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Cancer Research UK's proposals for the NHS 10-year plan

Cancer Research UK (CRUK) welcomes the development of a 10-year plan for the NHS, supported in part by the recent 5-year funding settlement for NHS England. We also welcome the strong commitment to cancer: with 1 in 2 people receiving a cancer diagnosis it must continue to remain a priority. The 10-year plan provides an opportunity to reset our ambitions for improving cancer survival in England, backed by the right investment, policies and ways of working. The cancer strategy for Englandⁱ provides a strong basis from which to accelerate progress – implementing this must be central to plans in the short to medium term. It also provides an opportunity to ensure the wider health system transforms to reduce incidence of disease and intercept disease earlier.

Three years into the cancer strategy we are learning a great deal from pilots well underway, such as testing new diagnostic pathways, and we should be rolling out best practice from these evaluated approaches as soon as possible. Looking further ahead, we're likely to see significant shifts in the use of technology, such as genomics, artificial intelligence and new types of diagnostic tests. Cancer care will become increasingly personalised as research provides a better understanding of disease and an ageing population means more patients will be diagnosed with cancer, many with multiple conditions and complex care needs. These aspects will shape the healthcare landscape and how care is provided in the future. The role that NHS staff will play in adapting to these changes will be critical.

There are three core challenges that the new plan must seek to address in relation to cancer care:

- 1) Providing the best possible care to an increasing number of people with a cancer diagnosis;
- 2) Transforming services to deliver better outcomes which other health systems (and parts of England) are already achieving;
- 3) Supporting a research agenda, especially for those cancers where survival remains poor.

This paper sets out:

- The changing landscape in cancer care (page 2)
- CRUK's ambitions for the plan (page 3)
- CRUK's 4 key priorities where acceleration is needed to achieve these ambitions (page 5)
- CRUK's practical recommendations for how the NHS can achieve this through (page 8 onwards):
 - A focus on the cancer workforce
 - A radical shift in prevention
 - Bold efforts to diagnose earlier
 - Becoming a world-leading adopter of new technology
 - Supporting new and optimised models of service delivery
 - Embedding research in NHS practice
 - Fulfilling the potential provided by data and intelligence

The changing landscape in cancer care

Incidence is increasing

By 2035, more than 500,000 people in the UK will be diagnosed with cancer each year, an increase of more than 150,000 people on 2015 levelsⁱⁱ. The rise is due partly to the growing and ageing population - by 2035, people aged 75 and over are projected to account for 46% of all cancer diagnoses and 62% of all cancer deathsⁱⁱⁱ. But the rise in cancer diagnoses is also in part driven by potentially modifiable risk factors. Today, around 4 in 10 cancers are preventable which equates to more than 135,000 cancer cases in the UK each year. Smoking causes at least 15 different types of cancer, 15% of new cancer cases in the UK and more than a quarter of all cancer deaths.^{iv,v} Incidence of some smoking related cancers is decreasing, largely because of decreases in smoking prevalence, but unless there is further progress in reducing tobacco exposure these decreases are expected to slow. CRUK analysis finds that obesity could cause 670,000 cases of cancer in the UK over the next twenty years unless action is taken to reduce trends.

Survival is improving, but is lower than the best performing countries^{vi}

Contrasting our cancer survival with countries of comparable wealth, comprehensive health systems and similar data quality is the best way to understand where we stand internationally. The International Cancer Benchmarking Partnership (ICBP)^{vii} has led the way in trying to understand differences in survival between countries including Canada, Denmark, Australia, Norway, New Zealand, Sweden and Ireland. Whilst comparisons to other countries are available, survival estimates for these other countries are less directly comparable to the UK figures and so less helpful in determining how we are improving and the levels we should be attaining.

Compared with many of these comparable countries, we remain behind, especially in older age groups. For example, five-year survival for colorectal cancer in patients aged 75+ was 15% lower in the UK than that for Canada, whereas the survival gap was 9.5% for patients in the 15-44^{viii} age bracket. The reasons for survival discrepancies are multi-factorial. The ICBP has shown that, for lung and colorectal cancer, we need to address late diagnosis as a matter of urgency, whereas for breast and ovarian cancers we do not compare well when patients are diagnosed at the same stage, indicating that access to treatments is more the issue in England. Breast cancer survival in England is, thus far, the only site where data show we are closing the gap with these countries.

Survival in England varies depending on the type of cancer. For example, survival in lung, oesophageal, brain and pancreatic cancer remain stubbornly low compared to the progress made for other cancer sites. For some cancer sites we know that much more research is needed to provide a larger range of interventions to tackle the disease.

Survival comparisons for comparable countries can also be extracted from the CONCORD study^{ix}. Our analysis estimates that we need to more than double the pace of improvement in 5-year survival for the UK to be among the best in 10 years' time.

Variation remains a significant feature of the health system

Right now, patient outcomes within England are subject to significant variation – where this is unwarranted, we can see inequalities:

- Smoking is the single largest contributor to the 10-20-year reduced life expectancy of people with a mental health condition.^x
- If the more deprived groups had the same incidence and mortality rates as the least deprived, there would have been around 15,300 fewer cases and 19,200 fewer deaths per year across all cancers combined in the most recently examined 5-year periods.^{xi}
- The proportion of patients diagnosed at stage 1 & 2, where treatment is more likely to be successful, varies from 46 to 61% by CCG^{xii}.
- While the inequality gap has reduced over time, in 2015 the one-year survival index for all cancers combined ranged from 67 to 77% by CCG^{xiii}.
- Between 2006 and 2015, 30% of all cancers in those aged 80-84 were diagnosed as an emergency in England, compared with 14% of cancers in those aged 50-59. Being diagnosed via an emergency route is associated with being diagnosed at a later stage and worse outcomes^{xiv}.
- People living in the most deprived areas are less likely to take part in screening. A study found 59.3% of people with the lowest socio-economic status have ever responded to a screening invitation, compared with 74.2% in the highest. Uptake is also lower amongst people with disabilities and non-white respondents.^{xv}

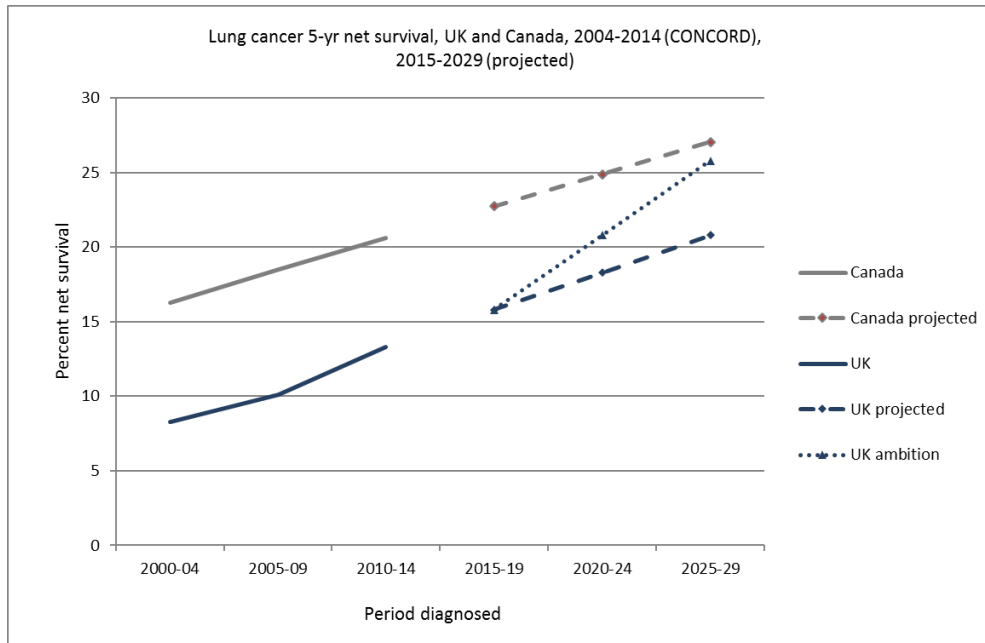
Ambitions

Below are a set of ambitions to incorporate into the 10-year plan. These are intended to be stretching, but realistic if substantial improvements to the provision of cancer care are made. *Methodology on request.*

1. We will match the best cancer survival of comparable countries in 10 years

For the UK to match, by 2028, the best 5-year cancer survival of comparable countries, **doubling the rate of improvement in cancer survival - seen since 2000-2004 - for many cancer sites will be required as a minimum.** Cancer survival in the UK is improving, but it is also improving in other countries too. The CONCORD study showed that over a 10-year period, UK survival had increased for lung, colon, rectum, ovarian, oesophageal and pancreatic cancers but the percentage point gap between UK and the best performing comparable country had showed little change. For some sites, such as breast, the gap between UK and the best comparable country has decreased.

Example: If our improvement in 5-year survival for lung cancer continued at the same rate of increase seen between 2000-04 and 2010-14, then patients diagnosed in 10 years would have similar survival as Canada achieved 5 years ago. Doubling the rate of improvement in 5-year lung cancer survival over the next decade would bring us very close to where we project the best comparable country could be, should they continue their rate of improvement.



2. We will live in a smoke-free country (less than 5% of the adult population is a smoker) in 10 years' time

If UK smoking prevalence could be reduced to 5% by 2028 (representing a more stretching ambition than the current Tobacco Control Plan sets out), there would be 2.6 million fewer smokers than if current trends continue:

- UK smoking prevalence in 2022 is projected to be 13% (14% in males and 11% in females) which will equate to 6.7 million UK smokers.
- UK smoking prevalence would need to be at most 11% by 2022 to be on track for 5% by 2028. This would be nearly 1 million fewer smokers than currently projected.

3. We will reduce the number of cancers diagnosed at late stage by 25% in 10 years

Late stage diagnosis (stage 3 and 4) is the reason for thousands of avoidable deaths in cancer and is still common for many types of cancer.

Reducing the number of cancers diagnosed at a late stage would lead to thousands fewer cancer deaths within 5 years of diagnosis across all cancers. Achieving this ambition by 2028 would mean over 22,000 more lung, prostate, ovarian and colorectal cancer patients would be diagnosed at an earlier stage, which could translate to nearly 9,000 fewer cancer deaths within 5 years of diagnosis, each year. Looking at this slightly differently, this would mean, for example, only 42% of colorectal patients would be diagnosed at stage 3 and 4 rather than the 56% that we see now.

What should be prioritised to achieve these ambitions?

The health system is in a strong position to accelerate progress and meet the ambitions set out above if significant improvement and investment is made in the right areas. Many of the solutions are already outlined in the current cancer strategy for England. While progress against the recommendations in the strategy have been slower than we would have hoped^{xvi}, they provide a solid platform from which to accelerate progress. For example, if given the right resources, Cancer Alliances are now in place to better coordinate cancer care, drive improvement across geographical areas and reduce inequalities.

The recent funding settlement for the NHS provides an opportunity to resource cancer services effectively to meet the needs of all patients and provide them with the best outcomes. However, we understand that this investment relates to the NHS alone. The NHS does not work in isolation from other aspects of the health service. To meet the ambitions we have set out, it's vital that further settlements are announced as part of the forthcoming budget. This includes increased funding for public health (both the Public Health Grant and budget for Public Health England), for training the cancer workforce (Health Education England) and for health research (through the National Institute of Health Research).

Building on the cancer strategy recommendations, the following accelerations are needed:

A focus on the cancer workforce: Significantly more staff will be needed to diagnose and treat cancer in the NHS. The growth in the number of new cancer cases, and efforts to improve outcomes, means action must be taken to ensure the NHS has enough staff, with the right skills, working in the right way. Plans to develop the workforce of the future must be backed by the appropriate level of funding. A fit for purpose, sufficiently resourced workforce, now and in the future, means addressing staff shortages in professions critical to cancer diagnosis and treatment:

- Diagnosis: Professions in primary and secondary care will need the greatest uplift in number if we are going to achieve earlier diagnosis. In particular:
 - Even without delivering transformative interventions like targeted lung screening, 70% more **radiologists** will be needed in 10 years compared to current levels. If lung screening is implemented, hundreds more diagnostic radiographers and radiologists would be needed on top of this.
 - Optimal use of the Faecal Immunochemical Test (FIT) in bowel screening could mean that the number of colonoscopies required increases by over 760,000 and the number of biopsies that need analysing by 84,000: all requiring more **endoscopists** and **pathologists** working in the NHS.
- Treatment: To deliver best-practice, our modelling suggests doubling the number of **therapeutic radiographers** and tripling the number of **oncologists** is required.^{xvii}

As well as meeting growing demand, a sufficiently resourced team is also needed to transform services; to reduce inequalities, adopt new approaches, share best practice, provide training and education to others, and have time for research.

The plan must address this as a matter of urgency. It should be clear about actions required now, derived from Health Education England's (HEE) existing work on cancer staff, which promised over 5,000 more staff working in the NHS by 2021. But it must also acknowledge that improving cancer outcomes in the future needs a fully-funded, long-term workforce plan to ensure there is a sufficient pipeline of staff being trained. Without investment in training through HEE and universities, and employing more staff in current services, the NHS will not be able to provide world-class cancer care and reach the ambitions we have set out above.

A radical shift to prevention: Nearly 4 in 10 cancers are preventable through lifestyle changes. Strong action is vital to help people make healthy choices, for example focusing on reducing childhood obesity and continuing to drive down smoking rates. The NHS can play a leading role in reaching the ambition to live in a smoke-free country by 2028 by implementing the Government's Tobacco Control Plan which sets out a target for a smoke-free NHS by 2020. A 'smoke-free' NHS by 2020 and beyond means:

- All patients in primary, secondary and mental health care settings are screened for smoking status, and those patients that smoke are given evidence-based treatment for cessation on an opt-out basis;
- All NHS staff are provided with support to quit smoking on an opt-out basis;
- All NHS estates are smoke-free.

It will also need to be complemented by local authority-commissioned Stop Smoking Services being made available to all smokers (funded via the Public Health Grant) to ensure that patients that smoke have access to cessation treatment beyond the healthcare setting.

Bold efforts to diagnose cancers early: To match the world's best cancer survival, it's imperative that the NHS creates the right environment to reduce late stage diagnosis (stage 3 and 4). Critical to this is providing sufficient staff capacity (as noted above) as well as a significant change in approach and culture towards an NHS that embraces the need for more diagnostic testing. Assuming enough staff capacity, an NHS that best supports early diagnosis means:

- Reducing late stage diagnosis in lung and colorectal cancer – the most common cancer sites for which a large proportion of patients are diagnosed at a late stage. In England, more than 25,900 lung cancer patients and 17,600 colorectal cancer patients were diagnosed at stage 3 or 4 in 2016.
- Fulfilling the potential of the Faster Diagnosis Standard (FDS) to support faster and earlier diagnosis in a broad range of cancers. Full implementation of the FDS, a key recommendation in the cancer strategy, requires a multi-faceted approach across primary and secondary care, significant clinical and patient engagement, and a cultural shift towards testing more people with suspicious symptoms.
- Embedding services to detect more poorly served and rarer cancers. New service models such as multidisciplinary diagnostic centres (sometimes referred to as Rapid Diagnostic and Assessment Centres) are exploring better ways for patients to enter the health system for investigation, including innovative approaches to triage in community and primary care that overcome traditional interface issues with secondary care.

Emerging technologies will offer the opportunity to think radically about how the NHS supports cancer diagnosis and surveillance. Overall, it's crucial that the NHS moves at pace to make evidence-based changes that support earlier diagnosis. A principle of acceleration, while learning from evidence as it emerges, should be taken.

A world-leading innovator: Swift and equitable adoption of the latest evidence-based technologies, such as new treatments and type of diagnostic tests, will be essential to support new ways of working and the shift in priority we envisage. Testing and learning about new approaches to service delivery has been supported by the Vanguard model, creating an environment in which to innovate and share best practice – this should be bolstered.

Further, the NHS must embed a culture of research and innovation in everyday practice. Evidence suggests that patients receiving care in research-active acute NHS Trusts are more likely to experience better outcomes^{xviii}. As a single, national system the NHS holds unparalleled potential to drive research and innovation, through better support for clinical studies and use of patient data.

These ambitions should be supported by the following underpinning principles:

- **A continued drive towards networked, integrated approaches to service planning and delivery:** Cancer Alliances provide the best platform for this approach in cancer services, bringing together multiple actors across a geography to provide a more joined up approach. Breaking down boundaries at the local level and pooling budgets would enable geographies to invest appropriately in areas that would make the most impact for patient outcomes. This includes health research, health education (to support workforce needs, as outlined above), public health and, crucially, social care, all of which should be treated as equally important to improving patient outcomes. Radiotherapy Networks will also become an important structure for pull-through of innovation, diffusion of best practice and ensuring consistency in radiotherapy quality across the country.
- **Multi-year (and integrated) budgeting to support forward planning:** A move to multi-year budgeting provides an opportunity to support a genuinely transformative shift to prioritising prevention and early diagnosis and creating an NHS that is truly forward-looking and can embrace innovation. The potential of Cancer Alliances will only be realised if they have long-term funding, so they can support these changes. Alliances, up to this point, have been severely restricted by limitations in funding arrangements. Reimbursement based on shared outcomes could incentivise more joined up working across the whole health system to support this.
- **Gaining insight from patients and health professionals in the development of services:** Those experiencing care – whether receiving it or providing it – have extremely valuable insights into how the health service can be improved. Gaining this insight should be built into the structures and processes at all levels. Notably, there is an opportunity to better harness clinical expertise in the development of optimal disease pathways to provide clear guidance to Alliances on expected best practice.

How can these ambitions be achieved?

Below we have set out recommendations that the system, NHS England together with the Five Year Forward View Arms Length Bodies and the Government, should enact to bring about these improvements.

We have focused on what is achievable within the next 5 years, but the benefit may be seen further into the future. This is an important principle to follow, if we only make decisions based on what will deliver impact within 5 years then the NHS will not make the transformational shifts needed to significantly improve outcomes for patients.

A focus on the cancer workforce

A sufficiently resourced cancer workforce is fundamental to the success of the 10-year plan. For example, making significant improvements in reducing late diagnosis will require more staff in primary and secondary care to support the testing of more people. Extra capacity is not only needed to meet growing demand, but to innovate and adopt new interventions that improve patient outcomes. Workforce requirements must therefore be a central tenet of the 10-year plan.

- 1. NHS England must support Cancer Alliances and employers to deliver actions identified in the phase 1 cancer workforce plan to address urgent shortages (from 2018 to 2021)*

Increasing staff numbers: Employers need to fill vacancies and increase their staffing capacity through international recruitment, retention efforts and return to practice schemes. Progress on this should see over 5000 more staff working in cancer services (both diagnostic and treatment) by 2021. These should be underpinned by national policy, including efforts to improve morale, pay, terms and conditions, as well as marketing to attract new staff. The recent removal of the tier 2 visa cap for doctors and nurses is a welcome first step, but the wider immigration system must also support and facilitate international recruitment. The Department of Health and Social Care (DHSC) has a role in setting pay and conditions which encourage NHS staff to both join and stay in employment.

Many of these efforts can be bolstered by the recent NHS England settlement being used specifically by providers to employ more staff. Safe staffing levels could be applied to the diagnostic workforce: for example, this could help address the variation in turnaround times and interpretation of scans which was investigated recently by the CQC due to radiologist and radiographer shortages.

More widespread use of approaches to optimise skills mix: New skill mix approaches should be implemented to revise the traditional responsibilities within a team and maximise the use of health professionals' skills and training. While not a panacea to current shortages, utilising these better ways of working will likely free up some capacity and promote retention. Clinical endoscopists, pharmacist prescribing, and reporting radiographers are good examples where health professionals can work at the top of their license and make a significant contribution to diagnosis and treatment of cancer. For example, if the total annual time requirement for cancer patient consultations is 435 FTE oncologists, and 30% of the consultations could be taken by consultant therapeutic

radiographers or other advanced roles, the UK would need 131 fewer oncologists in the future (if this approach was fully implemented across all cancer services).

To achieve skills mix:

- Professional bodies should provide more (joint) guidance, and work to secure buy-in from their members.
- DHSC should ensure that contracts reflect current and increasing future workload and include protected time for Supporting Professional Activities such as service improvement, training, and clinical.
- NHS England and HEE should publicly endorse and disseminate skill mix examples to spread best practice.

Providing accelerated training schemes: HEE should be funded to create and manage more accelerated training schemes for more reporting radiographers and clinical endoscopists. The clinical endoscopy training scheme should learn from the existing programme and ensure it provides trusts with funding to backfill the endoscopists' roles and includes enhanced training so that they can conduct colonoscopies, not just gastroscopy or flexible sigmoidoscopy. These additional endoscopists will enable the delivery of better bowel screening. HEE should also continue to explore accelerated training schemes for biomedical scientists to conduct more reporting in histopathology.

2. *HEE, working with NHS England, should ensure estimates for future staffing requirements is a central part of the 10-year plan, and is funded to ensure there is a pipeline of staff to deliver diagnosis and care beyond 2021-2023.*

We welcome the progress that has been made recently, with HEE consulting on long-term plans for both the health and care workforce and the cancer workforce specifically. Detailed estimates should be produced which consider the uplift needed to support earlier diagnosis, the increasing complexity of treatments, and is based on predicted clinical need rather than on what budget is available. These plans must be funded to ensure there is a pipeline of staff to deliver diagnosis and care in the future.

HEE must also have the resource to effectively plan – ensuring that policy and practice changes include a workforce impact assessment. Nationally, there must horizon scanning of changing models and initiatives likely to impact services in the next decade to enable workforce planning to be based on future demand. As well as increasing cancer incidence, we have identified several changes that are likely to occur over the coming years that will affect workforce needs. These range from initiatives to support early diagnosis, such as targeted lung screening and optimal use of FIT in bowel screening, to the wide spread use of immunotherapy in cancer treatment. The use of genomics and artificial intelligence (AI) are also key factors to consider.

Our estimates suggest that there will need to be 45 – 300% increase on staff numbers – depending on the profession - in diagnostic and cancer treatment services by 2028. This includes GPs; radiologists; therapeutic and diagnostic radiographers; endoscopists; pathologists; medical and clinical oncologists. We will share more detail on this work shortly. This is not an exhaustive list and other professions will need to be considered that play a role in cancer care, such as nurses.

There is no question that earlier diagnosis will require more investigative tests. Evidence suggests that performing more tests at a CCG level leads to better outcomes. For example, analysis shows that (on average) oesophago-gastric cancer patients belonging to practices with the lowest rates of gastroscopy are at greater risk of poor outcomes^{xix}. The diagnostic workforce in the future will therefore need to grow faster than previously, to meet the demands of this drive for earlier diagnosis. This will likely have knock-on effects on other services, as more patients diagnosed at an early stage would need curative surgery and/or radiotherapy.

While developments such as AI may have the potential to release some capacity in diagnostic services, for example in imaging and pathology, this does not negate the impact of a growing and ageing population and the requirement to deliver more diagnostic tests. These tools are likely to augment the work of pathologists and radiologists, rather than replace them, but it may reduce the growth in that workforce that would otherwise be needed in the long term. Our recent workshop on the use of AI in radiology and pathology found that there are currently products and services undergoing research evaluation which are aiming to use AI to augment tasks undertaken by these professions.^{xx} However, at the earliest some applications may come into practice in 5 years, but for others 10 years is a potential timeline for widespread adoption.

The cancer treatments workforce will also need to grow to meet demand and provide ever more complex care, as our recent report 'Full Team Ahead' found^{xxi}. As well as providing the basis for high quality cancer treatments in the future, sufficient capacity in the workforce is also required to give staff the time to be able to take part in clinical research. This is essential if we are to be able to continue to deliver clinical trials, which will lead to better treatments that benefit patients.

A radical upgrade in prevention

The Government's Tobacco Control Plan and Tobacco Control Delivery Plan set out targets for the NHS. These targets cover implementation of NICE guidance PH48 (which promotes stop smoking support and smoke-free policies throughout acute, maternity and mental health services), training for health professionals on delivering very brief advice for smoking, and integrated referral pathways between the NHS and local authority Stop Smoking Services.

1. NHS England should ensure all NHS Trusts are smoke-free by 2020

NHS England should require all trusts to appoint a clinical smoke-free lead as soon as possible. This person should be responsible for leading action to create a smoke-free trust by 2020 (2018 for mental health trusts). This means that trusts must be identifying patients who smoke and offering them treatment to quit, supporting staff that smoke to quit, and implementing smoke-free estate policies.

NHS England should promote rolling out the 'Ottawa Model' in all secondary, maternity and mental health trusts across England to ensure that, by 2020, all trusts are identifying patients who smoke and providing them with treatment to quit on an opt-out basis. This model, as described in the Royal College of Physicians report, 'Hiding in plain sight: treating tobacco dependency in the NHS', sets out how trusts can ensure that all patients who smoke are identified and offered treatment to quit^{xxii}.

This should be delivered on an opt-out basis. It is estimated that implementing this across all UK hospitals would cost a total of £24m. Taking this cost into account, the estimated net-saving is £60m after 1 year. The cost per quitter is just £182. This model is already being adopted by the NHS in some areas across the UK, including Greater Manchester, South Yorkshire and Bassetlaw. Once patients who smoke have been discharged, they should be referred to a local Stop Smoking Service to ensure continuity of treatment (unless treatment and support can continue onsite). Pathways should be established to make this feasible.

NHS England should introduce a standard tariff for treatment of tobacco dependency in secondary and mental health care trusts before 2020 to facilitate a truly smoke-free NHS. The introduction of a standard tariff for treating tobacco dependency in secondary and mental health care trusts will incentivise health professionals to treat smoking in the long-term more effectively than a 'pay for performance' scheme such as a CQUIN. A standard tariff would facilitate universal take up of smoke-free policies in the NHS, leading to a truly smoke-free NHS.

NHS England should vocally support the use of e-cigarettes (alongside other forms of NRT, pharmacotherapy and behavioural support) as a stop smoking aid on NHS estates as soon as possible. All NHS trusts should support the use of e-cigarettes to help staff and patients comply with smoke-free policies on site.

2. NHS England should direct and support CCGs to ensure all primary care providers deliver adequate smoking cessation services

NHS England should require all CCGs to appoint a clinical smoke-free lead as soon as possible. This person should be responsible for leading action to ensure all primary care patients who smoke are supported to quit on an opt-out basis, either by treatment in the primary care setting or referral to a local authority Stop Smoking Service, if available. Pathways into local Stop Smoking Services should be established across local healthcare systems before 2020, as set out in the Tobacco Control Delivery Plan.

NHS England should issue immediate instructions to CCGs to clarify that GPs can prescribe pharmacotherapy to patients who smoke. It is essential that all smokers can access support from their GP to quit smoking. This means being able to access prescriptions for pharmacotherapy, delivered with brief advice. The British Lung Foundation's report "Less help to quit" shows that the number of GP prescriptions for stop smoking medications has fallen in England by 75% in the last decade. It also shows that there is large regional variation in prescription numbers and highlights instances of CCGs producing guidance for GPs asking them not to prescribe stop smoking medication to smokers.^{xxiii} It is important that CCGs resolve this as a matter of urgency.

NHS England should strengthen the QOF SMOK indicators in the next QOF review (we anticipate in April 2019) to incentivise GPs to deliver pharmacotherapy and brief advice to patients who smoke and/or refer them to local authority-commissioned or in-house Stop Smoking Services on an opt-out basis. GPs need to be better incentivised to identify and treat or refer patients who smoke.

- 3. NHS England should work with education providers, NHS Trusts and CCGs to ensure all health professionals get the relevant training on smoking cessation*

NHS England should support Trusts and CCGs to roll out training on smoking cessation to all health professionals in their area by January 2019, as set out in the Tobacco Control Delivery Plan. To ensure the delivery of the above, all health professionals (across primary, secondary, maternity and mental health care settings) need to receive training on how to deliver very brief advice on smoking. Health professionals with the capability to prescribe need to be able to prescribe pharmacotherapy, delivered with brief advice. Trust and CCG clinical smoke-free leads should be responsible for rolling training out to all health professionals in their area, and NHS England must support them to do this. Cancer Research UK, in conjunction with the Royal College of GPs, has developed evidence-based training modules on delivering very brief advice.^{xxiv} The NCSCT also has effective, evidence-based training at all levels readily available.

NHS England should work with relevant agencies to ensure that all undergraduate and postgraduate healthcare professional curricula covers training in smoking cessation interventions by 2022. It is vital that undergraduate and postgraduate degrees cover training in smoking cessation, so that the next cohort of health professionals have the skills and knowledge to facilitate a smoke-free NHS. The GMC is currently developing a Medical Licensing Assessment, which all undergraduate medical students will be required to pass from 2022, and it is important that smoking cessation training is adequately covered on this. It is also important that nursing degrees and postgraduate training (coordinated by the Royal Colleges) covers smoking cessation training.

- 4. The Government should provide a sustainable funding settlement for public health in the forthcoming spending review*

The 10-year plan should urge the Government to provide a sustainable funding settlement for public health in the forthcoming spending review, in the first instance by reversing cuts to the Public Health Grant. Local authorities are responsible for providing smoking cessation services in the community. These services are important because they allow people who smoke to have access to evidence-based support to quit beyond the healthcare setting. Stop Smoking Services, which offer a combination of pharmacotherapy and behavioural support, give smokers the best chances of quitting.^{xxv,xxvi} Unfortunately, these services are disappearing: Research conducted by Action for Smoking and Health and Cancer Research UK shows that budgets for Stop Smoking Services were cut by 50% of local authorities in 2017, 59% in 2016 and 39% in 2015.^{xxvii} This coincides with an in-year cut to the Public Health Grant of £200m in 2015 and year-on-year cuts of 3.9% since 2015. Cancer Research UK supports increased investment in public health in the forthcoming spending review and is urging the Government to reverse cuts to public health funding. High-quality public health services are essential for ensuring a healthy population and sustainable health and care system. We would like NHS England to support these calls.

5. *NHS England should ensure appropriate data capture and reporting of smoking prevalence, treatment and quit rates*

To monitor implementation, it is important that data is captured and reported by all trusts and CCGs, and then used to identify and address unwarranted variation. The CQC should also report on NHS smoke-free estates are part of its annual report.

NHS England should ensure that data capture and reporting systems are put in place to capture prevalence of smoking and treatment rates in secondary care settings (including mental health), including the Cancer Outcomes Dataset (COSD) before 2020. All trusts and CCGs should report annually on their smoking prevalence, treatment and quit rates. NHS England should use this data to identify unwarranted variation in smoking treatment rates in primary and secondary care, and ensure that reasons for this are addressed using the GiRFT and Right Care programmes before 2020.

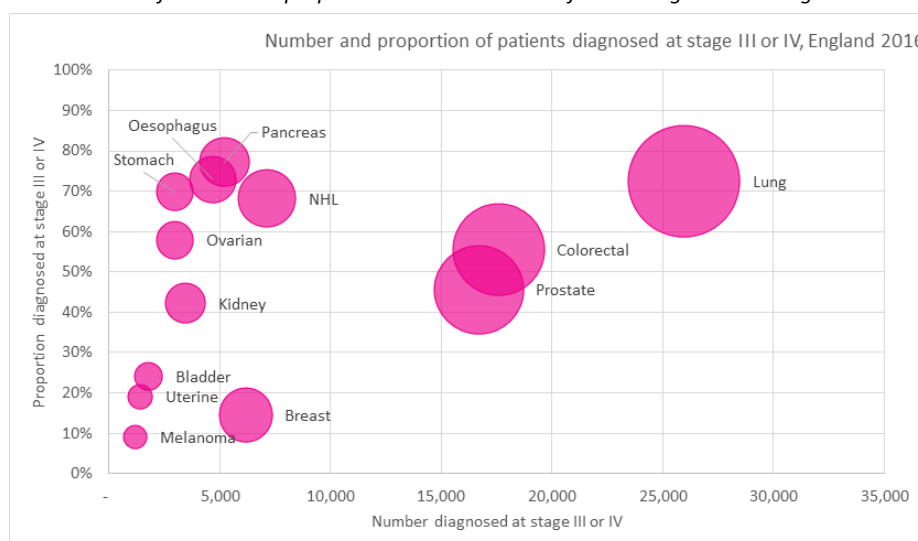
Bold efforts to diagnose earlier

Patients diagnosed early (at stage 1 and 2) have the best chance of survival. However, we tend to diagnose patients at a later stage than other comparable countries – a key reason why our survival is poorer. Substantial effort, at pace, is therefore required to reduce late diagnosis and intercept disease when it is most treatable. This will require the NHS to provide more tests, as well as a clear shift in approach and culture. As outlined above, significant improvements will not be made without sufficient workforce capacity.

1. *NHS England should reduce late diagnosis in lung and colorectal cancer*

Lung and colorectal cancer are good examples of where there is huge potential to improve outcomes for thousands of patients by reducing late diagnosis. They are two of the most common cancer sites for which a large proportion of patients are diagnosed at a late stage (72% and 56% of patients with those respective cancer sites; see Fig. 1). In England, more than 25,900 lung cancer patients and 17,600 colorectal cancer patients were diagnosed at stage 3 or 4 in 2016.

Figure 1. Number (x-axis) and proportion (y-axis) of patients diagnosed at stage 3 or 4, England 2016. Size of the circle is proportional to the number of cases diagnosed at stage 3 or 4.



Survival for these cancers types is better when diagnosed at an earlier stage. For instance, when diagnosed at stage 1, around 4 in 10 (40%) lung cancer patients survive their cancer for at least 5 years, but this falls to below 1 in 10 (1%) for patients diagnosed at stage 4 (these figures are 96% and 8% respectively for colorectal cancer).

There are several interventions that should be built upon or accelerated to achieve earlier diagnosis in these cancers. We have outlined the major ones, however, there will still be a need for other interventions, for example public awareness campaigns on lung cancer symptoms.

Targeted lung cancer screening: Several local projects in England and international trials have been exploring ways to diagnose lung cancer in people who are at high-risk of the disease because of their smoking history. For those eligible, a low-dose CT scan would be performed. Trials have shown this intervention diagnoses lung cancers at an earlier stage - which means that more patients are likely to be eligible for surgery or radiotherapy as a curative treatment. It also offers the opportunity for smoking cessation advice.

Subject to robust evaluation of current pilots, NHS England should plan for swift and wide roll out across the NHS. This will require increase in capacity. For example, if targeted lung screening is offered to all eligible 55 – 80-year olds, this could mean 2.3 million more CT scans every year. In 2014 – 2019, if guidelines were followed, there should have been a 40% increase in the number of endoscopies conducted.

Optimal use of the faecal immunochemical test (FIT) in bowel screening: NHS England should accelerate the adoption of FIT, underpinned by sufficient endoscopy capacity. This will mean that the potential of FIT can be realised in picking up more cancers (or precancerous changes) at an earlier stage.

To achieve optimal bowel cancer prevention and early diagnosis, FIT thresholds will need to be more sensitive than current plans for 120µg/g, and screening offered to a wider age range (including people from 50). If the threshold was lowered to the 80µg/g, compared with 120µg/g, we estimate that around 1,100 more cancers could be detected through the bowel screening programme each year. Further, 6,700 more patients detected with 'advanced' adenomas (precancerous changes that are high risk for developing into cancer). There would be larger gains in cancer and adenoma detection when the threshold is lowered further. For instance, compared with the threshold of 120µg/g, if it was lowered to 20µg/g in England, it's estimated that around 3,300 more cancers and 34,000 more advanced adenomas could potentially be detected through screening each year.

Public Health England should also develop interventions to improve bowel screening uptake, such as endorsement letters and marketing – especially when these narrow inequalities and encourage those less likely to take part (i.e. men and people from lower socio-economic groups). There is value in these interventions being tailored to specific populations within regions, in addition to national campaigns.

2. *NHS England should realise the potential of implementing the Faster Diagnosis Standard across the NHS*

The introduction of the Faster Diagnosis Standard (FDS) is a key recommendation from the cancer strategy and must be a priority within the 10-year plan. The FDS has huge potential to support swifter and earlier diagnosis of a broad range of cancers by enabling and incentivising changes in primary and secondary care. Its success will be underpinned by improvements needed in several areas, each of which will support efforts to diagnose patients earlier:

- More capacity in primary care, particularly for GPs to spend more time with patients;
- Greater support for GPs to refer at lower threshold of suspicion, based on the NICE ‘Suspected Cancer Recognition and Referral Guidelines’ (NG12); these are not in use everywhere, and we know that not all CCGs have updated their referral forms.
- Addressing variation in GPs being able to use all the pathways recommended by NICE, such as direct access to some tests.^{xxviii}
- Greater capacity in diagnostic services to investigate more people. We also know that GPs are having referrals bounced back^{xxix} – suggesting that constrained diagnostic capacity and cultural challenges also limits the ability to follow these guidelines.

Concerted effort is needed now to secure the definitions that the FDS will measure, through patient and clinician engagement. Learnings from our ACE programme should also be used to inform this.

3. *NHS England should look to embed services that support the diagnosis of cancers that tend to have non-specific symptoms*

Multidisciplinary Diagnostic Centres (MDCs) or Rapid Diagnostic and Assessment Centres (RDACs) are exploring better ways for patients to enter the health system for investigation, including innovative approaches to triage in community and primary care that overcome traditional interface issues with secondary care. These new models are proving invaluable for detecting more poorly served and rarer cancers as well as other diseases, notably mental illness. Subject to evaluation, and as our ACE programme developed further evidence, NHS England should look to roll these out at pace across the country.

A world-leading adopter of new technology

1. *NHS England must develop a sustainable long-term funding solution so that radiotherapy machines can be upgraded on a rolling basis to ensure patients have the latest techniques. Funding must also be found to provide the right IT infrastructure to enable interoperability between providers.*

Access to advanced radiotherapy has improved markedly in recent years, thanks to coordinated investment and prioritisation. However, access to some modern radiotherapy such as Intensity-Modulated Radiotherapy (IMRT) remains lower than it should be. The Radiotherapy Board estimates that just over 50% of radically treated patients should receive IMRT^{xxx}, but latest figures estimate access to be around 44%. There is also still significant variation in access across England, varying

between 23% and 69% across Clinical Commissioning Groups^{xxxii}. It is not yet clear how much of this variation is unwarranted, which highlights the need for better routine monitoring of treatment quality and uptake.

New Radiotherapy Networks will be important for benchmarking equity of access, quality of radiotherapy and the use of modern radiotherapy techniques. While we support the establishment of these Networks, they will not succeed without the necessary IT infrastructure to support networking between centres. For a relatively minimal investment, upgrading IT infrastructure and ensuring interoperability would give the new Radiotherapy Networks the ability to collaborate fully, promoting consistency and improving patient experience by minimising the number of patients who would need to travel for treatment. We are also hopeful that this could support NHS England's ambitions to improve recruitment into clinical trials.

Furthermore, there is still a need for a sustainable solution for radiotherapy services. NHS England's £130m investment in replacing and upgrading old linear accelerators (LINACs) was welcome, however it is a short-term solution. As recommended in the cancer strategy for England, we would like to see NHS England commence a rolling programme of replacements for LINACs. We would also like to see a rolling programme of upgrades to IT infrastructure, which will be a crucial enabler of networking. Finally, there is also a need to review the national tariff for radiotherapy: since payment is currently managed per fraction, there is a disincentive to perform clinical trials exploring hypofractionation.

- 2. NHS England and NICE should build on current efforts to improve patient access to cancer medicines and address the problem of long-term affordability of new cancer drugs to the NHS.*

It is important that patients of the future have access to the best evidence-based drugs available for their condition. The UK is in a strong position to lead the way: around 25% of the world's top 100 prescription medicines were discovered and developed in the UK^{xxxiii}, and the UK is a priority launch market for new cancer drugs – only three countries (the US, Germany and the UK) have access to more than 40 of the 55 oncology medicines initially launched between 2012 and 2016.

However, research suggests that patient uptake of the newest cancer drugs is slower in the UK than in other G5 countries^{xxxiii}. There is also significant geographical variation in access to medicines. For example, there is a five-fold difference in the use of chemotherapy between the highest- and lowest-prescribing cancer geographies^{xxxiv}. There is limited routine monitoring of uptake of cancer drugs, other than in the Cancer Drugs Fund – which may contribute to lower uptake in the UK.

Managed access schemes, like the reformed Cancer Drugs Fund (CDF), provide earlier access to a drug while further evidence of its clinical effectiveness is gathered from both ongoing clinical trials and real-world clinical use. Medicines approved through the CDF are given conditional approval for up to two years, while data is gathered, to support a reassessment at the end of that period. We are supportive of the reforms made to the CDF^{xxxv} and are monitoring it closely to assess the impact of the changes. Emerging evidence suggests that these reforms are helping accelerate patient access to

innovative medicines: according to NHS England, around 5,000 patients received treatment sooner than they would have under the previous CDF system between July 2016 and January 2018^{xxxvi}.

In the longer term, we hope that this managed access fund model could be used as a test bed for new pricing mechanisms, since it involves gathering real-world evidence that can be used in pricing negotiations^{xxxvii}. We would like to see this model extended so that more pricing decisions are based on real-world evidence, in addition to evidence from clinical trials. CRUK is exploring the feasibility of outcomes-based pricing for cancer drugs in partnership with the Greater Manchester Health and Social Care Partnership^{xxxviii} and will have more detail in the coming years. However, these approaches rely on high-quality, routinely-collected data.

Public Health England's Systemic Anti-Cancer Therapy (SACT) dataset is a world-leading resource and has the capability to underpin these changes. However, it requires improvement in completeness and accuracy to realise this potential. We would support an upgrade of the SACT dataset, which would lead to a more detailed picture of cancer treatment, including robust information about dosage, biomarker status, patient demographics and eventual outcome. This should also focus on building stronger links between NHS England and Public Health England, to improve monitoring of uptake for cancer drugs and reducing geographic variation in prescribing. An upgraded SACT dataset could also be used to support new uses of technology and future conversations about pricing and reimbursement, including novel pricing mechanisms.

The system also must be set up to support access to certain medicines. Precision medicines can treat some patients' cancer more effectively than conventional chemotherapy. Today, there are a handful of these types of drugs available in the NHS and they make up 90% of the late phase global oncology pipeline.^{xxxix} We urge NHS England to work at pace to implement the new genomic testing services in England, to create a system that provides a consistent approach to precision medicine for patients.

There is also variable uptake of inexpensive, off-patent medicines, such as bisphosphonates and tamoxifen, which can both be used to reduce the risk of cancer returning or developing in the first place. FOI data suggests that only 20% of CCGs are routinely commissioning bisphosphonates^{xl}.

New and optimised models of service delivery

- 1. NHS England must ensure that Cancer Alliances are sufficiently funded and resourced in the long-term, so they can fulfil their potential in delivering transformation in cancer services.*

Cancer Alliances were established to bring together key partners at a subregional level, including commissioners, providers and patients to drive and support improvement, and integrate care pathways. These organisations are intended to break down barriers between different NHS bodies to reduce unwarranted local variation and to enable the delivery of a more effective service that is more responsive to the needs of patients. NHS England should prioritise ensuring that Cancer Alliances baseline funding is sufficient and sustained, with a multiyear budget to ensure they can work effectively.

Sustainability and Transformation Partnerships (STP) are an important part of efforts to better integrate care planning and delivery. One aspect of STPs which we believe is critical to the future shape of the health service is the joint working between the health service and local authorities that they are intended to facilitate. This is key to delivering public health. Effective engagement between STPs and local authorities is essential both to creating a shared approach to public health and to the effective commissioning of services. A new long-term plan for the NHS should include measures to make this joint-working more effective.

2. *NHS England should continue work to reform multidisciplinary team meetings to ensure they meet the needs of the changing population*

MDTs are at the centre of cancer services across the UK. However, they are under significant pressure, with meetings increasingly rushed thanks to rising and increasingly complex caseload and little additional resource. There is an urgent need to reform MDT meetings to make them fit for the future; we are pleased to see that NHS England have made progress on this following CRUK's recent report^{xli} and look forward to engaging further.

3. *NHS England should pilot the routine usage of geriatric assessments for older people with cancer and should seek to gather further evidence of the relative benefits of different tools.*

As the patient population changes, services must adapt to make sure they are meeting every person's needs and that no group is left behind. Now and in the future, it is crucial that older people with cancer are given the support they need to access the most appropriate treatment for them, and to have the best possible experience of care. As previously discussed, there are already age-related inequalities in both survival and access to cancer treatments.

Older people with cancer are more likely to have complex medical and social needs, which can mean they require additional support to access treatment. In recent research on the needs of older people with cancer, we found that a lack of social and practical support can be a barrier to accessing cancer treatment. An underlying issue is that these complex needs are not consistently factored into treatment decision-making. This is partly because services lack the right tools to assess frailty in the cancer setting, and Comprehensive Geriatric Assessments are still rarely used in oncology. This is important: it is widely recognised that chronological age alone is not a strong indicator of how well a person will tolerate cancer treatment^{xliii}.

Embedding research in NHS practice

1. *NHS England and DHSC should ensure embedding research is a central tenet of the 10-year plan, building on NHS England's plans published in 2017 and implementing recommendations from the Life Sciences Industrial Strategy*

Supporting research and innovation in the health service is key to ensuring that patients can access the most modern, high-quality interventions and achieve the best possible outcomes. The NHS is not short of creativity and new ideas, but it is currently set up to provide the best possible healthcare within an ultimately fixed budget envelope. The new multi-year funding settlement offers an

opportunity to change the objectives of the NHS, making it a healthcare system that attempts to deliver world-class outcomes and, by doing so, provides a platform for research and for economic growth.

The Life Sciences Industrial Strategy identifies how to improve research and innovation in the UK economy and in the NHS. Implementing this strategy is essential to ensuring that we have a thriving life sciences sector. A key part of this will be increasing the investment in health research through the National Institute of Health Research (NIHR) as part of the forthcoming budget. Of relevance in cancer specifically is the prospect of a platform to support research into early detection of disease – this could be transformational in the development of new diagnostics and ultimately to achieve ambitions to diagnose more patients at an early stage. The Government must provide the necessary investment to support their implementation, which must be in addition to the investment the NHS requires to meet growing demand. This should be reflected in the new multi-year funding settlement for the NHS.

In the short term, NHS should set out steps to build on the research strategy published by NHS England in 2017. An immediate focus should be for NHS England to bring forward the necessary changes to meet the costs of Excess Treatment Costs of clinical trials. NHS England should also consider how to deliver investment to ensure that our research capabilities are fit for the long-term, for example by ensuring that we have sufficient research workforce and that our infrastructure supports new forms of trials such as adaptive/platform trials and trials for stratified medicine.

The barriers, real and perceived, to carrying out research are clearly documented in published reports by CRUK and others^{xliii}. For example, a Royal College Physicians survey (2015) of almost 2,000 doctors of all specialities and career stages found that doctors reported key overall barriers are a lack of time, funding and skills support.^{xliv} We also know that too often research is seen by commissioners and senior staff as ‘extra’ on top of service provision.^{xlv} Furthermore, Trusts report turning down the opportunity to participate in clinical trials because of staff shortages.^{xlvi} As discussed above, greater workforce capacity is crucial to deliver better care, as well as provide the space for health professionals to take part in research. Additional solutions, over and above the number of staff, will also be needed to embed the right culture in the NHS and provide adequate time in within jobs for research.

We need a thriving research sector to keep the NHS at the cutting edge of medical treatment. As we leave the European Union, it is essential to ensure that researchers can continue to collaborate across borders to carry out life-saving research. It is vital the UK fully aligns with the new EU Clinical Trial Regulation, including negotiating access to EU networks and databases. Over 4,800 UK-EU clinical trials took place between 2004 and 2016, and 28% of CRUK’s trials involve patients from at least one other EU country^{xlvii}.

Fulfilling the potential provided by data and intelligence

1. *NHS England, Public Health England and NHS Digital should set out clear plans to harness the potential of high quality data in the NHS.*

Delivery of NHS care, and research and innovation to improve this, must be underpinned by the effective use of high quality data. The information routinely collected by the NHS, in national datasets and in medical records, is vital for research into the causes of disease, improving the effectiveness of treatments and interventions, and evaluating the quality of services. The NHS could do a lot more to realise the potential of the vast amounts of data it collects and overcome difficulties with linking datasets.

Fundamentally, the NHS must move to digital ways of working and get better at managing, sharing and using data. This will unlock efficiencies and enable many of the new technologies described above. We support the recommendations of the Wachter review and its overall messages that successful digitisation requires careful planning and investment, as well as a strong informatics workforce^{xlviii}.

NHS investment in data collection and analysis represents a small proportion of overall budgets. This spend sits with NHS Digital and Public Health England, which have seen real terms budget cuts, including to the National Cancer Registration Service. The plan must ensure adequate investment in the management of information that will allow better use of new investment in the rest of the NHS. For cancer, this should be focused on the quality of treatment data, especially SACT and the radiotherapy dataset (RTDS).

Data also needs meaningful analysis to convert it into intelligence that guides action. We have welcomed the formation by NHS England and Public Health England of the Cancer Alliance Data, Evidence and Analysis Service (CADEAS). This has made a good start on providing comparative national data to Cancer Alliances and other stakeholders but is still at an early stage of development. The plan needs to continue to build the NHS's capacity to convert data in a timelier way into actionable intelligence. This requires investment in an appropriately skilled informatics workforce and funding for posts at both national and STP / Cancer Alliance level.

With the NHS as a single provider, and with a large, socially and ethnically diverse population, the UK has the potential to become a world-leading centre for innovative digital healthcare. This could increase efficiency, attract investment, create jobs and improve patient experience. It has also been found that digitally facilitated research can lead to substantial efficiency savings^{xlix}. However, even experienced researchers running major national studies experience continual delays and frustrations in accessing data from the NHS. While processes must be robust, they must all be proportionate and efficient. Currently NHS Digital and Public Health England run separate, overlapping application processes. The NHS plan should commit to working with Health Data Research UK to provide a single point of application to NHS data.

Ensuring public and professional trust in the use of patient data must be a priority for the Government and the NHS: engagement with patients and health professionals; clear decision-making processes; transparency in how data are used; and carefully planned communications, are key to ensuring support. We support the intention of the new Data Protection Bill and the new national data opt-out for health and social care, and hope both will be implemented in a way that does not inadvertently harm the use of data for research and innovation.

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