature of communities, antimicrobial resistance, economic uncertainty, climate change and natural disasters. Participants pointed out that the future health challenges articulated below should be considered in conjunction with the extensive list found in the Academy's report on 'Improving the health of the public by 2040'.[5] One group suggested criteria for the prioritisation of future health challenges: they must be ambitious, tractable, significantly improve population health, have substantial impact on health inequalities, and address one or more neglected areas. Another group noted that it is important to determine if the targets should focus on areas with the greatest possible gain or those with the worst health outcomes. Some participants argued that the goals should always be supported by numerical targets.

Public mental health

Delegates highlighted the importance of mental health across the lifecourse, but suggested a focus on childhood, adolescence and early adulthood. Although trends in health-related behaviours have been positive in these groups, mental health is worsening and there are significant opportunities for better intervention in schools and higher education institutions. Some participants suggested that if the focus of interventions is on mental health in adolescence (which is considered a neglected area), it will need to be structured around building resilience to uncertainty. That said, one group argued the importance of addressing the health and social needs of older people, which also requires a focus on mental health. Loneliness, for instance, is a major issue that needs tackling.

To address the challenges of public mental health, delegates called for a reduced reliance on individual counselling alone and towards more population-level preventive interventions. In addition, all interventions to improve other health conditions should simultaneously evaluate the intervention's impact on mental health. Attendees also noted that public mental health is intricately linked with the challenges associated with quality of life, obesity, multimorbidity and widening inequalities (see sections below).

When considering public health targets in mental health, careful definitions and good comparative population data over time is needed, due to the complex nature of mental health diagnosis and treatment.

Research gaps

Research into the following was proposed:

- Identifying **the relative contributions of social, cyber, cultural, educational, economic and technological drivers** (such as social media, parenting, perceptions of violence, worsening housing and changing patterns of employment) on mental health, to aid development of effective interventions.
- Better understanding the impact of **loneliness** on mental health.
- Understanding the impact of **increasing population density** on mental health.
- Better understanding the **epidemiology** of public mental health.
- Understanding the contributions that **new technologies** can make to improving public mental health, including the use of digital technologies to monitor health, and the associated ethical implications.
- Identifying how to **develop built environments and infrastructure** that support mental health.
- Identifying the **role of public health and population-level measures** in improving mental health.
- Understanding the differences in the effective treatment of **acute mental distress compared with chronic mental illness**.
- Understanding how to most **effectively intervene in schools and other early environments**, such as higher education and early employment.
- Developing effective **methodologies to conceptualise and measure** mental health and its associated disorders.
- Developing a meaningful **protocol for routine measurement** of mental health in different settings, such as in schools.
- Developing an **appropriate threshold** for 'normal' levels of anxiety and depression, recognising that people cannot be happy all the time.
- Creating a framework for measuring **intervention-outcome relationships** for public mental health.
- Quantifying the **cost-burden** to the NHS of the medicalisation of mental health conditions.

Possible goals

- Reduce by X% the proportion of young people experiencing mental health problems each year.
- Reduce by X% the number of older people experiencing mental health problems each year.

Productive workforce and sustainable economy

A healthy workforce is essential for the economy, and being healthy during working ages is essential to allow individuals and their families to reach their full potential. Attendees suggested productivity, and the health of people of working age, should be framed as a public health challenge. They argued that this could be a powerful way of rebranding public health, given the current focus on economic growth. Again, delegates highlighted that these health

challenges are all interrelated, with obesity and poor mental health, for instance, being issues that both affect productivity.

Participants noted that the public health community often no longer intervenes in the workplace, as it is assumed that this is covered by the occupational health community. However, occupational health does not tackle the systemic, upstream determinants of health. One group posited that it would be possible to influence workplaces to promote health by engaging with businesses, management consultants (who themselves aim to make other organisations more productive), and workforce organisations such as professional bodies and unions. That said, others noted that while large companies may see value in actively improving the health of their workforce, for small- and medium-size companies it may be seen as an inconvenience. Participants suggested that local government has a role to play in implementing robust public health measures in the workplace. In general, getting the right people working together to solve these challenges – from academia to government to the commercial sector – will require structural change. It will require methodical ways of involving multi-professional academics in research, and fostering a commercial culture that sees work in a different way.

Research gaps

Research into the following was proposed:
- Understanding the **links between health, quality of life, economic growth and sustainability**.
- Understanding the **commercial determinants of health**, for instance including the health impacts of a 'gig economy', of automation, and of longer working lives.
- Establishing the **impact of retirement age on public health**, including how to balance health and economic considerations.
- Identifying the **links between lifestyles, health and productivity**.
- Understanding the **health impacts of new technologies** in the workplace.
- Identifying ways for workplaces to promote good health, and developing methodologies to understand and intervene in **the relationship between work and health**.
- Understanding how to introduce **health and wellbeing into economic thinking**.

Possible goals
- Reduce sickness absence by X%. (This could also focus on quality-of-life in the workplace.)
- Enhance quality of life in the workplace by X.
- Reduce late morbidity in work by X%.

Multimorbidities

Participants agreed that the current approach to addressing multimorbidities – the presence of two or more long-term medical conditions – is too focused on individualised approaches and polypharmacy. One group stressed that, at present, there is very little primary research data on multimorbidities, particularly at a population level. Furthermore, existing data does not capture multimorbidity in a way that allows local authorities to implement interventions, for example in older populations. Participants argued that the clustering of certain types of disease is not random: it may result, for instance, from clustering of health-related

behaviours. Indeed, some argued that certain combinations of multimorbidities could be treated as syndromes rather than separate diseases, because of their interrelatednes. Many non-communicable diseases are interlinked, as they have the same risk factors and similar pathologies.

Delegates noted that to tackle multimorbidities, research from different domains needs to be integrated together. This should include research from health services (including primary care, secondary and tertiary sectors, local authorities, the voluntary sector, and private providers) as well as a wide range of academic disciplines. According to some, the goal of any programme of interventions to address multimorbidities should focus not just on personal and functional outcomes, but societal outcomes as well.

Research gaps

Research into the following was proposed:
- **Mapping the burden and distribution** of multimorbidities across the UK, with the aim of identifying clusters and their causes.
- Identifying the **risk factors for multimorbidity**, and how they can be effectively monitored.
- Identifying which multimorbidities are most **amenable to intervention**.
- **Quantifying the impact** of specific clusters of multimorbidity on people's lives.
- Improving the evidence base for combination prescriptions and other medical interventions to the oldest 5% of the population.

Possible goals

Possible goals
Attendees identified the following goals:
- Identify the causes of multimorbidities and delay by a decade the period people have more than two concurrent diseases.
- Narrow the gap between the bottom 40% and the rest of the population by X.

Health inequalities

Health inequalities were discussed extensively throughout the workshop as drivers of ill health and outcomes in their own right. Some participants stressed that health inequalities cannot be addressed without tackling socioeconomic inequality, and that articulating a bold goal about inequality is critical as no progress has yet been made: inequality in health is the same as it was 150 years ago. Attendees argued that a bold goal will help health inequalities become properly incorporated in policy development. Although often discussed in the political sphere, attendees felt that health inequalities are not being meaningfully addressed. Such a goal will need to be constructed very carefully, with input from the social sciences, to make the issue approachable and tractable. Whilst an ambitious long-term goal is critical for this area, delegates felt that the public health research community should also seek to generate evidence about health inequalities from existing data in the short-term.

Delegates felt that there is a need for strong patient and public research involvement and co-production to address health inequalities, particularly with those groups most vulnerable to poor health outcomes. However, taking steps to reduce health inequalities will also require a shift in evidence culture in local authorities. With the support of local authorities, more research could be conducted at the mezzo level (between the state and the individual), to make effective use of the rich local datasets. This is where public opinion lies, which offers a powerful means of bringing about legislative change. Generally, structural changes are required at all levels to enable identification of research opportunities at the mezzo level.

As with other future health challenges, participants stressed that there is no single solution to the problem: it must be tackled with a variety of intervention combinations, underpinned by a coherent conceptual frameworks and robust methodologies. One group argued that focusing on relative vulnerability across the population would be a suitable way of addressing health inequalities as well as a range of other health challenges.

Research gaps

Research into the following was proposed:
- Understanding how to **design places and enhance communities** to reduce health inequalities.
- Understanding **the role of the public health community in addressing health inequalities**, and the extent to which health inequalities are a political issue as opposed to a public health issue.
- **Evaluating initiatives** to address health inequalities already in place at regional and nation levels.
- Measuring inequalities in **quality of life and healthy life expectancy**.
- Understanding what can be learned from the **global literature and evidence on health inequalities in regenerating economies**.
- Understanding the **effect on health inequalities of the required health impact assessment** in Wales (and of other changes across the UK).
- Identifying the **impact of loneliness** on inequalities.

Possible goals

Attendees identified the following goals and targets:
- In 20 years, halve the current differential between the local authority with the highest and lowest average life expectancy.
- Reduce socioeconomic inequality by X. (Such a goal would have numerical sub-targets around specific forms of inequality, from housing to education to employment).
- Create a smoke-free generation: ensure no child born today is exposed to tobacco smoke in their first 20 years. (This goal would need to focus on a wide range of determinants and would reduce health inequalities.)

Obesity

Delegates broadly agreed that a comprehensive strategy, underpinned by a whole-systems

approach, is needed to understand and tackle the obesity crisis. Reversing the decline in physical activity will require interventions in transport, environmental planning and the structure of work. Making calorie-dense foods less available will require changes to obesogenic environments, whether social, physical or regulatory. These changes are needed across local, regional, national and international levels. That being said, one group felt that obesity can be described as a subset of the challenges of multimorbidities.

Fundamentally, tackling obesity comes down to reducing calorie intake and increasing physical activity. To do this, a wide range of approaches will be needed to generate the necessary evidence, including desk research, modelling, case studies and cluster trials. However, the pathway to wide-scale implementation of interventions will not just require evidence; it will require 'demonstrator sites', such as the Healthy New Towns programme.[6] It was suggested that collaboration with the food industry offered significant opportunity to further efforts to reduce calorie intake and improve diets.

It was highlighted that tackling obesity would likely to have a variety of wider, positive, implications. Participants pointed out links between obesity and other health challenges, such as excessive consumption of alcohol. In addition, increasing physical activity could result in lower consumption of fossil fuels, in turn resulting in less pollution, global warming and the associated health conditions. Similarly, changes in diets could affect agriculture, meaning food and physical activity both feed into the climate change debate. Focusing efforts on groups within the population with higher rates of obesity may also help tackle related issues surrounding health inequalities. Although tackling the obesity crisis is an ambitious challenge, some participants noted that metrics to establish progress are easily achievable as obesity levels are simple to track.

As a first step, participants suggested that a package of interventions should be developed as case studies or cluster trials, with built-in evaluation. These trials could encourage communities to take risks and try new measures, which will then be robustly evaluated. Delegates argued that the public is generally accepting of interventions that aim to improve children's health, and that focusing interventions on childhood and education could therefore mitigate any risk of being seen as paternalistic.

Research gaps

Research into the following was proposed:
- Better understanding the **impact of the commercial sector** on obesity, with the aim of engaging the industry in reducing reliance on products with high energy density.
- Better understanding **consumption behaviour**.
- Taking a **systems approach** to understanding obesity, including its physiological, psychological, social and environmental causes.
- Understanding the **impact of large-scale structural change** in the political or socioeconomic landscape on obesity. It may be, for example, that processed food becomes the most affordable food once the UK leaves the European Union.
- Understanding the relationship between **rehousing and obesity** (a natural experiment).
- Understanding wider trends by **comparing physical activity levels between countries**.
- Developing **the most effective interventions** to reduce food intake and increase physical activity, and developing a comprehensive strategy for population impact.
- Understanding **barriers to strategic implementation** and policy change to tackle obesity.
- Identifying **cheap and impactful interventions** (such as 'the daily mile'). These should be routinely evaluated.
- Modelling how to **combine interventions at multiple levels** (e.g. implementing sugar tax, aligning interests with the food industry, and applying small nudges to improve rates of physical activity).

- Identifying how to **build environments and infrastructure** that facilitate and encourage physical activity.

Possible goals

Attendees identified the following goals:
- By X, reduce the sedentary population to 0, while increasing physical activity by Y%.
- Reduce the average current car usage by X%.
- In 20 years' time, see childhood obesity levels return to what they were 20 years ago.
- Reduce obesity across all groups by 50% in 15 years.
- Increase healthy BMI from 60-80%.
- Quadruple national levels of physical activity by X.
- Achieve physical activity levels comparable to world's most active

Quality of life and healthy life expectancy

As they are interrelated, attendees combined the challenges of quality of life and healthy life expectancy into one. Life expectancy is increasing in the UK, but with longer periods of poor health. Delegates therefore stressed the importance of compressing morbidity so that people spend more years in good health, and noted that this is especially important in view of decreasing quality of life in younger and older people.

Chronic issues that affect quality of life, such as back pain and depression, also have significant economic impact as they affect people's ability to work. Some delegates argued that this further supports the need to make a strong economic case on the need for intervention. Others highlighted that quality of life is closely linked to inequalities. The differential gap between socioeconomic groups should therefore be a focus for this challenge area, so that those in more disadvantaged groups begin to meet the better health life expectancies of those who are more advantaged

At present, the quality-adjusted life-year (QALY) is the most widely used measure of health gains. However, some attendees posited that a new measurement could be developed by weighting the quality of life more strongly against the length of life than it is currently. A new measure like this could help shift the focus – across public health, clinical medicine and government – towards improving healthy life expectancy. Finding new ways of measuring the success of an intervention would require meaningful co-production between researchers, policymakers and the public. However, one group noted that quality of life is a large remit to be given to the public health community.

Research gaps

Research into the following was proposed:
- Understanding the **relative contribution of different diseases** to poor quality of life.
- Understanding the extent to which it is possible to have **'healthy ageing'**.
- Understanding how people interact with the **digital world**, and its impacts on behaviour and quality of life.

- Understanding how **social changes** affect quality of life.
- Identifying, modifying and evaluating the **environmental and intrinsic determinants of cognitive and physical capacity**.
- Identifying how to improve **quality of life in the elderly**, recognising the impact of factors across the lifecourse.
- Understanding how to tackle **social exclusion, educational attainment and economic security** – all drivers of quality of life.
- Understanding how to develop a person's **capacity for resilience**, with support from communities and the state.
- Understanding the **requirements for a good death**, and how public health can contribute to this.
- Identifying **methods to tackle the most prevalent diseases** across the population that affect quality of life, such as back pain, depression and skin disease. Many of these diseases share risk factors, so may be tackled concurrently.
- Developing new methods of **measuring and valuing health gains**.
- Understanding how **to interpret the need to improve quality of life as a health challenge**.
- Developing risk-based **tools for functional and cognitive disability**.

Possible goals

Attendees identified the following goals:
- Reduce to X the gap between life expectancy and healthy life expectancy for everyone.
- Increase disability-free lifetime by X.

References

5 Academy of Medical Sciences (2017). *Improving the health of the public by 2040: next steps.*
https://acmedsci.ac.uk/file-download/56798340

6 https://www.england.nhs.uk/ourwork/innovation/healthy-new-towns/

Overarching themes and next steps

Delegates outlined several themes and research gaps that cut across the future health challenges they identified, and suggested steps that should be taken after the meeting to develop ambitious goals for the health of future populations.

Overarching themes: working together with a shared language

Participants noted that the health challenges described in this report are not discrete. Many of the challenges are closely interlinked and have wider impacts that also overlap: obesity and public mental health, for instance, both affect productivity and quality of life. Similarly, a goal relating to one health challenge will likely be applicable to another. For example, a goal to reduce smoking or excess alcohol consumption will necessarily involve reducing health inequalities, and vice versa. Tackling any one of these challenges will depend on several underlying factors, including developing a shared language, fostering whole systems change, creating a framework that enables productive partnerships with the commercial sector, and developing appropriate capacity and skills within the public health and wider research community.

Delegates agreed that the public health research and service communities must come together much more powerfully, using a language that is less alienating and esoteric. This is needed to make the step changes in interdisciplinary working that are needed in both research and services to address the challenges outlined in this report. To influence those who can implement some of the most powerful interventions (such as HM Treasury), the public health research community must be able to provide policymakers with a clear appraisal of the benefits and costs (economic, political and otherwise) of various packages of interventions; they must present the right evidence at the right time in the right way.

Participants noted, for example, that the soft drinks industry levy was introduced without conclusive evidence of its potential effectiveness, demonstrating that decision-makers do not always need conclusive evidence but want to know that an intervention is their 'best bet'. On the other hand, some attendees argued that strong evidence will be required before interventions are implemented to mitigate the risk of being seen as paternalistic.

It was noted that, at present, there are good mechanisms linking central government and academia, but the same cannot be said for linking academia with local authorities. In addition, delegates consistently argued the case for a greater focus on engagement with local communities when conducting public health research and developing interventions. Limited mechanisms exist to support academic public health research within local authorities with

integrated posts, but there are examples of creative approaches in some localities and these should be evaluated for the sustainability and value for generalisability. Closer links with local authorities and public health practitioners would allow combinations of promising evidence-based interventions and measurement of their outcomes to together form a powerful tool for change across a complex system.

Attendees agreed that finding a way to engage with the commercial sector is critical to tackle the health challenges of the future. Not only does the sector strongly influence many of the drivers of the health outcomes discussed, but it also has a wealth of data that could be used for public health research (such as in supermarkets and social media companies). To facilitate this, it is important to establish a code of conduct for collaboration with the commercial sector. More generally, the health challenges of the future will not be addressed without increased data gathering and surveillance, tied in with community engagement.

The need for systems-wide change was seen across all of the health challenges highlighted in this meeting. This means integrating influences from all levels: local, regional, national and international. Public health leadership, for example, must be joined up across all these levels. In addition, delegates argued that none of these systemic health challenges will be solved by one or two interventions: they will all require complex packages of measures targeted across all levels and taking effect in the short-, medium- and long-term.

One group described a possible model for the generation of evidence, where research funders first commission a call for specific research goals, and then bring together local communities and academics to identify a detailed research programme (which may lead to work being commissioned to further define the problem). Finally, research funders would provide infrastructure funding for local government to initiate these programmes in conjunction with the right academics and directors of public health.

To conduct the research to fill the gaps identified, participants noted that a broader range of multidisciplinary expertise is required. Bridging this skills gap will require pulling together experts from a wide range of disciplines, but also training a cohort of public health researchers and practitioners with the appropriate skills (qualitative, quantitative and otherwise). A good understanding of real-world constraints of policy making in public health systems (which include but are not limited to political, financial and logistical constraints) will allow researchers to develop tractable interventions and measure their impact at scale.

Cross-cutting research gaps

Several research gaps identified by participants are applicable across many health challenges.

Creating environments that support public health
- Understanding how to appropriately intervene in educational and familial environments.
- Understanding how to design environments (including educational, social, online and built environments) and central infrastructures to support improvement in key health challenges.

Impact of industry on public health concerns
- Identifying ways of influencing market incentives and commercial determinants to improve health.
- Better understanding the relationship between the food industry and health, recognising that both malnutrition and obesity are linked to diet.

- Better understanding the influence of the media on health.
- Understanding how to affect the mind-set of commercial organisations.
- Understanding how to most effectively influence industry, from food to alcohol to fossil fuels, to improve the health of the public. Can the government intervene in the markets, using economic policy to tackle demand-driven commercial drivers of health?
- Understanding how to make the UK commercially attractive while encouraging the commercial sector to adopt changes for the benefit of public health.
- Understanding the impact of the digital development and the digital economy on health and health services.

Evaluating existing public health understanding and interventions

- Mapping what is known — and clarifying what is unknown — about the competing determinants underpinning these challenges and how they can be tackled.
- Developing better and more imaginative economic evaluation of public health impact, including around health inequalities, productivity costs and social care impact.
- Identifying research questions that cannot be answered with current methodologies.
- Supporting future evaluation of public health research by better understanding how to most effectively gather population outcome data.

Embedding systems approaches

- Better understanding the generational divide in risk exposure (such as alcohol and drug consumption), and whether current patterns will remain as young people move through their lifecourse.
- Determining the best strategy for implementing national-level approaches as well as frameworks at local and regional levels.
- Developing complex, non-linear systems approaches (analogous to climate modelling) to understand and intervene in all major health challenges.
- Developing methodologies for systems approaches to tackle complex multi-layered problems (such as health inequalities).

Next steps

The need to actively engage local authorities and public health practitioners in public health research was agreed to be a key conclusion of the workshop. Specifically, these stakeholders need to be central to shaping the research agenda. It was therefore decided that in the very near future a discussion should take place between people from the following organisations, to work through the longlist of health challenges and develop a clear plan to fund research on topics that are relevant and important to local government: NIHR, FPH, SCHOPR, Association of Directors of Public Health, Academy of Social Sciences, and Local Government Association. This meeting took place on Thursday 14 September, and a note of discussions can be found in Annex III.

Within NIHR, Professor Whitty also agreed to determine the best forum for subsequent discussions. SCHOPR, the new coordinating body for public health research that will be established as a sub-group of OSCHR, may be a suitable option for funders, but different opportunities will be needed for different challenges and SCHOPR will not have the breadth of expertise to cover all areas.

Annex I: List of attendees

Chairs

Professor Dame Anne Johnson DBE FMedSci FFPH
Chair of the Population and Lifelong Health Domain, Vice-Dean for External and International Relations Faculty of Population Health Sciences, and Professor of Infectious Disease Epidemiology, University College London

Professor Christopher Whitty CB FMedSci FFPH
Chief Scientific Adviser, Department of Health

Participants

Professor Clare Bambra
Professor of Public Health, Newcastle University

Professor Rosa Barciela
Strategic Head of Health Science Integration (Weather & Climate) and Principal Scientific Consultant, Met Office

Mr Mike Batley
Deputy Director, Research Programmes, Department of Health

Professor Chris Bonell
Professor of Public Health Sociology, London School of Hygiene & Tropical Medicine

Professor Peter Bradley FFPH
Director of Knowledge and Intelligence, Public Health England

Professor Carol Brayne CBE FMedSci FFPH
Director of the Cambridge Institute of Public Health; Chair, Academic & Research Committee, Faculty of Public Health.

Mr Dave Buck
Senior Fellow, Public Health and Inequalities, Kings Fund

Professor Rona Campbell
Deputy Director, National Institute for Health Research School for Public Health Research

Professor Simon Capewell FFPH
Professor of Clinical Epidemiology, University of Liverpool; Vice President of Policy, Faculty of Public Health

Ms Yolanda Clewlow
Strategic Lead for Health (Weather & Climate), Met Office

Mr Michael Chang
Project and Policy Manager, Town and Country Planning Association

Professor John Coggon
Co-Director, Centre for Health, Law, and Society, and Chair in Law, University of Bristol

Professor Cyrus Cooper OBE FMedSci FFPH
Director of the Medical Research Council Lifecourse Epidemiology Unit, University of Southampton

Professor Paul Cosford CB FFPH
Director for Health Protection and Medical Director, Public Health England

Dr Jeanelle de Gruchy
Vice President, Association of Directors of Public Health

Professor Yvonne Doyle CB FFPH
Regional Director for London, Public Health England

Professor Paul Elliott FMedSci
Chair in Epidemiology and Public Health Medicine, Imperial College London; Chair, Population and Medicines Systems Board, Medical Research Council

Professor David Ford
Professor of Health Informatics, Swansea University

Professor Julien Forder
Director & Professor of Economics of Social Policy, University of Kent

Professor Elizabeth Goyder FFPH
Professor of Public Health, University of Sheffield

Professor Bernie Hannigan
Director, Research, Translation and Innovation, Public Health England

Professor Sir Andy Haines FMedSci FFPH
Professor of Public Health and Primary Care, London School of Hygiene & Tropical Medicine

Ms Nancy Hey
Director, What Works Wellbeing

Professor Frank Kee
Director of the UK Clinical Research Collaboration Centre of Excellence for Public Health Research (Northern Ireland); Deputy Director of the Centre for Public Health, Queens University

Councillor Richard Kemp CBE
Deputy Chair of the Community Wellbeing Board, Local Government Association

Mr Paul Lincoln
Chief Executive, UK Health Forum

Professor Paul Little FMedSci
Professor of Primary Care Research, University of Southampton

Professor Dame Theresa Marteau DBE FMedSci
Director of Behaviour and Health Research Unit, University of Cambridge

Professor Paul McNamee
Professor of Health Economics, University of Aberdeen

Councillor Jonathan McShane
Cabinet Member for Health, Social Care and Culture, London Borough of Hackney

Professor Laurence Moore FFPH
Director of the Medical Research Council/ Chief Scientist Office Social & Public Health Sciences Unit, University of Glasgow

Professor Susan Michie FMedSci
Professor of Health Psychology and Director of the Centre for Behaviour Change, University College London

Professor Jon Nicholl CBE FMedSci FFPH
Dean of the School of Health and Related Research, University of Sheffield

Professor Patrick Olivier
Director of the EPSRC Digital Economy Research Centre and EPSRC CDT in Digital Civics, Newcastle University

Mr David Pye
Programme Manager – Research, Local Government Association

Ms Karen Steadman
Health, Wellbeing and Work Lead, Work Foundation

Professor Carol Tannahill FFPH
Director, Glasgow Centre for Population Health

Dr Helen Walters FFPH
Consultant in Public Health Medicine; Consultant Advisor, National Institute for Health Research Evaluation, Trials and Studies Coordinating Centre, University of Southampton

Professor Nick Wareham FFPH
Director, Medical Research Council Epidemiology Unit, University of Cambridge

Dr Ursula Wells
Head of Research Liaison - Health Protection, Global Health, Department of Health

Professor Martin White FFPH
Director, National Institute for Health Research Public Health Research Programme

Ms Teresa Williams
Director of Social Research and Policy, Nuffield Foundation

Dr Louise Wood
Director of Science, Research and Evidence, Department of Health

Professor Katrina Wyatt
Professor of Health Research, University of Exeter

Academy staff

Mr Matthew Balmforth
Policy Intern, Academy of Medical Sciences

Mr David Bennett
Policy Officer, Academy of Medical Sciences

Mr Joe Clift
Policy Manager, Academy of Medical Sciences

Dr Katharine Fox
Policy Officer, Academy of Medical Sciences

Dr Luiz Guidi
Policy Intern, Academy of Medical Sciences

Dr Naho Yamazaki
Head of Policy, Academy of Medical Sciences [Lead secretariat]

Academy staff

Annex II: Agenda

20 July 2017	
17.30-18.00	**Registration**
18.00-18.10	**Welcome** Dr Louise Wood, Department of Health
18.10-18.30	***Improving the health of the public by 2040*** **Update from the Academy of Medical Sciences report** Professor Dame Anne Johnson DBE FMedSci FFPH, UCL
18.30-19.00	**NIHR priorities & early findings from 'Health Futures' 20 year forward view** Professor Chris Whitty CB FMedSci FFPH, Department of Health
19.00-21.30	**Drinks reception and dinner**

21 July 2017	
08.30-09.00	**Registration and refreshments**
09.00-09.15	***The Health of People: How the social sciences can improve population health*** **Update from the Campaign for Social Sciences report** Professor Susan Michie FMedSci, UCL
09.15-09.30	**Faculty of Public Health: current and future priorities** Professor Carol Brayne CBE FMedSci FFPH, Faculty of Public Health
09.30-09.40	**Recap on aims and objectives of the day** Dr Louise Wood, Department of Health
09.40-10.45	**Breakout session 1** What are the future health challenges that could be tackled by public health?
10.45-11.15	**Feedback and agreement on challenges**
11.15-11.30	**Tea and coffee**
11.30-13.15	**Breakout session 2** What research gaps do we need to fill to help tackle the health challenges identified?
13.15-14.00	**Lunch**
14.00-15.20	**Feedback and consolidation** Professor Chris Whitty CB FMedSci FFPH, Department of Health
15.20-15.30	**Closing remarks and thanks** Professor Dame Anne Johnson DBE FMedSci FFPH, UCL
15.30	**Close**

Annex III: Engagement with local authorities: next steps

A meeting was held on Thursday 14 September, to follow up on discussions that took place during the 'Future of public health research' workshop. In this meeting, a possible new model for the generation of evidence was discussed.

Under this model, research funders will first commission a call for specific research goals from local government, and then bring together local communities and academics to identify a detailed research programme. This meeting aimed to explore this model further.

Meeting attendees

In attendance at this meeting was:
- Professor Chris Whitty CB FMedSci FFPH (Chair) (Department of Health)
- Professor Dame Anne Johnson DBE FMedSci FFPH (University College London)
- Mr Mike Batley (Department of Health)
- Dr Jane Barrett (Department of Health)
- Ms Rachel Connor (Department of Health)
- Dr Jeanelle de Gruchy (Association of Directors of Public Health)
- Councillor Jonathan McShane (London Borough of Hackney)
- Mr David Pye (Local Government Association)
- Professor Yvonne Doyle CB FFPH (Public Health England)

The local government perspective of public health research

Public health research is often focussed on developing discrete interventions that are difficult to implement at scale. Furthermore, it frequently does not demonstrate where the findings fit, in what is a highly complex system. Developing research within the local system could avoid this difficulty, and help to get communities to engage and ensure political feasibility of the outputs.

Researchers must better demonstrate costs. They should actively consider budgets for implementation as part of their work, and focus on value for money and free or self-sustaining intervention. They must also build research questions around the local political and

community priorities and be alert to changing attitudes of local councils, such as the current shift towards self-management and self-efficacy.

It is likely that a lot of research that is needed by local authorities is being undertaken in some form, but it can be difficult to find due the complexity and volume of research that is being undertaken. It is also difficult to translate the outputs, once found, into a relevant and accessible format. There is therefore a need to assess what information we have within the current evidence base, and evaluate its quality. Research demonstrating intervention failure is not always acted upon appropriately, with the results either ignored or used as a reason to cut wider funding. Perspective is needed so that promising interventions are not disinvested because of one study outcome.

In addition to evaluating research, review of programmes that have already been created to link public health research to public health improvement is needed. This will allow us to celebrate the things that have worked, tweak the near misses and avoid repeating past mistakes, and identify who best to engage in any future programmes. Gathering practical information on other countries' approaches to public health research could also provide insight into both successful and less appropriate measures (e.g. economic assessments of public health interventions in Latin America, evaluation of Boston's Housing Innovation Labs).

A new model of public health research

A new model of public health research funding with the agenda being set by local authorities was discussed. In this model, local authorities will first reach a consensus on high-level goals for public health over a set timeframe with input from public health practitioners. These goals must be broad and bold statements of what they want for their community.

Next, researchers are challenged to provide the steps to achieve these goals locally by identifying:
1. Those which are not possible to research;
2. Those we already have research on (although it may need to be synthesised better for the local audience); and
3. Those that could be addressed by X research approaches.

The condition for research funding would be that the local authorities commits (within funding limits) to instigate change from the research outcomes.

The key aim of this new system is to shift the balance of where the research is instigated away from academia and towards the political landscape. This shift should focus particularly on the local landscape, although the consensus of the local communities as whole should be sought (a 'national local' view). This will ensure that researchers already have the political buy-in to their findings, making research translation quick and effective. It will also ensure public (and by extension political) support as the concept of what their money is being spent on is easily understood and justified.

It was noted that key public health issues would not be challenging to find consensus on, but identifying common goals may be difficult. To ensure buy-in for a national-local agenda, a short list of public health goals should be created by a small group and then given to a wide pool of colleagues for feedback. Even with this process, getting commitment for tractable goals may be difficult but the offer of significant research investment may serve as an incentive.

The Academy *of* Medical Sciences