# SECURING A CANCER WORKFORCE FOR THE BEST OUTCOMES

## THE FUTURE DEMAND FOR CANCER WORKFORCE IN ENGLAND – NOVEMBER 2018

CANCER RESEARCH UK

# EXECUTIVE SUMMARY

## A NATIONAL AMBITION TO IMPROVE EARLY DIAGNOSIS

Despite some progress in recent years, cancer survival in England continues to lag behind comparable countries in Europe and the rest of the world[i]. In large part this is because we do not diagnose enough cancers at an early stage, where treatment is likely to be more successful. In 2016, only 54% of cancers with a known stage were diagnosed at stage 1 or 2[ii].

Cancer services in England are also subject to significant regional variation, with cancer survival being far better in some parts of the country than others[iii]. And analysis by Cancer Research UK (CRUK) estimates that we need at least to double the rate of progress in some cancer sites to match the best cancer survival of comparable countries in 10 years.

That's why the Prime Minister's announcement in October 2018 was so significant. An ambition to diagnose 75% of cancers at stage 1 or 2 by 2028 marks a commitment to a step change in early diagnosis, and offers a real opportunity to transform cancer services and close the survival gap.

The Prime Minister highlighted several initiatives to support the early diagnosis of cancer, including the lowering of the bowel screening age to 50. This and other commitments are welcome, but they are only part of what is needed to reduce the burden of late stage disease.

To be able to diagnose more cancers at an earlier stage, many more patients will need to be tested for suspected cancer. This will require a significant growth in numbers in the staff groups who deliver these diagnostic tests.

At the same time, early diagnosis is only effective in helping more people survive cancer if there is equitable access to the best possible treatments – and the workforce required to deliver these treatments will change as more people are diagnosed at an early stage. And as treatments become more specialised, there will be a need for more staff to perform them.

The Prime Minister's announcement last month was very significant. But it was also significant for what it lacked – a commitment to grow the workforce to support the new ambition for earlier diagnosis and improve outcomes.

And while the £20.5bn funding increase the Government has pledged to NHS England by 2023/24 to support the delivery of the long-term plan is welcome, this does not include funding for training and educating the staff of tomorrow or developing a long-term strategy for the future of the workforce. We urgently need to see a long-term strategy, and associated investment, for the cancer workforce. Some of the additional investment in NHS England should be deployed to optimise the existing workforce and ensure that the cancer workforce is being prioritised at a regional level. However, beyond this it is vital that Health Education England receives additional funding to ensure that the right numbers of medical staff can be trained for the future.

# A DEMAND-LED APPROACH IS NEEDED

By 2027, around 389,000 people in England are expected to be diagnosed with cancer every year. By 2035, this will rise to nearly 438,000 people - an increase of more than 130,000 on 2015 levels[iv].

Keeping up with this significant growing demand will rely – as always – on the dedicated array of staff involved in cancer diagnosis and treatment.

That is without considering the transformation that will be needed to achieve the new ambition to achieve greater early diagnosis of cancer and close the survival gap.

Workforce planning needs to be long-term, and needs to take account of predicted patient need – but this has been consistently lacking from NHS planning for several years, meaning we currently have significant gaps in the cancer workforce.

We have not yet seen a long-term strategy for growing the cancer workforce, despite the urgent need to ensure that we have enough staff to meet the needs of many more cancer patients in the future, and despite it being a recommendation of the 2015 Cancer Strategy for England[v].

In the absence of this strategy, through this report we have tried to demonstrate an approach to workforce planning that accounts for future need for care based on incidence projections – and considers how the transformation we need to close the survival gap might affect workforce needs.

The numbers in this report are estimates – they have been calculated with varying levels of clinical input and have varying degrees of confidence. We want to work with NHS England and Health Education England to refine this approach and ensure that we have a long-term workforce plan which plans for the right numbers of staff to meet future need.

# STAFF NUMBERS MAY NEED TO DOUBLE TO MEET DEMAND

Our headline finding is that staff numbers may need to double across key workforce groups by 2027 just to meet the needs of the growing number of patients[1].Given the scale of this estimated increase, it is vital that NHS England and Health Education England conduct their own detailed modelling exercises to better understand what increases we need over the course of the new long-term plan, and that this is tested with the wider cancer community.

For example, our estimates suggest that by 2027 the number of radiologists may need to grow by 70%; the number of gastroenterologists by 45%; the number of therapeutic radiographers by 80%; and the number of oncologists may have to triple.

We have been unable to estimate the scale of increase needed for diagnostic radiographers, histopathologists or GPs, but these staff groups will clearly be crucial to the early diagnosis of

[1] This estimate is based only on the way care is currently provided, rather than taking into account potential changes in the NHS. These changes are explored in more detail below.

cancer in the future and it is therefore likely that they will also have to grow significantly in numbers to meet demand.

## CHANGES IN THE NHS WILL NEED EVEN MORE STAFF

These estimates are only an attempt to quantify by how much staff numbers might have to grow just to meet the demand from an increased number of patients in 2027 – without accounting for any of the changes that are likely to take place in the NHS over that time.

We know that there are several changes that are likely to occur in the NHS over the next ten years – and many of these will have implications for the numbers of staff we need.

For example, the potential impact of AI has been discussed extensively, and HEE's Topol Review is currently considering the potential impact of AI on the workforce requirements of the NHS[vi].

And new initiatives to help us reach the Prime Minister's ambition for early diagnosis, such as lowering the bowel screening age, will likely have an impact on the staff we need in the future.

This report considers several of these key changes that CRUK feels are likely to impact on the way that cancer is diagnosed and treated, and explores how they could also impact on future workforce needs – in addition to the estimates above. These are not a definitive statement on how these changes will affect workforce needs, but demonstrate how many potential changes are in train and how significant their potential impact could be. HEE and NHS England should do further research to explore the impact of these changes, working with the cancer community to develop consensus.

## A LONG-TERM PLAN FOR THE WORKFORCE

A key element of the new long-term plan for the NHS must be a long-term workforce strategy to ensure that we have the staff we need to diagnose and treat cancer in the future. Without the right staff in place, we will not be able to achieve the ambition of diagnosing 75% of cancers at stage 1 or 2 by 2028.

As part of developing a long-term plan for the workforce, NHS England and Health Education England must consider the future demand created by a growing and ageing population. This report has attempted to demonstrate what the potential impact of increased demand could be on workforce numbers in key staff groups for the diagnosis and treatment of cancer. **NHS England and HEE should consider the findings of this report and incorporate them into their own models of future workforce needs.**

NHS England and HEE should also consider the impact of changes to technology and service delivery. Some of this work is already taking place, but there are potentially significant workforce implications for many likely changes to NHS cancer services which must be considered as part of a long-term workforce strategy.

This strategy will be ineffective unless it is matched by investment to ensure that the pipeline

of staff will deliver the right numbers in the future and that any actions to increase supply in the shorter term are fully funded. **The Government must ensure that funding is available to HEE for the purposes of developing and implementing a long-term strategy for the workforce.**

**NHS England must ensure that part of its existing settlement is used to support optimising the existing workforce and to ensure that regional NHS organisations prioritise the cancer workforce.**

# CONTENTS

# SECURING A CANCER WORKFORCE FOR THE BEST OUTCOMES

## BACKGROUND

Following the Government's commitment of an additional £20.5bn for the NHS by 2023/24, NHS England is currently developing a long-term plan for the NHS. We welcome the priority that has already been attached to cancer as part of the development of this plan, and welcome the Prime Minister's recently announced ambition to increase the early stage diagnosis of cancer.

Following a recommendation in the 2015 Cancer Strategy[vii], HEE has been developing a long-term plan for the cancer workforce. A phase one plan, with actions to 2021, was published in December 2017[viii]. The phase two plan is unpublished, but it is our understanding that the new long-term plan for the NHS incorporates the work that HEE has already done to develop a long-term workforce strategy for cancer. This is vital.

To successfully anticipate workforce needs in cancer, it is essential to consider both how many patients are expected to be diagnosed and treated in the future, and the likely areas in which cancer services will change. This should inform the scale of growth to achieve future scenarios: and specifically, could suggest how many and what kind of staff will be needed in future. We have not yet seen a publication that sets out how this approach is being taken by the NHS in relation to cancer.

Therefore Cancer Research UK wanted to explore the future demand for staff in more depth, to demonstrate how this approach could be taken in a long-term plan for the workforce. We wanted this to highlight the scale of increase required to meet the future needs of cancer patients, as well as consider what impact potential changes in services could have on staffing requirements in the NHS. We commissioned 2020 Delivery to develop the model that we used to generate these estimates.

## APPROACH

We first interviewed clinicians to determine, across several common cancer sites, what interventions were needed to diagnose and treat cancer, and how much time members of staff spend delivering those interventions. Using this data we were able to develop a 'best practice model' for diagnosing and treating these cancers, which also accounted for the fact that significantly more patients will be referred for diagnostic tests than will eventually be diagnosed with cancer.

This model was then applied, along with the projected number of cancer cases in 2027, to existing staff numbers drawn from NHS workforce data. This yielded a baseline estimate of how many additional members of staff might be needed to deliver the care that increased

numbers of patients will need in 2027. This estimate is not a categorical statement of what numbers are required in the workforce by 2027. Instead, it is an estimation of the scale of how much the workforce will need to increase by 2027 – we urge NHS England and HEE to replicate this kind of modelling to ensure the NHS has the right numbers in place in the future.

We then attempted to explore how predicted changes in services would impact on the need for staff in the future. Using HEE's 'five drivers of change,'[2] we have chosen several changes which we believe are the most likely shifts with substantial impact in the next few years. They largely reflect technology and innovation, with some service model changes also considered. They do not reflect *all* the potential changes in the health service, but capture those which we feel will have the most significant impact on cancer services.

While we have been unable to generate specific figures for how these changes will affect the staff numbers we need, we have used the latest evidence available to explore what the extent of the impact of these changes may be and what staff groups might be affected.

It should be noted that there are some elements that need to be built into the activity demands for the workforce which are not 'changes' but activity to address current gaps. One of these is more time for research. Without allowing for more time spent on research, we will not be able to achieve the ambitions of the Life Sciences Industrial Strategy[ix], or achieve research breakthroughs for the future.

As well as this, there are other gaps that need to be addressed which we have not considered as part of this paper, but should be considered in a future workforce plan, for instance:

- There is unwarranted geographical variation in cancer services, so ensuring that all patients across the country are receiving the best possible care may need further staff. For example, there is some evidence to suggest that bowel scope may not be offered to all eligible patients[x]
- Changes to services may require staff to be trained in new skills or to be aware of new treatments. For example, our survey of GPs found that nearly half were unaware of the potential benefits of tamoxifen to prevent breast cancer[xi]
- Existing shortages must be accounted for if current staffing levels are unable to meet demand e.g. around one in ten clinical radiology posts are currently unfilled[xii]
- Does the existing workforce have enough time to do a wide range of activities, including spending enough time with patients and providing high-quality care? E.g. our survey of the oncology workforce found that 73% of respondents identified staff shortages as a barrier to providing efficient cancer treatments and excellent patient experience[xiii].

[2] The five key drivers of change were set out in HEE's consultation on its draft workforce strategy to 2027 and comprise: demographic changes; technology and innovation; social, political and environmental changes; current and future service models; and patient/staff expectations.

# KEY FINDINGS

## HOW MANY STAFF MIGHT BE NEEDED IN 2027?

The first part of our work was to attempt to model how many more staff might be needed to diagnose and treat cancer in 2027, based only on projected cancer incidence until 2027. This estimate did not take into account the fact that there are shortages in the existing workforce, or account for any anticipated changes in the way that cancer services are delivered.

With input from clinicians we developed a model of how much time key staff might spend on the diagnosis and treatment of cancer – accounting for the fact that diagnostic staff will deliver care for patients with suspected cancer who do not go on to receive a cancer diagnosis, and the fact that only a proportion of a clinician's time will be spent on providing direct patient care to people with cancer. Using this model we estimated how much the current workforce would need to grow to keep pace with the projected growth in the number of cancers diagnosed, which is set to rise to around 389,000 by 2027.

We considered several key staff groups as part of this report, with seven being identified as key groups for the diagnosis and treatment of cancer: radiologists; gastroenterologists; therapeutic radiographers; clinical and medical oncologists; diagnostic radiographers; histopathologists; and GPs.

Based on this modelling, we estimate that for key staff groups where we have been able to make estimates, numbers will need to grow by the following amounts just to keep pace with the projected increase in demand:

| Staff type | Consultant (where applicable) full time equivalent (FTE) in 2016[xiv] | Estimated numbers required in 2027 based on incidence projections only |
|---|---|---|
| Radiologists | 2805 | 4764 |
| Gastroenterologists | 1065 | 1554 |
| Therapeutic radiographers | 2632 | 4763 |
| Oncologists (clinical and medical) | 1044 | 3002 |

*Fig 1. Estimated required staff numbers in 2027 across key staff groups*

These estimates mean increases ranging from between 45% to nearly 300% depending on the

staff group – and on average they suggest that we would need staff numbers to double across these workforce groups just to meet demand in 2027. The figures are not an exact calculation of the numbers we will need in the future, but as estimates they demonstrate the potential scale of the workforce increases we need – and the urgency of developing a long-term strategy for the cancer workforce.

While we didn't have enough clinical data to generate estimates for diagnostic radiographers, histopathologists and GPs, these are key staff groups in the diagnosis of cancer, so it is essential that we see growth in these areas if we are to achieve the ambition of 75% of cancers diagnosed at stage 1 or 2.

## FUTURE CHANGES AND THEIR POTENTIAL IMPACT

The figures above are only an estimate of the workforce numbers required to meet the needs of future numbers of patients. They do not account for any of the changes we have identified as having a potentially significant impact on the way cancer services are delivered, and therefore the workforce required to deliver them.

The table below expresses in summary the key changes CRUK anticipates having the most potentially significant impact on the way cancer prevention, diagnosis and treatment is delivered in the future. Based on the available evidence about these changes, we consider the workforce groups that are likely to be affected, and the scale of the potential impact of these changes.

When developing a long-term plan for the cancer workforce, NHS England and HEE should consider these potential changes and model for their impact, testing these models with the wider cancer community. As NHS England and any other relevant organisations start to implement these changes, they should also consider the workforce implications of the changes.

| **Part of the cancer pathway** | **Potential change** | **Workforce groups or activity affected (direct and 'spillover')** | **Estimated potential workforce impact[3]** |
|---|---|---|---|
| Prevention | Testing for inherited risks (genetic testing) | • Genetic counsellors<br>• GPs<br>• Molecular pathology (scientists, technicians and pathologists i.e. laboratory services)<br>• Oncology<br>• Radiology<br>• Radiography<br>• Endoscopy<br>• Surgery | **Moderate** – more testing will lead to increased demand on pathology, and could see growth in preventative options (prophylactic surgery) as well as surveillance |

[3] Based on our analysis of the latest available evidence, clinical input, and Cancer Research UK's own assessment of impact.

| | | | |
|---|---|---|---|
| Screening | Lung health checks for high risk individuals | • Radiology<br>• Radiography<br>• Pathology<br>• Surgery<br>• Oncology<br>• Chest physicians<br>• GPs<br>• Nurses or support staff<br>• Smoking cessation staff | **Major** – if widespread could mean uplift in imaging and subsequent nodule management. NHS England should consider the workforce implications of any potential roll-out of this approach |
| | Faecal Immunochemical Testing (FIT) in bowel screening<br><br>Age extension in bowel screening | • Endoscopy<br>• Pathology<br>• Surgery | **Major** – could lead to a significant increase in colonoscopy and pathology. Finding early stage cancers might also require more surgery |
| | Bowel scope | • Endoscopy<br>• Pathology<br>• Surgery | **Moderate** – if available nationwide, it would increase activity for colonoscopists and pathology, and finding early stages cancers might require more surgery |
| Primary care for initial diagnosis | Widespread use of NG12 guidelines | • GPs<br>• Endoscopy<br>• Pathology<br>• Radiology and radiography<br>• Surgery | **Major** – the effective use of NG12 guidelines would lead to many more patients being referred for diagnostic tests, which would require more diagnostic staff to deliver in a timely manner. If these tests were successful in identifying greater numbers of early stage cancer then this would impact on the required treatments workforce, e.g. more surgeries might be needed |
| | Rapid Diagnostic and Assessment Centres, Multi-disciplinary Diagnostic Centres, or other similar approaches to initial investigation | • GPs<br>• Endoscopy<br>• Pathology<br>• Imaging | **Moderate** – RDACs were a key element of the announcement on early diagnosis, but it is unclear how these will be rolled out and to what extent. The centres are currently used to manage investigations for patients with serious but non-specific symptoms but could be more radical in substituting for |

| | | | |
|---|---|---|---|
| | | | GP activity. Alternatively, moving more diagnostic activity to primary care could mean fewer people are referred to specialists but at higher risk |
| Diagnostics | FIT for symptomatic patients | • Endoscopy<br>• Pathology<br>• GPs | **Moderate** – would lead to increased activity for pathology and GPs, could reduce use of colonoscopy. May shift demand to CT colonography, depending on the pathway. |
| | Multi-parametric MRI (mpMRI) for prostate cancer | • Radiology<br>• Urology<br>• Pathology | **Moderate** – would lead to increased activity for radiology and urology, could reduce level of biopsy |
| | Artificial intelligence in the diagnostic pathway | • Radiology<br>• Pathology<br>• Clinical oncology, clinical scientists and technicians<br>• Bioinformaticians<br>• Digital technologists | **Moderate** – could augment histopathology, radiology interpretation. Also likely to be used in radiotherapy planning. |
| | Biomarkers | • Pathology<br>• Radiology<br>• Endoscopy<br>• Oncology<br>• GPs, depending on point of access | **Moderate** – could reduce some surveillance imaging/scoping, would increase demand for pathology |
| | Molecular diagnostics and genomic analysis | • Molecular pathology (scientists, technicians and pathologists)<br>• Oncology<br>• Nurses<br>• Biomedical scientists<br>• Genetic counsellors | **Moderate** – will increase demand on molecular pathology and guide treatment options rather than grow activity |
| Treatment | Interventional endoscopy/radiology | • Endoscopy<br>• Radiology<br>• Surgery | **Minor** – may replace some surgical procedures |
| | Immunotherapy | • Oncology<br>• Nursing<br>• Pharmacy<br>• Gastroenterology<br>• Clinical immunologists | **Moderate** – immunotherapy could lead to an increase in activity and complexity, and immunotherapy is likely to be available for more patients. A successful shift to early stage diagnoses may affect demand. |

| | | | |
|---|---|---|---|
| | Innovative radiotherapy | • Clinical oncology<br>• Therapeutic radiographers<br>• Clinical scientists (medical physicists)<br>• Clinical technologists<br>• Nursing | **Major** - Significantly more time could be required for planning and activity if techniques are used more frequently |
| Research | New approaches to clinical trials | • Research nurses<br>• Oncologists<br>• Clinical scientists | **Minor** – not likely to increase or decrease activity but would be more complex to organise |

*Fig 2. Summary of future changes and their potential impact*

The detail and evidence which informs our assessments of the potential impact of these changes is available in the appendix to this paper. From the table above, it is clear that there are several changes which we anticipate would or will have a major impact on workforce requirements, including:

- The potential expansion of targeted lung health checks
- The introduction of FIT in bowel screening, and expanding the age range to 50
- The widespread uptake of NG12 guidelines
- The increased use of innovative forms of radiotherapy

For example, depending on how lung health checks are expanded, this change is likely to have a significant impact on demand for staff. It could significantly increase demand for nurses (for the initial triage) and imaging staff (radiographers and radiologists) for the low-dose CT scan. The intervention could shift workload onto thoracic surgeons and clinical oncologists – if more patients were diagnosed at an earlier stage, there would likely be more operable early lung cancers, or those which can be treated curatively with targeted radiotherapy. Estimates from a Canadian study estimated that the rate of operable early lung cancer per thoracic surgeon increased by at least 16%.[xv]

Similarly, the introduction of FIT in bowel screening could significantly increase demands for colonoscopy – without accounting for future increases in the sensitivity of the test or the proposed expansion of the age range for bowel screening.

It is particularly important that NHS England considers the workforce implications of these potential or planned changes, ensuring that the right workforce is in place to deliver these potential changes so that the full potential of reducing late stage cancer can be realised.

# RECOMMENDATIONS

The estimates above are an attempt to account for how both increasing incidence of cancer and planned and potential future changes to cancer services will affect the need for staff in the future. They demonstrate the potential scale of future increase that is needed, suggesting that we may need to double the workforce to 2027 – even before accounting for the changes that need to be made to improve outcomes.

We urge NHS England and Health Education England to consider this approach as they develop a long-term plan for the NHS – and a strategy for its workforce. Based on these findings we make the following recommendations to the Government, NHS England and HEE:

1. **NHS England and Health Education England must work together to deliver a long-term workforce strategy, including HEE's existing work on the long-term cancer workforce**
2. **NHS England and HEE should consider the findings of this report and incorporate them into their own models of future workforce needs**
3. **The Government must ensure that funding is available to HEE for the purposes of developing and implementing a long-term strategy for the workforce.**
4. **NHS England must ensure that part of its existing settlement is used to support optimising the existing workforce and to ensure that regional NHS organisations prioritise the cancer workforce.**

[i] International Cancer Benchmarking Partnership. https://www.cancerresearchuk.org/health-professional/data-and-statistics/international-cancer-benchmarking-partnership-icbp/icbp-findings

[ii] Public Health England, Stage breakdown by CCG 2016 http://www.ncin.org.uk/publications/survival_by_stage

[iii] Office of National Statistics, 2018. Geographic patterns of cancer survival in England. https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/conditionsanddiseases/bulletins/geographicpatternsofcancersurvivalinengland/adultsdiagnosed2011to2015andfollowedupto2016#geographic-patterns-of-cancer-survival

[iv] Smittenaar CR, Petersen KA, Stewart K, Moitt N. Cancer Incidence and Mortality Projections in the UK Until 2035. Brit J Cancer 2016.

[v] Independent Cancer Taskforce, 2015. Achieving World Class Cancer Outcomes. https://www.cancerresearchuk.org/sites/default/files/achieving_world-class_cancer_outcomes_-_a_strategy_for_england_2015-2020.pdf

[vi] Health Education England, 2018. Topol review. https://www.hee.nhs.uk/our-work/topol-review

[vii] Independent Cancer Taskforce, Ibid.

[viii] Health Education England, 2017. 'Cancer Workforce Plan Phase 1'. https://www.hee.nhs.uk/sites/default/files/documents/Cancer%20Workforce%20Plan%20phase%201%20-%20Delivering%20the%20cancer%20strategy%20to%202021.pdf

[ix] Office for Life Sciences, 2017. Life Sciences: industrial strategy. https://www.gov.uk/government/publications/life-sciences-industrial-strategy

[x] McGregor, L. et al. 2015. 'Uptake of Bowel Scope (Flexible Sigmoidoscopy) Screening in the English National Programme: the first 14 months'. https://doi.org/10.1177/0969141315604659

[xi] Cancer Research UK, 2017. 'Understanding GP Attitudes to Cancer Preventing Drugs'. https://www.cancerresearchuk.org/about-us/we-develop-policy/our-policy-on-preventing-cancer/understanding-gp-attitudes-to-cancer-preventing-drugs

[xii] Health Education England, 2017. 'Cancer Workforce Plan Phase 1'. https://www.hee.nhs.uk/sites/default/files/documents/Cancer%20Workforce%20Plan%20phase%201%20-%20Delivering%20the%20cancer%20strategy%20to%202021.pdf

[xiii] Cancer Research UK, 2017. 'Full team ahead: understanding the UK non-surgical cancer treatments workforce.' https://www.cancerresearchuk.org/sites/default/files/full_team_ahead-full_report.pdf

[xiv] Health Education England, 2017. 'Cancer Workforce Plan Phase 1'. https://www.hee.nhs.uk/sites/default/files/documents/Cancer%20Workforce%20Plan%20phase%201%20-%20Delivering%20the%20cancer%20strategy%20to%202021.pdf

[xv] https://www.ncbi.nlm.nih.gov/pubmed/24961839