NHS
Health Education England

Strategic Framework for Cancer Workforce

Interim working paper July 2018, not official or final HEE position

What's in this report...

Overall aims

- In December 2017, HEE published phase 1 of the Cancer Workforce strategy, focussing on the short-term actions required to deliver funded commitments by 2021. We promised **phase 2 would follow, focussing on the longer-term workforce needs beyond 2021, based on forecast patient demand.** This work began with partners in January 2018.

- On 11 June 2018, Prime Minister Theresa May announced a new five-year settlement for the NHS, giving the service real-terms growth averaging **3.4%** per year. **The funding was for the NHS England commissioning Budget only and did not include capital, public health, workforce or social care.**

- In July 2018, the NHS was tasked with developing a 10-year plan, (which later became the Long Term Plan, covering a five-year period) setting out how the service intends to deliver major improvements in key areas including transforming cancer care, to be followed by a multi-year workforce plan (which subsequently became The People Plan).

- **HEE concluded the work on Phase two and submitted it as an interim working paper to NHS England to inform The Long-Term Plan (LTP).** The LTP has since been published, as has the Interim People Plan, the Topol Review on the Digital future, and we now know what HEE's settlement is for 2020/21. We also have a new PM and Secretary of State for Health.

- **In short, the world has moved on.** Much of the analysis is now out of date and the People Plan is effectively 'phase 2' of the cancer strategy. Nevertheless, many of the long-term challenges remain, so **we are making this interim working paper from 2018 available in the interests of transparency, and to provide a framework for future discussion and analysis beyond the LTP.**

Report on a page: Based upon HEE's call for evidence and subsequent seminars and interviews with key experts and stakeholders, our emerging hypotheses are that…

Exam Question: what workforce do we need to improve prevention, early diagnosis, treatment, outcomes and experience of cancer for all?

Demand

The volume and complexity of demand for cancer services is set to rise, as the incidence of cancer increases by 2% p.a. amongst a growing, ageing population with more co-morbidities, increased mortality and potential re-occurrence.

Early diagnosis and better outcomes means activity will be 'redistributed' across the patient pathway rather than completely removed. Although developments in IT, digital and AI will support clinicians to be more productive, genomics, plus increased expectations, will drive more personalised medicine, requiring not just new roles, but also an increase in numbers and skills to meet the increased demand (depth not just breadth). Future service models will impact upon demand, so we will work with NHSE to align assumptions as part of the ten-year plan.

Key strategic supply questions

- The size of the pie: How many health care professionals will be needed? What scale of growth will be required to meet the forecast increase demand?
- What new skills and new roles will be needed in different parts of the pathway?
- What skills/tasks could be delegated or supported by AI and other innovations?
- Where should staff/resource be distributed across the four parts of the pathway?
- Tactical but mission critical: how do we source supply?

Conclusion

Overall, the workforce has grown over the past ten years, but this growth has been characterised by 'boom and bust' and has varied between professions and geographies. Agreeing a multi-year funding settlement for workforce will allow for consistent, stable growth aligned to the delivery of policy outcomes. In advance of the ten-year plan, we need to be clear about what can be delivered by different levels of workforce growth which we have previously said needs to be between 3-5% p.a. In crude terms, 15% aggregate growth over the next ten years may be sufficient to meet forecast demand but does not allow for new ambitions or service improvements. 30% aggregate growth over the next ten years may be sufficient to meet forecast demand and support improvements in some priority areas but with limited opportunity for systemic transformation. To deliver world class cancer services for all patients is likely to require aggregate workforce growth in the order of at least 45% over the next ten years. This level of growth will allow the service to a) 'catch up' and fill existing gaps to meet current needs; b) meet future forecast demand and c) create the conditions for a transformational step change, so staff have the time and resources to care and learn, with the opportunity to develop new skills and roles to support life-long flexible careers and better cancer outcomes for all.

In December 2017, we published Phase 1 of the cancer workforce plan, identifying **7 professions for action in the short-term to deliver the cancer strategy by 2021**

For each of the occupational areas outlined in the plan, (histopathology, gastroenterology, clinical radiology, diagnostic radiography, therapeutic radiography, clinical and medical oncology and nursing, a 'waterfall' graph was developed to express the potential inflow and outflow of the workforce (by rolling forward observable history), before setting out **the likely 'net supply' by 2021 if no further action was taken.**

We assessed the forecast 'net supply' and agreed that **in all seven areas the supply was unlikely to be sufficient to deliver the improvements** in diagnosis and treatment set out in the Cancer Strategy by 2021 unless further action was taken.

We then **identified the most impactful levers for each profession** and agreed a set of actions with partners most likely to increase net supply by 2021 (focusing on short and medium-term actions to better utilise existing capacity) such as improved retention or reduced attrition from training.

Except for nursing, as we did not have enough data about the nursing cancer workforce at the time of going to print (but this is now included on pages 35 – 47).

These national ambitions now form the basis for workforce plans currently being developed by the regional offices of HEE to support Cancer Alliances and the delivery of the Cancer Strategy by 2021 as set out in the next slide.

Phase 1 forms the basis of our regional workforce plans to deliver 1,490 additional consultants and clinicians by 2021

The 'do nothing' outcome, is the projected supply of those in the system if we do nothing more than let the 'observed trends' of the past five years continue. So if we take no further action in Histopathology, for example we are likely to see a reduction of around 40 FTE posts.

The New Actions in the Education Pipeline, highlight the potential increase in supply that may be achieved in the next three years if we reduce attrition out of training, and improve the rate of transition into employment into the NHS, once they have completed training. For instance, improving the **'leaky-pipeline,'** could improve the supply of clinical radiologists by 56 FTE posts.

The New Actions in the Recruitment & Retention, highlight a series of actions that could be undertaken to improve the 'stock' of people in these key occupations. Four possible routes were identified that could reduce the **'leaky bucket'.** The initiatives include; reduced retirement, retention, recruitment of non-NHS, international recruitment. By improving on these areas, around 400 FTE, posts could be created in the consultancy workforce and 640 FTE in Therapeutic and Diagnostic Radiographers.

OCCUPATION	DO NOTHING		NEW ACTIONS – EDUCATION PIPELINE			NEW ACTIONS – RECRUITMENT & RETENTION							
	Baseline	% Increase	Attrition	Employment	Leaky Pipeline	Reduced Retirement	Retention	Additional Recruit Non-NHS	Additional Recruit International	Leaky Bucket	Total New Actions	Total Additional Supply	% Increase
Histopathology	-40	-3.4%	16	10	26	11	11	26	20	68	94	54	4.6%
Gastroenterology	243	22.8%	11	19	30	6	11	14	12	43	73	316	29.7%
Clinical Radiology	376	13.4%	23	33	56	18	29	69	120	236	292	668	23.8%
Clinical & Medical Oncology	167	16%	9	13	22	6	12	18	18	54	76	243	23.3%
Total Consultants	746	12.3%	59	75	134	41	63	127	170	401	535	1281	21.1%
Diagnostic Radiography	1447	10.6%	248		248	64	379		89	532	780	2227	16.3%
Therapeutic Radiography	443	16.8%	68		68	8	75		24	107	175	618	23.5%
Total Radiography	1890	11.6%	316	0	316	72	454	0	113	639	955	2845	17.5%
Overall Total	2636	11.8%	375	75	450	113	517	127	283	1040	1490	4126	18.5%

Phase 2: Beyond 2021

The phase 1 report set out the short-term actions necessary to deliver the funded policy objectives set out in the Cancer Strategy by 2021. HEE committed to producing a longer-term cancer workforce plan, **using forecast patient need beyond 2021 as our demand line** (phase 2). We also promised to consider nursing in the light of the Macmillan census.

This document sets out a **strategic framework for consultation** in advance of the NHS 10-year plan and HEE's wider workforce strategy, setting out the key workforce challenges and choices if the UK is to match the best in Europe for cancer outcomes.

Once we have further clarity on the scale of growth we might expect from the multi-year funding for clinical places, the relative level of investment in new roles/skills and life-long learning and agreement on the assumed impact of AI, genomics and future service models and ambitions as set out in the NHS 10-year plan, we will work with partners to **produce more detailed workforce plans where necessary.**

To date, NHS Workforce planning decisions have been made in the context of:

1} **Short-term affordability.** HEE was established in 2012 to take its 'demand line' from local employers, based not on forecast patient need, but the amount of posts Trusts intended to establish in the short-term. Demand has become a proxy for affordability resulting in a mis-alignment between policy objectives and workforce availability.

2} **Assumed or agreed impacts of technology and innovation** on key professions – with different implicit assumptions underpinning different planning processes.

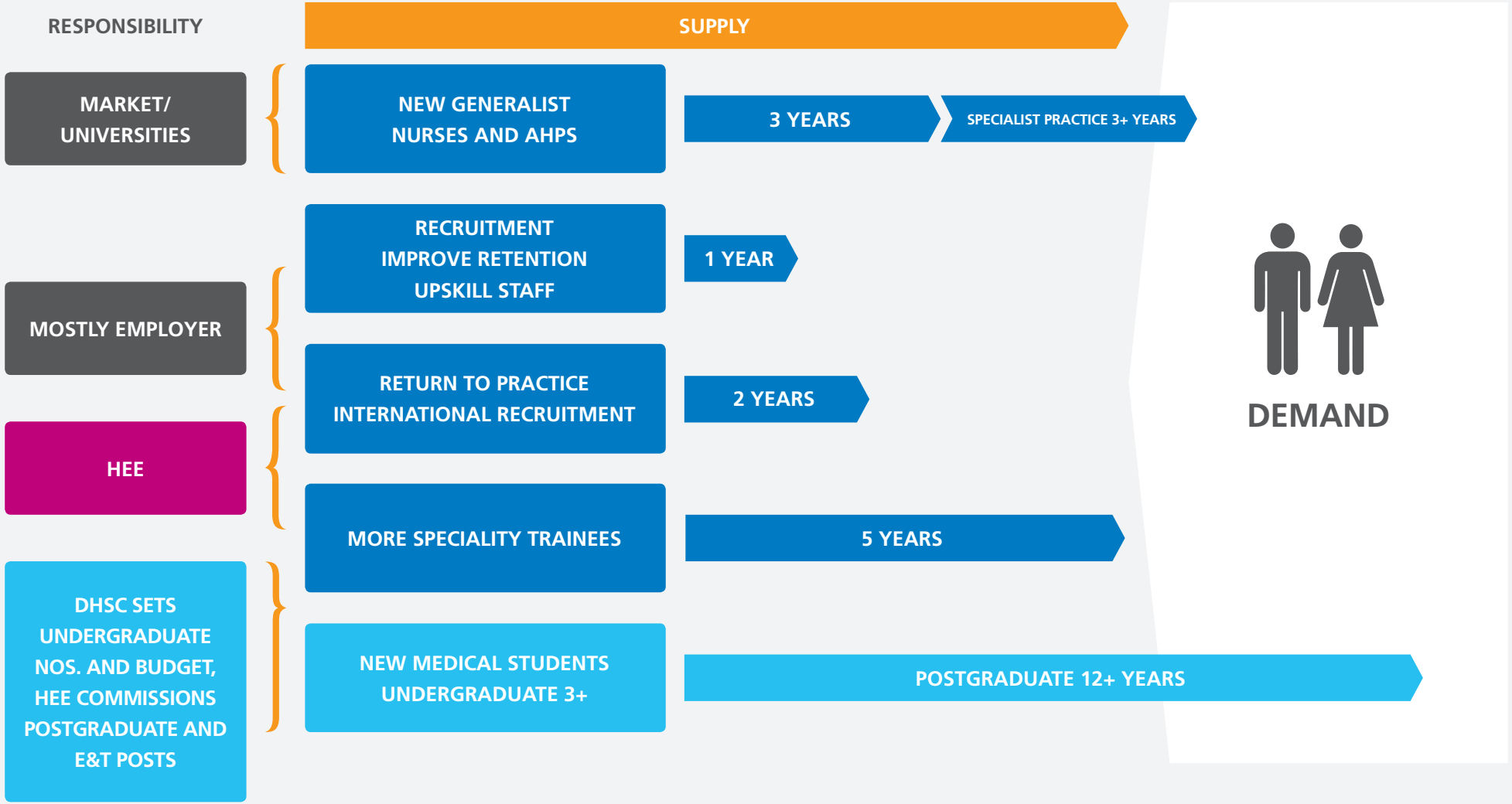
3} **Assumed or agreed service models** to deliver service priorities as set out by NHS England and/or Government (which rarely include the full costs of workforce).

4} **Assumed levels of NHS funding/capacity over the long-term.** As NHS budgets are typically set over 1-3 years and it takes fifteen years to train a consultant from scratch, the system has generally erred on the side of conservative rather than ambitious assumptions about future funding levels.

The combined impact of 1-4 has led to **'boom and bust'** in the workforce, increasing the risk of a gap between real demand (need rather than affordability) and supply (qualified staff). **Investment in the workforce has not been aligned with service ambitions and planning.** Agreeing a multi-year investment plan for all professions would be a more sustainable and flexible way of ensuring supply meets demand, although in the longer-term, planning should be viewed through the lens of patient needs.

BACKGROUND / THE LEVERS FOR WORKFORCE PLANNING ARE NOW DISTRIBUTED ACROSS THE SYSTEM

Because of the time it takes to train clinicians and the global, competitive market for their skills, and the fact that our levers for action are now distributed across the system, there is no easy, cheap or quick fix once gaps in the workforce emerge. Long-term workforce planning (light blue) is therefore a necessary gamble on the future, built on assumptions about decisions that have not yet been taken (budgets, future service models and skill mix) and reliant on the actions of others (Government, employers, HEIs etc.)



Call for evidence for phase 2

In phase 1, 'demand' was determined by the funded Cancer Strategy to better align workforce planning with forecast patient need. For phase 2, HEE made a call for evidence for the 5 key drivers of change we identified in our Strategic Framework 15 beyond 2021 to inform our demand line.

Demographics (population profiles)

Technology and Innovation

Current and future service models

Expectations (patients or staff)

HEE Strategic Framework 15

We received **27 submissions from charities,** Royal Colleges, universities and Cancer Alliances and carried out an **extensive desk top literature review. Thank you to all.**

Broadly, this revealed a **high degree of consensus** on future demographics, consensus on the key variables in social, political, economic and environmental, and emerging agreement re: future patient and staff expectations.

However there were **diverging views** on future impact of technology and innovation and **incomplete information** on future service models.

Building on four seminars and further work with partners, this report sets out our initial thinking on the long-term cancer workforce strategy for consultation.

Our starting point is the forecast needs of future patients and their carers.

There's a growing consensus about future cancer demand

Key messages	Past and present	Forecast trends
OUR POPULATION IS GROWING	BY 2016 THE UK POPULATION HAD REACHED 65.6M	IT IS ESTIMATED THAT OUR POPULATION WILL RISE TO AROUND 69.2M BY 2026
THE POPULATION IS GETTING OLDER	IN 2016 18% OF THE POPULATION WERE AGED 65 AND OLDER; THE OVER 85 AGE GROUP COMPRISED 2.4% OF THE POPULATION.	THE PROPORTION OF PEOPLE WHO ARE AGED OVER 85 IS PROJECTED TO DOUBLE OVER THE NEXT 25 YEARS.
CANCER INCIDENCE IS GOING TO RISE 2% PA	CANCER INCIDENCE RATES HAVE INCREASED BY 12% SINCE THE EARLY 90S. IN 2015 THERE WERE APPROXIMATELY 360,000 NEW CASES OF CANCER IN THE UK.	THERE WILL BE A PROJECTED ADDITIONAL 514,000 NEW CASES OF CANCER PER YEAR BY 2035, (2% CUMULATIVE) [IF CURRENT TRENDS ON OBESITY CONTINUE THIS COULD RISE TO 670,000 CANCERS BY 2035].
CANCER MORTALITY RATES WILL DECREASE, AS MORE PEOPLE SURVIVE.	IN THE 1970S, ONLY 25% SURVIVED CANCER FOR >10 YEARS.	NOW 50% OF PEOPLE SURVIVE FOR >10 YEARS. MORE THAN THREE TIMES THE AMOUNT OF OVER 65s WILL BE LIVING WITH CANCER BY 2040 (4.1M). AT THE SAME TIME, ONE ESTIMATE PROJECTS THAT FOR ALL CANCERS COMBINED OVERALL MORTALITY RATES WILL FALL BY AROUND 15% 2014-2035.
THE NUMBERS OF PEOPLE LIVING WITH MULTIPLE CONDITIONS WILL GROW	IN 2015, THE PROPORTION OF THOSE AGED OVER 65 LIVING WITH MORE THAN FOUR CONDITIONS WAS 9.8%.	IT IS ESTIMATED THAT BY 2035, 17% OF THOSE AGED OVER 65 WILL LIVE WITH FOUR OR MORE LONG-TERM CONDITIONS (A DOUBLING OF THE FIGURE).

The needs of patients are changing

A new approach: the Three Cancer Groups

Macmillan's Three Cancer Groups' analysis aimed to generalise the more than 200 existing cancers into groups that are primarily based on survival data in order to facilitate service design.

The three types of cancer identified were:

The longer-term survival group which includes cancers where 80% of people live five years or more and many go on to live at least a decade

The shorter-term survival group includes cancers where fewer than 50% of people survive a year

The intermediate survival group experience moderate survival where one year survival is over 50% but less than 90%

As well as cancer groups with different survival outcomes, people with suspected cancer can also be divided into cohorts, as their symptoms may be more/less difficult to diagnose.

Creating different demands on the workforce

The nature and role of our workforce will need to transform in order to embrace increased survivorship, as people affected by cancer will need not just care and palliation, but rehabilitation, with support to return to work/school/living, alongside ongoing monitoring and the fear that cancer may return. **The NHS will need to support people to live their best lives, rather than turning their needs into a series of out-patient appointments.** This means we need to look beyond the traditional cancer workforce to consider psychiatry and counselling, occupational therapists, physiotherapists, health coaching, community and social support and prescribing, to name but a few.

Individuals and their carers will require a **more joined-up (and ongoing) support** from physical and mental health and social services **built around the needs of people,** and our staff will need support to develop the appropriate knowledge and communication skills to support them.

But the future level and nature of demand is not set in stone.

We can reduce the level of forecast demand through prevention.

According to Cancer Research UK (CRUK), four-in-10 cancers could be prevented. Smoking causes 60,000 cases of cancer every year in the UK and is a risk factor for 14 cancer types. Being overweight or obese causes around 20,000 cases of cancer each year, is a risk factor for 13 different types and could cause an extra 670,000 cancers by 2035. However, it would take at least 10-15 years for public health measures to have a visible impact.

We can change the nature of forecast demand (and outcomes) through earlier diagnosis.

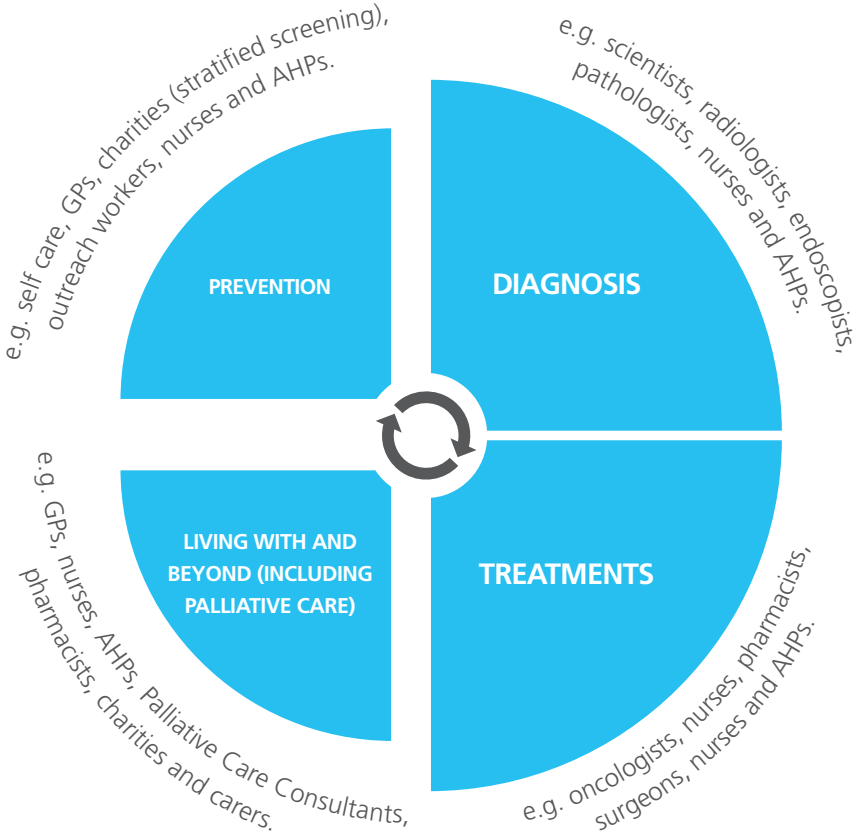
70% of patients diagnosed at stage 1 are likely to have surgery and just 12% have chemotherapy, compared to 39% of patients diagnosed at stage 4 having chemotherapy and only 13% receiving surgery. An increase in early diagnosis could improve outcomes but also increase demand for surgery and/or radiotherapy.

Technology and innovation (treatments/ roles/service models) may transform how we respond to demand.

New diagnostic techniques and processes such as Faecal Immunochemical Tests (FIT) and multi-diagnostic centres, using biomarkers, blood or other samples for earlier detection (GRAIL) and the rise of chemo-preventative drugs may improve outcomes and short-medium-term NHS costs.

The extent to which future service models focus on prevention, earlier diagnosis and/ or use new technologies and innovations will impact on demand. We will work with NHSE to align assumptions as service models emerge

Demand is distributed across the pathway of care, but our workforce tends to be concentrated in the acute sector and focussed on diagnosis and treatment rather than prevention



There are four strategic questions we need to answer in order to shape long-term planning (and tactical but mission critical decisions about how to source supply):

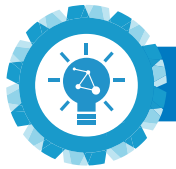
The size of the pie: How many health care professionals will be needed? What scale of growth will be required to meet the forecast increase demand?

What new skills and new roles will be needed in different parts of the pathway?

What skills/tasks could be delegated or supported by AI and other innovations?

Where should staff/resource be distributed across the four parts of the pathway? i.e. should we be investing more in prevention?

The assumed impact of technology and innovation will help determine the answers, as will the service model. For example, will GPs remain the gatekeepers to cancer diagnosis or do we expect to see more direct access to diagnostic tests? The former requires greater investment in GP skills and numbers, the latter more investment in outreach workers.



Predicting the future is hard...

Nuffield Trust predictions in 1999

In the 1990s, the Nuffield Trust established a Policy and Evaluation Advisory Group (PEAG) and published a series of predictions 1999 looking forward to 2015.

Nuffield predicted in 1999	What happened
Greater concentration of specialist expertise and equipment	There is a greater consensus that this is necessary and NHS England retain this as one of their recently published ambitions. However, it remains controversial and difficult to implement locally. Particular examples of where specialist services have been centralised include the creation of specialist stroke centres (over half of all patients now suffering from a stroke are admitted to a specialist centre).
Growing importance of self-diagnosis and treatment	There has been a huge growth in the availability of self-screening kits (kits are now available to test for cholesterol, bowel cancer, prostate cancer and diabetes amongst others). There has also been a huge growth in the number of people using the internet for health purposes. In 2016, 51% used it for health related information. However, there is little evidence of transformed pathways of care as a result: many self-screening kits are used as a prompt for a person to access existing services, rather than tools for self-diagnosis and care.
Greater number of common conditions treated locally linked telemetrically to specialist centres	This is technologically possible and is happening in some areas, but not systematically or at scale. There have been numerous trials based around telehealth, some suggesting that they may lead to a 20% reduction in A&E attendance, with a cost saving of over approximately £188 per year for each patient involved in the trial – but this has yet to be realised at scale.
Capacity for screening and treating serious disease will be more widespread	The use of health checks has been introduced and continues to grow although take up is still relatively low. In 2015/16, of over 15 million people eligible for a health check, only 18.8% were offered one and less than half of those offered a check took up the option.

HEE held a one-day seminar with over 50 experts and stakeholders in March 2018 to consider the likely impacts of genomics and AI on the future NHS workforce and to test our emerging views based upon submissions to our call for evidence.

The forthcoming Topol report will consider these issues in more detail.

Technology and innovation: the impact of genomics

- Genetic services in the NHS have **historically focussed on relatively rare, inherited genetic risks** (often involving a single gene) but we now know that cancer is essentially a disease of the genome. Cancer patients can be given more precise information by **analysing their tumour at a molecular level.**

- **Molecular diagnostics** analyses the biological markers in the genome and the information it provides has **three actionable uses** in medicine: it can be used to help with the **diagnosis** of disease, assess the **prognosis** or risk of disease progression, and potentially help **predict** which therapies might work best for which patients, leading to more personalised or stratified care. Six diagnostic tests are already commissioned by NHS England, with more expected.

- Developments in molecular diagnostics will allow us to identify those patients most likely to benefit from a given treatment leading to (a) more **personalised health care** and (b) potentially **cheaper cost profile for the drugs** which could be targeted at those most likely to benefit, and (c) optimising dose and **minimising side effects.**

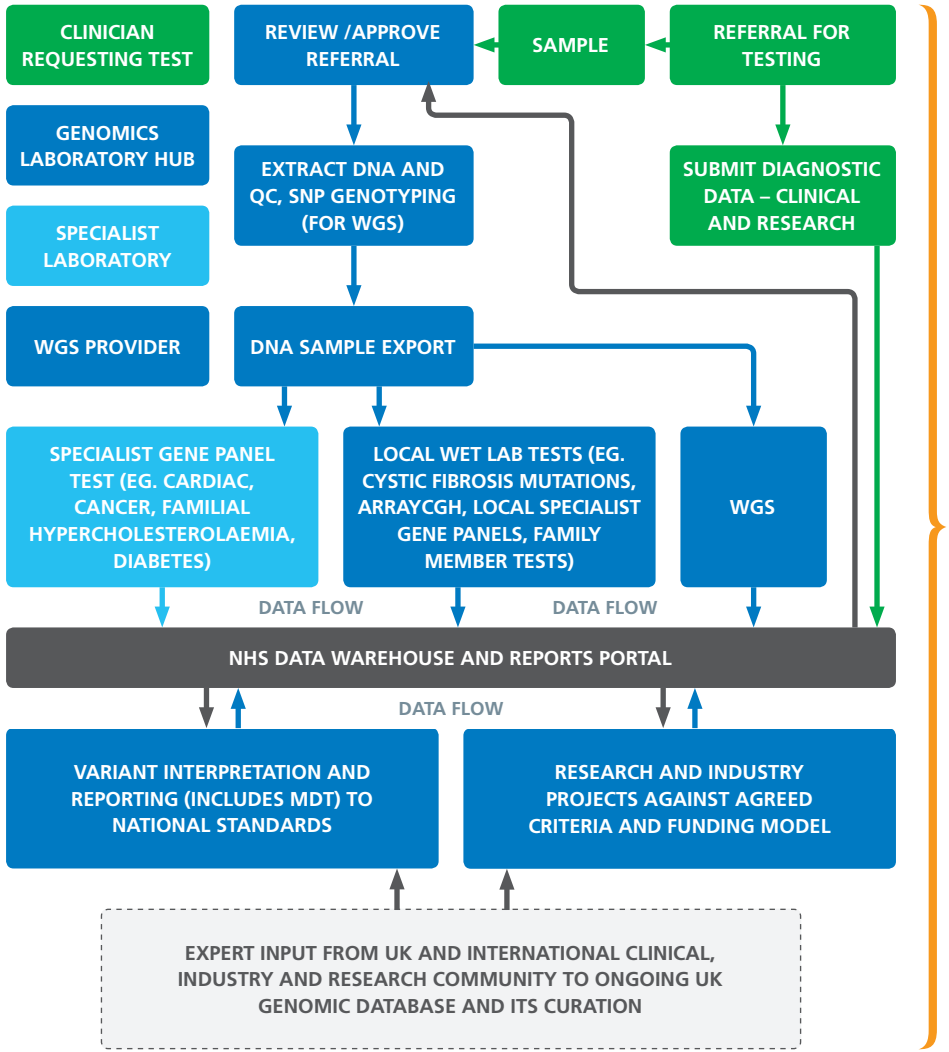
"Enabling a quicker diagnosis and ending the diagnostic odyssey, matching people to the most effective medications and interventions and increasing people surviving cancer through accurate diagnosis and precision therapy."

Sue Hill, Chief Scientific Officer

But only if we have enough people with the right knowledge and skills to make this a reality.

The National Genomic Medicine Service is being rolled out to link genetic information to service. For the first time, cancer tests will be part of the Genetic Testing Directory, which:

- Defines all genetic and genomic tests available through the NHS in England – from single gene to whole genome sequencing (WGS) **>300,000 tests/year.**
- Covers common cancer classes and 300+ rare diseases.
- Sets out the what, where, why, when and how of each genetic test.
- Structured by: technology, test name, test scope, targets/genes and clinical indication.
- **Data and outcomes on testing will be collected,** reviewed with other emerging evidence, with the directory updated annually.
- Pharmacogenomic testing to be included as suitable evidence developed.
- **25% of existing testing expected to be replaced** by newer technologies, through the assessment of clinical utility, efficiency and effectiveness.



Workforce implications

Staff working in genomic services will experience increased demand for existing tests as well as demand for new tests as our understanding develops. Clinicians may need more time to deal with the increasing complexity of ordering, interpreting, communicating counselling and acting upon test results.

However, whilst mainstreaming this rapidly moving field of genomics into the wider NHS, we need to avoid locking the workforce into outdated models of care.

Other relevant mutations and treatments are likely to emerge with further research, including **genomic sequencing** which could indicate diagnostic subtypes, predict tumour behaviour, prognosis and enable monitoring for early recurrence of disease.

Tests to detect circulating DNA may make it possible to detect the development or recurrence of cancer **before symptoms appear.** It is still early days and more research is needed, but the sheer **pace and scale of developments in genomics will require the NHS to remain alert, flexible and forward-looking.**

Pre-symptomatic testing could disrupt and revolutionise the whole of the patient pathway in cancer, with:

A major shift towards **prevention, early diagnosis and monitoring,** with more 'outreach' and support

Radically improving **outcomes and survival rates,** but requiring ongoing monitoring and support

Blurring the distinction between diagnosis and treatment at the point of care.

This revolution will only become a reality if we make sure we have **enough staff with the right skills in the right place to support new and innovative models of delivery,** i.e. this could mean a greater role for GPs, nurses and other community/outreach workers, with more demand for **'versatilists'** as well as generalists and specialists and more education and support required for high-risk individuals. There will be a greater need for specialist counsellors, but all staff will need some counselling skills.

But as well as looking forwards, we need to be clear about where we are starting from

Access Gap:

Patients do not currently have equity of access to existing genetic tests. Although there is generally good understanding of National Institute for Health and Care Excellence (NICE) approved molecular diagnostics. In 2014, CRUK estimated that 24,000 patients in England missed out on tests that would have helped guide their treatment.

Skills Gap:

Whilst HEE has developed training programmes in genomics, these now need to be targeted at Cancer multidisciplinary teams (MDTs) who are increasingly being sent actionable information by pathology labs that they may not understand.

Numbers Gap:

There is growing evidence of a shortage in key professions who support MDTs such as oncologists, radiologists, pathologists and clinical scientists **(see Cancer Workforce Plan, Phase 1: Delivering the cancer strategy to 2021 – https://hee.nhs.uk/our-work/cancer-workforce-plan).**

Time Gap:

Genomics offers the potential for personalised, stratified care, but this requires time to learn so the information can be understood, time to consult with colleagues and time for meaningful conversations with individual patients about their individual disease and treatment options so they can make informed choices.

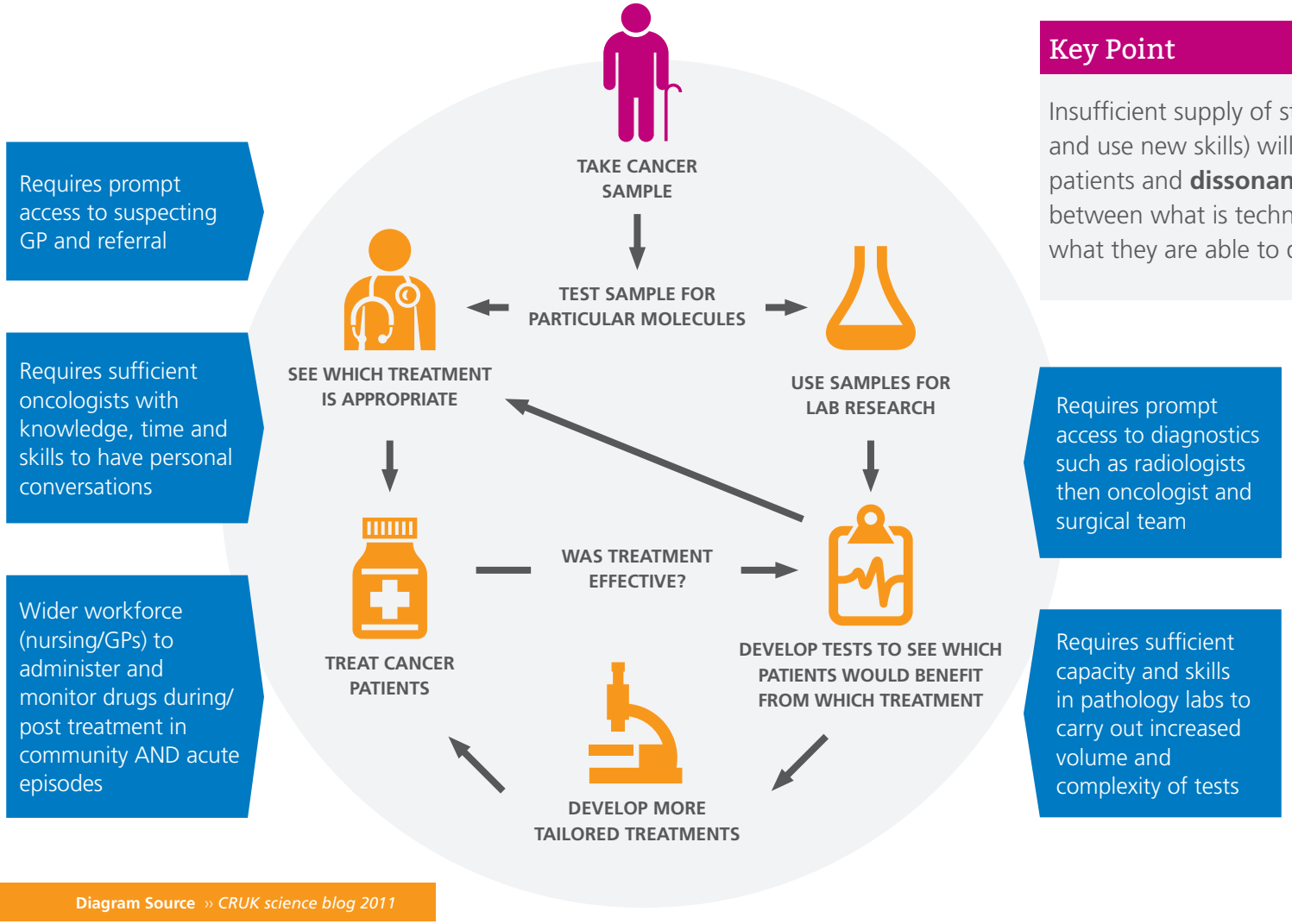
Communications Gap:

Regional Genetic Centres have grown out of rare diseases and an understanding of genomics has until recently been the preserve of specialists. How do we support our MDTs and wider workforce to share learning and formalise conversations about risk and the choices presented by genomic information?

Funding Gap:

The projected global spend on oncology drugs is forecast to rise from $107 billion to $150 billion by 2020, reinforcing the need for a specialist workforce to evaluate and implement these drugs so the NHS gets best value for money.

Mind the gap: The creation of NICE in 1999 ensured equitable access to drugs of potential benefit to all patients. Twenty years later, **the challenge now is to ensure we have enough staff with the right skills and knowledge in the right places to ensure all patients have access to the opportunities science and technology will increasingly provide.** 65% of the NHS budget is spent on staff, as it is people who deliver care to patients.



Key Point

Insufficient supply of staff (with the time to learn and use new skills) will increase **inequity** for patients and **dissonance** for clinicians if the gap between what is technologically possible and what they are able to deliver grows.

Diagram Source ›› *CRUK science blog 2011*

Genomics: emerging proposals for the workforce

As genomics shifts from being a research project to part of mainstream service delivery, we will need a two-fold strategy for (1) the **general workforce** and (2) the **specialist professions over the short, medium and long-term.**

- **The general workforce:** all healthcare professionals will need some degree of understanding of genomics and risk, both as part of their undergraduate and postgraduate curricula, **with lifelong education and training throughout their career** so that they can keep up with rapidly changing developments and develop skills and experience in understanding and communicating risk. **HEE to work with NHSE to identify priority groups and develop a roll out strategy for online genomics training tools** to support delivery.

- **The specialist workforce will need a significant expansion in both the numbers and skills** to meet the increased volume of demand as WGS becomes systemised. Genomics is already part of undergraduate curricula and the postgraduate curricula is out for consultation, but staff will need life-long education to keep pace with developments. In the **short-term,** HEE will fund a **targeted and ongoing education genomics programme for priority groups, such as GPs with a special interest in family history of cancer and** for all members of MDTs and the proposed new Genomic Tumour Advisory Boards (with a genomic lead for each) so that MDTs are continually supported to be fit for purpose. In the **longer-term,** a **significant expansion of the workforce** will be required to meet forecast increased volume and complexity of demand as **personalised** medicine becomes more mainstream. This includes not just oncologists (pages 47 – 58) but clinical geneticists, cancer genomic scientists, genetic counsellors, bio-informaticians, pathologists and pharmacists.

- **The general population** will need some degree of understanding of genomics and risk so that they can participate in **informed decisions about their individual care** and be empowered and supported to reduce/manage/live with risk.

- **Hospitals that are active in research have better patient outcomes.** Staff need protected time and resource to participate in research, including admin/research nurse support to enable all patients equal access to clinical trials.

Technology and innovation: the impact of Artificial Intelligence (AI), digital and IT

There is currently **no agreed definition or taxonomy of 'AI',** which means people are often talking at cross-purposes as it has become shorthand for a range of developments:

- **Digital medicine** typically refers to **products** that impact upon diagnosis, prevention, monitoring and treatment, with potential for more self-care and 'virtual' consultations and provision.

- **AI** generally refers to tasks performed by computer software that would otherwise require human intelligence i.e. **a bundle of algorithms** that follow a series of steps to arrive at an action or conclusion. There are two broad types of artificial intelligence:

General AI refers to holistic systems that have equal or greater intelligence to humans, and which can complete all manner of tasks, from playing chess to greeting customers in a shop. Most experts believe we are several decades away from seeing machines that can pass for humans.

Considerably more progress has been made in the second field of **narrow or weak AI,** these are systems that can perform discrete tasks such as image recognition.

- Carefully designed **AI algorithms** could enhance NHS productivity through off-loading some human tasks such as clinical pathway streamlining and public health applications.

- **Robotics** are currently being utilised not just for automated repetitive tasks, but minimally invasive surgery, with microsurgery, robotic endoscopy and assisted living robots on the horizon.

What TYPE of impact could technology have on the NHS workforce?

The question is not whether some places will at some time pilot or implement innovations in AI, digital or robotic medicine, but whether and when the NHS will do this **systematically at scale,** thus requiring changes to how we plan for and invest in our current and future workforce.

Box 3: Three ways technology impacts upon work

Form	Impact	Examples
1. Substituting	Removing people and replacing them with a machine.	• Unmanned self-service checkouts • Autonomous machines on assembly lines
2. Complementing	Allowing people to achieve more or do better quality work.	• Voice-activated robots that help carers lift patients • 'Chatbots' that produce partial responses for call centre staff
3. Creating	Doing work that was never previously done by humans.	• Elder care AI assistants that keep older adults active • AI in farming that predicts crop yields and determines where to spray pesticides

Source ››

Table from The Age of Automation: Artificial Intelligence, robotics and the future of low-skilled work RSA Action and Research Centre p.31

What could be the SCALE of the impact of AI and digital on the NHS workforce?

- There is currently **no clear consensus** about the scale of the impact of AI on industry in general and the health service in particular. According to a recent Royal Society of Arts' report, opinions range from those who are **alarmists, dreamers, incrementalists and sceptics.**

- Reasons to be more **sceptical** about the future **scale** of AI in the NHS include: current technical, regulatory, governance and cultural limitations within the NHS, recent observable history and experience of large-scale IT or other innovative projects and the limited number of complete jobs that could be reduced to tasks.

- At the HEE seminar, participants concluded that:

The impact of AI/digital is likely to be **low over the next five years and high over the next 10-15 years.** Opportunities include supporting prevention, self-management, assisting image interpretation and supporting clinical decision-making, to automated referral, planning and appointments.

AI is more likely to **complement and support existing jobs and tasks,** rather than replace entire professions.

AI will **create new jobs** (AI specialists, medical software engineers etc.) and **require life-long investment in leadership and AI skills and knowledge** so our staff can safely take full advantage of the opportunities (AI could help by supporting digital learning at scale and pace).

- The most important benefit AI offers is the **gift of time,** by supporting and streamlining low-skill tasks and processes, clinicians will be able to **focus on where they can add most value** as humans to their patients and teams.

Where might AI and digital have the greatest impact?

AI offers the potential for more **systematic and consistent diagnosis.** Many think it will have the most impact on diagnostics (taking on/supporting tasks some of the simpler tasks currently performed by pathologists and radiologists, who will still have **overall responsibility for Quality Assurance,** and be able to **devote more time to using their expertise, skill and judgement on the more complex cases** and contributing to MDTs.

There may be more scope for innovation and impact on the **least populated parts of the patient pathway, such as prevention and living with and beyond cancer,** where there are opportunities to create new services from scratch.

Examples might include **digital apps to support prevention and monitoring of high risk patients,** and/or using AI to support **follow-up and on-going monitoring** once active treatment has finished. AI could help prevention efforts to be developed for those who are 'living with and beyond cancer', reducing the risk of reoccurrence or prompt diagnosis and treatment if it returns, and/or provide **support and advice** for people in active treatment where there is no 24/7 oncology service, so that warning signs (such as high temperatures) are dealt with promptly, potentially reducing acute illness and improving mortality.

Asking **'how might we use AI to improve care for patients?'** rather than **'which jobs could AI or digital replace'** is likely to identify more options for how we could improve prevention, diagnosis, treatment and living with and beyond cancer.

Emerging recommendations from the Topol review

The Secretary of State for Health has set up an independent review led by Professor Topol to advise him on how technological and other developments are likely to impact on the future workforce. Due to report by end of 2018, the Interim report has identified that:

"AI, machine learning and robotics technology will support clinicians in delivering safer, higher quality care.

"Deep learning technologies have already shown expert-level performance in medical image analysis, in domains such as screening for breast cancer, skin cancer… "Whilst radiology, pathology and ophthalmology are frequently cited as the disciplines most likely to be influenced by AI tools, the impact will inevitably affect all specialties and every clinician from doctors to nurses, pharmacists to paramedics and beyond.

"All clinicians should be educated in the ethical standards and good practice of working with AI, best practice in data curation and governance and the interpretation of clinical statistics and recommendations generated by AI systems. The NHS needs AI specialists who understand the requirements of patients and healthcare professionals and are keen to be embedded in all care settings, so that AI systems designed for healthcare are fit for purpose."

Open call for evidence

Evidence and comments are being sought from any organisation or individual with an interest in workforce education and development.
Closing date: Wednesday 29 August at 12.00 noon.

Topol report: *https://hee.nhs.uk/our-work/topol-review*

Emerging characteristics of future service models

The service models for cancer, and the underlying activity assumptions that underpin them, will be a key factor in the workforce required i.e. earlier diagnosis in the community leading to fewer late stage interventions in the acute sector will not just improve patient outcomes but could change the shape of the cancer workforce. **More details are expected in the NHS 10-year plan,** but in advance of this, emerging models from Cancer Alliances suggest they will increasingly be:

Person-centred and holistic, focussing on wider mental/emotional, social and financial needs. There will be a shift towards prevention, staying well and maintaining control, with an asset-based approach.

Accelerated early diagnostic pathways will lead to greater consistency/prescription over all parts of the cancer pathway with regard to what needs to happen in what order and within what timescale.

Increasingly networked (pathology and imaging) and integrated.

Underpinned by **specialist resource** in (regional) centres of excellence.

Supported by **hub and spoke** model reaching out into communities.

We will continue to work with NHSE and Cancer Alliances to further understand future service models and ensure we have workforce plans to deliver them.

Expectations of future patients, staff and Ministers will be as important as demand

The National Patient Experience Survey measures both the process and experience of care, including:

National Cancer Patient Experience Survey

Largely measures adherence to best practice and overall satisfaction scores such as:

- How many times you saw a GP before diagnosis
- Whether or not you understood the diagnosis or side-effects
- How involved you felt in your care
- Degree of satisfaction with access times and overall care
- Degree of trust in clinical team.

The Cancer Taskforce Strategy set out defined outcomes and ambitions in the following areas:

- Fewer people getting preventable cancers
- More people diagnosed at an early stage
- More people having a positive experience of care and support (including co-ordination)
- More people surviving for longer after a diagnosis
- More people having a better long-term quality of life
- Reduce unwarranted variation in outcomes (geographic and social)
- Improved cancer waiting times

Staff experience of care

Our staff will increasingly expect to be able to provide high quality care for all, and be less tolerant of gaps between what is possible and what is deliverable. Millennials will increasingly wish to ensure a positive work/life balance with less FT working.

Overall strategy will remain, but ambition is likely to grow

More detail is expected in the NHS 10-year plan, but in advance of this, our assumptions are that **patient expectations will continue to increase** in the areas measured by the National Cancer Patient Experience Survey and it is highly likely that all Governments of whatever party will want us to go **further and faster** on the ambitions set out in the cancer strategy to improve prevention, diagnosis, treatment, outcomes and living with and beyond cancer (LWBC) so that England can be amongst the best in Europe.

Forecast needs and expectations helps describe a possible future – how fast and comprehensively this is delivered to all will depend upon resources

From	To
Cancer as a rare and unpredictable life event	Some cancers increasingly common, predictable and preventable for some at-risk groups
Diagnosis often late, leading to costly and potentially risky late-stage interventions or none at all	Earlier diagnosis means fewer late-stage interventions and harmful side effects but ongoing monitoring and care
Treatment episodic and 'one size fits all'	Genomics and immunotherapy provide bespoke, personalised and often on-going/multiple regimes
Cancer as something many die from	Cancer increasingly something many will live with and beyond, often alongside other conditions
A biological model where we treat the organ not the person and their community of carers, in a binary model where you are cured or you die	Holistic care system increasingly responsive to the mental and social impact on individuals and families who may 'survive' cancer but fear its return and/or live many years with an incurable disease/s
Most people do not receive palliative care and die in a place not of their choosing	Palliative care available to all with people supported to die at home or in a hospice if they wish to

Emerging hypotheses

- The **population is growing,** with greater numbers of older people with more than four long-term conditions
- Within that population, the **incidence of cancer is forecast to increase by 2% each year**
- Patient expectations of access, quality, treatment and aftercare will **continue to increase.**
- Our ability to **predict and potentially prevent** cancer in some at-risk groups is likely to increase.
- To **diagnose cancer earlier** which may reduce some acute interventions but will increase monitoring etc.
- **Genomics may enable us to offer more bespoke** and personalised treatment regimes.

- Different people will have different journeys, moving between watch-and-wait and active care, and chronic and acute episodes at different times. More people will be monitored for cancer, more will live longer with better outcomes and fewer side-effects from chemotherapy but other interventions will have different effects. Fewer people will die of cancer but the health, social and mental health needs of individuals and their carers of some will increase in the longer-term.

Key Point

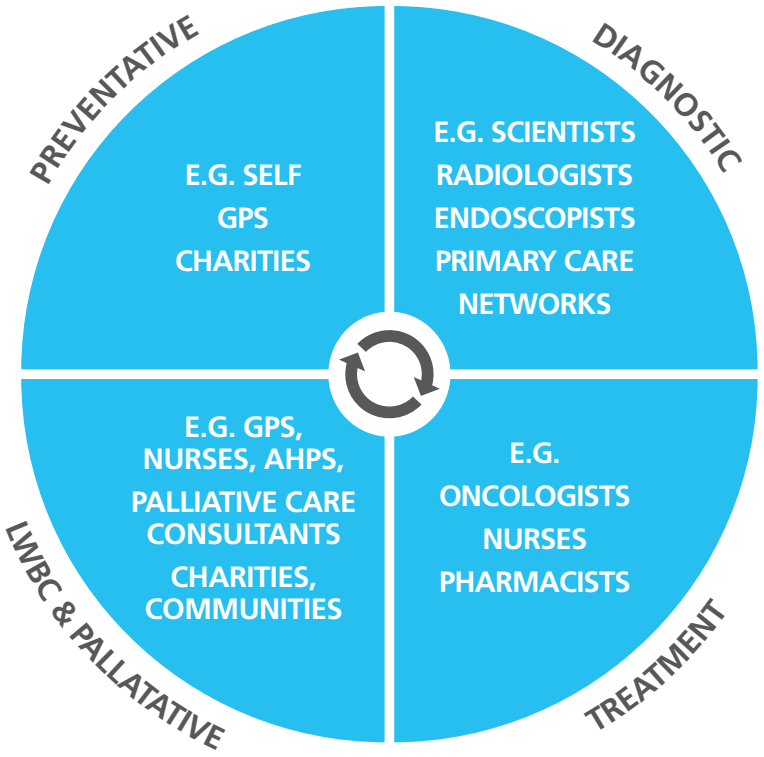
Demand: The volume and complexity of demand for cancer services is set to rise, as the incidence of cancer increases by 2% p.a. amongst a growing, ageing population with more co-morbidities, increased mortality and potential re-occurrence. Early diagnosis and better outcomes means activity will be 'redistributed' across the patient pathway rather than completely removed. Although developments in IT, digital and AI will support clinicians to be more productive, genomics, plus increased expectations, will drive more personalised medicine, requiring not just new roles, but also an increase in numbers and skills to meet the increased demand (depth not just breadth). Future service models will impact upon demand, so we will work with NHSE to align assumptions as part of the ten-year plan.

Key strategic supply questions

So if demand is set to rise, what does that mean for supply?' There are six key questions we need to address.

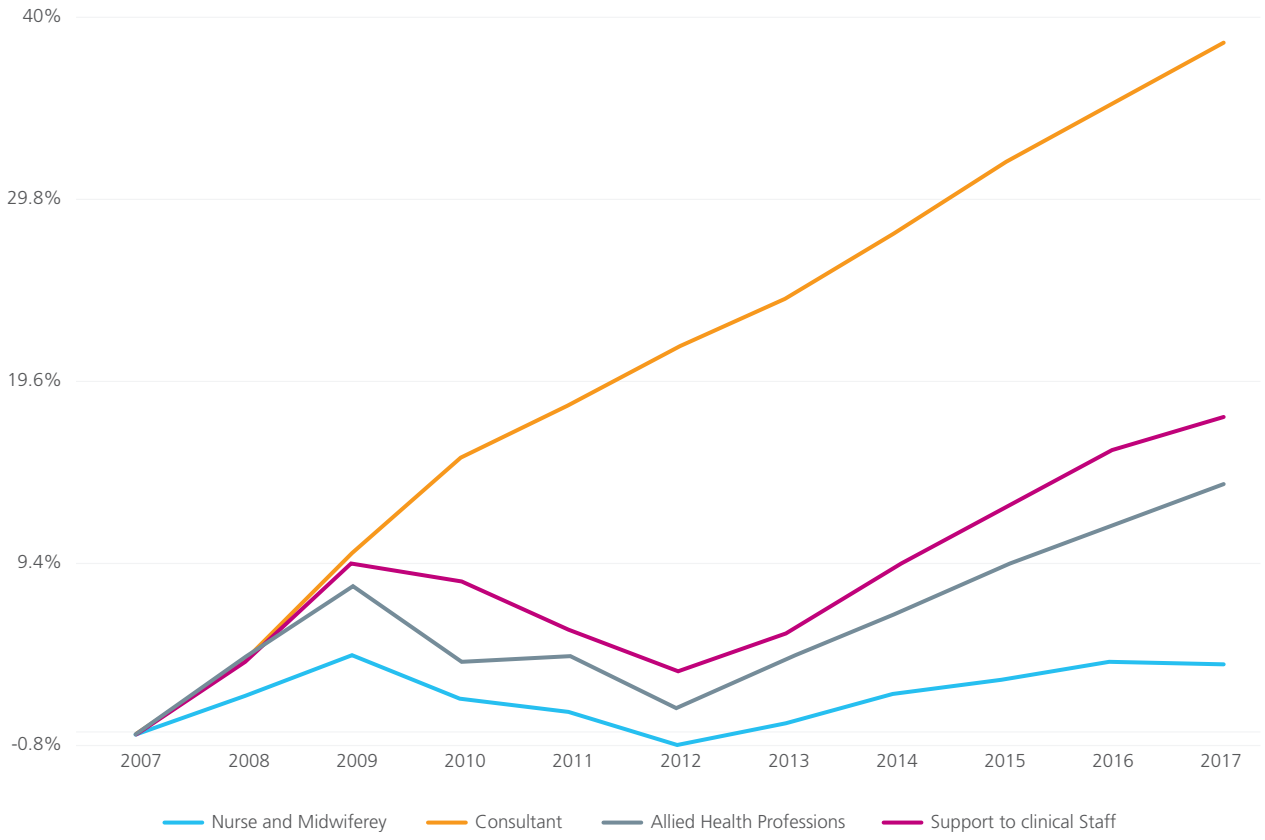
- **The size of the pie:** How many health care professionals will be needed? **What scale of growth will be required to meet the forecast increase in demand?**
- What **new skills and new roles** will be needed in different parts of the pathway?
- Which skills/tasks could be **delegated or supported** by **AI and other innovations?**
- What role do (different) **patients and carers want to play in their own care?**
- **Where** should staff/resources be **distributed** across the four parts of the pathway?
- **Tactical but mission critical:** how do we source supply?

Service Model



Overall, the employed workforce has grown over the past decade, but whereas the aggregate Consultant workforce has grown **significantly (38.5%) nursing has grown by just 3.8%,** leading to an **imbalance** within the health care teams required to treat patients. This is **'boom and bust' – with some professions booming – rather than a multi-year, sustainable, team-based approach to workforce investment** that reflects service priorities such as primary care.

% increase in NHS employed staff 2007 to 2017



Sources ››

NHS Workforce Statistics in England, Summary of staff in the NHS – 2004-2014, Overview.

NHS Workforce Statistics Monthly Provisional Statistics.

Towards a multi-year funding strategy for workforce: three supply scenarios

1} The level of growth the NHS receives year-on-year is vital for workforce planning and we now have clarity that over the next five years, the NHS will receive on average 3.4% real terms growth each year. We welcome the Government's commitment to a multi-year funding strategy for clinical training places, which will be set out later this autumn. **As workforce represents 65% of the total NHS spend by providers, the workforce strategy is the delivery strategy.**

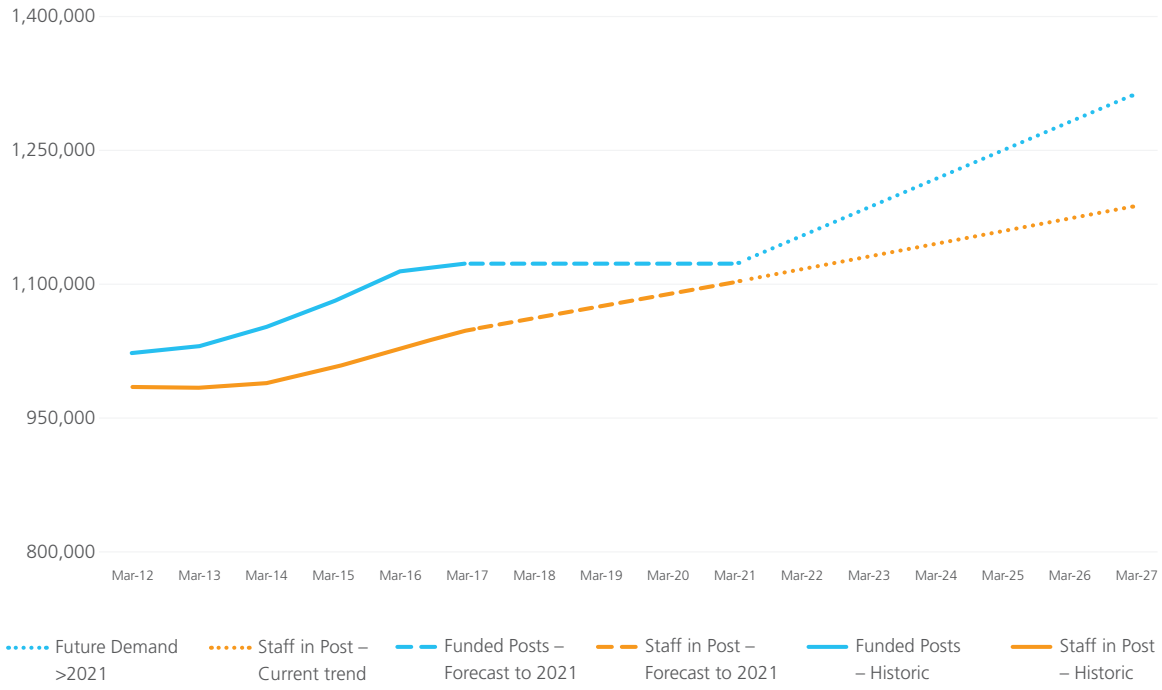
2} Instead of trying to forecast the impact of every variable on each individual profession and/or chase a perfect balance between supply and (funded) demand that in reality will never happen, here we will focus on the big strategic shifts we expect to see over the next **decade,** and the general **scale** of workforce investment that might be required to deliver them: **reduced, minor, moderate or significant growth.** Having a clear understanding of the consequences of different funding/supply scenarios can help clarify the choices, in advance of the autumn settlement.

3} This is not a binary choice between a focus on numbers or new roles/skills/transformation – **the extent to which staff can develop themselves or transform services will depend upon whether they are working in conditions of under/'over' supply.** A fully resourced team has **time to learn, time to teach, time to care** and will constantly innovate to improve; an under-resourced team will be running just to keep up with current demand, unable to prepare for or lead the future.

Scale of supply-side scenarios: minor, moderate or significant growth?

In our consultation document on the future workforce, HEE forecast that if we fail to reduce demand and increase productivity, then we will require at least 190,000 more staff by 2027. This is a 'do nothing more' position, and does not assume or allow for increased ambitions with regard to access or quality, as it merely keeps up with forecast demand. We are therefore taking this **(@15%)** as our basis for **minor** growth. **Moderate growth** would be in the region of **30%** and **significant growth** would see an **expansion of workforce posts of at least 45% over 10 years** (this is how much Consultants have grown between 2002-2014, but this aggregate figure masks significant professional and geographical variation and – nursing has been 3.8%, for example **some low growth/ high priority professions might need even higher growth to allow for catch up and/or rapid expansion).**

Future Demand for Staff – Beyond 2021/22



3 potential scenarios for workforce growth over the next ten years

Minor/flat growth @15% – meets forecast demand as long as no Increase in ambitions/outcomes for cancer patients

Overall growth may meet forecast demand, as long as there are no new ambitions in terms of access to or outcomes from cancer treatment. There will be limited potential for staff to innovate or retrain as they will be busy meeting current demand. High stress/ low reward environments will make it hard to retain staff, re-skilling may increasingly be driven by substitution, with a lower ratio of experienced to new staff reducing adaptivity, flexibility and safety. Gaps will need to be filled by unplanned expenditure on agency/locum and international recruitment and the NHS may not fully reap the benefits of the latest treatments/technologies such as genomics equally across the country as we may not have sufficient staff with the rights skills and time to deliver them.

Moderate growth @30% – meets forecast demand, allowing some Improvements for cancer patients in priority areas

Overall growth may meet forecast demand, allowing for some improved ambitions in limited priority aspects of care/diseases/ geographies. Any growth outside priority areas would need to be supported by reduction in demand/increasing productivity and/or cuts elsewhere. Growth is likely to be in particular professions and not always matched by growth in the wider supporting workforce required to deliver systemic improvements. There will be some opportunities to reskill and retrain in priority areas/geographies, with some patients having access to some of the latest treatments over time.

Significant growth @45% – meets forecast demand and supports systemic transformation to bring patient cancer outcomes in line with the best in Europe

Medical and non medical posts are increased to meet forecast demand and deliver systemic transformation in all parts of the patient pathway/country. Sufficient supply for today means staff have the time to transform services for tomorrow. The ability to provide better quality and safer care will provide more rewarding working lives, improving retention of experienced staff, greater flexibility, skill mix and innovation to reduce demand, improve care, outcomes and productivity. Expenditure on staff is planned and treated as a returnable investment (50% of today's staff will work for the NHS in 2032), with investment in life long learning. The NHS is increasingly able to provide the latest benefits to all patients because we will have sufficient staff with the right skills, flexibility and time to deliver them.

What would these high-level scenarios mean in practice? Nursing, Therapeutic Radiographers and Oncologists as case studies

In the following section we consider the impact of different growth scenarios in just three professions for **illustrative purposes.**

Nursing (the largest profession in the NHS, involved in all aspects of cancer care)

Oncologists (as one of the few medical professions dedicated to the care of cancer)

Therapeutic radiographers (one of the key Allied Health Professions vital to the delivery of radiotherapy treatments).

We know that **cancer care is provided by teams,** including surgeons, radiologists, pathologists, scientists, gastroenterologists, Palliative Care Consultants, GPs and the wider AHP and support workforce, and that those teams will need to diversify to reflect greater survivorship, including psychiatry, counsellors, occupational therapists, health coaches and community support workers. **The most important member of the team is the person affected by cancer,** and teams will need to evolve to reflect and meet (without always medicalising) their needs.

We cannot possibly consider all these issues here, but the framework and analysis in the following section is applicable to other professions and we will **work with partners to develop our thinking further both in the run up to and following the 10-year NHS Plan.**

The contribution of nursing to cancer care

The Cancer Taskforce Strategy nursing recommendations focussed on Cancer Nurse Specialists (CNSs):

- NHS England and NHS Improvement to encourage providers to ensure that all patients have access to a **CNS or other key worker** from diagnosis onwards, to guide them through treatment options and ensure they receive appropriate information and support.
- NHS England and Health Education England should encourage providers to work with Macmillan Cancer Support and other **charities to develop and evaluate the role of support workers** in enabling more patient centred care to be provided.

Source ›› *Cancer Workforce Strategy*

Whilst we absolutely recognise the important role of CNSs, if we want to improve prevention, diagnosis, treatment and LWB cancer care, then **we also need to focus on the wider nursing workforce** because:

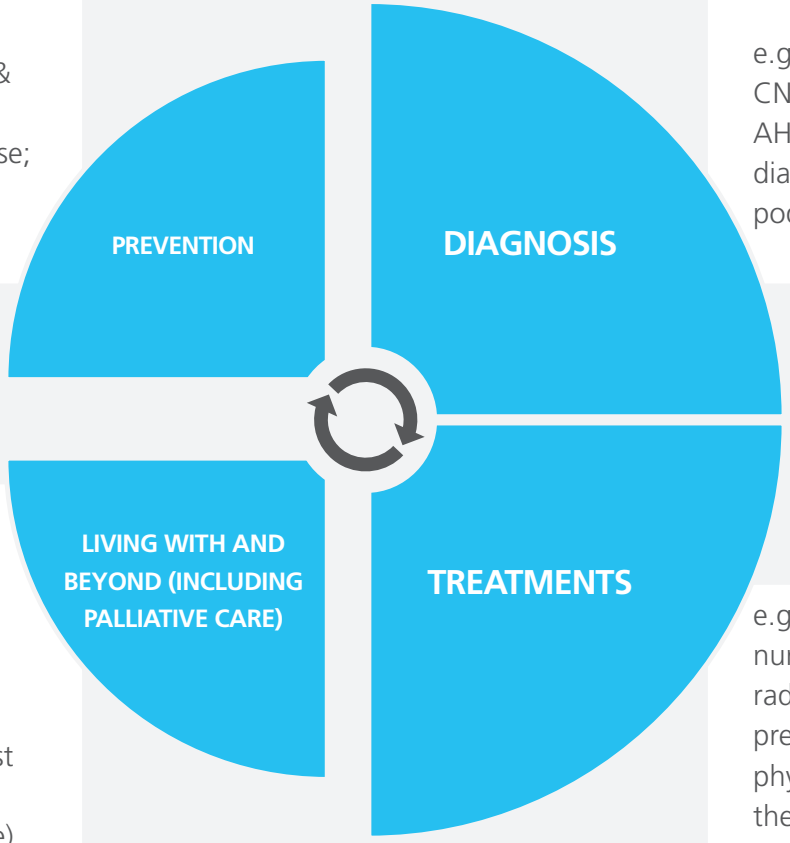
a} **All nurses have contact** with and make a contribution to the care of people affected by cancer;

b} **General (adult) nursing is the traditional supply pool for CNSs** and other advanced practitioner roles and chemotherapy and palliative nurses - you can't expand the latter without expanding the former; and

c} **Nursing is about teams,** not individual posts

Nurses and AHPs work across all four parts of the pathway. Because their contribution is not coded on ESR, they are often missed off supply projections and investment decisions.

e.g. promotion of health & wellbeing – primary care / practice nurse; school nurse; AHPs: dietitian



e.g. general nurse; cancer CNS; nurse endoscopist; AHPs: radiographer – diagnostic; chiropodist / podiatrist; orthoptist; ODP

e.g. cancer CNS, primary care / practice nurse; hospice / palliative care nurse; AHPs: art / music / drama therapist; radiographer – diagnostic (surveillance); dietitian; chiropodist / podiatrist; occupational therapist; osteopath; orthotist / prosthetist; physiotherapist; speech & language therapist; paramedic (end of- life)

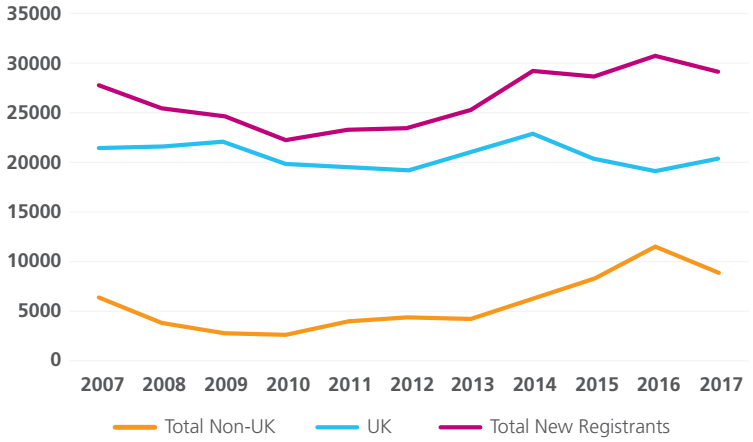
e.g. chemotherapy nurse; theatre nurse; AHPs: radiographer - therapeutic; radiographer diagnostic (interventional); prehabilitation & rehabilitation – physiotherapist; speech & language therapist; occupational therapist; dietitian; orthotist / prosthetist

The nursing workforce has grown, but fewer nurses are joining

There are 14,717 more (FTE) adult general nurses (7%) working in the NHS since (2012), but…

Fewer nurses joining from overseas

Total New NMC Registrants by Nationality, Nurses and Midwives, 2007 to 2017 (headcount)



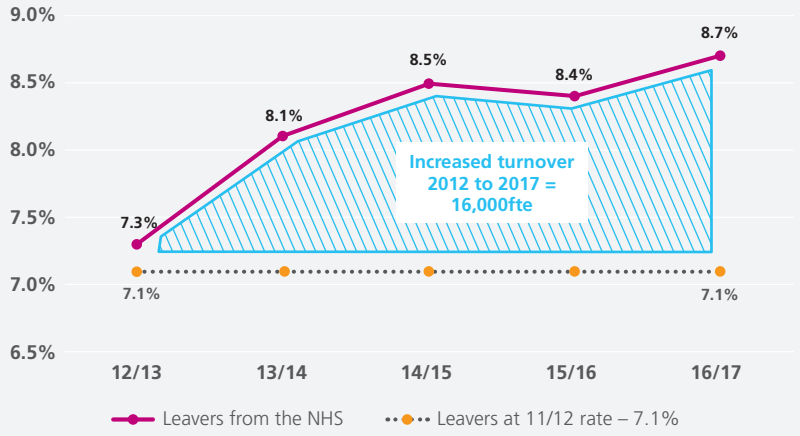
Source ››

HEE analysis of Nursing and Midwifery Council register data – HEE Workforce Fact File 2018

And more nurses are leaving

The percentage of nurses leaving the NHS for reasons other than retirement increased from 7.1% in 2011/12 to 8.7% in 2016/17. This means that in 2016/17, 5,000 more nurses left NHS employment than in 2011/12. Had the rate remained at 2012 levels through to 2017, we would have 16,000 more nurses working in the NHS today – that's almost half of our currently vacant nurse posts filled.

Nurse leaver rates from the NHS – 2012 to 2017



Higher vacancy rates – We currently have a vacancy rate of 9.4%.

Nursing high level 'if we do nothing' supply scenario

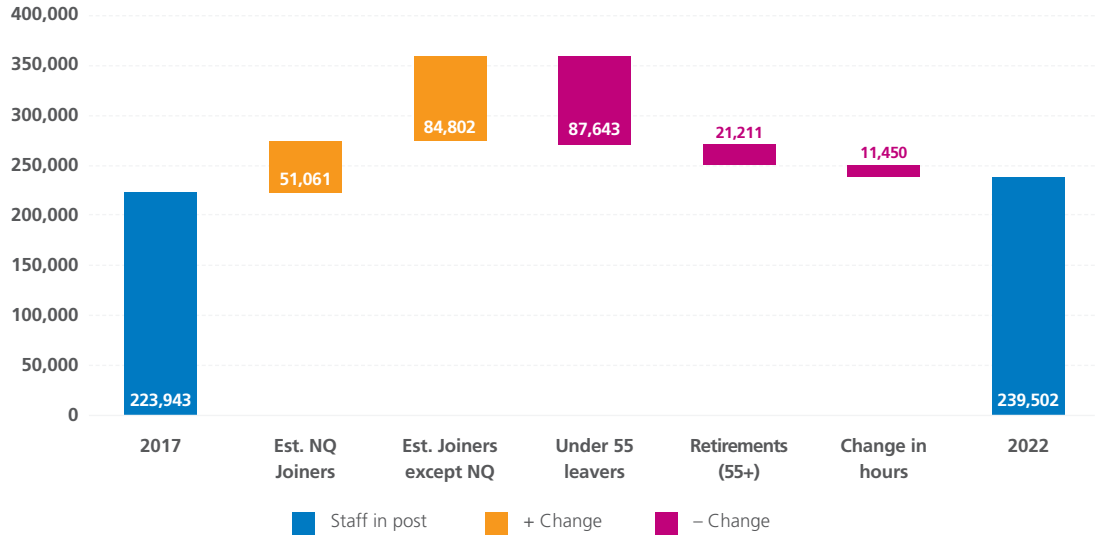
The waterfall diagram shows the most likely changes in the adult nursing workforce 2017 to 2022, **if we roll forward observable history.** This includes changes due to retirement, changes to contracted hours and other leavers decreasing workforce numbers on one side, and newly qualified staff graduating from training growing the workforce on the other side.

It does NOT estimate or allow for planned improvements on retention being led by NHSI.

This forecast would see the workforce grow to a net supply of 239,502 FTE at the end of 2022, an increase of 15,559 FTE or 6.9% (1.38% p.a.). This would mean an additional 31,118 adult nurses at the end of the 10 years' period (2017-2027).

If the same trends were applied to the specialist Cancer Nursing workforce, then it would increase approximately by 6.9% between 2017 – 2022 or 14% between 2017 – 2027 (although as the workforce is older we might expect more leavers).

NHS adult nursing expected change in supply 2017 to 2022, based on current performance



Note: Adult Nursing excludes Psychiatric Nursing, Learning Disability Nursing, Paediatric and Neonatal Nursing, Health Visitors, and Registered Midwives.

Source ››

HEE analysis of NHS Electronic Staff Record data

Is the 'do nothing further' forecast supply likely to be enough to meet forecast demand? Our emerging hypotheses suggests not

- Our 'do nothing' projections show roughly an additional **31,118 adult nurses – 14% growth at the end of the 10 years' period (2017-2027).** In addition, the Government has confirmed an increase in clinical placement funding, allowing for a further **25% increase in student nurse places from 2018.** This means an extra 26,000 nurses could be available for employment by 2027 – but to date, Higher Educational Institutions (HEIs) have not filled their additional places with student nurses, so the anticipated growth may not materialise. However, we estimate it could support a further 1% per annum growth (7% by 2027) and the anticipated conversion of Nursing Associates to Registered Nurses (RNs) through the apprentice route would add a further 1% annual growth contributing another possible (5% by 2027). So a 26% total over 10 years. This is welcome and necessary but likely not sufficient as…

- Demand for cancer services is forecast to increase in volume, complexity and longevity, yet **the rate of growth in nursing is forecast to remain static, as both our waterfalls (2012-2017 and 2017-2022) show the same rate of growth 7% over the considered period.**

- All nurses will have contact with people affected by cancer in prevention, diagnosis, treatment and living with and beyond care, but nurses are also required to support improvements in primary and urgent care. **Nursing growth benefits all patients, not just cancer** - but **historically nursing growth has not kept pace with Consultant growth** (@3.8% compared to 38.5% between 2007 and 2017). Nursing has been more vulnerable to periods of **boom, bust and freezing of posts as Trusts seek to balance their books** (i.e. NHS Plan growth, QIPP reductions, post-mid Staff's growth followed by austerity) rather than **long-term sustainable growth to support forecast patient need.**

Key Point

To ensure we have enough supply to meet forecast demand for cancer whilst also meeting other NHS priorities, we think we need significant growth – in the order of **45% over 10 years (an additional 100,000 nurses by 2027).**

Growing the nursing workforce as a whole will enable us to expand new roles and skills, to support greater prevention and earlier diagnosis in cancer

As **the adult general nursing workforce is also the 'supply pool'** for nurses working at an advanced level of practice in cancer such as **CNSs and clinical endoscopists,** increasing the overall supply pool of nurses will help us to increase not just numbers, but the skills and expertise to take advantage of technology and innovation, so that **more nurses and other clinicians can work at an advanced practice if they wish to and at the top of their skill set** as part of team.

Example: the minimum selection criteria for a Macmillan Cancer Nurse Specialist (CNS) is:

- A first level nurse registration
- **At least five years' post-registration clinical experience, two of which must have been in cancer, palliative care or a specialty area**
- A first level degree in a related subject
- Specialist qualification in cancer, palliative care or a clinically related subject
- Evidence of specialist learning or an intention to work towards specialist learning
- CNSs are some of our most experienced nurses, and therefore will come from our existing workforce, not newly qualified nurses

Nursing and Cancer Nursing high level observations

Nurses working within cancer care are typically **Bands 5 to 9,** and spend over 50% of their time directly supporting adults living with cancer. The data returned by NHS Trusts to the **2017 Macmillan Census** shows a total of **4,020 Whole Time Equivalent (WTE)** posts in England. This is an increase of 932WTE (30%) from 3,088 WTE reported in the last census in 2014.

The data suggests that nurses working within cancer care (including CNSs) tend to be:

Older with 37% of Cancer Nurses being over 50, compared to 28% of adult nurses.

96% of Specialist Cancer Nurses are female, compared to 89% of adult nursing.

Almost all are from the UK – only 5% of Specialist Cancer Nurse post-holders are from outside the UK compared to 20% of Adult Nurses.

66% are full time compared to 73% of Adult nurse roles.

This suggests **retention and RTP as the most effective way to increase supply of Specialist Cancer Nurses in the short-term,** and a need to ensure we have sufficient numbers of skilled nurses in the general 'supply pool' in the medium to long-term. International recruitment is unlikely to be significant

Macmillan carried out a census of nurses working in cancer in 2017

The report provides information about four different types of posts employed within the NHS (numbers are calculated based on whole time equivalents (WTE) working in cancer):

4,020
SPECIALIST CANCER NURSES

2,686
ADULT CHEMOTHERAPY NURSE POSTS

635
CANCER SUPPORT WORKERS

978
SPECIALIST PALLIATIVE CARE NURSES

Overall, the specialist cancer nurse workforce is continuing to grow.

3,088
NUMBER OF WTE 2014 CENSUS SPECIALIST CANCER NURSE ROLES

4,020*
NUMBER OF WTE FROM 2017 CENSUS SPECIALIST CANCER NURSE ROLES

** The 2014 numbers do not include community nurse roles; in 2017 the data includes 17 WTE census specialist cancer nurse roles that may have been excluded from the 2014 census as they provide care in the community.*

If we applied the same **'do nothing' 7% growth** forecast between 2017-2022 to the specialist cancer workforce **then by 2022** we would expect to see…

An additional 281 FTE Specialist Cancer Nurses

An additional 188 FTE Adult chemotherapy nurses

An additional 68 FTE Specialist palliative care nurses

An additional 45 FTE Cancer support Workers

This level of growth appears insufficient to deliver the policy objective 'to ensure that all patients have access to a CNS or other key worker' or meet forecast growth in demand.

How can we achieve transformative growth in the numbers, skill and time of the nursing workforce as a whole over the next 10 years?

If we agree that we need sustainable significant growth in the nursing workforce to support improvements in cancer and other care priorities over the next decade, then we can work back from this with partners to identify the actions that will get us to this net supply position. Initial proposals could include:

In the short-term, a national targeted drive on:

- **Retention** – reverting back to 2012/3 rates of retention would increase numbers by 3,200 per year.
- **Return to practice** – If we could attract 1,000 former nurses per year that would result in an estimated 600 FTE.
- **International recruitment** – Earn Learn and Return scheme could support around 500 people per year into nursing.
- This set of actions would attract **an additional 12,900 FTE nurses by 2021.**
- Achieving this net supply position in the time frame will require **national dedicated and resourced programmes** to improve access to training (such as considering bespoke incentives in professional and/or geographical areas where there is evidence of market failure') and more support for employers on retention and RTP from other partners (Government, General Medical Council etc.) to **remove any obstacles** to recruit and retain overseas nurses.
- Deciding the scale of growth required is the **big strategic choice** we need to make. How we source the required supply in the time frame is tactical and should be **discussed with those who know best – staff and employers - so that we have sustainable solutions linked to ongoing HR policies.**

Expanding the numbers, skills and time of nurses operating at an advanced level

Significant growth **(45%)** would produce an additional **1,809 Specialist Cancer Nurses, resulting in a total of 5,829 by 2027.** If we applied the same 45% growth forecast between 2017 -2027 to the specialist cancer workforce then by 2027 we would expect to see:

An additional 1,209 FTE adult chemotherapy nurses

An additional 440 FTE specialist palliative care nurses

An additional 286 FTE cancer support workers

In order to deliver this level of growth:

- **In the short-term** we will need a **targeted retention** programme for existing Specialist Cancer Nurses and a focussed **'return to cancer' RTP** programme for experienced nurses.
- **In the medium-term** (subject to funding) HEE could **expand its postgraduate non-medical budget** to support the **rapid expansion of Advanced Clinical Practitioner roles** by developing clear routes to nationally agreed standards and consistent training courses. With protected funding and time to allow back fill, this would support employers achieve improved retention, greater levels of skill mix, and deliver service transformation at pace.
- **In the longer-term the supply pool would increase** as the number of trainees and experienced nurses increases/remain with improved outcomes for patients and staff morale.
- **HEE to increase the clarity and leverage of new routes into nursing** such as enabling Nursing Associates to go on to train as RNs and the degree nurse apprenticeship, enabling all to work at the top of their skill set, as part of a wider transformative/growth agenda rather than substitution.

The role and contribution of nursing in cancer is changing

It's not just about one profession: if we grow the number of nurses with the title 'CNS' but fail to grow the numbers, skills and time of the wider diverse clinical team, including medics, occupational therapy, psychology etc. – of which they are a part – then we will have missed a huge opportunity. What is required to deliver the needs of people affected by cancer? How can we build diverse teams that reflect and support those needs (without further medicalising them)?

Nurses are team members with different levels of practice and expertise engaged in meeting the needs of people with cancer. Teams will include individuals with a range of different skills and knowledge, from support workers, practitioners to senior and consultant level practitioners.

The whole model of care and therefore the CNS model is changing: as people live longer with cancer, often moving back and forth between chronic and acute care with personalised, different treatments offered at different stages, historic nursing models based on intensive short-term needs may not always apply. **Nurses will become more, not less important** and the line between physical and mental health will increasingly blur. The care model – and the skills to deliver it – will need to change so that the NHS can support people to live or die as well as they can

It is the skills, knowledge, compassion and availability of the nurse that patients most value, not their title, status or location.

Now and then … a vision of the future

Past		Future
GENERALISTS AND SPECIALISTS	INDIVIDUAL SKILLS	TIERS OF SKILL: COMPETENT / SPECIALIST / HIGHLY SPECIALIST
UNI-PROFESSIONAL SILOS	PROFESSIONAL BOUNDARIES	INTER / CROSS / FLEXIBLE PROFESSIONAL ROLES ADVANCED CLINICAL PRACTICE
PROFESSIONAL HIERARCHIES	TEAM WORKING	MULTIDISCIPLINARY TEAMS: SKILL MIX SUCCESSION PLANNING
PATERNALISTIC, SERVICE / PROFESSIONAL FOCUS, MEDICAL FOCUS	PHILOSOPHY OF CARE	CO-PRODUCTION; SUPPORT TO SELF MANAGE CITIZEN FOCUS; PATIENT CENTRIC, HEALTH AND SOCIAL CARE – SOCIAL PRESCRIBING
HOSPITAL BASED SERVICES	LOCATION / ACCESS	CLOSER TO HOME COMMUNITY BASED SERVICES
SECTOR BASED OPERATIONAL SILOS PRIMARY / SECONDARY / TERTIARY REFERRAL HEALTH / SOCIAL / LOCAL AUTHORITY SERVICES	ORGANISATION	INTEGRATED & INTERCONNECTED SERVICES HOLISTIC AND SEAMLESS CARE PRIVATE / THIRD SECTOR PARTNERS
SERVICE BASED	COMMISSIONING	INTEGRATED WITH WORKFORCE PLANNING NATIONAL DIRECTION: LOCAL DELIVERY

Nursing supply scenarios: a summary

Our emerging hypothesis is that we need to **significantly grow the numbers, skills and time** of the nursing workforce. 45% growth over ten years – an additional 100, 000 nurses – would:

- Lead to **improvements across all parts of the cancer pathway** (prevention, diagnosis, treatment and living with and beyond cancer) because all nurses have contact with cancer patients, **AND it will improve care and outcomes for other conditions as nurses support all patients** (although a similar growth rate is arguably needed for the registered nursing workforce working in mental health, paediatrics and Learning Disabilities).

- **Increase the supply pool for advanced practitioners, and clinical endoscopists to support earlier diagnosis and community-based nurses to support prevention,** monitoring and follow up, creating the time and space for nurses to develop their skills.

- **Help retain those nurses who we will support to learn, as well as those nurses who are able to teach** and mentor, as the NHS becomes dedicated to lifelong learning, with **time to learn, time to teach and time to care.**

- **We will run a national conversation with nurses to shape delivery:** Building on the Perceptions of the Nursing survey, we will work with partners explore what the factors that encourage nurses to choose cancer as their career and how we can support them further, using the work of the CNS Advisory Group as the basis for discussion.

Supply case study 2: Oncologists

Clinical and Medical Oncologists are specialist physicians trained in the assessment, prescription and treatment of cancer, using a wide range of therapies and interventions. Whilst there are some differences between the two roles (only Clinical Oncologists can prescribe radiotherapy) they are complementary disciplines. Oncologists are the only medical profession dedicated to cancer care, and Consultants are responsible for 'holding the ring' on an increasingly complex patient pathway involving multi-disciplinary teams, when our understanding of the disease and actionable information is changing almost daily.

The Consultant Oncologist is usually the person who, following their initial diagnosis, explains to someone the stage and type of their cancer, their likely prognosis and treatment options available to maximise their chance of a cure and/or improve quality of life, monitors progress and adjusts treatment accordingly, and when a patient may no longer benefit from active treatment, they initiate this difficult conversation.

As cancer treatment becomes ever more complex, personalised and network-based, the unique role and skills of oncologists are likely to become more important, as is their ability to stay abreast of the latest research, access to trials and the skills and time to communicate.

HEE findings, published in the Cancer Workforce Strategy 2017

The NHS ESR data at March 2017 indicated there were 670 FTE clinical oncology and 415 FTE medical oncology consultants in post: a **combined total of 1,085*.** A relatively small but important workforce.

NHS Providers' data indicates vacancy rates of approximately 5% in clinical oncology and 14% in medical oncology, but due to concerns re accuracy of the two component workforces, we have more confidence in the **combined vacancy rate of 7%.**

In March 2017, approximately one quarter (27%) of the NHS Clinical Oncology consultant workforce in England was comprised of doctors who undertook their primary medical education (i.e. degree or equivalent) **outside the UK. Within this total 9% were from the European Economic Area.**

In order to forecast the 'net' number of oncologists likely to be working in the NHS by 2021, we look at how many we expect to join the profession compared to how many we expect to leave.

**Although ESR data is flawed (mis-coding) and the source (and therefore the numbers) are slightly different from Royal College Census data, overall this is a relatively small workforce and we agree about overall trends and issues.*

Oncologists (Medical and Clinical) high level 'if we do nothing' forecast

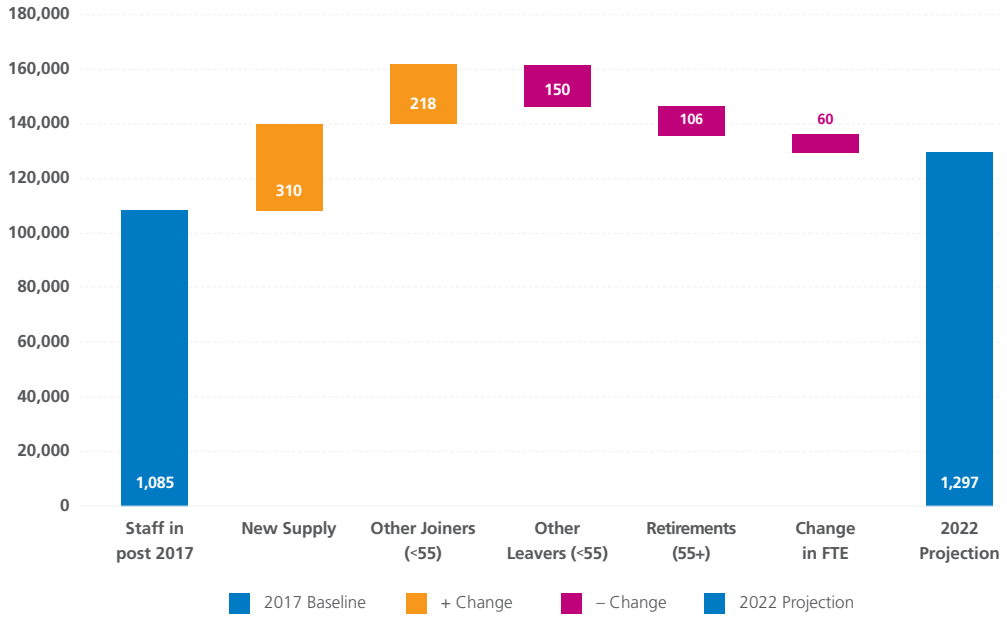
- **If we 'roll forward' observable history** and take no further action above what is planned, then between 2017 and 2022, 29% will have just completed training within the UK; a further **20% are estimated to join England's profession via the CESR route or from abroad or agencies.**

- Between 2017 and 2022, there are estimated to be 106 **(10%) leavers due to age retirement and 14% leavers, for reasons other than retirement, from the NHS** (note, this is a 'roll forward the past' forecast, and does not allow for Brexit etc.).

- In 2017 there were 1,085 clinical and medical oncologists in post. **If we take no further action** and the above forecasts of joiners and leavers are broadly correct, then in 2022 we would expect to see approximately **1,297 staff** in post, **an increase of 212 FTE (20 per cent).**

- **This is less than the growth of the previous five years (30%, or 5.3% p.a.) and is within a relatively small workforce. By 2027, the growth could rise to 35%** an additional 384 FTE bringing the workforce to 1,469 in total. But **will this moderate growth be sufficient to meet forecast demand and close the gap between the UK and the rest of the world in terms of cancer outcomes?**

Projected change in supply of NHS CT holders 2017 to 2022 (WTE)



Source ››

HEE model, 2018, updated from phase 1 report which forecast growth of 16%

Is the 'do nothing' projected growth sufficient to meet forecast demand?

The **volume and complexity of demand** for cancer services is set to rise, as the incidence of cancer increases by 2% p.a. amongst a growing, ageing population with more co-morbidities, increased mortality and potential re-occurrence.

But **our ability to respond to this demand is also increasing in volume and complexity.** The increasingly complex nature of **systemic anti-cancer treatments** such as chemotherapy (where courses have increased by 8% per year for the past five years), an explosion in **new drugs,** including **immuno-oncology,** our understanding of **genomics** and new developments in **radiotherapy** (which may be more important with increased early diagnosis), including Intensity-modulated radiation therapy (IMRT), stereotactic radiotherapy, proton beam therapy and synchronous SACT with radiation, mean that patients and their clinicians may increasingly pursue **multiple lines of treatment,** either in parallel, sequentially and/or repeatedly depending upon their response.

These developments – which will increase in both scale and pace – mean **we need a workforce with the time and expertise to deliver state-of-the-art treatments,** with sufficient time in their job-plans to accommodate **lifelong education in rapidly changing fields such as oncogenetics,** and to support the increased pressure on general and acute medicine caused by **side-effects** of new treatments.

A workforce beset with vacancies and high burn-out rates will not deliver this model.

According to CRUK and the Royal College of Radiologists we need to at least double the non-surgical oncology workforce just to deliver current best practice

CRUK recently commissioned research on the future needs of the non-surgical oncology workforce.

Their model used census rather than ESR data to count supply, and modelled future demand on how many people would be needed to deliver 'best practice' in cancer.

This innovative model suggests a need for up to **170%** more oncologists than the 2015 levels (approximately a further **2,000**), or potentially nearer **100%, – 1,500 more** – given the skill mix happening already and the implications this has had on the need for oncologists. if current best practice is to be delivered – **at least a doubling of the clinical and medical oncology workforce.**

The Royal College of Radiologists believes we have a **current shortfall of @300 WTE clinical oncologists.** Their most recent census has shown a reduction in retirement age below 60 for the first time, an increasingly feminised workforce, with **28% of the current consultant workforce working less than full time (LTFT), a 5% increase since 2012.** Consultant **vacancy rate has increased at 5% this year with half of the posts being vacant for 12 months or more.** In order to make up the current shortfall, absorb the changing demographics of the workforce and patients and allow time for training in genomics and trial development to improve outcomes, the **RCR conclude that over the next 10 years, we will need to at least double the number of clinical oncologists (100%).**

Impact of workforce shortages in Oncology*

43%

of oncologists report that the backlog of patients makes it difficult to support ongoing demand.

43%

of oncologists reported working more than an additional eight hours each week.

64%

of locum/agency oncologists are working to fill permanent vacancies rather than short-term issues such as sickness or annual leave.

29%

A shortage in nurses, therapeutic radiographers, pharmacists and administrative staff limits the ability of oncologists to participate in clinical trials. Only 29% of patients had said someone had talked to them about taking part in cancer research.

**CRUK Survey*

Teamwork and skill mix could free up time of oncologists

New skill-mix approaches – whereby other members of the team are trained to take on additional responsibilities – can free up valuable Consultant time for more complex cases and contribute to improved patient experience as well as staff development (and therefore retention) 70% of the non-surgery oncology workforce agreed or strongly agreed that skill mix is a positive development.

Skill mix could **reduce the level of growth in oncologists** required, as Advanced Clinical Practitioners, therapeutic radiographers and pharmacists take on more tasks, possibly supported by IT systems and digital working, **but it will not remove the need for growth.**

The ability to train people (such as therapeutic radiographers) to take on an enhanced role may be **limited by existing shortages in that profession** (and could exacerbate it – 'robbing Peter to pay Paul'). Opportunities for further development are key to retaining the radiographer workforce, but it will require sufficient supply and experienced mentors/trainees with the time to develop and support team members to practice advanced skills

The expansion of Clinical Support Workers (CNSs) (Macmillan pilot to free up senior CNS time in oncology, so that we can support oncologists in an increasingly complex role that relies on connections between many disciplines and organisations) could **release valuable oncologist time and productivity.**

Supply of Oncologists: emerging hypotheses

- The incidence of cancer, the **complexity and depth of demand for personalised care and the range of potential responses is forecast to increase.**

- Oncologists are one of the few professions dedicated to the care of cancer patients: they **'hold the ring'** on **a complex pathway across many disciplines and providers** in an environment that is rapidly changing due to developments in genomics, technology and informatics, where tomorrow is increasingly possible today and where the support/workforce (admin/IT) has decreased.

- Although the number of Consultant Oncology staff in post have increased over the past five years, (5.3% p.a.), the rate of growth is not enough for forecast demand. Training posts for future Consultant Oncologists have not increased, alongside an increase in all genders working less than full time. Working above and beyond contract due to the above, with staff shortages and insufficient protected time making it difficult to keep up with the latest developments is leading to **increased burn-out and leaver rates.**

- The **current shortfall will prevent the transformational step change needed** to accelerate cancer outcomes improvements and close the gap between the UK and other countries.

- **Significant growth is therefore required** (a) in order to 'catch up'; fill current gaps and provide service to patients in need and (b) to meet future forecast demand and (c) allow the time and headroom for Oncologists to participate in ongoing education in training in genomics etc. as well as research and clinical trials to improve outcomes for all patients.

- To achieve this, 'significant growth' for this small but vital workforce may be in the order of **100% – a doubling of the workforce over the next 10 years which equals to 108 FTE (10%) p.a. or 1,085 (100%) in ten years.**

How could we achieve transformative significant growth in the numbers, skill and time of Oncologists over the next five years?

If we agree we need significant growth in the **number, skills and time** of Oncologists to support improvements in cancer, then we can work back from this with partners to **identify the different actions that will get us to this net supply position in the agreed time frame** and create the conditions for the **transformational step change** needed to move UK outcomes towards the very best in Europe. Initial proposals **in the short-term could** include:

- A national targeted drive on **retention, return to practice and international recruitment.** (We committed to an additional 76 Oncologists by 2021 through these measures in phase 1 **(14%)** but the scale of ambition needs to increase. **As 25% of clinical oncologists are from non-UK,** and given the commonality of our model, **a targeted international recruitment campaign is likely to yield the most gains in the short-term,** with the right support such as mentoring.

- **Targeted and resourced education programmes** for all oncologists in genomics, for example, to **increase knowledge of staff and better outcomes for all,** not just those patients who live near big teaching centres.

- A commitment to **a rolling programme of investment in equipment replacement** to improve **patient outcomes, staff morale and release time.**

- Staff are best placed to know what further support they need to use, develop and share their skills and expertise, so we **will seek the views of oncologists** (from trainees to Consultants).

How might we achieve transformative growth in the numbers, skills and time of Oncologists over the next 10 years?

In the medium-term:

- In phase 1, we estimated that **one-in-10** of those who begin training in oncology will not complete their training programme, and only **7-in-10 of those completing will transit to the NHS** within three years. HEE to work with Royal Colleges and employers to **reduce attrition from postgraduate training courses and increase transition to NHS.**
- **HEE to develop national postgraduate medical education and training programmes** to **support skills mix** through the expansion of Advanced Clinical Practitioners, with enhanced roles for reporting radiographers, pharmacists etc. and explore the possible roll-out of Clinical Support Workers **free up time/increase productivity** of oncologists.
- **Greater investment in AI and digital support for virtual clinics/apps** (perhaps targeted at neglected/ struggling areas such as follow up clinics and/or prevention/reducing risk of reoccurrence).
- **Increased investment in clinical trials** for **better outcomes for all** (including admin and research nurses).

In the longer-term:

- (subject to funding/undergraduate expansion) **HEE** to **significantly expand the number of Oncologist training posts to support a doubling of the workforce over the next 10 years.**

Therapeutic Radiography high level 'if we do nothing' supply scenario

Therapeutic radiographers plan and deliver radiotherapy to treat cancer. Those who specialise in a particular pathway such as breast or lung are responsible for streamlining and focussing care and support across the radiotherapy pathway. It takes at least three years to gain a degree in radiotherapy and register to practice. They are vital to the new proton beam therapies, and may have an increasingly important role as our ability to stratify and personalise radiotherapy treatments and improve outcomes for cancer patients increases.

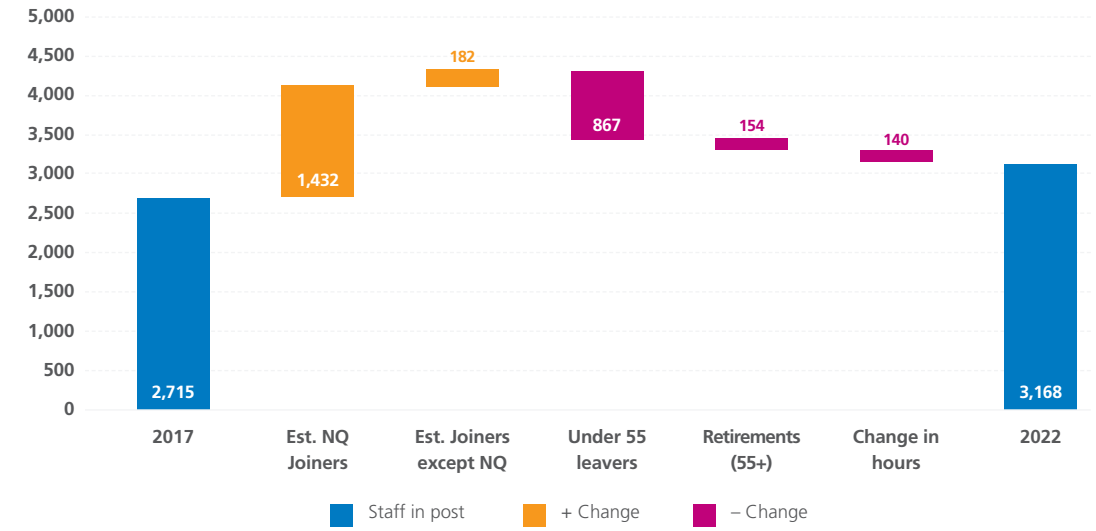
The chart shows the most likely changes in the therapeutic radiography workforce 2017 to 2022, **if we roll forward observable history.** This includes changes due to retirement, changes to contracted hours and other leavers decreasing workforce numbers on one side, and newly qualified staff graduating from training growing the workforce on the other side.

It does not estimate or allow for planned improvements on retention being led by NHSI or factor in recent drop in applications to training programmes.

This forecast would see the workforce grow to a net supply of 3,168 FTE at the end of 2022, an increase of 453 FTE or 16.7% (3.3% p.a.), which is less growth than between 2012 and 2017 (22%).

This would mean an additional 906 therapeutic radiographers at the end of the 10 years' period (2017-2027). By 2027 the cumulative percentage growth would be 33% for this workforce and represents moderate growth.

Therapeutic radiography – change in supply, 2017 to 2022 (based on current performance)



Therapeutic Radiography – a potential shortfall in trainees

As we highlighted in our phase 1 report, the **number of people leaving therapeutic radiography for reasons other than retirement is higher than for other professions (28% over five years).** Since we reported, there has been a **further deterioration** in people leaving for reasons other than retirement, which has risen from 5.6% in 2012/13 to 6.4% in 2016/17.

More worryingly, the **numbers of training places available has dropped by 25% (from 400 in 2016/17 to 300) and** currently, **only half of the training places for therapeutic radiography have been filled** for the intake beginning in September (in 2016/17, fill rate was **99.5%**)

We do not yet have full data of this emerging picture, but Society of Radiographers report that the **removal of bursaries has been a significant factor,** as would-be radiographers are now required to pay full fees and loans for an eventual salary which seem **less competitive with other degree courses.** As the fees students pay are less than the fees HEE used to pay, this programme may be **less attractive to the HEIs,** and one has put its programme into suspension.

There is currently no role substitution in therapeutic radiography. If this trend continues, then **this could affect the delivery of the NHS Proton Beam therapy programme** (which relies on at least 80 therapeutic radiographers to staff the two new planned centres by 2020) and/or the **wider role of radiotherapy in cancer services,** and the ability to create new roles at advanced and consultant levels of practice (key to retaining skilled staff) as we seek to move the UK towards the best in Europe.

Emerging hypotheses and urgent actions for Therapeutic Radiographers

We know that the incidence of cancer and the **range and complexity of treatment is forecast to increase.** Increase in **early diagnosis** will **increase use of radiotherapy** as first line treatment. New roles and skill mix at advanced and consultant practice are **key to improving access to innovative and advanced treatments.**

If we do nothing further, then by 2027 there would be moderate growth of 33% therapeutic radiographers. Our emerging hypotheses is that significant growth is required in the workforce to enable us to move the UK towards the best in Europe for cancer outcomes. **Significant growth of 45% would produce an additional 1,222 FTE therapeutic radiographers by 2027.** However, this depends upon us continuing to fill the training places. **Urgent action is required to ensure we fill the 300 training places available this year** and to come up with a sustainable plan going forward.

In the **very short-term, all stops need to be pulled out,** HEIs must work with employers, HEE and SoR to fill as many training places as possible through applications and clearing. These efforts will need to be sustained, with **wider efforts to promote therapeutic radiography as a career,** reaching out to mature students alongside **new routes to training such as apprenticeships and two-year MScs.** The **RTP** campaign led by the DHSC will need to be stepped-up and HEE to support NHSI/employers to develop a **package of incentives to delay retirement and retain existing staff,** including clinical educator roles to support the retention of students as well as staff.

We will work with the Government to consider how to improve access to training and consider bespoke incentives where there is evidence of market failure in particular professions and/or geographies, recognising the increasing role therapeutic radiographers will have in delivering radiotherapy and improved cancer outcomes, and consider a **rolling programme of investment in equipment replacement.**

Delivering better outcomes through earlier diagnosis

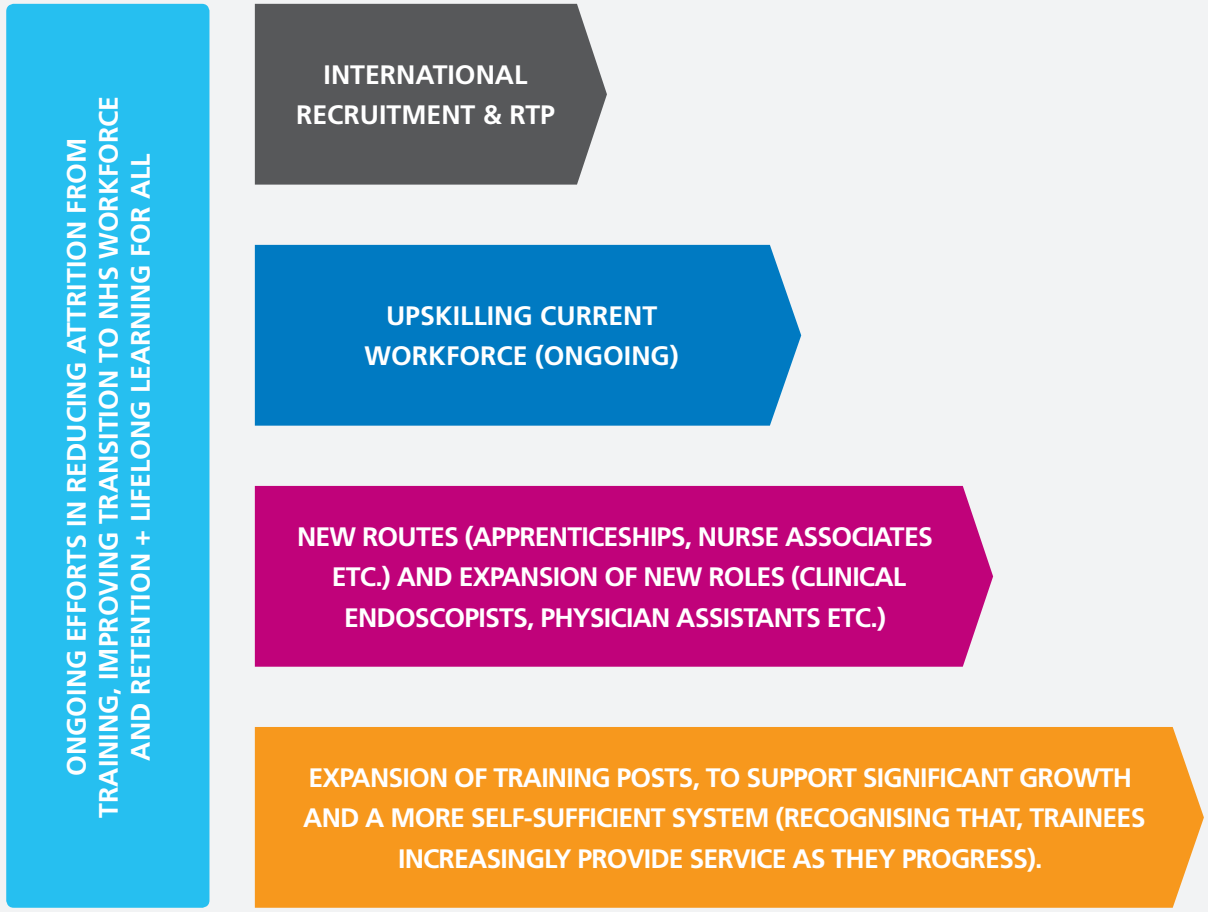
In phase 1, we focussed on immediate actions to increase the numbers of radiologists, pathologists, radiographers, oncologists and nurses by 1,500, including national programmes to deliver 400 clinical endoscopists and 300 reporting radiographers by 2021 to support earlier diagnosis and improved outcomes.

The NHS 10-year plan is expected to go further and faster on the ambitions set out in the existing strategy, with a greater shift towards prevention and earlier diagnosis. This may require us to investigate a larger number of patients for signs of cancer – closer to the NICE recommended 3% threshold risk of cancer rather than the current 8% – bringing UK usage of investigative tests such as MRIs, CT scans and endoscopies more in line with the rest of Europe. Both ambitions will require an increase in workforce numbers and skills.

In this framework we have considered the scale of growth required through the illustrative lens of three professions: nurses, oncologists and therapeutic radiographers against the overall forecast increase in incidence of cancer. But another approach would be to consider which aspects of cancer care are growing in line with forecast incidence; those which are growing faster and those which are growing much faster. Arguably, the diagnostic workforce is an area which needs to grow much faster than incidence.

We will continue to explore these issues further with NHS England, Public Health England and other partners over the coming months and set out proposals in the NHS 10-year plan and HEE's 10-year Workforce Strategy to deliver the agreed service models and ambitions.

A five-fold strategy to secure supply over the short, medium and long term whilst we develop a self-sustaining workforce



Whilst a self-sufficient system might be the long term goal, given the time it takes to train clinicians we will require a **five-fold strategy** running in parallel to secure supply in the short, medium and long term.

The extent to which we rely on the four different sources of supply will shift over the next 5, 10 and 15 years, if we succeed in creating an environment of significant growth, life-long learning and improved retention and morale.

Our new trainees will be equipped to take advantage of genomics, digital and AI as they become mainstreamed within a similar timescale.

Summary of emerging conclusions of Phase 2

- The incidence of cancer is forecast to grow by **2% pa** and the nature of that demand is likely to be increasingly complex.

- The workforce has grown, but **overall growth figures mask periods of 'boom and bust'** and **differential growth between the professions** - 38% growth in consultant posts over the past 10 years compared to just 3.8% for nurses.

- Whilst growth is planned in almost all individual professions, in many cases, this is likely to be lower than historical growth and less than predicted patient demand for cancer services. **The question is not whether the workforce is growing, but whether it is growing enough.**

- There is a **false dichotomy** between the current and future workforce and numbers versus skills: **50% of today's workforce will be working for the NHS in 2032.** Just growing more of the same staff will not deliver the improvements we need, but staff need to work in environments where there are sufficient numbers so that they have the **time to learn (e.g. genomics), and develop new and more productive ways of working (e.g. AI) as members of a diverse team centred around patient need.**

- **Genomics will require an increase in the volume, skills and time of clinicians working in cancer. AI is unlikely to replace entire professions, but support clinicians to be more productive,** giving them **the gift of time** and allowing them to concentrate on where humans add most value.

- Our emerging hypothesis is that **the NHS workforce will require significant growth – at least 45% in aggregate over the next 10 years)** in order to a) 'catch up'; fill current gaps and provide service to patients in need and b) to meet future forecast demand and c) allow the time to participate in life long learning **to support a transformational step change in cancer outcomes and experience.**

Summary of Proposals to significantly grow the nursing workforce by 45% over 10 years (to be considered as part of the workforce and ten-year NHS Plan)

Short-term (in year)	Medium-term (3-5 years)	Long-term (>10 years)
Through Improved **retention, (employers) Return to Practice and International Recruitment** initiatives, HEE could yield up to an additional **4,300 adult general nurses per year** (2%). HEE and Cancer Alliances to update plans and set out how they will achieve this.	Subject to funding, HEE to work with **HEIs to significantly expand the number of nurse training places,** so combined actions to improve retention delivers at least **21,500** additional net supply of nurses in employment.	Subject to funding, **HEE to work with HEIs to significantly expand the number of nurse training places,** so combined actions to improve retention etc. deliver at least 100k additional net supply of nurses in employment.
	HEE to take responsibility for developing a national training programme for CNSs and other post –graduate non-medical roles to drive skill mix and new roles, ensuring a clear and consistent route to training that we can **roll out at scale and pace** on behalf of the system.	**45% increase in the specialist nurse cancer workforce** would achieve an additional • 1,209 FTE Adult chemotherapy nurses • 440 FTE Specialist palliative care nurses • 286 FTE Cancer support Workers.
We will work with the government to review 'the offer' to nursing staff, including access to **life-long learning,** rewards to retain the most experienced and support to work at the top of their skill set as part of a team, informed by **national conversation led by nurse leaders.**	To support the necessary growth in training places, we will work with the Government to develop bespoke incentives where there is evidence of market failure in particular professions and/or geographies.	To support the necessary growth in training places, we will work with the Government to develop bespoke incentives where there is evidence of market failure in particular professions and/or geographies.

Summary of proposals to double the number of oncologists over the next ten years (to be considered as part of the workforce and ten-year NHS Plan)

Short-term (in year)	Medium-term (3-5 years)	Long-term (>10 years)
HEE to improve **attrition** from courses and **transition** to the NHS. Improved **retention, (employers) Return to Practice and International Recruitment** initiatives (HEE) targeted at Oncologists to deliver **at least 14%** additional growth as agreed in phase 1.	Improved retention, RTP, and IR commitments in phase 1 will yield 76 more oncologists by 2021, (14%) But in the light of this report, **local plans should seek to be much more ambitious.**	Subject to funding, **HEE to significantly expand the number of oncology training posts so that we double the workforce,** providing a net supply of **2,170** within 10 years.
We will work with the government to review 'the offer' to staff in general and oncologists in particular, informed by an urgent review so that we can retain and support our existing oncologists. This could include **protected time for life-long learning and a rolling programme of investment in equipment replacement.**	To support employers, **we will work with the government to consider how obstacles/rewards might be revised** in order to attract and retain this vital workforce.	We **recommend increased investment in clinical trials, supporting all oncologists to deliver better outcomes** for all patients (including investment in administration and research nurses).
Subject to funding, HEE to **provide targeted and ongoing genomics education programmes to all oncologists, MDTs and genomic leads** and pilot/roll out **Clinical Support Workers.**	**HEE to develop national postgraduate non medical education and training programmes to support skills mix** through the expansion of Advanced Clinical Practitioners, with enhanced roles for therapeutic radiographers, pharmacists etc.	Over time (flexible) **we recommend greater investment in AI and digital support for virtual clinics/apps,** starting with neglected areas such as follow up clinics and/or prevention/reducing risk of reoccurrence).

Summary of proposals to significantly grow therapeutic radiographers by 45% over ten years (to be considered as part of the workforce and ten-year NHS Plan)

Now	Short-medium-term (1-3 years)
HEIs to work urgently with employers, HEE and SoR to fill as many training places as possible, including targeted clearing. **DHSC-led RTP programme to be stepped up.** **HEE to work with NHSI/employers to develop a package of incentives** to delay retirement and retain existing staff.	HEE to work with HEIs to **achieve significant growth of 45%** to produce an additional 1,222 therapeutic radiographers by 2027. In order to sustain growth, **HEE to work with SoR on a campaign** to promote therapeutic radiography as a career, with employers offering work experience and volunteering opportunities and new routes to training such as apprenticeships, 2 year MSc's. **New roles and skill mix at advanced and consultant practice** within therapeutic radiotherapy are key to improving access to innovative and advanced treatments and retaining skilled staff. **HEE to roll out such roles at scale and pace through new postgraduate non-medical budget to support New National Roles** (once core supply is secured).

We will work with the Government to develop bespoke incentives where there is evidence of market failure in particular professions and/or geographies, recognising the increasing role therapeutic radiographers will have in delivering radiotherapy and improved cancer outcomes, and consider a **rolling programme of investment in equipment replacement.**

Summary of Genomics and AI: the future is uncertain, so we need to invest in life-long learning for flexibility (to be considered as part of the workforce and ten-year NHS Plan)

	General workforce	Specialist workforce
Genomics	**In the short-term, all staff will need some understanding of genomics.** HEE to roll-out **online training courses** so all staff can increase their knowledge. **In the longer-term,** HEE to **develop proposals to support life-long learning in genomics** so all staff can keep up-to-date as developments occur.	**In the short-term, HEE to fund a targeted and on-going genomic education programme for all MDTs, genomic leads and other priority groups key to delivery,** so that MDTs are fit for purpose and up-to-date. In the **longer-term, a significant expansion of the genomic workforce** will be required to meet forecast increased volume and complexity of demand, including clinical geneticists, cancer genomic scientists, genetic counsellors, bio-informaticians, pathologists and pharmacists.
AI	"All clinicians should be educated in the ethical standards and good practice of working with AI, best practice in data curation and governance and the interpretation of clinical statistics and recommendations generated by AI systems." Topol interim report.	"The NHS needs AI specialists who understand the requirements of patients and healthcare professionals and are keen to be embedded in all care settings, so that AI systems designed for healthcare are fit for purpose." Topol interim report.

Workforce – being clear on who needs to do what

Cancer services and staff exist to meet the needs of patients, so the forecast demand and emerging needs of patients should always be our starting point in workforce planning – this is best carried out **once** at a national level whilst allowing for local variation. **HEE to consider producing a patient demand forecast every 3 years.**

Individual members of staff are the experts in their profession and understand what they need to support them to do their current job better and what further skills they will require to keep up to date and continue to innovate and improve – we should listen and respond to their voices **through reviews and surveys.**

Individual employers are responsible for recruiting, retaining and retraining their staff, supported by NHSI. Continuing Professional Development (CPD) budgets should be **increased, protected and devolved to Trusts** so that they can support **life-long learning** and develop **innovative new roles and skill-mixes.**

Innovation occurs locally, but implementation at scale and pace requires national support and leadership. (i.e. clinical endoscopists, Nursing Associates, Physician Associates). Once it is agreed with the DHSC/ NHS England that a new role or education/training programme should be rolled out, **HEE should use a new dedicated national budget** for this purpose. This (rather than postgraduate medical training places) should form the basis of its **Annual Investment Plan,** so that we can **rapidly expand and transform the skills, knowledge and roles in the current workforce within 1-3 years.**

The overall strategy for investment in Postgraduate Medical Trainee posts should be set as part of the multi-year funding plan for clinical training places and refreshed every 3 years, led by HEE and agreed with partners (DH/NHSI/NHS England) and aligned with wider planning processes, funding envelopes, service priorities and models.

Explicit assumptions, informed choices and the distribution of risk

This framework sets out the key issues facing the cancer workforce over the next 5, 10, 15 years and our emerging hypotheses so that wherever possible, we can develop a **shared set of explicit assumptions to inform the future NHS ten year plan and the multi-year funding plan for clinical training places.**

This will require honesty. A transformational step change in cancer outcomes that moves the UK closer to the best in Europe cannot be **delivered in the context of workforce scarcity,** where staff struggle just to meet the demand walking through the door. **Transformation requires investment in the numbers and skills of staff** so that staff have the time to learn, to teach as well as to care, creating a virtuous circle of improvement.

This is about our appetite for risk and where we think it should be distributed. In scenario 3, significant growth could result in an 'oversupply' of skilled clinicians (if you take funded posts as the demand line rather than patient need), **the risk is carried largely by the Government and the tax payer,** and perhaps skilled clinicians who may find they have to continually adapt and re-skill to ensure a life-long career in the NHS.

In scenario 1, minor/flat growth, where staff struggle just to keep up with the current demand and service models, **the risk is distributed towards the individual patient and their carers** who may not gain timely access to the diagnostic/treatment options that are available **because we do not have sufficient numbers of staff with the right skills and knowledge** to provide it – and this will vary across the country.

Next Steps...

This report represents our **emerging hypotheses** and we seek your input as we develop our thinking and plans.

As we build consensus on the big strategic choices, **we will develop more detailed proposals to support the development and delivery of the NHS 10-year plan including key professions** not considered here, such as the wider team that will be required to support increased survivorship, and the palliative workforce required to support people to die well.

What you can do:

Please use this report as a basis for a discussion within your organisation alliance or network and provide us with your views on our emerging hypotheses and recommendations by **Friday 28th September so that we can use your views to shape and inform HEE's wider workforce strategy and our contribution to the NHS ten year plan.**