FACULTY OF PUBLIC HEALTH

Developing the long term plan for the NHS: Consultation response from FPH (30.9.18)

1. About the Faculty of Public Health

1.1 The Faculty of Public Health (FPH) is a registered charity and membership organisation for nearly 4,000 public health professionals across the UK and around the world. Our role is to improve the health and wellbeing of local communities and national populations.

1.2 We do this by professionally supporting the current public health workforce and the development of a future workforce, encouraging and promoting new public health research and policy, and improving public health practice at a local, national, and international level by campaigning for change and working in partnership with local and national governments on specific public health projects.

In addition to the comments provided here, FPH also endorses the submissions of the Academy of the Medical Royal Colleges and the Royal College of Physicians of London

We are not able to contribute on all sections of this consultation in the time available, but we will forward comments on these when completed.

Overarching questions

1. What are the core values that should underpin a long-term plan for the NHS?

- Prevention and early intervention
- High quality prevention treatment and integrated care no matter where you live
- Personalised care
- Reducing inequalities
- Reducing variation in outcomes
- Partnership working on holistic approaches eg child poverty, childhood obesity

2. What examples of good services or ways of working that are taking place locally should be spread across the country?

- Community support initiatives eg Community Catalysts https://www.communitycatalysts.co.uk/
- Scotland – integrated Health and Care – care is needs based not means tested.

FPH is running a policy programme looking at the role of the NHS in prevention over three years from 2018-2020. It includes a Health Foundation funded project which will run through to mid-2019. Preliminary findings of our first stakeholder workshop will be forwarded to the NHSE by mid-October 2018. We have been assured that these findings will not be out of time and will form part of overall advice in the further development of the NHS plan.

3. What do you think are the barriers to improving care and health outcomes for NHS patients?

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- Narrow view of care and treatment with lack of understanding about whole person, whole life view

1. Life stage programmes: Early life

1.1 What must the NHS do to meet its ambition to reduce still-births and infant mortality?

- Support midwives in undertaking their prevention roles including smoking cessation and promoting breast feeding uptake and maintenance through at least 6/12.
- Use of technology to support their prevention work
- Training in Making Every Contact Count
- Increase the numbers of midwives so they have time to fulfil their role
- Implement interventions that are known to improve birth outcomes, including continuity of midwifery care: Poppie trial (https://www.cochrane.org/CD004667/PREG_midwife-led-continuity-models-care-compared-other-models-care-women-during-pregnancy-birth-and-early) women who receive care by one named midwife or a small group of midwives throughout pregnancy, birth and postnatal periods are 24% less likely to experience a preterm birth and more likely to have better maternal and infant outcomes, have more positive experiences of care and use resources more effectively.

1.2 How can we improve how we tackle conditions that affect children and young people?

- Work with other agencies to take holistic approach to the issue eg child poverty, housing and educational opportunity, improve interagency coordination.
- Enhance early intervention services across sectors eg mental health prevention in schools
- Greater focus on emotional health and wellbeing.
- Reducing Adverse childhood experiences. Understanding and addressing impacts of harmful adult behaviours on children.
- New models of care can include prevention and approaches to population health including health system strengthening. http://www.instituteofhealthequity.org/resources-reports/reducing-health-inequalities-through-new-models-of-care-a-resource-for-new-care-models/reducing-health-inequalities-through-new-models-of-care-a-resource-for-new-care-models.pdf.
- An example of a new model of care programme for CYP is CYPHP which incorporates health promotion, disease prevention into new models of healthcare. The programme is a clinical-academic partnership with health systems strengthening as its foundation. https://www.cyphp.org

1.3 How should the NHS and other bodies build on existing measures to tackle the rising issues of childhood obesity and young people's mental health?

- Taking holistic approach: universal and targeted approaches
- Prevention/integration across agencies.
- NHS should train staff to understand and deliver prevention in their service delivery (MECC)
- Key roles here for Health Visitors and School Nurses, this should be supported through training
- NHS could become an active contributor and member of the International Network of Health Promoting Hospitals and Health Services https://www.hphnet.org and WHO

Healthy Hospitals, Healthy Planet, Healthy People initiative
http://www.who.int/globalchange/publications/healthcare_settings/en/

1.4 How can we ensure children living with complex needs aren't disadvantaged or excluded?

- Better integrated services. Child/family at centre of service which includesprevention as well as delivery of services in an integrated way and does not overly affect education.
- Cross departmental /agency work to create accessible cities, towns and buildings.
- Training and support for school nurses and health visitors
- Examples of this in Sweden, Child Health Centres – promote child development and coordinated intersectoral care.

1. Life stage programmes: Staying healthy

1.5 What is the top prevention activity that should be prioritised for further support over the next five and ten years?

Based on the Global Burden of Diseases study (2016), the top 5 contributors to Disability Adjusted Life Years (DALYs) are as listed below. There is a need to continue to focus on prevention activities that tackle these major risk factors:

- Tobacco control
- Dietary support and advice
- Hypertension services
- Obesity
- Alcohol and drug services

1.6 What are the main actions that the NHS and other bodies could take to:
a) Reduce the burden of preventable disease in England?

Focus on actions that reduce major risk factors (Global Burden of Disease 2016):

- Tobacco control
- Dietary support and advice
- Hypertension services
- Obesity
- Alcohol and drug services

Other goals for the NHS should include:

- Reduce the burden of ambulatory care sensitive conditions by focusing on interventions to prevent progression of acute and chronic conditions
- Healthy ageing
- Reducing healthcare acquired infections
- Improving vaccination rates
- Tackling social causes of admission and prolonged length of stay (eg cold homes)

The NHS and other bodies should work to reshape systems rather than focusing on individual interventions eg creating active environments and opportunities to be active. The NHS should be working in partnership and recognise that we are working in a complex system so consider evidence relevant to complex systems

b) Reduce preventable deaths?

We should strive to prevent infant mortality as we are falling behind other

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similar countries as per the Global Burden of Disease and "NHS at 70" report.

In addition we should be:

- Reducing healthcare acquired infections
- Improving vaccination rates
- Tackling social causes of admission and prolonged length of stay (eg cold homes)
- Tackling inequality in life expectancy is essential in reducing preventable deaths.

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c) Improve healthy life expectancy?

- It is essential to tackle the wider determinants of health and reducing health inequalities. Healthy life expectancy is over 18 years less in the group 10% most deprived of men and women compared to the 10% least deprived. (Source ONS) Tackling this inequality is essential in improving population level healthy life expectancy.
- Ensuring adequate funding for both prevention and public health activities

d) Put prevention at the heart of the National Health Service?

- Ensure that prevention is seen as a priority for all areas of health care (not just Public Health).
- Reverse the trend in falling spend on preventative services
- Where grey areas exist between responsibilities (i.e. NHS vs local authorities), there is a need for better collaboration in finding a solution. To avoid legal battles, such as with HIV pre-exposure prophylaxis, which are costly and delay the role out of effective preventative services.
- There is a need for workforce development and standards development in prevention for the whole NHS workforce
- Re-embed public health professional expertise back into NHS organisations

1.7 What should be the top priority for addressing inequalities in health over the next five and ten years?

- Inequalities in health can be looked at in terms of social and economic inequalities; inequalities due to vulnerability and life circumstances and inequalities across protected characteristics in the Equality Act. To address inequalities in social and economic determinants of health requires the full implementation of the six recommendations of the Marmot report 2010: improving early years services; young people's education work and health; healthy workplace initiatives; reducing inequalities in income; improving housing and environment; and reducing inequalities in access to health services and unequal quality of services.
- There a role for the NHS to advocate more broadly to address the determinants of health. This should be both at a national level (NHS England) and also through the workforce to ensure a holistic approach to the health of an individual.
- Vulnerability: There is a group of patients with complex clinical demands for whom services are poor and outcomes are appalling. They rarely feature in our priorities because their numbers are not so great as the cancer and cardiovascular patients. Homeless people are five times more likely to attend hospital, stay three times as long and yet still die of mostly preventable disease in their 40s. Others might include drug users, patients in the criminal justice system, and patients with enduring

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mental health problems whose physical health needs are managed poorly and for whom life expectancy is reduced. (This latter is acknowledged in the plan).
There are other complex and time consuming care needs variably met by health and partner agencies - such as child and adult safeguarding and domestic violence.

- Reducing inequalities in health due to inadequate accesses in health
- services requires in the first instance much better data collection on
- occupation - it is not possible to measure inequalities in access to care without an understanding of the social and occupational make up of patients attending. The same applies to collection of data on protected characteristics, especially ethnicity, disability and sexuality.

1.8 Are there examples of innovative/excellent practice that you think could be scaled up nationally to improve outcomes, experience or mortality?

- We should look to experiences in other United Kingdom nations e.g.
  - Minimum unit pricing for alcohol in Scotland
  - Wales Public Health Act

1.9 How can personalised approaches such as paying attention to patient activation, health literacy and offering a personal health budget reduce health inequalities?

- Overall, national government interventions in policy, regulation and taxation are the most cost effective and potentially rapid way to promote behaviour change and healthy lifestyles. We require a contract between government, the health and local government services and the individual for each to play an active part in a healthier nation.
- An asset-based approach to helping individual change and to developing community support is essential to avoid the negative and victim blaming approaches often observed in health 'education'. Personalised approaches to prevention should be delivered through patient-focussed secondary preventive measures which will require substantial enhancement of NHS staff capability in Making Every Contact Count, and in rebuilding preventive services such as stop smoking services, sexual health and contraceptive services and alcohol interventions in health care settings. Services which enhance personal knowledge and give people tools and strategies to improve their own health are more likely to be successful than those maintaining a dependent relationship with service providers.
- Personal budgets for health are likely to increase inequalities. There is a need to ensure that such approaches do not actively increase health inequalities through greatest uptake by higher socioeconomic groups

1.10 What is the best way to measure, monitor and track progress of prevention and personalisation activities?

- Consider what outcomes we want to achieve (do not just count what is easy to be counted). Ensure indicators are meaningful
- Avoid perverse incentives in the system
- Measure all of these in terms of inequalities
- Ensure standards are set nationally for prevention activities and that adherence is monitored
- Improved collaboration and data sharing between the NHS and Public Health bodies

1.Life stage programmes: Ageing well

1.11 What more could be done to encourage and enable patients with long-term health issues to play a fuller role in managing their health?

FPH endorses the "NHS FRAILTY PREVENTION PROGRAMME – KEEP FIT AND STAY WELL LONGER" from Sir Muir Gray

- Promotion of physical, mental and social activity alongside any drug therapies..
- Activity therapy should be started from age 40-50, before many people develop a long term condition, to prevent or delay onset, and to slow disease progression.
- Develop a "National Activity Therapy Service NATS model" which includes walking for health, and walking plus.
- This approach should be personalised, and also build on local community capacity.

1.12 How can we build pro-active, MDTs to support people with complex needs to keep well and to prevent progression from moderate to severe frailty for older people?

1.13 What would good crisis care that helps prevent unnecessary hospital admissions for older people living with various degrees of frailty look like?

1.14 What would be the right measures to put in place to know that we are improving patient outcomes for older people with various degrees of frailty?

- Consider issues of over-medication – and regular medication review.

1.15 How can we ensure that people, along with their carer are offered the opportunity to have conversations about their priorities and wishes about their care as they approach the end of their lives?

1.16 What are the main challenges to improving post-diagnostic support for people living with dementia and their carers, and what do you think the NHS can do to overcome them?

1.17 What is your top priority to enhance post-diagnostic support for people living with dementia and their carers?

2. Clinical Priorities: Cancer

2.1 What are your top three priorities for improving cancer outcomes and care over the next five and ten years?

The FPH endorses the submission from Michel Coleman and colleagues.

- The NHS is under-funded. The budget has increased very little in real terms since 2010. Services have not kept pace with the increasing demand posed by an ageing population. This is particularly the case for cancer, where the proportion of patients treated within 62 days of urgent referral by their GP has remained below the 85% target for the NHS in England since December 2015, falling to 78% in July 2018, the lowest proportion since 2009. The highest priority is therefore to achieve a substantial increase in the funding for NHS primary and secondary care, to provide more clinical staff, better

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- access to diagnostic and therapeutic equipment and services, and greater access to post-operative intensive care.
- The NHS must ensure equitable access and timely delivery of optimal diagnostic and treatment services across England, in the light of known geographic and socio-economic inequalities in both treatment and survival.
- Make cancer registration statutory, to reflect the public health importance of cancer. When infectious diseases were first made notifiable by law in the 1880s, they caused 40% of deaths; today, that figure is below 1%. Cancer is now responsible for 28% of deaths, and rising. Legislation would facilitate complete, unbiased data collection, including from the private sector. It would also simplify the use of data for research under the law.

2.2 What more can be done to ensure that:

a. More cancers are prevented?

Cancer prevention strategy is not solely the purview of the NHS: NHS England must act in partnership with the government of the day and maintain political pressure on the government to implement these policies:

- Implement the updated European Code Against Cancer.
- Strengthen further the existing anti-tobacco strategy, particularly on price, plain packaging, prohibition of smoking and e-cigarettes in public places, and the sale of tobacco products to the younger generation. Emphasise the dangers of smoking especially to young women.
- Maintain the pressure to reduce excessive alcohol consumption through all forms of public education and government policy, as set out in the World Health Organisation's Global Strategy for Cancer.
- Improve access to healthy food, emphasise reduction in levels of obesity, and promote active lifestyles.
- Maintain funding and support for the national cancer screening programmes; increase compliance with these programmes, especially amongst the socio-economically deprived, the less well educated and ethnic minorities; ensure rapid extension of vaccination coverage against human papilloma virus for both boys and girls; maintain vaccination against hepatitis B and C viruses.
- Extend public education programmes against excessive exposure to ultraviolet radiation.

b. More cancers are diagnosed early and quickly?

- Improve compliance with screening programmes (see above); improve speed of access to secondary care for those who screen positive.
- Undertake, fund or promote research to improve understanding of what drives socio-economic inequalities in cancer.
- Undertake, fund or promote research to examine whether the primary care gateway may add to the health service component of delay in diagnosis, and to consider the policy response. Streamline the referral pathways between primary and secondary care.
- Consider the Danish response to their survival deficit relative to other Nordic countries, particularly with respect to the designation of suspected cancer as an emergency. Consider extension of "one-stop shops" for early diagnostic activity, and enabling GPs to refer directly to these facilities.

c. People can maintain a good quality of life during and after treatment?

d. People with cancer have a good experience of care?

- Prepare future cancer strategy in the language of human rights,

recognising that all people have a right to access high-quality healthcare without the need to incur financial risk.
- Consult cancer patients or their advocacy bodies on future cancer strategy. They should be able to participate meaningfully in the decision-making process.

2.3. How can we address variation and inequality to ensure everyone has access to the best diagnostic services, treatment and care?

- Undertake, fund or promote independent research into variations and inequalities in access to diagnostic services, treatment and survival.
- Ensure that improved data access for research becomes a reality, not just an aspiration. It is a public health responsibility to make data available for analytical research (2015 cancer strategy). Delay in the release of data for officially approved research prevents researchers from examining health risks and inequalities.
- Encourage research, by publicly recognising the provisions to enable data access for scientific research in the public interest under the EU General Data Protection Regulation (Articles 9, 89) and the UK Data Protection Act 2018 (Section 19); Schedule 2, Part 6
- Ensure that Public Health England facilitates, access to the relevant data for independent public health research, where researchers have already acquired statutory and ethical approval from the Health Research Authority and NHS Research Ethics Committees.
- Ensure that stage at diagnosis, investigative procedures and the first course of treatment with each main modality of treatment are systematically ascertained, recorded and transferred to the cancer registry. These data are required to enable assessment of progress in early diagnosis and adherence to treatment guidelines, and their impact on survival.

2. Clinical priorities: Cardiovascular and respiratory

2.4 What actions could be taken to further reduce the incidence of cardiovascular and respiratory disease?

- The NHS should implement the recommendations of the RCPL Hiding in Plain Sight report on smoking cessation responsibilities within the NHS and in clinical services. Particularly investing in rebuilding the highly cost-effective stop smoking and nicotine replacement services lost through recent local government public health budget cuts.
- THE NHS should implement through STPS and ICS the full recommendations of the PHE Cardiovascular tool kits.
- A systematic risk stratification approach to cardiovascular and pulmonary disease risk in primary care is likely to yield greater life saving and improved health outcomes than is the NHS health check model.

2.5 What actions should the NHS take as a priority over the next 5-10 years to improve outcomes for those with cardiovascular or respiratory disease?

- The interventions most likely to yield rapid improvement are in relation to identification and effective treatment of hypertension, stopping smoking and identifying and treating atrial fibrillation.

2. Clinical priorities: Mental health

2.6 What should the top priority for meeting peoples mental health needs over the next five, and ten years be?
Prevention and early intervention. More information, self-care and education about mental health – and development of Primary Mental Health Services.. Much of the 'churn' in the system is caused by bounce back from secondary, specialist services. Investment in primary Mental Health Care would take pressure off GPs and prevent issues escalating.

2.7 What gaps in service provision currently exist and how do you think we can fill them?

- Primary Mental Health Services – build into GP teams.
- Crisis services for people with complex and multiple needs who do not fit 'boxes'. Rough sleepers, people with personality disorder.
- 'Tier 2' services for Children and Young People

2.8 People with physical health problems do not always have their mental health needs addressed; and people with mental health problems do not always have their physical health needs met. How do you think we can improve this?

- Build into training and CPD for medical and health staff.
- Information and advice available for patients' families and staff.
- GPs and MH Trusts to be supported in undertaking meaningful health checks.
- Greater focus on effects of medication (on oral health, weight management etc).
- All physical health care staff – primary and secondary care to understand social / psychological / wellbeing impacts on patient outcomes.
- Utilise MECC in a meaningful way.

2.9 What are the major challenges to improving support for people with mental health problems and what do you think the NHS and other public bodies can do to overcome them?
Challenging stigma is a major challenge. This is compounded by lack of knowledge and fear – across the system. Suggest an approach may be embedding knowledge and sensitivity- through bridging roles – locating expertise across the system such as housing teams, police teams etc.

2.10 How can we better personalise mental health services, involving people in decisions about their care and providing more choice and control over their support?
Develop alternatives such as peer mentor schemes, Crisis houses, advocacy and sufficiently resourced third sector schemes.
References for Mental health peer support: https://www.nationalelfservice.net/publication-types/systematic-review/peer-support-workers-in-mental-health-is-the-nhs-ready-for-this/
http://www.ucl.ac.uk/news/news-articles/0818/030818-peer-support-mental-health

2. Clinical priorities: Learning disability and autism

2.11 What more can the NHS do, working with its local partners, to ensure that people with a learning disability, autism or both are supported to live happy, healthy and independent lives in their communities?

- Understand social model of disability.
- Focus on living well – not being a 'patient'.

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- Invest in third sector and in peer led initiatives.
- Employ people with learning disabilities and Autism.
- Work with housing authorities to develop suitable accommodation.
- Develop support services for autism in the community (currently very few).

Please also see more detailed submission for children and young people, key points are bulleted here:

Childhood:

1. Reduce the age of diagnosis to improve outcomes
2. Decrease the waiting times for referral to specialist services and offer services while waiting for referral
3. Consider co-morbidity of autism and learning disabilities.

Childhood and adolescence:

1. Ensure all GP practices develop registers of which patients are on the autism spectrum, learning disability or both and offer annual health checks.
2. Extend Education, Health and Care Plans to cover education and training beyond school
3. Consider co-morbidities in autism and learning disabilities or both such as anxiety and depression

2.12 How can we best improve the experiences that people with a learning disability, autism or both have with the NHS, ensuring that they are able to access the full range of services they need?

- Would be helpful if NHS promoted social model of disability – and took and asset based approach.
- Training for NHS staff in LD and autism.
- Employ PWLD / Autism as peer mentors - / navigators
- Note there are few, if any services available for adults with autism post diagnosis. Small investment in living well with autism (through local autism strategy groups) would go a very long way. Must be undertaken jointly with local authorities and third sector.
- Integrate care through:
    - Improving transitioning from child to adult services
    - Case manager or service co-ordinator for every child and young person
    - Increasing the employability of people with autism or learning disabilities who want to work
    - Improving wellbeing and tackling loneliness

3. Enablers of improvement: workforce

3.1 What is the size and shape of the workforce that we need over the next 10y to help deliver the improvements in services that we would like to see?

- The NHS workforce already faces substantial shortfalls in a wide range of service areas. This will worsen following leaving the EU. The expense of agency services means that it should be possible to meet some of the shortfalls in the longer term through judicious short-term investment to re-grow permanent staffing. The same applies to the social care and public health workforces. Jobs generated in public health and social care tend to be for local provision rather than for the benefit of multinational companies.
- Development of the NHS workforce needs to be seen as an economic

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- regenerator and not a cost. Economic multipliers suggest the value to the economy for each pound spent is between £2.7-4 generated. NHS workers incomes are a major contribution to local economies. The Treasury needs to commit further funds to NHS workforce development as part of its economic and industrial strategies.
- Properly trained specialists in public health should be the primary provider of population health expertise to all levels of the NHS.
- There should be a systematic approach to developing the whole NHS workforce to deliver public health interventions, including Making Every Contact Count (MECC). This should be driven by effective standards.

3.2 How should we support staff to deliver the changes and ensure the NHS can attract and retain the staff we need?

- The NHS workforce will need to be built from high school upwards. There should be new investment into University Technical colleges on the lines of the Health Futures development in West Bromwich, growing 14-19 year olds for NHS employment, in collaboration with local NHS trusts.
- There is a need for multidisciplinary development and inter-professional learning to solve complex clinical issues.
- The vital population health expertise of Public Health specialists needs to be recognised and capacity needs to increase (20% lost since 2013); public health careers need to develop across NHS local government and academic settings; monitor the strength and diversity of the public health workforce; development of the public health practitioner workforce
- We are committed to leading development of public health expertise within all clinical specialties and NHS disciplines, we are seeking funding to develop population health qualifications and credentialing. We are working with the Academy of the Medical Royal Colleges and keen to work with NHSE, Health Education England and other UK bodies to achieve this.
- We also see a major need to train new generations of health data analysts. Our Information and Intelligence Special interest group will be seeking to develop work on this.

3.3 What more could the NHS do to boost staff health and wellbeing and demonstrate how employers can help create a healthier country?

- The Health of the NHS workforce needs to be improved. The NHS provides a microcosm of the social and economic inequalities in health in society as a whole, with the lowest paid and most temporary staff having poorer health. Overall working conditions and rewards need to be looked at very critically in this context.
- FPH supports the principle of a National Occupational Health Service proposed by the President of the Faculty of Occupational Medicine in 2017. https://www.bmj.com/content/357/bmj.j2334.full
- We support the efforts of NHSE to become smoke-free and are signatories of the Smoke-free charter.

3. Enablers of improvement: primary care

Comment to follow

3. Enablers of improvement: digital innovation and technology

3.9 What can the health and care system usefully learn from other industries who use digital technology well?

- Develop business models that support the rapid adoption and deployment of digital solutions.
- Develop systems that are user friendly.
- The adoption of standardised communications platforms that avoid multiple incompatible systems.
- Establish training programmes to ensure that staff and commissioners are digitally and technologically literate (many of our patients are far more tech savvy than we are).
- Adopt and share best practice more effectively and at greater speed.
- Avoid 'not invented here syndrome'.

3.10 How do we encourage people to use digital tools and services? (What are the issues and considerations that people may have?)

- Referring to 3.9, the development of appropriate business models that reward engagement and adoption, not only in terms of improved care but economically and in terms of improved efficiency.
- NB: some current NHS tariffs and targets directly dis-incentivise the use of digital or telehealth solutions for service providers in the case of non-face to face consultations. The dramatic rise in telehealth adoption in the USA has been largely brought about by improved repayment revenue models for suppliers.
- Ensure staff are 'technology aware' within their sphere of work, so that they see technology as a means to help them rather than as a barrier. Integrate technology awareness training within the core curricula.
- Establish Healthcare Technology 'facilitators' both within healthcare establishments and in the community to support community healthcare delivery. (Potentially a new profession and one that would fit both younger and early retiree generations).

Top technologies

Mobile/wearable Technologies in conjunction with 5G and IoT (internet of Things) enhanced capabilities for telehealthcare

- Will reduce need for hospital/clinic attendance and support patients living with long term conditions and older people in the community.
- Will enable patients to be discharged earlier to home.
- Such devices are already widely available and available on the high street.
- 5G network coverage will provide for real-time interactions with IoT enabled devices.

Virtual and Augmented Reality

- For use both within healthcare training and in delivering healthcare solutions to patients in their own homes.
- Healthcare training - already possible to superimpose CT, X-Ray images over body during surgery.
- Patients - already used for cardiovascular rehabilitation; phobia and chronic pain management

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Artificial Intelligence, Machine Learning & Health Informatics

- The rapid development of AI will see the development of more 'clinical assistants' that support clinical decision making.
- AI and Machine Learning systems will provide for more rapid analysis of complex 'Big Data' surces of clinical information, allowing for faster and more accurate diagnosis and risk analysis.

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Genomics and Personalised Medicine

- Dramatic improvements in the speed and costs of genetic mapping will directly improve efficiency of diagnostic and drug therapies.
- Reduced cost and size of gene sequencers will make the technology more widely available within community care.

3-D Printing & Additive Manufacture

- Greater availability of biocompatible materials and the ability to print a wider range of biological 'organic' materials.
- Already used for within surgical reconstruction, prosthetics & orthotics and in transplantation.
- Low cost of 3-D printers are now available.

3. Enablers of improvement: research and innovation

See above -Comment to follow

3.15 – What should our priorities be to ensure that we continue to lead the world in genomic medicine?

- Genomic information needs to be used to improve patient care through effective, high quality implementation which is responsive to new knowledge.
- Genomic medicine can and should be used to generate efficiencies in current care pathways and services.
- Education and training – effective and relevant education and training needs to be developed from medical school, through specialist training, in partnership with universities and specialty Royal Colleges. In addition there needs to be adequate practical training for the current workforce to feel competent in genomic medicine (workforce development through deaneries and trusts).
- Development of clinical practice and pathways - NHSE needs to work with speciality colleagues and healthcare public health to provide guidelines, standards and information to clinicians regarding pathways of care incorporating genomic testing, in a systematic and transparent way, to ensure efficiency and safety.
- There needs to be further emphasis on the use of genomic information in predictive and preventative healthcare, further data gathering and implementation research is required for this area of genomics to be effectively harnessed for patient benefit.

3. Enablers of improvement: engagement

Responses provided by:
The President of the UK Faculty of Public Health (FPH), With Specialty Registrar Rachel Chapman. Other contributions from the FPH Vice President for Policy. Stephen Watkins, Health Service Committee Chair, Dr Chris Packham, Dr Ann Hoskins, Dr Ingrid Wolfe

(British Association of Child and Adolescent Public Health) Dr Ingrid Slade (FPH Genomics Special Interest Group, Ms Christina Gray (FPH Mental Health Special Interest Group), Professor Michel Coleman and the London School of Hygiene and Tropical Medicine Cancer Survival Group, Sir Muir Gray, Robert Verrechia Speciality Registrar, Chris Ramsden, Andres Roman-Urrestarazu..

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