![Royal College of Physicians | National Lung Cancer Audit]

National Lung Cancer Audit

National Lung Cancer Audit annual report

(for the audit period 2018)

Published August 2020

National Lung Cancer Audit annual report (for the audit period 2018), August 2020.

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The Healthcare Quality Improvement Partnership (HQIP) is led by a consortium of the Academy of Medical Royal Colleges, the Royal College of Nursing and National Voices. Its aim is to promote quality improvement in patient outcomes, and in particular, to increase the impact that clinical audit, outcome review programmes and registries have on healthcare quality in England and Wales. HQIP holds the contract to commission, manage and develop the National Clinical Audit and Patient Outcomes Programme (NCAPOP), comprising around 40 projects covering care provided to people with a wide range of medical, surgical and mental health conditions. The programme is funded by NHS England, the Welsh Government and, with some individual projects, other devolved administrations and crown dependencies.
www.hqip.org.uk/national-programmes

National Lung Cancer Audit

The National Lung Cancer Audit (NLCA) is commissioned by HQIP. The NLCA is a programme of work that aims to improve the quality of care, services and clinical outcomes for patients with lung cancer in England, Scotland and Wales. To find out more about the NLCA visit www.rcplondon.ac.uk/projects/national-lung-cancer-audit

Public Health England National Cancer Registration and Analysis Service

This work uses data that has been provided by patients and collected by the NHS as part of their care and support. The data is collated, maintained and quality assured by the National Cancer Registration and Analysis Service (NCRAS), which is part of Public Health England (PHE). Access to the data was facilitated by the PHE Office for Data Release. www.ndrs.nhs.uk/

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Contents

1   Executive summary

The National Lung Cancer Audit (NLCA) annual report uses data provided by Public Health England (PHE), the Welsh Cancer Network, and lung cancer teams in Jersey and Guernsey to provide a summary of key findings, national averages and geographical variance across an agreed list of lung cancer service performance indicators and patient outcomes.

The audit makes 13 specific recommendations around quality improvement for the attention of healthcare executives, multidisciplinary teams and commissioners of lung cancer services, highlighting deviation from National Institute for Health and Care Excellence (NICE) guidelines and other nationally recognised standards of care.

Additionally, this year, the NLCA team have produced a quality improvement toolkit to support organisations seeking quality improvement, including those notified as being potential negative outliers.

Key findings are reported as follows:
> There were 39,754 new patients diagnosed with lung cancer between 1 January and 31 December 2018 (this compares with 39,205 patients diagnosed in 2017).
> Early-stage diagnoses have increased to 29% (from 26% for 2016 patients).
> Late-stage diagnoses have reduced to 49% (from 53% for 2016 patients).
> 1-year survival in stage III patients has increased to 63% (from 45% for 2015 patients).
> Curative-intent treatment rates remained steady at 81% (compared with 80% for 2016 patients).
> More patients received access to specialist nursing, 74% (versus 71% for 2016 patients).

It should be noted that:
1   Owing to the COVID-19 pandemic, the NLCA outlier process was interrupted during this audit cycle and therefore outlier organisations have not been fully validated and as such have not been identified in this publication. Data has been shared with all potential outliers and organisations will inevitably progress quality improvement activities as services start to recover from the initial impacts of COVID-19.
2   English trusts could not be given the opportunity to fully refresh their data ahead of data submission to the audit this year. While accurate caseload records remain the responsibility of individual trusts, it is possible that new caseload allocations by the registry may explain why some trusts require more improvement than previous years.

2   Recommendations

Recommendation		Result/ page in the report	Standard/guidance	Key audience
Recommendations for local services (1–9)				
1	Trusts with data completeness below the recommended level should implement the recommendations in our accompanying improvement toolkit, such that both PS and stage are recorded in at least 95% of cases; for patients with stage I–II and PS 0–1, data completeness for FEV1 and FEV1% should exceed 75%.	12	**National Service Guidance for Commissioners (NSGC) guidance:**[*] The MDT should participate in the NLCA. **NICE QS 4:**[†] Adults with lung cancer being considered for treatment with curative intent have investigations to assess lung function. **NICE guideline:**[‡] Centres performing lung resections for lung cancer should validate their data for the NLCA.	**MDTs CLs Managers**
2	MDTs with pathological confirmation rates of <90% in patients with PS 0–1 should use our accompanying toolkit to ensure that they have adequate access to all the appropriate diagnostic procedures and pathological processing techniques.	16	**NICE QS 6:**[†] Adults with NSCLC stage III or IV who are having tissue sampling, have samples taken that are suitable for pathological diagnosis and assessment of predictive biomarkers. **NSGC guidance:**[*] People with lung cancer have adequate tissue samples taken in a suitable form to provide a complete pathological diagnosis including tumour typing and subtyping.	**MDTs CLs Managers**
3	MDTs with lower than expected access to specialist nurses should use the recommendations in our accompanying toolkit to review the nursing workforce number and their roles, in order to ensure that at least 90% of patients have access to this service.	17	**NICE QS 3:**[†] Adults with suspected or confirmed lung cancer have access to a named lung cancer clinical nurse specialist.	**MDTs CLs Managers**

CCGs = clinical commissioning groups; CL = clinical lead; CT = computed tomography; FEV1 = forced expiratory volume; MDT = multidisciplinary team; NICE = National Institute for Health and Care Excellence; NLCA = National Lung Cancer Audit; NSCLC = non-small-cell lung cancer; NSGC = National Service Guidance for Commissioners; PS = performance status; QS = quality standard; SACT = systemic anticancer therapy; SCLC = small-cell lung cancer

[*] Lung Cancer Clinical Expert Group. Clinical Advice to Cancer Alliances for the Commissioning of the whole Lung Cancer Pathway, 2017. www.roycastle.org/for-healthcare-professionals/clinical-expert-group/ [Accessed 17 February 2020].
[†] National Institute for Health and Care Excellence. *Lung cancer in adults: quality standard 17*. London: NICE, 2019. www.nice.org.uk/guidance/qs17 [Accessed 25 January 2020].
[‡] National Institute for Health and Care Excellence. *Lung cancer: diagnosis and management. National Guideline 122 [NG122]*. London: NICE, 2019. www.nice.org.uk/guidance/ng122 [Accessed 25 January 2020].

4	MDTs with lower than expected access rates of surgical resection should utilise the recommendations in our accompanying toolkit to review the workup and selection of patients for surgery, in order to ensure that at least 20% of patients with NSCLC have access to this form of treatment.	18	**NICE guideline:**[‡] For people with NSCLC who are well enough and for whom treatment with curative intent is suitable, offer lobectomy.	**MDTs** **CLs** **Managers**
5	All MDTs should utilise the recommendations in our accompanying toolkit to map and improve their pathways through diagnosis and treatment for patients with SCLC, in order that at least 70% of patients receive chemotherapy, and this is delivered within 14 days of diagnosis in at least 80% of these patients.	19	**NICE guideline:**[‡] Offer platinum-based combination chemotherapy to people with extensive stage disease SCLC if they are fit enough. **NSGC guidance:**[*] People with SCLC have treatment initiated within 2 weeks of the pathological diagnosis.	**MDTs** **CLs** **Managers**
6	MDTs with rates of SACT in good PS patients with advanced NSCLC should utilise the recommendations in our accompanying toolkit to improve their performance to the recommended level of 70%.	20	**NSGC guidance**:[*] People with stage IIIB or IV NSCLC and eligible PS are offered systemic therapy.	**MDTs** **CLs** **Managers**
7	MDTs with lower than expected curative-intent treatment rates for stage I–II PS 0–2 NSCLC should use our accompanying toolkit to review their processes for selection of patients for such treatment, in order that a rate of at least 85% is achieved.	21	**NICE QS 5**:[†] Adults with NSCLC stage I or II and good PS have treatment with curative intent.	**MDTs** **CLs** **Managers**
8	MDTs with multimodality treatment rates in stage III disease that are lower than the national mean (25%) should use our accompanying toolkit to review their pathways and policies for treatment selection and how treatment options are discussed with patients, including optimisation of staging and patient fitness.	25	**NICE guideline**:[‡] Consider chemoradiotherapy for people with stage II or III NSCLC that are not suitable for, or decline, surgery.	**MDTs** **CLs** **Managers**
9	MDTs should consider increasing the use of radical radiotherapy in combination with chemotherapy for stage I–III limited stage SCLC in accordance with NICE guidelines, which recommend use of concurrent twice-daily radical radiotherapy for patients with PS 0–1 and offering once daily concurrent or sequential radical radiotherapy for less-fit patients.	27	**NICE guideline**:[‡] Offer twice-daily radiotherapy with concurrent chemotherapy to people with limited-stage disease SCLC and a WHO performance status of 0 or 1, if they present with disease that can be encompassed in a radical thoracic radiotherapy volume. Offer sequential radical thoracic radiotherapy to people with limited-stage disease SCLC who are not well enough for concurrent chemoradiotherapy but who respond to chemotherapy.	**MDTs** **CLs** **Managers**

Recommendations for other organisations (10–11)				
10	Commissioners and cancer alliances should engage with local lung cancer MDTs to encourage and support progress towards meeting all our recommended targets.	Throughout	**NSGC guidance**:* This national clinical advice to cancer alliances sets out the key evidence-based priorities for commissioning high-quality, patient-centred services for people wherever they live, taking into account the need to ensure value for money and where possible a reduction in cost. It supports a more integrated approach to commissioning as recommended by the Independent Cancer Taskforce.	**MDTs** **CLs** **Commissioners** **Managers**
11	CCGs should examine the route of referral and stage at presentation for their population and look at ways to increase the numbers of patients presenting with early-stage disease.	13	**NICE QS 1**:[†] Local authorities and healthcare commissioning groups use coordinated campaigns to raise awareness of the symptoms and signs of lung cancer and encourage people to seek medical advice if they need to.	**Commissioners**
Recommendations for other organisations based on recent reports and evidence (12–13)				
12	The UK National Screening Committee should review the most up to date evidence on CT screening for lung cancer to inform decisions on implementation of a national programme, in order that the proportion of patients diagnosed with lung cancer at an early stage can be increased.	13–14	Our audit shows that only 29% of patients are diagnosed with stage I–II disease. The **NHS Long-Term Plan**[§] seeks to diagnose at least 75% of (all) cancers at stage I/II by 2028. Evidence from international studies suggests that CT screening will be a key driver of this ambition.	**UK national screening committee**
13	NHS England should consider the findings of this report in the context of data from our organisational audit, which indicates that inadequate staffing and other resources may drive some of the variation seen in lung cancer outcomes.	12, 17, 18 and 25	The **NLCA organisational audit**** found significant gaps between recommended and actual levels of staffing (**NSGC guidance***) for lung cancer services.	**NHS England**

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* Lung Cancer Clinical Expert Group. Clinical Advice to Cancer Alliances for the Commissioning of the whole Lung Cancer Pathway, 2017. www.roycastle.org/for-healthcare-professionals/clinical-expert-group/ [Accessed 17 February 2020].
§ NHS. NHS Long Term Plan. www.england.nhs.uk/long-term-plan/ [Accessed 9 March 2020].
** Royal College of Physicians. *National Lung Cancer Audit. Organisational audit report 2019*. London: RCP, 2020. https://nlcastorage.blob.core.windows.net/misc/NLCA_organisational_audit_2019.pdf [Accessed 6 July 2020].

3   Introduction

The NLCA forms part of the National Clinical Audit and Patient Outcomes Programme (NCAPOP) commissioned by the Healthcare Quality Improvement Partnership (HQIP) and is delivered in partnership with a number of key stakeholders noted on pages 35–36.

The purpose of the NLCA annual report is to understand the current quality of care and outcomes for patients with lung cancer. The main body of the report gives an overview of data completeness and the clinical outcomes for 39,754 patients diagnosed with lung cancer in 2018 at a national level. *More detailed results at regional- (cancer alliance) and local- (hospital and clinical commissioning group) level can be obtained and downloaded from our website www.nlcaudit.co.uk, enabling patients, carers, clinicians and commissioners to compare services in their area with others.*

The report includes 13 recommendations, nine for the attention of members of multidisciplinary teams (MDTs), two for commissioners and clinical commissioning groups (CCGs), one for the UK national screening committee, and one for NHS England. The recommendations are informed by national clinical guidelines (for example National Institute for Health and Clinical Excellence (NICE)), national commissioning advice, and expert clinical opinion derived from the NLCA advisory clinical expert group.

To support organisations seeking quality improvement, the NLCA have additionally this year made available a quality improvement toolkit[††]with detailed steps to improving services that are applicable to all organisations, not just those notified as being potential negative outliers.

Other recent NLCA publications include a lung cancer surgical outcomes report, a spotlight report on molecular testing, a spotlight report on curative-intent treatment and a lung cancer services organisational audit; which can all be found on our website www.nlcaudit.co.uk.

[††] https://nlca.azurewebsites.net/AnnualReport

4   Methods

Full details of the NLCA annual report methodology are available at
https://nlca.azurewebsites.net/Home/Support. The report covers patients with a diagnosis of
cancer who have been classified with code C34 of the 10th edition of the World Health
Organization International Classification of Disease (ICD-10), and where the diagnosis was made
between 1 January and 31 December 2018.

4.1 Data collection in England

NHS hospitals in England submit the details for all lung cancer patients, including patients
undergoing lung cancer surgery, to the NLCA, via the National Cancer Registration and Analysis
Service (NCRAS) as part of the Cancer Outcomes and Services Dataset (COSD). The data are
linked to other datasets, including Hospital Episode Statistics (HES), the National Radiotherapy
Dataset (RTDS), the Systemic Anticancer Therapy (SACT) Dataset, pathology reports and death
certificate data.

4.2 Data collection in Wales, Jersey and Guernsey

Welsh data are collected through the Cancer Network Information System Cymru (CANISC) and
a pseudo-anonymised extract of patient-level data is submitted to the NLCA for analysis. This
extract contains all the relevant data fields and is not linked to any other data sources.

The report also includes data from Guernsey and Jersey, who have a separate funding
agreement to participate in the audit directly with the RCP. The data are collected and
submitted directly to the NLCA analysis team.

4.3 Audit standards

The NLCA standards have been developed over the last 15 years and form a consensus across
the NLCA team and its clinical advisory group and board members of key performance indicator
targets that all NHS hospitals delivering lung cancer services should be achieving.

4.4 Analysis of the data

For this report the outlier policy has been updated by modifying key outlier status measures.
'Alert' level outliers are of two standard deviations from the mean, and an 'alarm' level of three
standard deviations from the mean. These correspond to significance levels of 95% and 99.8%
respectively.

Outlier measures 2019:[‡‡]
>   Pathological confirmation in patients with stage I/II disease and PS 0–1
>   Surgery in NSCLC
>   SACT in stage IIIB–IV PS 0–1 NSCLC
>   Chemotherapy in SCLC
>   Assessed by a specialist nurse[§§]
    o   This measure has been included to reflect the importance of the role and to
         ensure patients benefit from specialist nurse support.
>   Curative-intent treatment in patients with stage I–II NSCLC and PS 0–2 NSCLC[***]

[‡‡] The outlier policies for England and Wales can be viewed at https://nlca.azurewebsites.net/Home/Support
[§§] New outlier measure

o Recent development in radiotherapy data collection means that use of curative-intent radical radiotherapy in patients can now be identified for patients who do not undergo surgery. Linking the radiotherapy dataset (RTDS, only available for England) to NLCA data allows an overall curative-treatment rate to be calculated.

1-year survival

This year, survival has been removed as an outlier measure for the following reasons:
> the survival measure is not lung cancer-specific and is not standardised to certain patients characteristics such as age
> patients often move between different organisations for their diagnosis, (multiple) treatment(s), and for their care prior to death, therefore it becomes impossible to attribute all the responsibility for death to the trust in which the patient was first seen
> being an outlier for survival does not naturally lead to any specific quality improvement intervention since it is the sum of so many individual parts.

5 Results

5.1 Data completeness

For this audit period, data was collected on all patients diagnosed with lung cancer from 1 January 2018 – 31 December 2018. Details were submitted on 40,408 patients, of whom 654 were excluded for a variety of reasons including a death date before the diagnosis date, a non-lung cancer diagnosis and an unknown trust in which the patient was first seen.

Of the 39,754 cases, 37,425 were from England, 2,228 from Wales, 60 from Jersey and 41 from Guernsey.

For the overall patient population across all regions (Fig 1):
> PS was recorded in 85.3% of patients (compared with 76.3% in 2016)
> disease stage was recorded in 95.8% of patients (compared with 94.9% in 2016)
> forced expiratory volume in 1 second (FEV1) was recorded in 60.8% of patients with stage I/II and PS 0–1 lung cancer (compared with 52.7% in 2016).

Fig 1. Data completeness for data on all patients diagnosed with lung cancer between 1 January and 31 December 2018
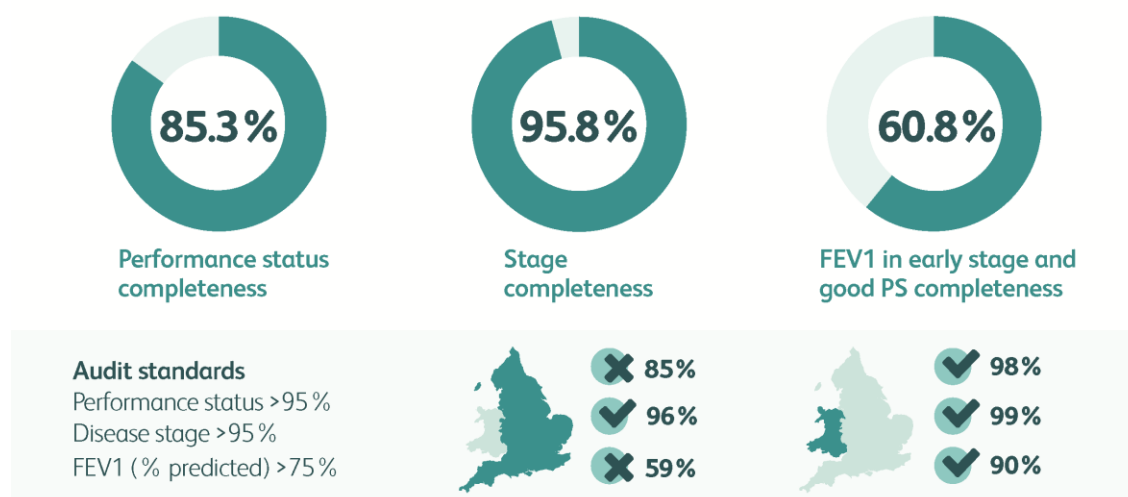
Glossary

Performance status (PS) describes a patient's level of functioning in terms of their ability to care for themselves, daily activity and physical ability.

Stage refers to the extent of the cancer, such as how large the tumour is and whether it has spread.

FEV1 (forced expiratory volume in 1 second) is a measurement of lung capacity to determine the health of a patient's lungs.

Commentary

The lung cancer community has provided exceptional quality data for the relevant population of patients. Data completeness in Wales continues to be of a higher standard, exceeding all the recommended benchmarks, even though these were increased from 90% to 95% for PS and stage this year. In England, data completeness is similar to the previous year, albeit with a small drop in FEV1 recording.

The 2019 NLCA organisational audit showed that only 67% (90/133) of units had an MDT member with responsibility for data quality, and of these only 18% (16/90) had time in their job plan for this role. Furthermore, only 65% (86/133) of units carried out validation of their COSD data submissions and only 72% (95/132) accessed the CancerStats website to monitor their data quality.

Recommendation 1

Trusts with data completeness below the recommended level should implement the recommendations in our accompanying improvement toolkit, such that both PS and stage should be recorded in at least 95% of cases; for patients with stage I–II disease and PS 0–1, data completeness for FEV1 and FEV1% should exceed 75%.

5.2 Demographic analysis

A demographic analysis of the 39,754 cases included in this audit period are shown in Tables 1 and 2. Lung cancer was slightly more common in males and the median age at diagnosis was 73 years. Approximately two-thirds of carcinoid tumours occurred in females. The median age at diagnosis for NSCLC was 73 years, for SCLC was 70 years and for carcinoid tumours was 67 years.

The proportion of patients who had SCLC has fallen gradually over several years from 11.0% in 2014 to 9.7% in 2018. This could reflect the reduction in smoking prevalence, since SCLC is more closely linked to cigarette smoking than some types of NSCLC (Fig 2).

Table 1. Cancer type by sex

Cancer type	Percentage
All cases	**100.0**
Male	52.2
Female	47.8
NSCLC	**88.6**
Male	52.6
Female	47.4
SCLC	**9.7**
Male	50.8
Female	49.2
Carcinoid	**1.6**
Male	37.4
Female	62.6

Table 2. Cancer type by age

Cancer type	Percentage
All cases	**100.0**
<70yrs	35.6
>70yrs	64.4
NSCLC	**88.6**
<70yrs	34.1
>70yrs	65.9
SCLC	**9.7**
<70yrs	45.6
>70yrs	54.4
Carcinoid	**1.6**
<70yrs	56.5
>70yrs	43.5

Fig 2. Proportion of lung cancer patients with small cell histology
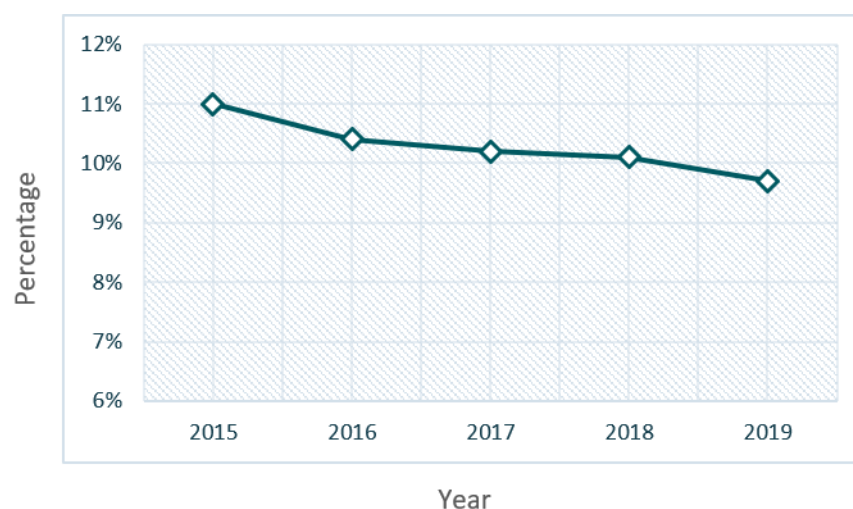

Figure 3 shows the stage distribution and demonstrates that around half of patients presented with incurable stage IV disease. However, the proportion of patients diagnosed with stage IV has fallen by 4% since 2016, and there has been a similar rise in the proportion with early-stage and potentially curable disease stage (Fig 4). The proportion of patients presenting with early-stage disease still varies considerably from 16–42% across different organisations (Fig 5), which is likely to be more a reflection of attitudes and management in the community setting rather than in secondary care. These findings reinforce the NICE Quality standard 1 which recommends that local authorities and healthcare commissioning groups use coordinated campaigns to raise awareness of the symptoms and signs of lung cancer and encourage people to seek medical advice if they need to.

Diagnosing at least 75% of (all) cancers at stage I/II by 2028 is a key ambition of the NHS Long Term Plan. Evidence suggests that implementing a national targeted CT screening programme is a key element to support this ambition, and we are pleased that pilot lung health checks are being rolled out across England. Following the positive results seen in the publication of the NELSON trial,[***] we advocate for these pilots to be extended to a national programme.

Younger patients are more likely to be diagnosed with stage IV disease than older patients (58% in patients aged <50 years compared with 49% in patients aged >80 years) as shown in Fig 6. This is thought to be the result of more frequent medical assessment and testing on older people.

Fig 3. Cancer stage distribution (excluding patients with missing stage data)
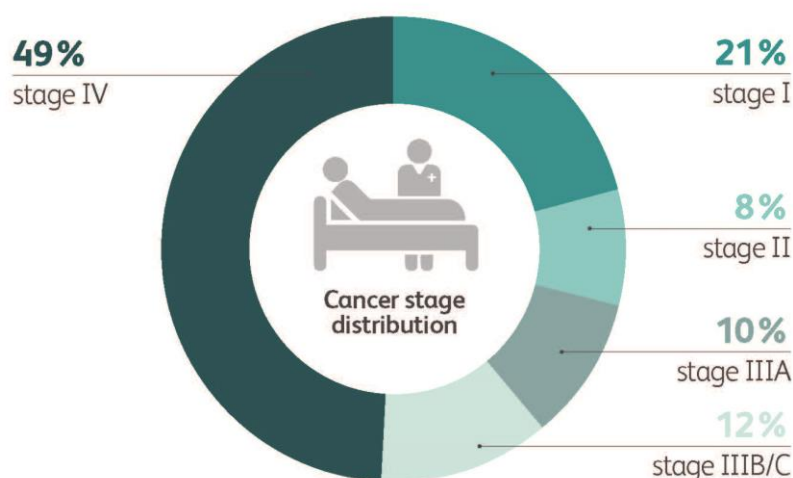

Fig 4. Cancer stage distribution change 2016–19 (excluding patients with missing stage data)

*** de Koning HJ, van der Aalst CM, de Jong PA *et al*. Reduced Lung-Cancer Mortality with Volume CT Screening in a Randomized Trial. *N Engl J Med* 2020;382:503–13.

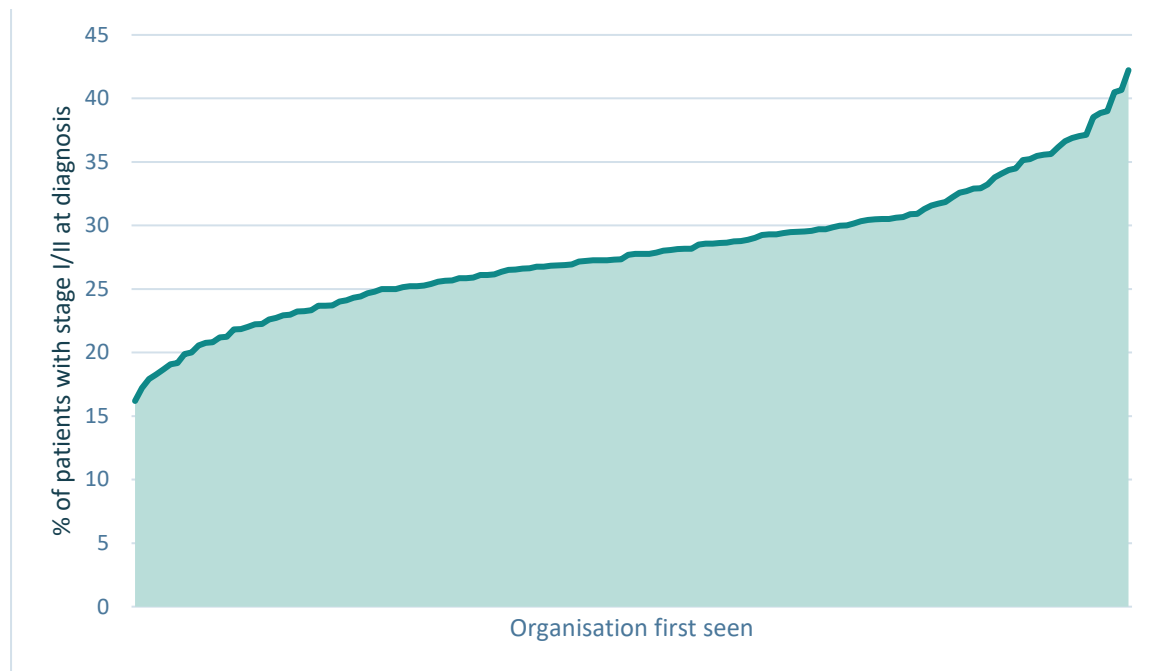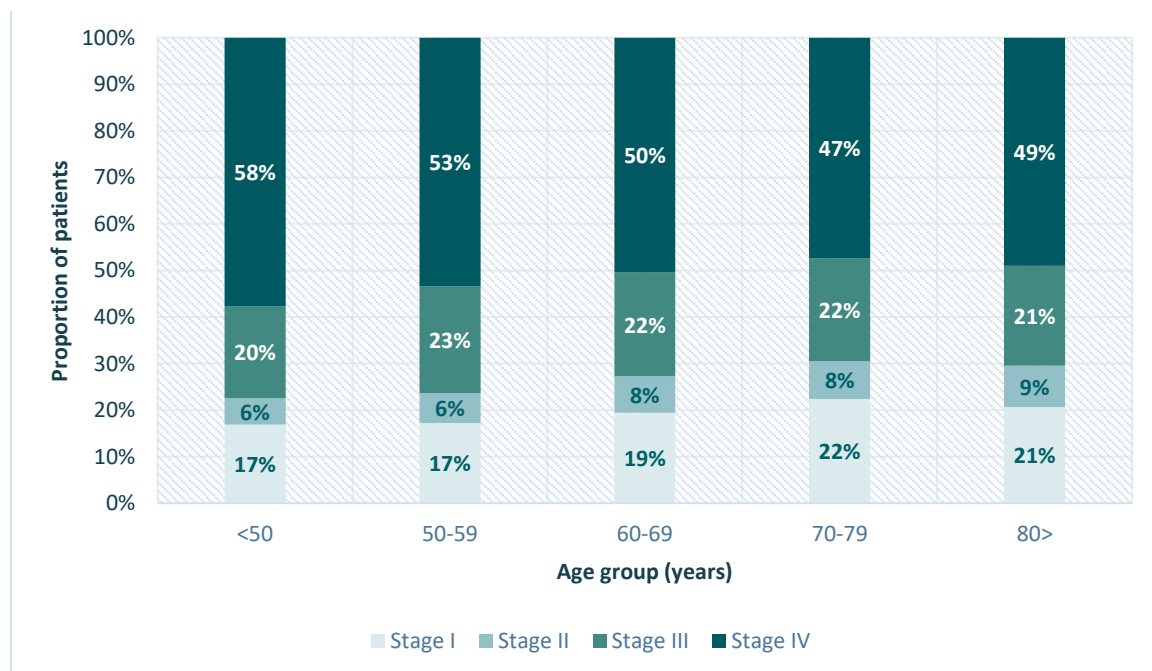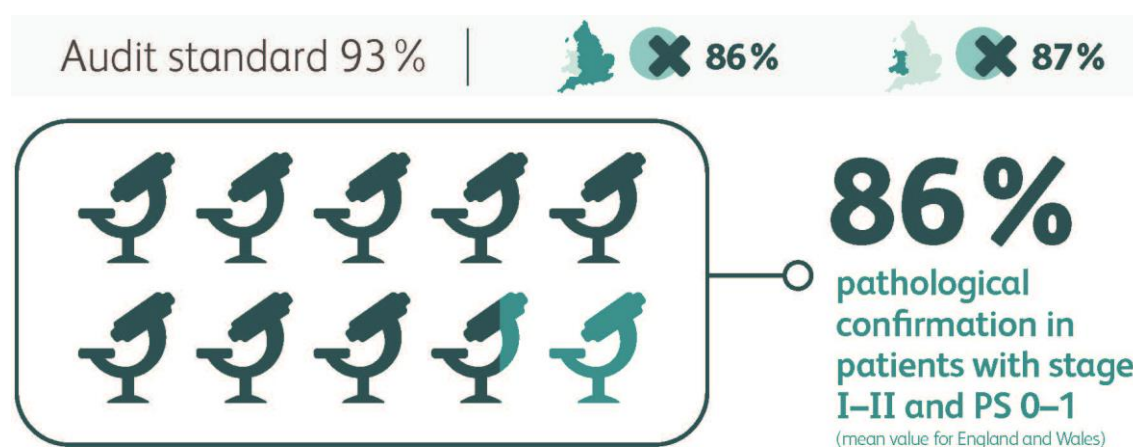**Fig 5. Variance in early-stage diagnoses by organisation (excluding patients with missing stage data)**

Fig 6. Cancer stage distribution by age group (excluding patients with missing stage data)

5.3 Pathological confirmation in patients with stage I/II and performance status 0–1

Fig 7. Pathological confirmation in patients with stage I–II and PS 0–1

Commentary

In total, 86% of patients with stage I/II lung cancer and PS 0–1 received a pathological diagnosis (England 86%, Wales 87%; a decreased rate for both countries since 2017) (Fig 7). Neither met the suggested standard which was increased this year from 90% to 93%.

Across individual organisations (excluding tertiary trusts), adjusted for case-mix, the percentage of patients with stage I/II disease and PS 0–1 who received a pathological diagnosis varied from 33% to 100%.

The NLCA organisational audit 2019[†††] noted that 16% (20/125) of units had consultant respiratory physician staffing levels that met the recommendations in national commissioning guidance, and in many cases key diagnostic investigations were not available locally. It is inevitable that organisational factors such as these will influence decision-making with respect to biopsies.

It is encouraging to see that for those patients that did have a pathological diagnosis, the proportion of patients with a not otherwise specified (NOS) NSCLC remained low at 8% nationally, which is below a previously set target of 10%. However, 33 organisations did not meet this standard.

It was agreed that a pathological confirmation rate of 90% in all patients with PS 0–1 should become the key performance indicator in the future.

Recommendation 2

MDTs with pathological confirmation rates of <90% in patients with PS 0–1 should use our accompanying toolkit to ensure that they have adequate access to all the appropriate diagnostic procedures and pathological processing techniques.

[†††] www.rcplondon.ac.uk/projects/outputs/organisational-audit-report-2019

5.4 Lung cancer nurse specialist assessment

Fig 8. Patients assessed by a specialist nurse
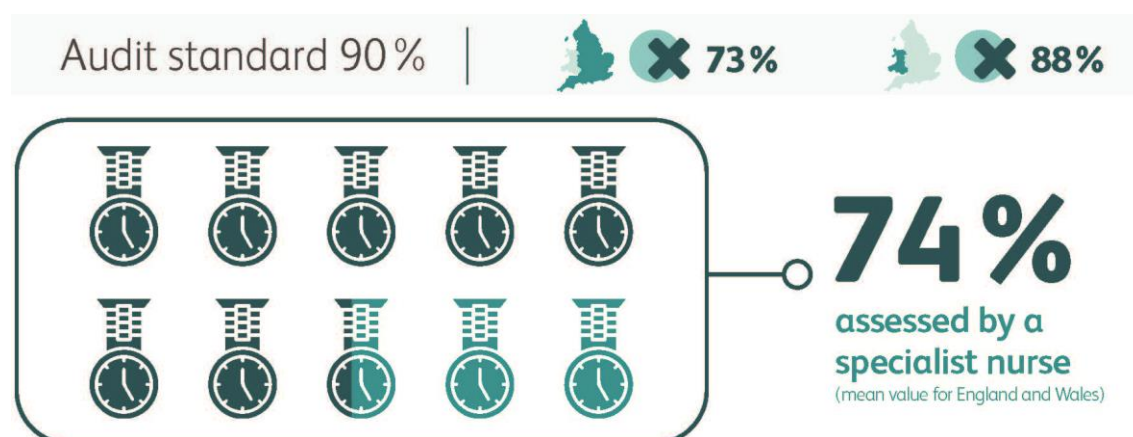
Commentary

The results for assessment by a lung cancer nurse specialist improved from 57% in 2016 to 74% in 2018 (Fig 8).

The proportion of patients recorded as having had a specialist nurse present at the time of diagnosis (recommended >80%, available for England only) has also risen from 14% in 2016 to 61% in 2018.

The results from the 2019 NLCA organisational audit[‡‡‡] sheds light on why so few organisations are able to achieve the recommended standard. National commissioning guidance recommends that there should be the equivalent of one whole-time-equivalent specialist nurse for every 80 new diagnoses of lung cancer in each organisation, but this audit demonstrated that this level of staffing was available in only 32% of organisations that took part.

Recommendation 3

MDTs with lower than expected access to specialist nurses should use the recommendations in our accompanying toolkit to review the nursing workforce number and their roles, in order to ensure that at least 90% of patients have access to this service.

[‡‡‡] www.rcplondon.ac.uk/projects/outputs/organisational-audit-report-2019

5.5 Surgical resection

Fig 9. Patients with NSCLC who underwent surgery
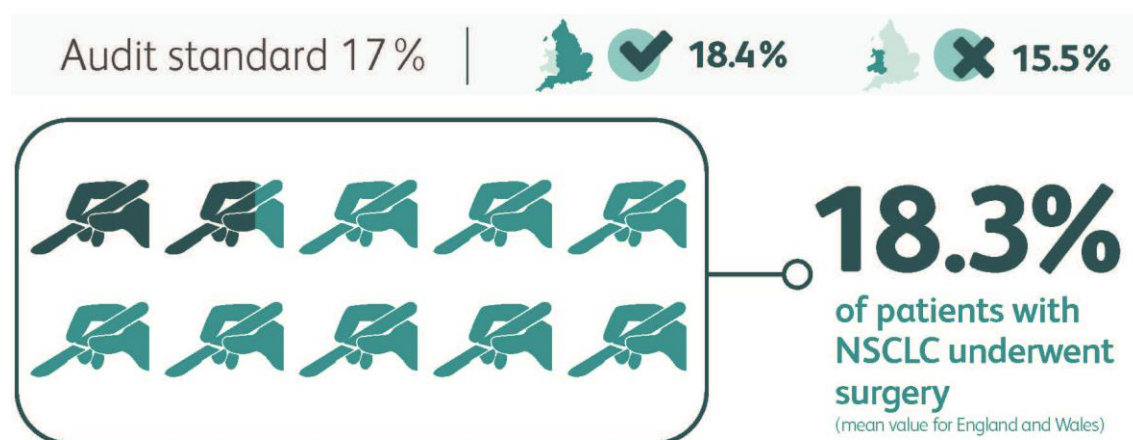
Commentary

There has been a drop in resection rates in Wales such that they have fallen below the audit standard this year.

Sixty organisations failed to meet the audit standard of 17% (compared with 52 last year).

Resection rates have continued to rise slowly and many organisations achieved rates well above the target of 17% (Fig 9); the NLCA recommend a future target of 20%.

Resection rates in patients with early-stage (I/II) disease was 50%. Furthermore, and for patients with early-stage disease and good PS (0–2), it was 59%. Organisations who have low overall resection rates should look closely at this latter group of patients when trying to evaluate and improve their service.

These results should be interpreted alongside the proportion of patients who received overall curative-intent treatment (consisting of surgery and/or curative-intent radiotherapy) in patients with stage I and II disease with PS 0–2, which is covered later in this report.

Fourteen organisations (excluding tertiary centres) were identified as having a significantly better rate of surgery than the national average, suggesting overall, adjusted surgical resection rates in NSCLC varied from 10.0% to 33.3%.

Recommendation 4

MDTs with lower than expected access rates of surgical resection should utilise the recommendations in our accompanying toolkit to review the workup and selection of patients for surgery, in order to ensure that at least 20% of patients with NSCLC have access to this form of treatment.

5.6 Chemotherapy in small-cell lung cancer

Fig 10. Patients with SCLC who received chemotherapy
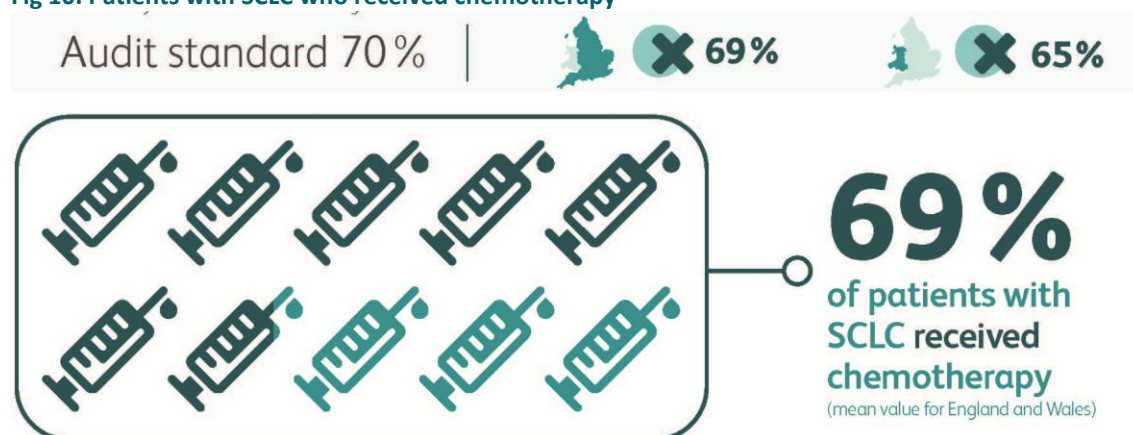
Commentary

In 2019 the NLCA set an audit standard that at least 70% of patients with SCLC should receive chemotherapy.

Overall, 69% of patients with SCLC received chemotherapy (England 69%, Wales 65%) (Fig 10). The result for England was very similar to last year. However, in Wales the result had fallen from 77%. The result was exceptionally high and may reflect normal variation for a measure covering a relatively small population of patients. Across individual organisations (excluding tertiary trusts) the results, adjusted for case-mix, varied from 35% to 100%.

The NLCA also set a standard that at least 80% of patients should receive their chemotherapy within 14 days of their pathological diagnosis. For patients diagnosed in 2018, that standard was achieved for only 33% of patients, mirroring last year's result.
However, the recommendations from last year are not yet likely to have led to improvement due to the time lag of the audit process.

This low result represents an improvement for organisations to design pathways that adequately reflect the urgency of treatment.

> **Recommendation 5**
>
> All MDTs should utilise the recommendations in our accompanying toolkit to map and improve their pathways through diagnosis and treatment for patients with SCLC, in order that at least 70% of patients receive chemotherapy, and this is delivered within 14 days of diagnosis in at least 80% of these patients.

5.7 Systemic anticancer treatment for patients with stage IIIB–IV non-small-cell lung cancer and performance status 0–1

Fig 11. Patients with advanced/good PS NSCLC who received SACT
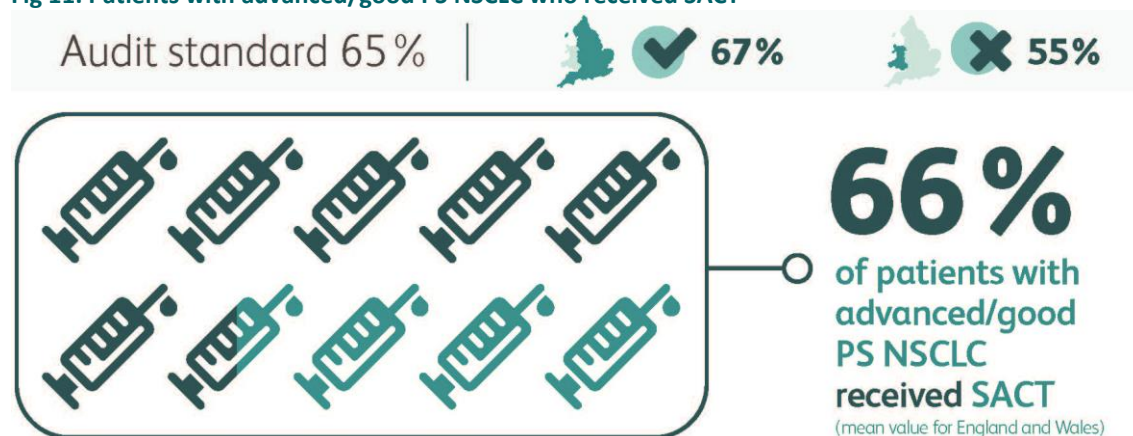
Commentary

Overall, 66% of patients with good PS and advanced NSCLC received SACT (Fig 11) and this had risen from 63% in 2016, so the standard has been met for the past 2 consecutive years. However, the result for Wales (55%) was low and requires further evaluation and action.

Across individual organisations (excluding tertiary trusts), the case-mix-adjusted results varied from 32% to 98%, with 67 organisations failing to achieve the standard.

Since this measure was first introduced, there have been significant developments in the treatment options available to patients, such that the term 'chemotherapy' should now be replaced by the term 'systemic anticancer treatment' (SACT). Last year, the NLCA set an audit standard of SACT for 65% of patients with advanced NSCLC and good PS.

Considering the increasing number of treatments available for this group of patients, the NLCA consider that a higher target of 70% is achievable in the future.

Recommendation 6

MDTs with rates of SACT in good PS patients with advanced NSCLC should utilise the recommendations in our accompanying toolkit to improve their performance to the recommended level of 70%.

5.8 Curative-intent treatment

Fig 12. NSCLC patients who received curative-intent treatment
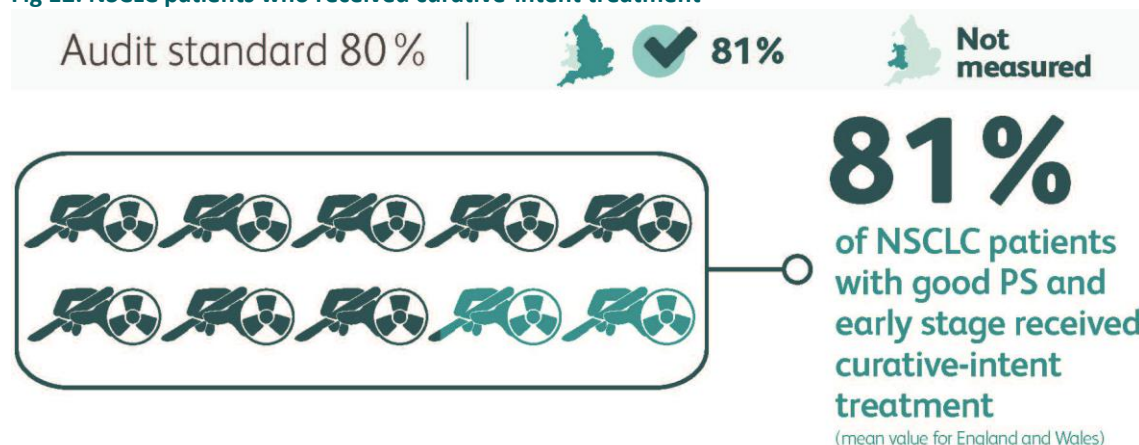
Commentary

A curative-intent treatment rate can only be calculated for England, as it relies on data included in the National Radiotherapy Dataset (RTDS) and combines receipt of surgery and radical radiotherapy. The RTDS in not currently fully available in Wales. The measure also applies only to patients who would normally be expected to be suitable for curative treatment, ie patients with stage I–II NSCLC and PS 0–2. This has also been adopted by NICE as a care quality standard (www.nice.org.uk/guidance/qs17).

Overall, 81% of patients in England received curative-intent treatment in 2018 (Fig 12), which was identical to the result from the 2017 cohort and means that the audit standard has again been achieved.

Across individual organisations (excluding tertiary trusts), the rate of this curative-intent treatment varied from 55% to 100% (a narrower range than last year), and 59 organisations failed to achieve the standard (65 last year).

A new standard of 85% has been set by the NLCA.

Recommendation 7

MDTs with lower than expected curative-intent treatment rates for patients with stage I–II and PS 0–2 NSCLC should use our accompanying toolkit to review their processes for selection of patients for such treatment, in order that a rate of at least 85% is achieved.

5.9 Other results

There are many more analyses undertaken on the data than are included in the NLCA outlier policy. All of the analyses are available in the information sheet in the 2018 annual report (www.nlcaudit.co.uk/AnnualReport).

Survival

The 1-year survival was 38.9% (England 38.7%, Wales 40.4%), compared with 36.7% last year. The median survival was 256 days by cancer alliance-level (and 265 days at trust-level).

The previous survival analysis at cancer alliance-level (England only) has been updated and now evaluates 2- and 3-year survival statistics. Patients diagnosed in England and analysed/reported in previous years of the audit (2014–17) have had further analysis carried out of their longer-term survival. Details of 2- and 3-year survival statistics are available online, [§§§] and as seen in Fig 13, there is significant variation.

Analysis of the 1-year survival for patients diagnosed in 2018 compared with those diagnosed in 2015 demonstrates interesting stage-related changes in survival as shown in Table 3. There appears to be a substantial improvement in the survival of patients with stage III disease from 45% to 63% alive at 1 year.

Table 3. Proportion of patients surviving to 1 year after diagnosis

Stage	Proportion surviving to 1 year after diagnosis (%)	
	2015 diagnosed patients	2018 diagnosed patients
Stage I	83%	83%
Stage II	67%	68%
Stage III	45%	63%
Stage IV	17%	17%

[§§§]https://nlcastorage.blob.core.windows.net/misc/NLCA_2_and_3_yr_survival_2019.xlsx

Fig 13. 1–3-year survival across cancer alliances (England only)
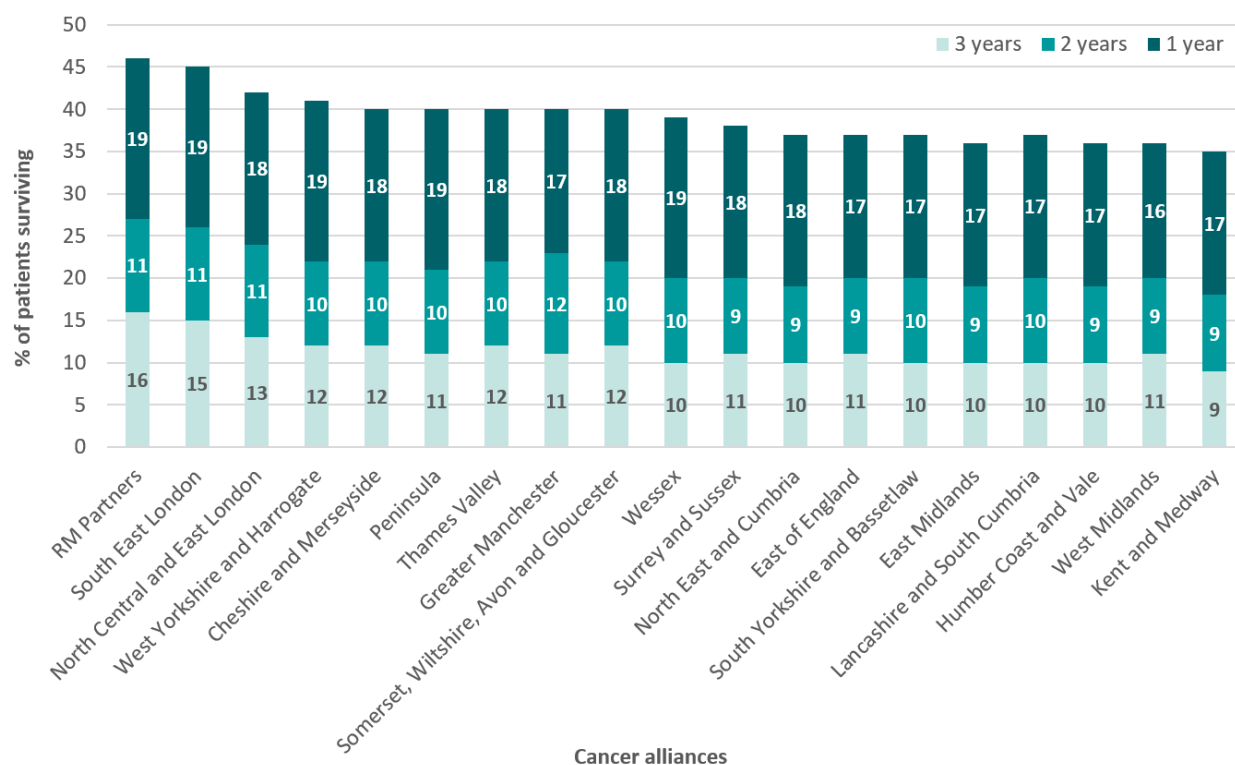
Note: Wales and the Channel Islands to be incorporated in the next audit cycle.

Anticancer treatment

Overall 58% of patients had anticancer treatment (any one of surgery, SACT or radiotherapy). The rate was slightly lower in Wales (52%) compared with England (59%).

The result did also vary by a factor of two across organisations from 40% to 80% as shown in the Fig 14. However, in patients with PS 0–1, the anticancer treatment rate was 85% overall (England 85%, Wales 77%), and varied from 63% to 96% across organisations.

Twenty-six organisations had treatment rates of less than 80% in PS 0–1 patients and this should prompt a review of pathways and policies for selection of treatment, as well as the ways in which treatment options are discussed with patients.

Fig 14. Proportion of patients having anticancer treatment
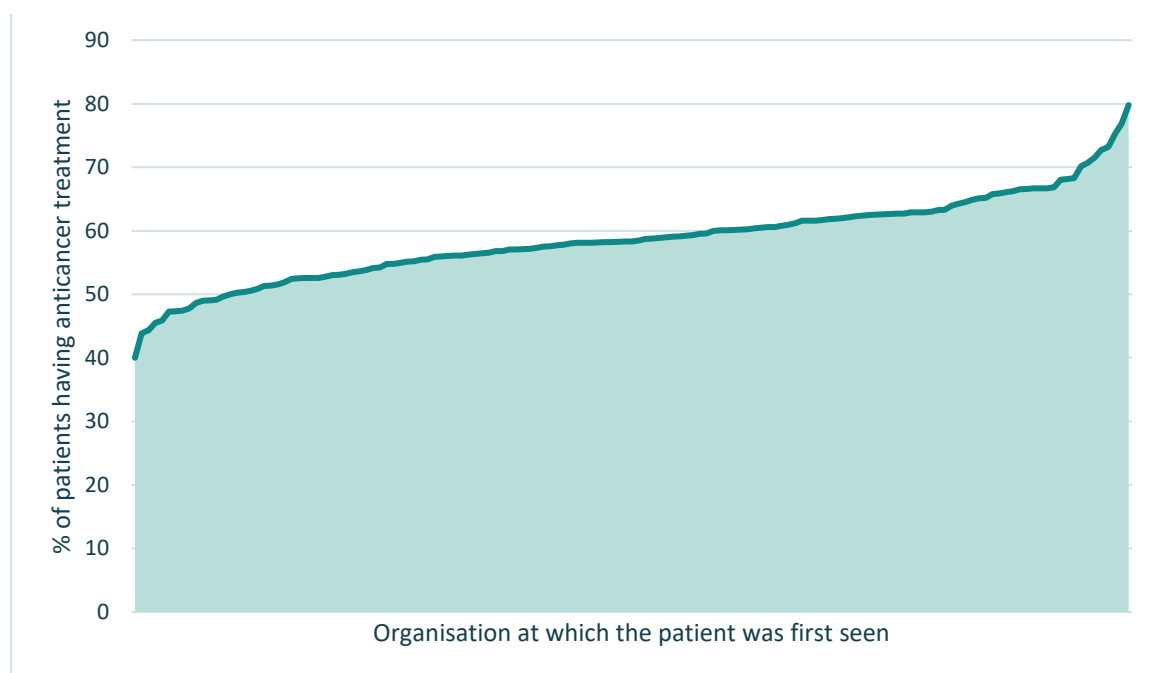
Smoking

NICE quality standard 2 recommends that adults with suspected or confirmed lung cancer who smoke receive evidence-based stop smoking support.[****]

Overall, 59% of patients had their smoking status recorded (data not available for Wales). Of these, 35% were current smokers, 56% were ex-smokers and 9% were recorded as having never smoked.

The 2019 NLCA organisational audit noted that only 47% of units had a policy for the treatment of tobacco addiction and pharmacotherapy was prescribed in only 37%. Future iterations of the COSD will include the ability to record whether any treatment for tobacco addiction has been provided.

Epidermal growth factor receptor mutation status

For patients with pathologically confirmed non-squamous NSCLC of stage IIIB–IV, only 14% of patients had their epidermal growth factor receptor (EGFR) mutation status recorded. However, the following organisations deserve a special mention for managing to record this in over 50% of their patients: Harrogate and District NHS Foundation Trust (FT), University Hospitals Coventry and Warwickshire NHS Trust, York Hospitals NHS FT, Royal Devon and Exeter NHS FT, Wye Valley NHS Trust, Royal Bournemouth and Christchurch Hospitals NHS FT, South Warwickshire NHS FT and University Hospitals Bristol NHS FT.

Since personalised therapies matched to specific genetic mutations have become such an important part of lung cancer treatment in recent years, it is crucial that the audit captures mutation status more accurately.

[****] National Institute for Health and Care Excellence. Lung cancer quality standards. London: (NICE), December 2019. www.nice.org.uk/guidance/qs17 [Accessed 25 January 2020].

Future iterations of the COSD will include the ability to record the status of a range of markers, and trusts are encouraged to refine their data collection methodologies to capture these.

Work is ongoing to automate the collection of molecular pathology data direct from the regional/local laboratories, but in the meantime the COSD submissions will remain important.

Multimodality treatments for stage III NSCLC

Stage III NSCLC is a heterogeneous group of patients with ongoing debate regarding what constitutes optimal curative-intent treatment and for what extent of locally advanced disease this can be delivered to. However, for all patients with good PS, NICE recommends the use of multimodality treatments, namely surgery and/or radical radiotherapy together with systemic anticancer therapies.[††††]

Overall, 22.2% of stage III patients in England received multimodality treatments with SACT and either surgery or radical radiotherapy, with a further 11.3% receiving surgery or radical radiotherapy alone, meaning that 66.5% patients receive either palliative treatment or no active treatment (Fig 15).

For patients with stage IIIA PS 0–2 NSCLC, 37.3% received multimodality treatment (compared with 34% in 2017 and 31% in 2016) with a further 21.2% receiving surgery or radical radiotherapy alone. Although these results are trending upwards, it still means that 41.5% of patients in this 'best' stage III subgroup were only receiving palliative treatment or no active treatment.

For all the stage III NSCLC cases receiving chemotherapy and radical radiotherapy with complete SACT and RTDS data available, 53.9% were treated with concurrent, as opposed to sequential, chemoradiation. Concurrent treatment is the most effective treatment regime for patients fit enough to tolerate it.

Across cancer alliances delivery of multimodality treatment for all cases of stage III NSCLC varied from 15.0–41.0% and for stage IIIA PS 0–2 cases varied from 26.5–51.3%. Use of concurrent chemoradiation varied from 18.4–76.9% for all patients with stage III NSCLC.

Recommendation 8

MDTs with multimodality treatment rates in stage III disease that are lower than the national mean (25%) should use our accompanying toolkit to review their pathways and policies for treatment selection and how treatment options are discussed with patients, including optimisation of staging and patient fitness.

More detailed information on these treatments is available online.[‡‡‡‡]

[††††] National Institute for Health and Care Excellence. Lung cancer: diagnosis and management. London: NICE, 2019. www.nice.org.uk/guidance/ng122 [Accessed 17 February 2020].
[‡‡‡‡] https://nlca.azurewebsites.net/AnnualReport

Fig 15. Multimodality treatments in patients with stage III NSCLC

Treatment in stage III NSCLC

Only **21%**
of patients had **multimodality treatment**

13%
of patients had **surgery** or **radiotherapy** alone

67%
had **no anticancer treatment**

systemic anticancer therapy   radiotherapy   surgery   no active treatment
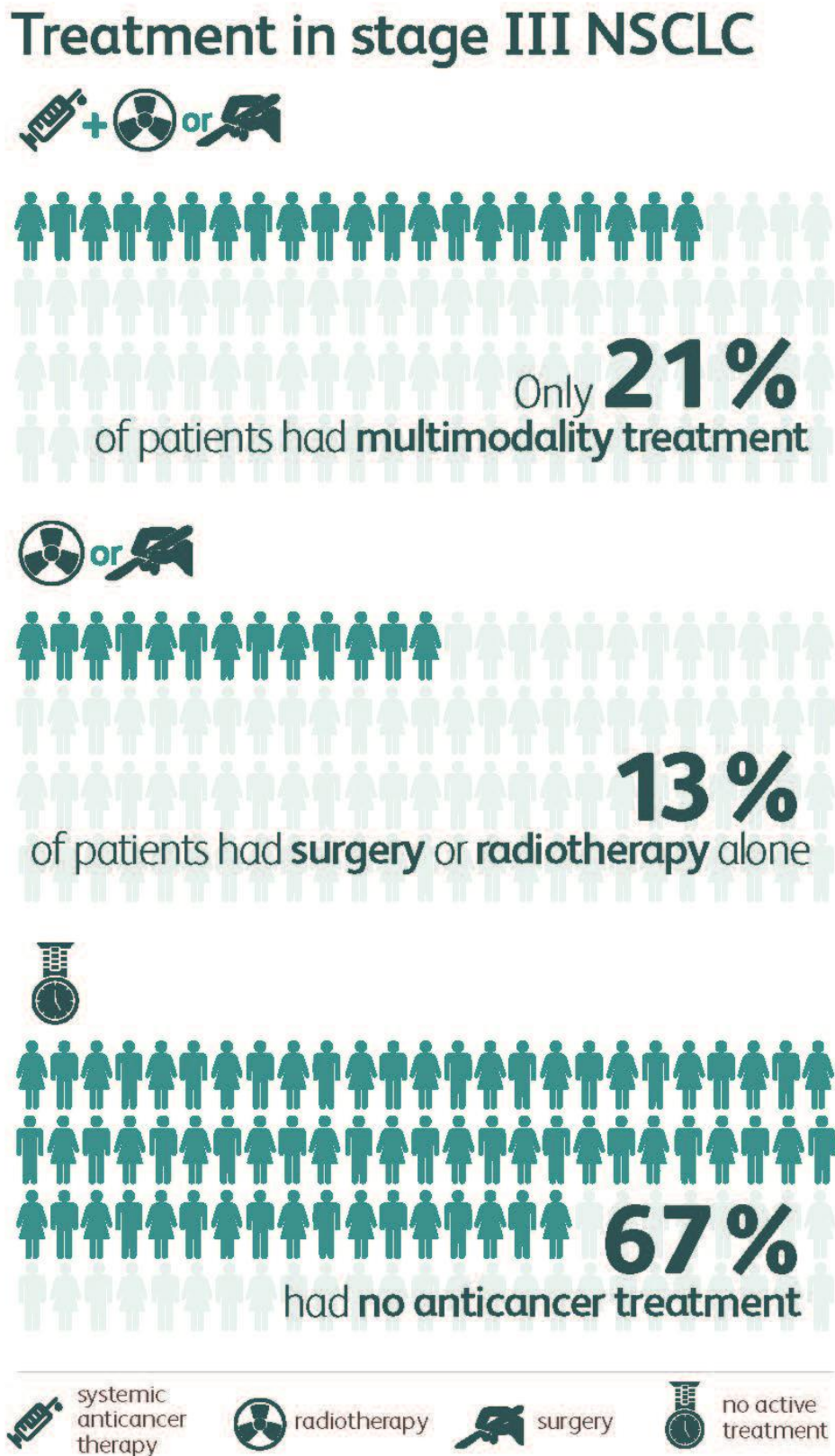
Multimodality treatments for stage I–III SCLC

Overall, across England, multimodality curative-intent treatment for patients with stage I–III SCLC was delivered in 36.3% cases with a further 3.7% receiving radical radiotherapy or surgery alone. Concurrent chemoradiation was delivered in 52% of all patients with stage I–III SCLC who were receiving chemotherapy and radical radiotherapy, who had complete SACT and RTDS data available.

For the subset of patients with PS 0–2, multimodality curative-intent treatment was delivered in 41.1% with a further 3.7% receiving surgery or radical radiotherapy alone meaning that 55.2% of patients only received palliative treatment or no active treatment. This compares with 42% for patients diagnosed in 2017 and 39% for patients diagnosed in 2016.

Recommendation 9

MDTs should consider increasing the use of radical radiotherapy in combination with chemotherapy for stage I–III limited-stage SCLC in accordance with NICE guidelines, which recommend use of concurrent twice daily radical radiotherapy for patients with PS 0–1 and offering once daily concurrent or sequential radical radiotherapy for less fit patients.

6   Commentary (Wales)

We would like to take this opportunity to acknowledge the hard work of all our MDT data clerks in ensuring that the data are as complete as possible, and Anne Lane, information specialist at Wales Cancer Network.

In the 2018 patient cohort, Wales has reduced the number of MDTs submitting data to the audit. Smaller MDTs within the same health board have merged to form single larger MDTs; this helps ensure more consistent subspecialty representation and therefore compliance with MDT standards. While this more accurately reflects the organisation structure in 2018, it makes comparison of performance more difficult over time.

Wales has continued to perform well in collecting patient metrics such as stage, PS and FEV1. In total, 88% of patients had an assessment by a lung cancer nurse specialist with a target of 90%. Histological confirmation rate in patients with stage I–II PS 0–1 NSCLC was 87% and failed to reach the target of 93% but was above the England and Wales mean of 86%. SACT treatment in patients with stage III–IV PS 0–1 NSCLC was 55% (compared with 56% in 2017), missing the target by 10%, and 11% below the England and Wales mean. This appears to be a consistent finding over a number of years. Looking at the 2018 data, investigations found some missing cases through inaccurate data capture and differences in PS assessment at presentation and at pre-treatment assessment. This remains an area of concern and will warrant further investigation over the coming year.

It is disappointing to see that NSCLC surgical resection has fallen from 18.3% in 2017 to 15.5% in 2018, especially after the steady improvement over the last few years. This does reinforce the need to continue to work on the south Wales thoracic surgical reorganisation. The feasibility and impact of lung health checks in Wales are currently being scoped. While 49% of cases continue to present in stage IV, it will remain very difficult to increase resection rates significantly.

Wales was unable to report on curative-intent treatment due to differences in data collection between England and Wales. Improvements are being made in data collection with the introduction of a new lung cancer e-form – this allows collection of additional data items such as staging investigations, molecular markers and smoking status. In addition, the e-form allows the current data to be visible to the treating physician in the Welsh Clinical Portal. The Wales Cancer Network in conjunction with National Welsh Informatics Service (NWIS) have developed a lung cancer dashboard which is designed to provide real-time data feedback to individual MDTs. It is hoped these initiatives will continue to drive improvements in patient outcomes by providing feedback in a timely manner and increasing the accuracy and visibility of data. These initiatives are still work in progress, but Wales is committed to using high-quality audit data to improve patient outcomes.

Dr Gareth Collier
Chest physician
Hywel Dda Health Board

7   Improvement journey

Due to the timelines involved in the collection of data and production of these reports, it is necessary to observe trends and consider that for example, any action plans put into place during 2019 would drive improvements for patients during 2020 and be demonstrated in reporting available in 2021.

However, comparing the outliers from the 2017 report with the current data, we can see significant improvements for several organisations, examples of which are shown in Fig 16.

Fig 16. Examples of improvement

Portsmouth Hospitals NHS Trust (RHU) improved their adjusted rate of surgery in NSCLC from 10.6% (alarm) to 15.6% (not statistically significant).	Northampton General Hospital NHS Trust (RNS) improved their adjusted rate of SACT in NSCLC from 36.8% (alarm) to 53.8% (not statistically significant).
Mid Essex Hospital Services NHS Trust (RQ8) improved their adjusted rate of SACT in NSCLC from 25.7% (alarm) to 48.4% (not statistically significant).	East Kent Hospitals University NHS FT (RVV) improved their adjusted rate of SACT in NSCLC from 45.8% (alarm) to 56.7% (not statistically significant), and also improved their adjusted rate of chemotherapy in SCLC from 42.8% (alarm) to 59.3% (not statistically significant).

More detailed improvement stories are shared over pages 30–32.

Royal United Hospitals Bath NHS Foundation Trust

The results for our trust from the 2017 NLCA annual report (2016 cohort) were poor. Our trust was identified as an 'alert' outlier for surgical resection and 1-year survival. After receiving the results, it is fair to say our team experienced several emotions. Initially denial ('it must be a problem with the data'), shock ('but we have a great clinical team forming our MDT'), followed by concern and then, in all honesty, upset. After reviewing the data and results, it became apparent there were three explanations to our poor results: 1) slightly inaccurate data entry to the NLCA (a minor component); 2) an unusual clinical aberration relating to surgical resection (which has resolved without any action); but most importantly 3) identifying that our timelines were far too long.

At the same time the National Optimal Lung Cancer Pathway (NOLCP) was published, which was an extremely helpful and timely occurrence. As lead for the lung cancer service I was asked to explain our results at senior management board meetings and explained that the poor 2017 NLCA results presented a clear opportunity for improvement, and the NOLCP provided a national blueprint for the solution.

Using the NLCA report and the NOLCP created momentum for service improvement and has helped us achieve significant changes to our pathway. We have renamed and relaunched our lung cancer service, now named the 'LIFT' (Lung Investigation Fast Track) service. This was not only to revitalise the service but also reflected that the term '2-week wait' is far too long for a patient to wait for a lung cancer clinic appointment; and is not in line with the NOLCP. We have created an enhanced lung cancer team ethic and hold quarterly business meetings for the entire MDT. We have appointed two full-time lung cancer navigators and an additional lung cancer nurse specialist. We now hold daily meetings reviewing the diagnostic timelines for all patients and audit all timelines for every part of the pathway from the first CT scan to treatment.

Although there still are many improvements required, the 2017 NLCA report acted as a catalyst for improvements and we have been able to use this as an aid for service development rather than a barrier.

Dr Vidan Masani
Consultant respiratory physician

Mid Essex Hospital

In December 2017 I was informed that our lung cancer service had been flagged as an alarm-level outlier for SACT in good PS advanced lung cancer patients in the 2016 cohort of the NLCA. It was challenging and disappointing and I have shared my reflections on it before. This year I am in a happier position having been asked to reflect on and celebrate our achievement of no longer being negative outliers for SACT, and even having two positive outlier results in the process measures.
It is a much better brief to have and it is true that as a team we have worked very hard. In the 2017 cohort we were an alert level outlier and in 2018 we are not statistically significant (NS). There have been improvements that we implemented that have contributed to this. Our data quality is much better than it was, in most areas, but we still have no data manager. We now have a substantive full-time consultant oncologist, who is both hard-working and an excellent clinician. Unfortunately, they are our only oncologist; I have been told recruitment is a problem nationally.

These changes need to be put in the context of the broader changes that are ongoing in the delivery of lung cancer services with the NOLCP and an expanding range of therapeutic options. Quality improvement (QI) is an ongoing process and we continue to develop our services and change is a constant too. We are a positive outlier for clinical nurse specialist (CNS) assessment and I think our 2019 data will improve, but both our Band 7 CNS' have resigned in the last 3 months to move onwards and upwards. In 2020 our service will merge as part of our sustainability and transformation partnership (STP) changes and this will also impact our reporting.

This leads me to the conclusion that we should celebrate our achievements and work on our weaknesses but perhaps not get too perturbed by either. The outlier process can focus minds and leverage change, but the QI needs to be relentless and mitigation is not the same as solving the problem. If you have been an outlier in this process, then I would recommend looking hard at your service and use it as an opportunity for positive change. Do not take it personally and do not despair.

Dr Malcolm Lawson
Consultant respiratory physician

Portsmouth Hospital

Portsmouth Hospitals NHS Trust serves a diverse population of approximately 675,000 people, with a broad spectrum of socioeconomic groups. Approximately 450 cases of lung cancer are diagnosed each year, with a further 50 cases of mesothelioma.

In 2018, Portsmouth Hospital was identified as an outlier for surgical resection rates for lung cancer treatment. The lung cancer MDT, in conjunction with support from our local thoracic surgery colleagues, reviewed the lung cancer pathway to identify opportunities to increase the resection rates for those felt to be appropriate. One improvement was to have a thoracic surgeon present for the full duration of the weekly MDT meeting. This has ensured all 'borderline' surgical candidates and complex cases are discussed with the full MDT in attendance, and all potential surgical candidates are offered clinic review with a surgeon for further discussion. Alongside this, our thoracic surgical colleagues have developed their pathways to include a complex patient MDT attended by surgeons, anaesthetists and the nursing team to ensure all patients have all opportunities to be considered for surgical treatment if felt to be appropriate. By implementing the above changes, our surgical resection rates have improved to within the national average.

These changes promoted an enthusiasm to improve other aspects of the lung cancer service within Portsmouth Hospital. The entire diagnostic pathway was reviewed on the principle that every day matters. Each step was analysed to assess inefficiencies and determine where and why delays were occurring. Multidisciplinary changes have been implemented across the pathway to reduce the time to diagnosis for a patient with possible lung cancer.

We have implemented a telephone consultation for patients where their CT scan shows no evidence of malignancy to reduce unnecessary clinic appointments and unnecessary patient anxiety. This has proved highly successful and is valued by patients. Within the clinics, we have created new documentation to improve communication within secondary care and between primary and secondary care. This also helps ensure all appropriate investigations are requested at the first opportunity and are available for review at the MDT. We have increased our CT scan capacity, enabling early CT scans with dedicated cardiothoracic radiologist reporting. Portsmouth Hospital has introduced new lung cancer pathway coordinators who liaise with patients to organise clinics and diagnostic tests and highlight results outside of the MDT setting to ensure prompt action. We have also worked closely with business intelligence to create a dashboard showing real-time data for time to review, investigations, diagnosis and treatment.

These multiple small improvements together have sped up our overall lung cancer pathway improving our compliance with national targets, but more importantly, provided our patients with a streamlined diagnostic pathway to facilitate lung cancer diagnosis and treatment.

Lauren Fox, respiratory research fellow
M. Walid Ibrahim, consultant respiratory physician

8   Reflections

After 10 years of successful partnership with the Health and Social Care Information Centre (now rebranded as NHS Digital), a new 3-year contract was awarded to the Royal College of Physicians (RCP) in 2015. Subsequently, contract extensions have been granted and the team are delighted to be continuing to deliver this crucial work. While the team look forwards, it is interesting to look back and reflect on the audit's achievements.

Instead of a standalone system of data collection, we have developed a strong partnership with NCRAS in order to use cancer registrations as our primary data source. This has facilitated linkage of other data sources such as SACT and RTDS, which has made our data more accurate and has allowed new analyses to be undertaken, such as on curative-intent treatment rates. The clinical community, however, were shocked when we reported an additional 7,000 patients (tending to be patients of older age and with poorer PS) identified outside of COSD submissions. It was only through detailed analysis that we were able to reassure clinical teams, that these were real cases, identified by the rigorous cancer registration process.

A challenge for both clinical teams and the audit team has been the allocation of cases to the 'trust first seen'. This method of cohorting patients for analysis has been used since the very beginning of the NLCA and has served us well. COSD includes a data field to record the trust first seen, but in many cases this is not completed, or is completed with multiple different codes. We worked with NCRAS and our analysis team to develop an accurate (but not perfect) algorithm that used a range of additional pieces of information in the dataset to define the most likely trust first seen.

Issues such as these have inevitably left clinical teams viewing the registration and analysis process as something of a black box, of which they have little understanding or control. We were pleased to introduce a data validation or 'data refresh' process which, while requiring additional input from local services, enabled a reassurance that results were accurate and meaningful. An enormous amount of time and effort was expended by NCRAS in setting up the 'data refresh' process but unfortunately, without dedicated funding, it wasn't possible to complete this step in the most recent audit period. These issues will need to be carefully thought through in a further cycle of audit.

I am particularly proud of how we have moved forward in the analysis and presentation of our data. Our website (www.nlcaudit.co.uk) hosts all our reports across all of our workstreams and we have implemented a method of producing organisation-level dashboards to bring to life to the otherwise monotonous stream of numbers. Likewise, we have changed from reporting odds ratios to adjusted proportions which are much more meaningful to non-statisticians like myself! We were one of the first national audits to develop and implement a robust outlier policy, and although this has led to a good deal of pain for some organisations, feedback has also shown that the process can and does lead to real and meaningful change. Ultimately feedback suggests that the outlier process is a helpful process. We have also aligned our measures and recommendations to guidance produced by bodies such as NICE and the national Lung Cancer Clinical Expert Group.

The NLCA has had enormous impact at local, regional and national levels, and we have seen standards and outcomes improve year by year. However, we must recognise that the variation we highlighted in the early 2000s persists in the data we report today.

Dr Paul Beckett, NLCA senior clinical lead

Document purpose

Document purpose	To disseminate results on the quality of care for patients diagnosed with lung cancer in the period between 1 January and 31 December 2018
Title	National Lung Cancer Audit annual report (for the audit period 2018)
Author	Royal College of Physicians, Care Quality Improvement Department
Publication date	August 2020
Target audience	NHS staff in lung cancer multidisciplinary teams; hospital managers and chief executives; commissioners; lung cancer researchers; patients and their carers.
Description	This is the 15th annual report on the clinical component (process of care) of the National Lung Cancer Audit. It publishes national and named team results on the quality of lung cancer care for patients diagnosed between 1 January and 31 December 2018. It covers many processes of care across the entire patient pathway.
Related publications	*NICE guideline: Lung cancer: diagnosis and management, 2019*: www.nice.org.uk/guidance/ng122 *NICE Quality standard for lung cancer in adults, 2019*: www.nice.org.uk/guidance/qs17 *National Lung Cancer Audit annual report 2018 (2017 cohort)*: www.rcplondon.ac.uk/projects/outputs/nlca-annual-report-2018 www.nlcaudit.co.uk/Home/Data
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The University of Nottingham provides the analysis of the patient-level data; clinical leadership is provided by lung cancer experts recruited through the Care Quality Improvement Department at the RCP. The NLCA board is constituted by the Society for Cardiothoracic Surgery (SCTS), the Roy Castle Lung Cancer Foundation (representing lung cancer patients), Wales Cancer Network Lung Cancer Group, Lung Cancer Nursing UK (formerly the National Lung Cancer Forum for Nurses) and the British Thoracic Oncology Group.

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