Department of Health & Social Care - Advancing our health: prevention in the 2020s – Consultation

INTRODUCTION

The Institution of Engineering and Technology welcomes the government's green paper 'Advancing our health: prevention in the 2020s'. The UK's health and social care sector is, appropriately, one of our most treasured national assets. Nonetheless, the complexity and size of the system, as well as the associated pressures it faces from finite resources and an ageing population, mean that making improvements to health and care can be a significant challenge. This green paper is a chance to rebalance and explore innovative approaches for the NHS to focus on prevention, by transforming it from an illness to a wellness service.

1. ABOUT THE IET

1.1 The Institution of Engineering and Technology (IET) is one of the world's leading professional engineering institutions. We provide independent, impartial and expert advice. We represent over 169,000 engineers in more than 150 countries, across multiple sectors including Healthcare, Design & Manufacturing, the Built Environment, Energy, Transport and Digital.

1.2 On behalf of the profession, the IET strives to inform and influence government on a wide range of engineering and technological issues. The organisation's membership spans a broad range of professional knowledge, and regularly offers unbiased, independent, evidence-based advice to policymakers via several channels. We believe that professional guidance, especially in highly technological areas, is critical to good policy-making.

2.   INTELLIGENT HEALTH CHECKS

Do you have any ideas for how the NHS Health Checks programme could be improved?

2.1 *Updating the Screening programmes*

2.2 The effectiveness of NHS Health Checks could be improved by making them more stratified. While screening programmes make great intuitive sense and are widely regarded as popular with the general public, balancing their benefits and costs has its complexities. If applied inadequately, screening can do more harm than good.

2.3 The determination to modernise NHS health checks is welcome given the limited evidence for their cost-effectiveness and effectiveness. However, finding a more effective approach of using "personalised, intelligent health checks" will require investment and careful consideration of the costs and benefits.

2.4 Although a data-driven approach on more targeted health checks is still to be developed, there is some evidence for other forms of screening that such an approach could improve outcomes. For instance, a modelling study on breast-cancer screening has shown that moving from the current age-based screening strategy to a risk-based approach could reduce over-diagnosis, improve cost-effectiveness, and maintain the benefits of the current screening programme. The focus on preventative, personalised healthcare is important in order to harness the latest technology and techniques, which will move the NHS away from the one-size-fits-all approach of the past.

2.5 It is imperative that any new (or expanded) screening programs are linked to adequately-resourced follow-up clinical pathways and associated interventions. Simply adding additional diagnostic tests where there is no established mechanism for escalation and treatment will be a net cost to the healthcare system.

2.6 Given the resource-intensive nature of screening programs (it has been widely reported that due to the increasing population size, annual diagnostic screening continues to rise at 3 times the rate of workforce growth), tangible clinical benefits could arise in the near term from technologies which deliver interoperability and workforce efficiencies to existing screening programs.

2.7 Risk to health inequalities

2.8 A key challenge for better targeting of prevention interventions will be the NHS's impact on health inequalities. For instance, the current Health Check programme is universal for 40–74 year olds. Yet, as individuals who take up health checks tend to be healthier than the general population, the programme brings more benefit to people who had better health in the first place.

2.9 It is very plausible that technology and data may be able to assist with these problems. For instance, linked data may be used to target and monitor the impact of health checks in marginalised groups. This on its own may not address inequalities in access but could be used alongside tailoring community engagement and behavioural science approaches to ensure that people who are currently missing out benefit more in the future.

2.10 Nonetheless, approaches of such kind need to be tested. If risk prediction is to be used to make wellness and prevention strategies more stratified, this approach must be based on robust evaluation of benefits and costs, and must be designed to ensure that they have a positive, not a negative, impact on health inequalities.

3. TAKING CARE OF OUR MENTAL HEALTH

3.1 There are many factors affecting people's mental health. How can we support the things that are good for mental health and prevent the things that are bad for mental health, in addition to mental health actions in the green paper?

3.1.1 Technology has opened a new frontier in mental health support and data collection. Mobile devices like smartphones and tablets are giving the public, doctors, and researcher's new ways to access help, monitor progress, and increase understanding of mental wellbeing.

3.1.2 Digital phenotyping can improve the quality of clinical decision making, and potentially prevent people entering crisis and avoid unnecessary hospital admissions. Digital phenotyping, put simply, a set of observable characteristics of an individual resulting from their interaction with the environment around them, offers a unique way of harnessing a great deal of data relevant to medical researchers and clinicians. The characteristics include, but are not limited to, behavioural patterns, physical mobility, social interactions, cognitive function, sleep, gross motor activity and speech production.

3.1.3 Any digital phenotyping must be linked to other existing forms of primary and secondary interventions to ensure that integrated and sustained care is made available to the individual to realise long-term beneficial outcomes. This linkage is both a technical (integration) requirement and a clinical one in that the information must complement and enhance already validated decision making processes.

3.2 Have you got examples or ideas about using technology to prevent mental ill-health, and promote good mental and wellbeing?

3.2.1 Digital technologies and engineering present innovators with new opportunities to deliver NHS services differently, hopefully enabling more people to access the treatment and support they need.

3.2.2 To achieve this, it is necessary to horizon scan into international examples of tech excellence. For instance, in the United States, organisations such as 'Bewie' and 'MindStrong Health' are developing in cutting-edge work relating to digital phenotyping. Similar work is being carried out by colleagues in the UK, and globally. It has the potential to drastically improve outcomes for individual service users and the operational efficiency of mental health services.

3.2.3 Moreover, Australia also provides some fantastic examples of how digital technology can be used to redesign the delivery of mental health services. eOrygen and eheadspace are just two of many innovators that clearly present the opportunities to not only help

empower individuals to take charge of their own recovery, but also to provide better support and advice to families and carers.

3.2.4 In the UK, Kings College London has worked with the charity Autistica on the use of CBT therapies to reduce anxiety for people with ASD. Their "Molehill Mountain" app was developed using an evidence-based approach involving user groups from the outset with ASD, there is currently a chronic lack of effective support for people with anxiety from the NHS, and such apps can be part of the overall solution.

3.2.5 Opportunities exist to link technology with social prescribing so that individuals can readily access community-based resources that are known to lead to sustained good mental health and wellbeing.

4. SLEEP

We recognise that sleep deprivation (not getting enough sleep) is bad for your health in several ways. What would help people get 7 to 9 hours of sleep a night?

4.1 Some technological innovations if used inappropriately can do damage to our sleep. For instance, technology and especially electronic gadgets such as laptops, smartphones and tablets can serve as a hindrance to quality sleep when used around bedtime. But sleep-deprived consumers shouldn't ban all devices from the bedroom as if used appropriately, technology can also be a benefit for some.

4.2 The key ways that technology can help people fall asleep and even support quality sleep include:

- Blocking blue light: Scientists have found that short-wavelength blue light emitted by many electronic devices' screens can cause sleep deprivation. Fortunately, many of these devices offer a "night mode" that shifts display colours to the warmer end of the colour spectrum during the evening hours.
- Bringing the white noise: "White noise" can be conducive to sleep by blocking out disruptive background noises. Currently, smartphones, tablets and smart home speakers (like Amazon Echo and Google Home) can play white noise such as, gentle nature sounds, the sound of soft static and many more.
- Controlling interior lights' brightness: Especially as bedtime approaches, exposure to bright lights can affect people's sleep by delaying drowsiness To help set the mood for sleep, smart light bulbs such as the Philips Hue can be set to sync with the sunset, thus emitting soothing (and sleep-friendly) ambient colours before sleep.
- Helping maintain sleep schedules: Keeping sleep schedules consistent has been proven to support higher-quality sleep and a smart alarm clock can help those with sleep issues establish and maintain them. Devices such as the Kello smart clock can help people fall asleep faster with integrated speaker and lighting systems that support built-in breathing/sleep exercises, then ease the wake-up routine with features such as progressive body-clock training and multiple content, lighting and volume choices.

- By tracking sleep: Activity trackers such as the Fitbit or Apple watch can help individuals understand and take charge of their sleep patterns with features such as sleep tracking, which provides insights about sleep quality, duration and stages, as well as other tools like a silent alarm that can wake the wearer with a quiet vibration.

4.3 Ultimately technical innovations such as those listed above are unlikely to solve the issue alone. Challenges persist around an "always-on" working culture and as research into the long-term health impact of sleep-deprivation continues, it is not inconceivable that change may have to be driven at a policy level, not unlike the sugar tax or the working email restrictions that were proposed in France a few years ago.

[This consultation was submitted through an online portal - https://consultations.dh.gov.uk/prevention/a09d31b8/]

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