



Royal College  
of Physicians

National Lung  
Cancer Audit

National Lung Cancer Audit

# National Lung Cancer Audit annual report

(for the audit period 2019 England, Wales and Guernsey  
and 2020 England only)

Published January 2022



In association with:



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### 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 <https://nlca.rcp.ac.uk>.

### 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](http://www.ndrs.nhs.uk)

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## Foreword by Dr Neal Navani, NLCA senior clinical lead

The past 2 years have been a period of great challenge and change for the NHS. On behalf of the National Lung Cancer Audit (NLCA), I would like to pay tribute to all the healthcare professionals caring for patients with lung cancer during the COVID-19 pandemic, many of whom were redeployed to support COVID-19 patients. It is through your hard work, dedication and resilience that we have the data to be able to produce this annual report. This is also, sadly, the last report with the Royal College of Physicians (RCP). The RCP has provided outstanding leadership for the NLCA since 2014. Since its inception, the NLCA – with the RCP – has been at the vanguard of cancer audit and has driven quality improvement for lung cancer patients across England and Wales. In particular, the NLCA has helped to drive up the surgical resection rate and in turn, the number of thoracic surgeons within the NHS. The NLCA has impacted at local, regional and national levels, helping to inform national and international guidelines. As a result, standards and outcomes for patients with lung cancer have improved year on year.

While the process for data collection in Wales remains unchanged, the data collection for England has followed a new process for this annual report. For the first time, the Welsh audit data are presented separately and are not compared with England due to the differences in data processing. The impact of COVID-19 caused restrictions on lung cancer data availability from Public Health England (PHE).<sup>\*</sup> In addition, reforms to the public health system resulted in the disestablishment of PHE. We are grateful to the National Cancer Registration and Analysis Service (NCRAS) at PHE, our longstanding data partner for NLCA reports, who developed the Rapid Cancer Registration Dataset (RCRD) during the pandemic, which provided the data used in this annual report. The RCRD is different to the traditional annual registration dataset and required us to develop a new methodology for the report. However, this rapid data source enabled us to provide a view of lung cancer care in 2019 and 2020 in a more timely fashion than we have previously been able to do. We are very grateful to our analytical partners Dr Onosi Ifesemen and Professor Richard Hubbard at the University of Nottingham for conducting this work and to NCRAS colleagues Sean McPhail, Jackie Charman, Ellie Fitzgerald, Wouter Verstraete and Natasha Wood for their support and advice on using the RCRD.

The use of the RCRD represents a new phase in the evolution of the NLCA. The original lung cancer audit dataset (LUCADA) was a standalone system of data collection, reliant upon clinicians and multidisciplinary team coordinators submitting data for analysis. In 2014, the process for data collection changed to being automated via trusts to NCRAS within PHE. The data were linked to other sources, including the Systemic Anticancer Therapy (SACT) dataset, Radiotherapy Dataset (RTDS) and Office for National Statistics (ONS) data – the latter providing diagnoses registered only via death certificates. At the time, two significant issues emerged: firstly, an additional 7,000 patients were registered, tending to be older patients with poorer performance statuses and secondly, ‘trust first seen’ (a field in the monthly submission from trusts) was often not completed or contained multiple different codes. An algorithm was therefore developed and validated that allocated patients to a ‘trust first seen’.

For this annual report, only the RCRD was available from PHE and we therefore initially compared this dataset of 2019 patients with the usual quality-assured NLCA dataset from 2018. This showed that the 2019 RCRD appears to have not included approximately 4,300 patients in 2019. The RCRD included far fewer patients with more advanced stage disease than 2018 data, indicating that the majority of patients not captured are those with advanced stage disease. As a result, the 1-year survival of 46% for patients diagnosed in 2019 (compared with 39% in 2018) is not an accurate representation of all

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<sup>\*</sup> Public Health England was dissolved on 1 October 2021. The responsibility for the management of the National Cancer Registration and Analysis Service (NCRAS) was transferred to NHS Digital.

patients and shows that the RCRD is skewed to those patients with better survival. Additional analysis is ongoing to further understand these missing patients and how they can be captured for future years.

Another significant issue for the NLCA team was that 'trust first seen' was not available for the RCRD and it was not possible to run the trust allocation algorithm used in previous years. Therefore, a decision was taken to only provide data<sup>†</sup> at alliance level. For similar reasons, an outlier process was not possible.

Data completeness varied across alliances and may reflect a further impact of the pandemic. A huge advantage, however, of the RCRD is that the data are available for extraction 4 months after diagnosis and the last data refresh for the 2020 cohort was in June 2021, prior to analysis in July 2021. This is a significant improvement on the 18 months between diagnosis and analysis in previous years. Once the review process was factored in, previously reports were not available to the clinical community for at least 2 years after patients' diagnosis, limiting their impact on quality improvement. If the RCRD continues to be used for future audit cycles, we hope that upcoming annual reports will be available a maximum of 1 year after the last diagnosis and that regularly updated dashboards are available for local quality improvement initiatives.

After traversing a rocky road for the NLCA, we are pleased to provide a report of the national picture for lung cancer care which includes 2 years of data for the first time: 2019 and 2020. It is very encouraging that 1-year survival of lung cancer patients in England is likely to be improved in 2019 compared with 2018. If we assume that the 4,300 patients not included in the 2019 RCRD all did not survive for 1 year, then the 1-year survival of patients diagnosed in 2019 is 40.7%. This represents an improvement from 2018 when it was 39% and shows that prior to the pandemic, outcomes for lung cancer patients were continuing to improve.

However, despite the caveats of the RCRD, the results for 2020 make for sobering reading. Many of the predictions of the impact of COVID-19 have come to pass and perhaps the outcomes are worse than expected. There was a significant decrease in curative treatment rate, from 81% in 2019 to 73% in 2020, with surgical resection rates in 2020 similar to 10 years ago. Compared with 2019, lung cancer patients diagnosed in England in 2020 had worse performance status, were more likely to be diagnosed via emergency presentation and less likely to have a pathological diagnosis. The NLCA must be central to the recovery of lung cancer services and there must be an urgent refocus on early diagnosis. To achieve this, further implementation of lung cancer screening is required and complementary work must be done at alliance- and commissioner- as well as trust-level to promote early presentation of lung cancer patients. The NLCA will also benefit in the future from an emphasis on primary care indicators in addition to hospital-based metrics.

This NLCA annual report would not have been possible without a dedicated team, calmly navigating uncharted waters over the past 12 months. I would like to acknowledge the outstanding work from colleagues within the RCP NLCA team, particularly Tatyana Guveli, Katie Edmondson, Dhara Patel, John Conibear and Doug West in delivering this annual report in very challenging circumstances. It has been a privilege to work with them and I wish them well with their upcoming endeavours. The teamwork between NHS colleagues in the face of adversity has been inspiring and I hope that it can continue as we recover from the pandemic.

The NLCA has been recommissioned and the future audit provider will need to continue to work closely with patients, NCRAS and the clinical community to build upon previous successes. Significant progress was being made in lung cancer care and this has been reversed by the pandemic. Huge improvements are urgently needed again and the NLCA should continue to provide the data to guide them.

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<sup>†</sup>See <https://nlca.rcp.ac.uk/AnnualReport>



# 1 Executive summary

This National Lung Cancer Audit (NLCA) annual report provides information on the process of care and outcomes for patients diagnosed with lung cancer between 1 January 2019 and 31 December 2019 in Wales and Guernsey and between 1 January 2019 and 31 December 2020 in England.\* The report utilises data provided by PHE, the Welsh Cancer Network and lung cancer teams in 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 impact of the COVID-19 pandemic meant that our PHE colleagues at the National Cancer Registration and Analysis Service (NCRAS) were unable to provide the usual quality-assured data that has been the basis of previous reports. In a change to previous methodology, this report utilises data from the Rapid Cancer Registration Dataset (RCRD) for England. This dataset contains fewer data items than the usual quality-assured cohort but is available more rapidly. For the first time, this annual report also covers patients diagnosed over 2 years in England. Despite the pressures on staff in hospital trusts and NCRAS, it is a great achievement that the RCRD has been made available and this report has been possible. The Welsh audit data are presented separately and are not compared with England due to the differences in data processing between England and Wales. A separate section provides a detailed analysis of lung cancer patients diagnosed in Wales in 2019 (section 5, page 25).

## Key findings

- > In 2019 in England, the incidence of lung cancer recorded in the RCRD was 83% of that recorded in the 2018 full registration dataset. The RCRD has not captured approximately 4,300 patients in 2019 and included far fewer patients with more advanced stage disease than the 2018 data. As a result, the 1-year survival of 46% for patients diagnosed in 2019 (compared with 39% in 2018) is not an accurate representation of all patients and shows that the RCRD is skewed to those patients with better survival.<sup>†</sup>
- > In 2019 in England, the RCRD provided data on 33,091 patients diagnosed with lung cancer in 2019 and 31,371 patients diagnosed in 2020. In 2019, there were 2,240 patients diagnosed with lung cancer in Wales and 39 patients diagnosed in Guernsey.<sup>‡</sup>
- > For patients diagnosed with lung cancer in 2019, 1-year survival improved compared with 2018.
- > In 2019 in England, curative treatment rates of NSCLC patients with stage I/II and good performance status from the RCRD were 81%. This metric fell significantly to 73% in 2020 with a drop in surgical resection rate from 20% to 15%.
- > Compared with 2019, lung cancer patients diagnosed in England in 2020 had worse performance status, were more likely to be diagnosed via emergency presentation and less likely to have a pathological diagnosis.
- > In 2019 in Wales, the rates for surgical resection (16%), chemotherapy in small-cell lung cancer (65%) and systemic anticancer treatment for stage IIIB–IV, PS 0–1 non-small-cell lung cancer NSCLC patients (54%) remain below the audit standards and have remained static for the past few years.

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\*Lung cancer teams in Jersey were unable to submit their 2019 data due to resource challenges during the pandemic.

<sup>†</sup>The RCRD does not include patients who only appear in Hospital Episode Statistics.

<sup>‡</sup> The Guernsey audit data are not analysed in this report but can be found in the data information sheet on our website at <https://nlca.rcp.ac.uk/AnnualReport>

## Recommendations – England

Ref. No	Recommendation	Standard	Key audience
E1.	Trusts should review their data completeness in the Cancer Services and Outcomes Dataset as this is the main source for the Rapid Cancer Registration Dataset. PS and stage should be recorded in at least 95% of cases	<a href="#">Clinical Advice to Cancer Alliances for the Commissioning of the Whole Lung Cancer Pathway</a> . <sup>8</sup> the MDT should participate in the NLCA	Multidisciplinary team Clinical lead Cancer manager
E2.	Cancer alliances and clinical commissioning groups (CCGs) should examine the route of referral and stage at presentation for their population and look at ways to increase the numbers of patients diagnosed who are presenting with early-stage disease	<a href="#">NICE quality statement 1 (QS17)</a> . <sup>1</sup> 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	Commissioner Cancer alliance
E3.	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	This audit shows that only 28% of patients are diagnosed with stage I/II disease in 2020. The NHS Long Term Plan seeks to diagnose at least 75% of (all) cancers at stage I/II by 2028	UK National Screening Committee
E4.	Cancer alliances with lower than expected curative-intent treatment rates for stage I/II PS 0–2 NSCLC should review their processes for selection of patients for such treatment, in order that a rate of at least 85% is achieved	<a href="#">NICE quality statement 5 (QS17)</a> . <sup>1</sup> adults with NSCLC stage I or II and good PS have treatment with curative intent	Cancer alliance Multidisciplinary team Clinical lead Cancer manager

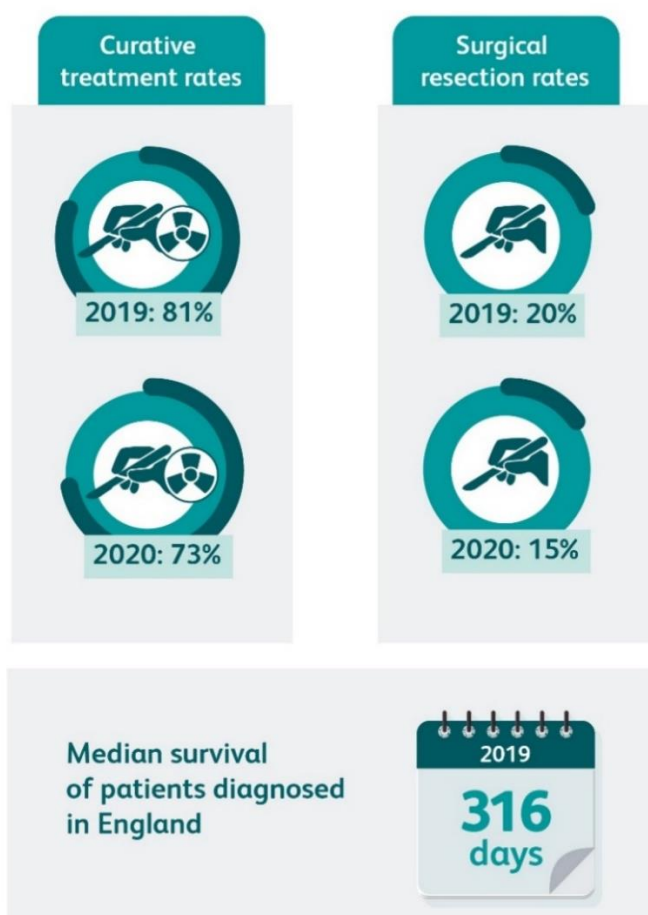
## Recommendations – Wales

Ref. No	Recommendation	Standard	Key audience
W1.	Health boards should examine the route of referral and stage at presentation for their population and look at ways to increase the numbers of patients diagnosed who are presenting with early-stage disease	<a href="#">NICE quality statement 1 (QS17)</a> . <sup>1</sup> 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 needed	Health boards
W2.	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	This audit shows that 48% of patients in Wales are diagnosed with stage IV disease in 2019. The NHS Long Term Plan seeks to	UK National Screening Committee

Ref. No	Recommendation	Standard	Key audience
	proportion of patients diagnosed with lung cancer at an early stage can be increased	diagnose at least 75% of all cancers at stage I/II by 2028	
W3.	Health boards with lower than expected surgical resection rates should review their processes for selection of patients for surgery, in order that a rate of at least 17% is achieved	<a href="#">NICE quality statement 5 (QS17)</a> : <sup>1</sup> adults with NSCLC stage I or II and good PS have treatment with curative intent	Health boards Multidisciplinary team Clinical lead Cancer manager

## Summary of results from patients diagnosed in England in 2019–20 using the Rapid Cancer Registration Dataset

### Cancer incidence



In view of the limitations around the RCRD, only alliance level results are presented for England. Trust-level results are not reported and an outlier process was not conducted. Despite the COVID-19 pandemic, it was possible in this report to include two new important metrics of care for England: time from diagnosis to treatment (available from the RCRD) and clinical trial recruitment (from the National Institute of Health Research).



Data from this annual report confirm the significant detrimental impact of COVID-19 on lung cancer care and outcomes and emphasise the urgent need for a recovery plan for lung cancer services. The RCRD provides more real-time data than has been available previously and utilisation of this dataset and real-time dashboards will be vital in aiding the challenge ahead.

However, further work needs to be done to improve data completeness and case ascertainment in the RCRD. This begins with trusts ensuring the Cancer Outcomes and Services Dataset (COSD), which populates the RCRD, is as complete and accurate as possible with regular validation.

It has been a hugely challenging 2 years for the NHS. The NLCA team at the Royal College of Physicians would like to pay tribute to all staff in NHS trusts, cancer alliances and in NCRAS who have been involved in tackling the pandemic. This annual report provides a baseline from which to launch a recovery from the impact of COVID-19.

## 2 Introduction

The NLCA forms part of the National Clinical Audit and Patient Outcomes Programme (NCAPOP) funded by NHS England and the Welsh Government. It is commissioned by the Healthcare Quality Improvement Partnership (HQIP) and is delivered in partnership with several key stakeholders noted in the [acknowledgements](#).

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 clinical process and outcomes for 33,091 patients diagnosed with lung cancer in England in 2019 and 31,371 patients in 2020. A separate section provides a detailed analysis of 2,240 patients diagnosed in Wales in 2019 (section 5, page 25).

For the first time, this report utilises a new Rapid Cancer Registration Dataset (RCRD) for England, provided by the National Cancer Registration and Analysis Service (NCRAS) within Public Health England (PHE). A major advantage of this dataset is that it is available far more contemporaneously than the full NLCA dataset, allowing data from NCRAS to be made available for extraction 4 months after diagnosis, compared with 18 months for the standard quality assured NLCA dataset. This allows the NLCA to report 2 years of patient data for the first time. However, although the RCRD is provided more rapidly, there is a trade-off with case ascertainment, discussed further below.

*More detailed results for cancer alliances and clinical commissioning groups where available can be obtained and downloaded from our website <https://nlca.rcp.ac.uk/Home/Data> enabling patients, carers, clinicians, and commissioners to compare services in their area with others.*

*Abbreviations and scientific terms are explained more fully in the [glossary](#) – see page 34.*

## 3 Methods – England

This report consists of data from PHE's RCRD and represents a significant change from previous NLCA reports. It covers patients with a diagnosis of lung cancer, 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 2019 and 31 December 2020.

### 3.1 Data collection

NHS hospitals in England submit the details for all lung cancer patients, including patients undergoing lung cancer surgery, to the NLCA via NCRAS as part of the Cancer Outcomes and Services Dataset (COSD). Hospitals also submit information on lung cancer patients via other datasets, including Hospital Episode Statistics (HES), the National Radiotherapy Dataset (RTDS), the Systemic Anticancer Therapy (SACT) dataset, pathology reports and death certificate only data. Previously these datasets were fully linked and quality assured. However, due to challenges posed by the pandemic, PHE was unable to provide the standard quality assured NLCA dataset. Therefore, in a change to previous methodology, the report was compiled using the RCRD.

#### Rapid Cancer Registration Dataset

The RCRD was developed by NCRAS using the standard administrative datasets which flow into PHE and is available for extraction approximately 4 months behind real time. It consists of 79 data items from the COSD, RTDS, SACT and HES datasets. More information about the RCRD dataset can be found at [www.cancerdata.nhs.uk/covid-19/rcrd](http://www.cancerdata.nhs.uk/covid-19/rcrd). Importantly, registrations of lung cancer only occur from the COSD dataset and patients with entries only in SACT, HES, RTDS or death certificate only are not included. Linkage to molecular datasets was not available. Therefore, the limitations of using the RCRD include missing registrations and certain fields, eg 'trust first seen' are not included and so patients are allocated according to where treatment takes place. This means that trusts cannot be compared as accurately as in the past as the algorithm used previously for trust allocation was not available. However, a major advantage of the RCRD is that more data are available in real time allowing this report to include patients diagnosed in 2020 as well as 2019. In addition, data completeness in the RCRD remains high, eg 92.5% stage completeness in the 2019 RCRD.

### 3.2 Audit standards

The NLCA standards have been developed over the past 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 and health boards delivering lung cancer services should be achieving.

### 3.3 Analysis of the data

In this report, all data from England in 2019 and 2020 are from the RCRD. The patient-level 2019 and 2020 RCRD datasets were transferred from PHE to the University of Nottingham for analysis in June 2021. To clarify the utility of the RCRD, the 2019 data were initially compared with the gold standard 2018 dataset. The gold standard dataset is usually available around 18 months after the end of diagnosis period. It links together a number of cancer datasets and is quality assured prior to release. Given concerns around case ascertainment, data quality and correct allocation to trusts in the RCRD, it was agreed by the NLCA board that data would only be reported at alliance level. As in previous years, case-mix adjustment was carried out using age, gender, stage, socio-economic status and performance status (PS). The standard outlier process employed in previous years was not followed, particularly in view of uncertainty around trust allocation. Median and 1-year survival is reported for the 2019 cohort but at the time of analysis was not available for the 2020 cohort due to limited follow-up. The median survival for the 2020 RCRD will be published when available.

## 4 Results – England

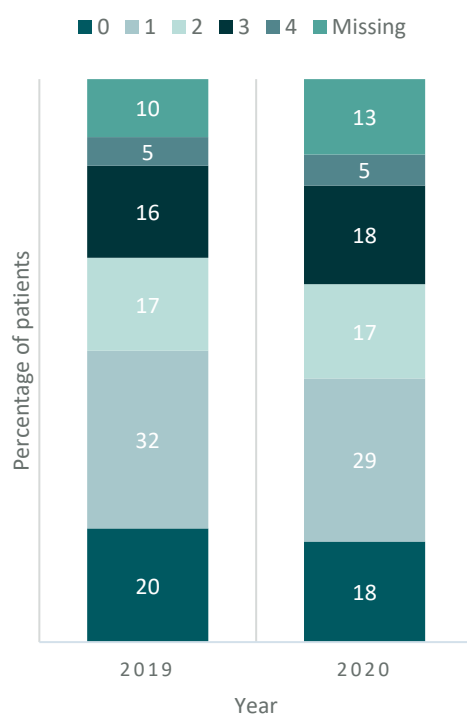
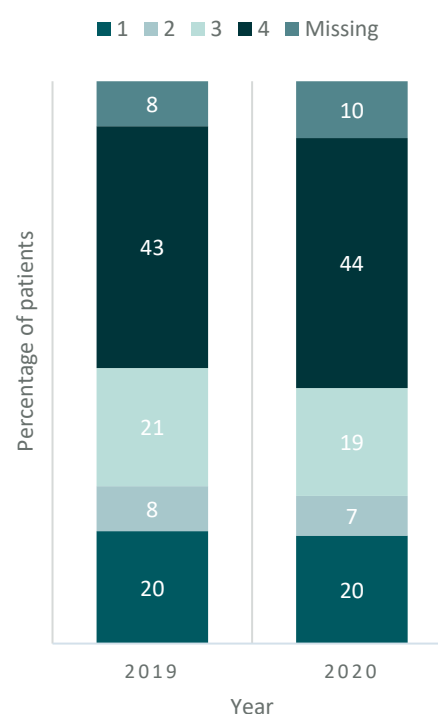
### 4.1 Comparison of RCRD 2019 with the 2018 gold standard NLCA dataset

Given the new use of the RCRD and to understand this dataset better, the NLCA team felt it was important to compare this with the 2018 gold standard dataset. This comparison of patients included in the 2019 RCRD against the 2018 NLCA data shows that caveats must be applied to the 2019 and 2020 datasets (the comparison table can be found on the data spreadsheet from our website <https://nlca.rcp.ac.uk/AnnualReport>). There are 33,091 patients diagnosed with lung cancer in the 2019 RCRD, which is 83% of the patients in the 2018 NLCA cohort. When analysed according to the 21 cancer alliances, the number of cancer registrations ranges from 80% to 98% of 2018 numbers. This variation suggests that at trust level, there may be variability on how data is recorded effectively. It will be useful to focus on this metric to understand good practice which can be shared between trusts (see page 24 for a case study demonstrating good practice by Dorset County Hospital NHS Foundation Trust). However, it is reassuring that the included patients in the 2019 RCRD have similar high data completeness to previous years with 85% of patients having data completeness for both performance status and stage.

Although patients in the 2019 cohort have a comparable age and gender distribution to the previous year, the 2019 patients have a significantly higher survival. The 1-year survival for the 2019 patients from the RCRD is 46%, compared with 39% if diagnosed in 2018 and included in the gold standard dataset. However, there are significant caveats to the estimation of patient survival from the 2019 RCRD dataset as described in the methods above. There are significantly more patients with stage IV disease in the 2018 cohort (49%) than in 2019 (43%) and a slightly higher proportion received surgery and curative treatment rates in 2019. The proportion of patients with advanced disease and good performance status who received systemic therapy was 54% in 2019 compared with 67% in 2018 suggesting an issue with the data quality or linkage between the RCRD and the SACT datasets for the RCRD. Assuming that the incidence of lung cancer should not be different between 2018 and 2019, the implication is that the 4,300 patients missing from the 2019 RCRD have more advanced stage and poorer prognosis. This needs to be borne in mind when interpreting the RCRD 2019 and 2020 datasets.

### 4.2 Demographic analysis

In the 2019 RCRD, 33,091 patients diagnosed with lung cancer were available for analysis, while in 2020 there were 31,371 cases registered. The median age for non-small-cell lung cancer (NSCLC) was 73 years, for small-cell lung cancer (SCLC) it was 80 years and for carcinoid tumours it was 68 years. The proportion of lung cancers proven to be SCLC has fallen again to 9% in 2019 and 8% in 2020, having been 10% in 2018 and 11% in 2014. Distribution of stage and performance status for all patients with lung cancer in 2019 and 2020 is shown in Fig 1a and 1b.

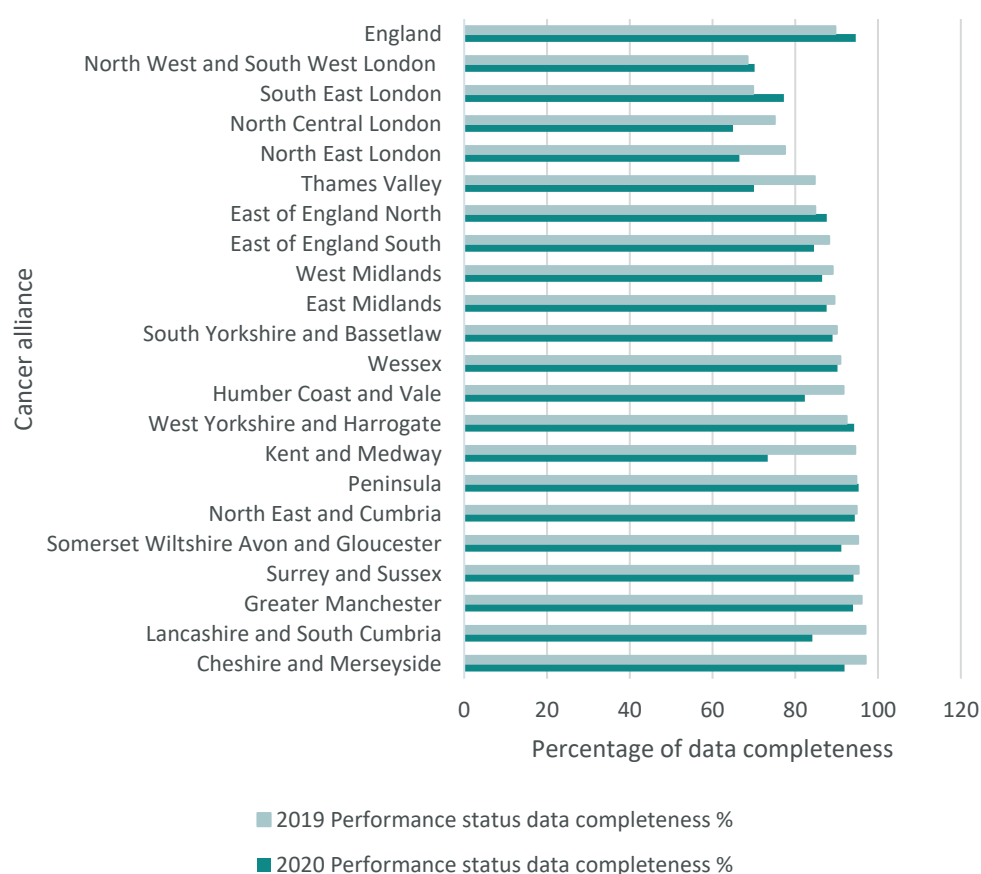
**Fig 1a. Distribution of performance status of patients with lung cancer in England in 2019 and 2020****Fig 1b. Distribution of stage of patients with lung cancer in England in 2019 and 2020**

Comparison of the 2019 and 2020 RCRDs shows that PS distribution has been adversely affected in 2020 with 52% of patients presenting with PS 0–1 in 2019 compared with 47% in 2020. In 2019, 28% of patients were diagnosed at stage I and II, with 43% of patients at stage IV. In 2020, there was a 1% reduction in early-stage patients to 27% and a 1% increase in the proportion with stage IV disease to 44%. This highlights the huge gap between these figures and the ambition of the NHS Long Term Plan to diagnose at least 75% of all cancers at stage I/II by 2028. We support the expansion of the lung health check programme to help close this gap and advocate for a national lung cancer screening programme. In addition, we support further measures which have been proven to increase earlier stage diagnosis, such as awareness campaigns and self-referral for chest X-rays, consistent with [NICE quality standard 17](#).<sup>1</sup> The 2020 RCRD also shows an adverse distribution in PS compared with 2019, with 52% of patients presenting with PS 0–1 in 2019 compared with 47% in 2020.

Given the caveats around the RCRD described above, we have not reported on variation at trust level as in previous years. However, data completeness for PS and stage reflects the quality of the COSD output for trusts and at alliance level in 2020 varied hugely between 58% and 91%. Data completeness of PS and stage by cancer alliance are shown in Figs 2a and 2b for both 2019 and 2020. This should continue to be a focus of quality improvement for trusts and alliances.



**Fig 2a. Data completeness of performance status of patients with lung cancer by cancer alliance in England in 2019 and 2020**



**Fig 2b. Data completeness of stage of patients with lung cancer by cancer alliance in England in 2019 and 2020**

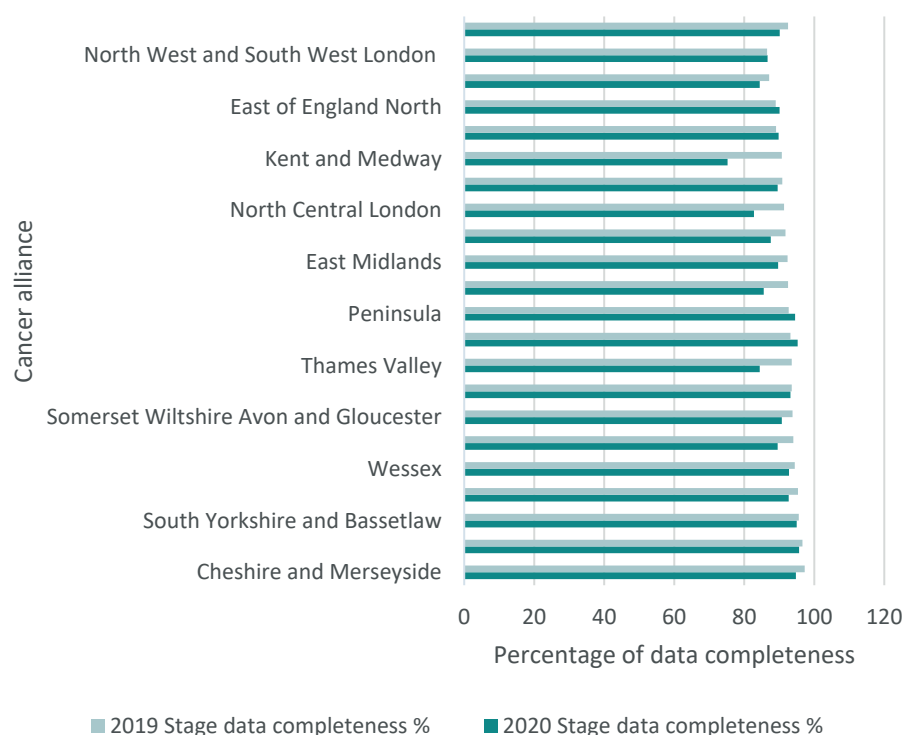


Table 1 provides a comparison of 2019 and 2020 RCRD data against NLCA benchmarks.

**Table 1. England 2019 and 2020 comparison of key indicators against benchmarks**

Key indicators*	NLCA benchmark figures	2019 RCRD	2020 RCRD
Number of patients	N/A	33,091	31,371
Proportion of patients with stage IV disease	N/A	43%	44%
Proportion of patients with PS 0–1	N/A	52%	47%
Proportion of patients with pathological confirmation of lung cancer for stage I/II and PS 0–1	≥90%	84%	77%
Proportion of patients with NSCLC undergoing surgery	>17%	20%	15%
Proportion of patients with SCLC receiving chemotherapy	>70%	69%	66%
Curative treatment rate in patients with stage I/II and PS 0–1	>80%	81%	73%
Proportion of patients with NSCLC stage IIIB–IV and PS 0–1 who received systemic anticancer therapy	>65%	54%	55%
Proportion of patients seen by lung CNS	≥90%	80%	75%
Diagnosis via emergency presentation	N/A	31%	35%
Median time from diagnosis to treatment	N/A	28 days	27 days
Median survival	N/A	316 days	N/A

\*abbreviations and scientific terms are explained in the glossary on page 34.

### 4.3 Pathological confirmation in patients with stage I/II and PS 0–1

Overall, 84% of patients with early-stage disease and good PS in 2019 had a pathological diagnosis, an apparent fall from previous years (86% in 2018) and below the audit standard of 90%. When analysed by cancer alliance this varied from 58% to 94%, highlighting ongoing variation in practices. The data from 2020 demonstrate a significant fall in this key indicator with 77% of patients having a pathological diagnosis and a range by cancer alliance of 53% to 92%. This fall may be explained by a direct impact of COVID-19 on the availability of lung cancer biopsy procedures which are considered aerosol generating.

### 4.4 Lung cancer nurse specialist assessment

This data item was added to the RCRD at the request of the NLCA and is taken directly from COSD feeds from trusts as previously. The proportion of patients assessed by a lung cancer nurse specialist (LCNS) increased in 2019 to 80%, having previously been 57% in 2016 and 74% in 2018. This may in part reflect some selection bias in the case ascertainment of the RCRD. However, it is also likely there has been improvement in data completion for this field and an increasing specialist nursing workforce. This figure remains lower than the audit standard of 90% and the 2019 [NLCA organisation audit](#)<sup>2</sup> highlights that further nursing resources are required with few organisations achieving the recommended standard of one whole-time equivalent nurse for every 80 new diagnoses. In 2020, the proportion of patients assessed by a lung cancer nurse specialist dropped to 75% and this may reflect the number of LCNS that were redeployed to other clinical areas during the pandemic.

### 4.5 Surgical resection

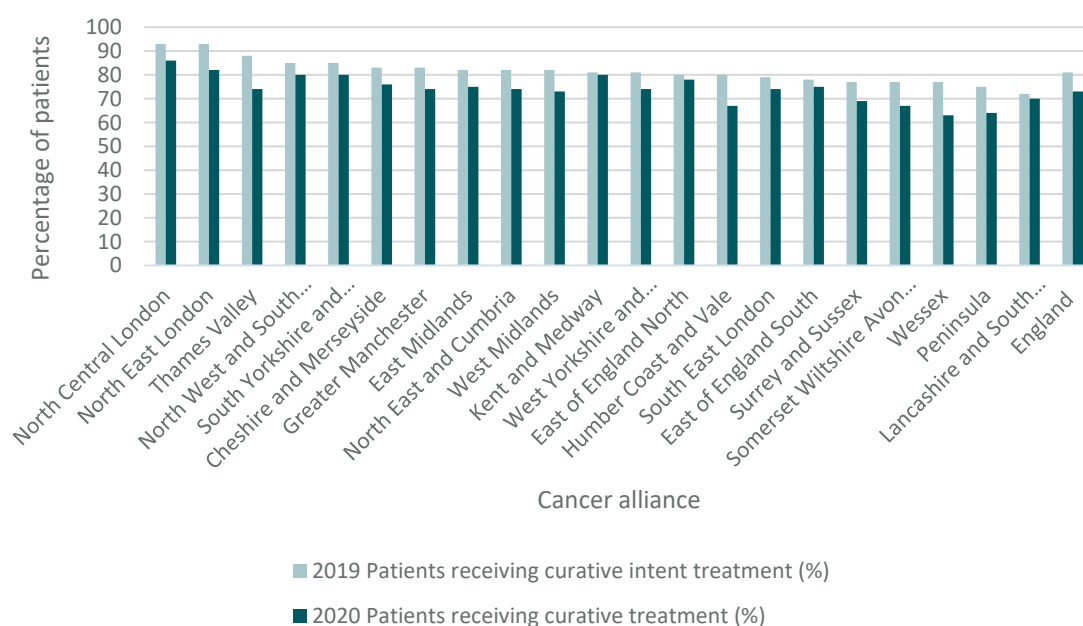
Using data linked to the HES dataset, the surgical resection rate (using NSCLC patients as the denominator) is 20% for 2019, an increase on the previous proportion of 18% in 2018. When focusing on patients with NSCLC stage I/II and PS 0–2, 58% of patients underwent surgical resection with curative intent in 2019. Variation in this important metric was evident at alliance level with the proportion of patients undergoing surgery ranging from 43% to 84%. A spotlight audit into why patients with early-stage disease and good PS do not undergo surgery was carried out in 2017 and [repeated in 2019](#).<sup>3</sup> In

2020, however, there was a significant fall of 10% in the proportion of patients with early-stage disease and good performance status undergoing surgery to 48%. The resection rate in patients with NSCLC dropped significantly from 20% in 2019 to 15% in 2020, a level not seen since 2011 when it was also 15%, demonstrating the impact of COVID-19 pandemic.

## 4.6 Curative intent treatment

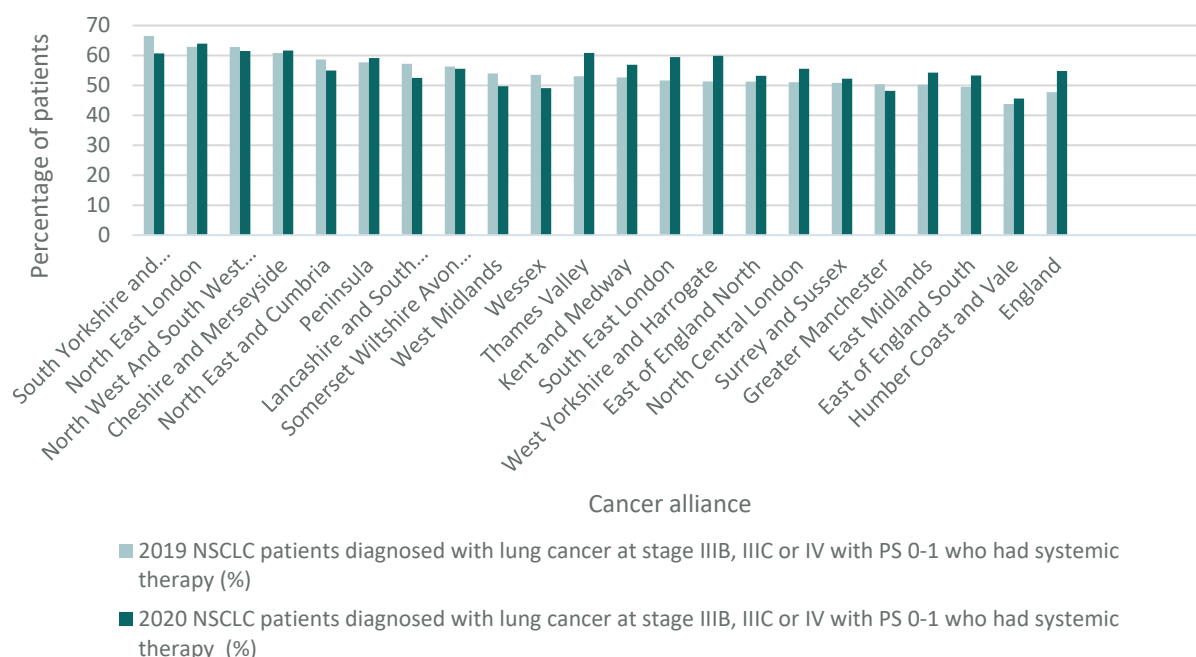
This metric relies on linkage with the national radiotherapy dataset (RTDS) and combines surgery and radical radiotherapy including stereotactic ablative radiotherapy (SABR). [NICE quality standard 17 \(QS17\)](#)<sup>1</sup> recommends patients with NSCLC stage I or II and good PS have treatment with curative intent. In both 2019 and 2020, 26% of PS 0–2 stage I/II NSCLC patients received curative intent radiotherapy. When this is combined with the surgery figures, in 2019 81% of patients in England received curative intent treatment which is unchanged from 2017 and 2018. Across cancer alliances the rate of curative intent treatment varied from 72% to 93%. In 2020, the proportion of patients undergoing treatment with curative intent dropped significantly to 73%, with a range of 64% to 86% at alliance level. The percentage of patients receiving curative intent treatment by cancer alliance in 2019 and 2020 is shown in Fig 3.

**Fig 3. Percentage of NSCLC stage I/II patients with PS 0–2 receiving curative intent treatment in England in 2019 and 2020**



## 4.7 Systemic anticancer therapy for patients with stage IIIB–IV non-small-cell lung cancer (NSCLC) and performance status 0–1

Clinical trials have demonstrated that patients with advanced and incurable NSCLC can benefit from systemic anticancer therapy (SACT), delivered to improve both quality of life and to extend survival. In 2017 the NLCA set an audit standard of SACT for 65% of patients with advanced NSCLC and good PS. Results for 2019 and 2020 are shown in Fig 4.

**Fig 4. Percentage of patients diagnosed with lung cancer at stage IIIB, IIIC or IV NSCLC with PS 0–1 who had systemic therapy in England in 2019 and 2020**

Overall, 54% of patients in 2019 and 55% in 2020 with good PS (0–1) and advanced NSCLC (stages IIIB, IIIC and IV) received SACT. This appears to represent a substantial fall from the 2018 result of 65% and reveals that the audit standard of 65% was not met during both these analysis periods. Across cancer alliances, results varied from 44% to 67% in 2019 and 46% to 67% in 2020. These results are subject to the potential consequences of using the new RCRD for compiling the report and could reflect incomplete data collection. This area will need to be closely monitored in future audits using the RCRD as the data source to determine if it is a true reflection of treatment rate or data incompleteness.

#### 4.8 Multi-modality treatment for stage III non-small-cell lung cancer (NSCLC) and stage I–III small-cell lung cancer (SCLC)

The 2019 data for England revealed that 64% of stage III NSCLC patients received any active therapy. In 2020 this figure was 58%.

We also analysed curative-intent single or multi-modality treatments used for stage IIIA NSCLC patients with PS 0–2 and the 2019 data for England showed:

- > 57% received curative intent treatment, eg surgery, radiotherapy, or some multi-modality combination of surgery, radiotherapy with chemotherapy
- > 23% received palliative intent therapies, eg palliative chemotherapy, palliative radiotherapy, or a combination of the two
- > 19% received no active treatment.

In 2020, the data in England for the same cohort of stage IIIA patients with PS 0–2 revealed:

- > 51% received curative intent treatment, eg surgery, radiotherapy, or some multi-modality combination of surgery, radiotherapy with chemotherapy
- > 25% received palliative intent therapies
- > 24% received no active treatment at all.

Both the 2019 and 2020 data demonstrate that approximately 40–50% of stage IIIA patients with PS 0–2 and potentially ‘curable’ stage III NSCLC are either receiving no active treatment or palliative intent chemotherapy with or without palliative radiotherapy. These treatment rates are likely to have

significantly contributed to the low median survival for stage III NSCLC patients in England at 12 months in 2019.

Further analysis of the radiotherapy plus chemotherapy data revealed that in 2019, 19% of stage IIIA PS 0–2 patients received radical chemoradiotherapy. Of these patients (n=523), 62% received concurrent chemoradiotherapy and 38% received sequential chemoradiotherapy. In 2020, although the number of patients receiving radical chemoradiotherapy seems to have reduced (n=334), the proportion receiving concurrent chemoradiotherapy had increased to 74% with 26% receiving sequential chemoradiotherapy. As concurrent chemoradiotherapy is considered the international gold standard for patients with stage III unresectable NSCLC, it is encouraging to see this rise in the proportion of patients receiving it as treatment in England.

Similarly, we analysed curative intent multi-modality treatments used for stage I–III SCLC in both 2019 and 2020. In 2019, 10% of PS 0–2 SCLC patients with stage I–III disease received multi-modality treatment consisting of chemotherapy, radical radiotherapy or occasionally surgery. In 2020 only 7.4% of SCLC PS 0–2 patients with stage I–III disease received multi-modality treatment.

## 4.9 Chemotherapy for small-cell lung cancer (SCLC)

SCLC is a particularly aggressive type of lung cancer which typically presents at an advanced stage at the time of diagnosis. Because of this, surgery is usually not appropriate in the management of SCLC patients. SCLC tumours are, however, very sensitive to chemotherapy (and radiotherapy) and the prompt use of these treatments has been demonstrated to improve patient survival and quality of life.

Overall, only 69% and 66% of SCLC patients received SACT during 2019 and 2020 respectively. This demonstrates a fall in this key indicator when compared with the 2018 NLCA report (England 70%) and might represent a drop in standards or an issue with RCRD data quality, or a combination of both. Across cancer alliances the results varied from 57% to 83% in 2019 and 53% to 81% in 2020.

It is particularly important that patients with SCLC are diagnosed quickly and receive chemotherapy as soon as possible after the diagnosis is made. In 2017 the NLCA set a standard that at least 80% of patients should receive chemotherapy within 14 days of their pathological diagnosis. For patients diagnosed in England in 2019 and 2020, that standard was achieved in only 16% and 17% of patients respectively and again, it might represent a drop in standards or an issue with RCRD data quality, or a combination of both. The performance varied from 9% to 27% across cancer alliances in 2019 and 4% to 38% in 2020 which highlights the importance of accurate data collection and a clear and urgent need to improve pathways for these patients within the NHS.

### 4.10 Route to diagnosis

The RCRD allows linkage to the ‘cancer waiting times’ dataset which, along with COSD, also provides the route to diagnosis. It has been [established](#)<sup>4</sup> that lung cancer patients who present via the emergency route have lower survival compared with those who are diagnosed electively. In 2019, 31% of patients presented via the emergency route. While this has improved from 39% in [2008](#),<sup>5</sup> it worsened again in 2020 to 35% and remains an important area for ongoing quality improvement. The proportion of patients presenting via the emergency route varies between cancer alliance and ranges between 24% and 40%. Results are presented online (<https://nlca.rcp.ac.uk/AnnualReport>) according to cancer alliance and clinical commissioning group.

### 4.11 Time to treatment

There is an increased focus on rapid diagnostic and treatment pathways with the National Optimal Lung Cancer Pathway (NOLCP)<sup>6</sup> recommending 49 days from presentation to treatment. We report the interval from diagnosis to treatment for the first time. The benchmark according to standard cancer waiting times for this interval is 31 days and shortened to 21 days in the NOLCP. Given concerns around



trust-level data, we provide time from diagnosis to treatment by cancer alliance. The median time from diagnosis to treatment nationally was 28 days in 2019 and 27 days in 2020. In 2019, 16 out of the 21 alliances had a median time from diagnosis to treatment below 31 days (range 22–40 days) but no alliances met the NOLCP target, highlighting the improvement required.

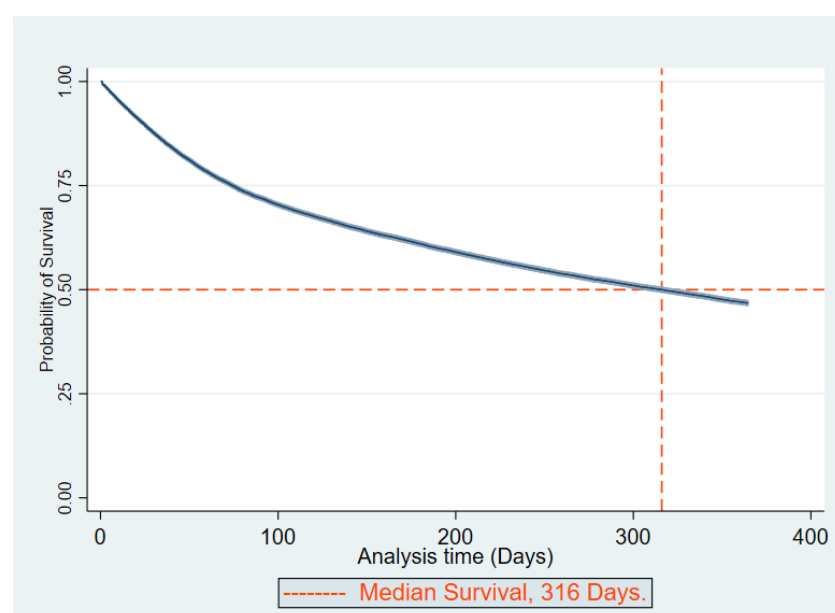
## 4.12 Smoking status

Smoking status was available for 61% of patients in the 2019 cohort and 51% in the 2020 cohort. Excluding the missing data, 8% of patients were registered as never smokers in 2019. Of these, 65% were women. Importantly, 33% of patients were current smokers at the time of diagnosis and should receive stop smoking support in line with [NICE quality statement 2 in QS17](#).<sup>1</sup> Data completeness for smoking status requires improvement and future iterations of the COSD will also include the ability to record whether any treatment for tobacco addiction has been provided.

## 4.13 Survival

The median survival for lung cancer patients was 316 days in 2019 and the 1-year survival for the 2019 cohort was 46%. Survival by alliance is presented in the online datasheet.<sup>5</sup> However, the survival data of the 2019 cohort need to be interpreted with some caution, particularly noting that the 1-year survival was 39% for 2018 patients with a median survival of 256 days. As described above, the new methodology utilising the RCRD has resulted in some selection bias by excluding lung cancer patients with poorer prognosis, explaining the higher survival in the 2019 cohort (Fig 5a). Approximately 4,300 patients with poorer prognosis, usually registered via the death certificate only route, are likely to have been excluded. Based on a 1-year survival of 39% in 2018, we would expect 14,582 patients to be alive at 1 year if diagnosed in 2019. However, from the RCRD in 2019, we already have 15,222 patients who have survived for 1 year, so 1-year survival must have improved in 2019 compared with 2018. If we assume that none of these patients missing from the 2019 cohort survived for 1 year, then the 1-year survival for the 2019 cohort is at least 40.7%. This has improved from 39% in 2018 and suggests that improvements in lung cancer care were continuing. Survival data are not yet available for the 2020 patients at the time of writing (in August 2021) and will be provided when available.

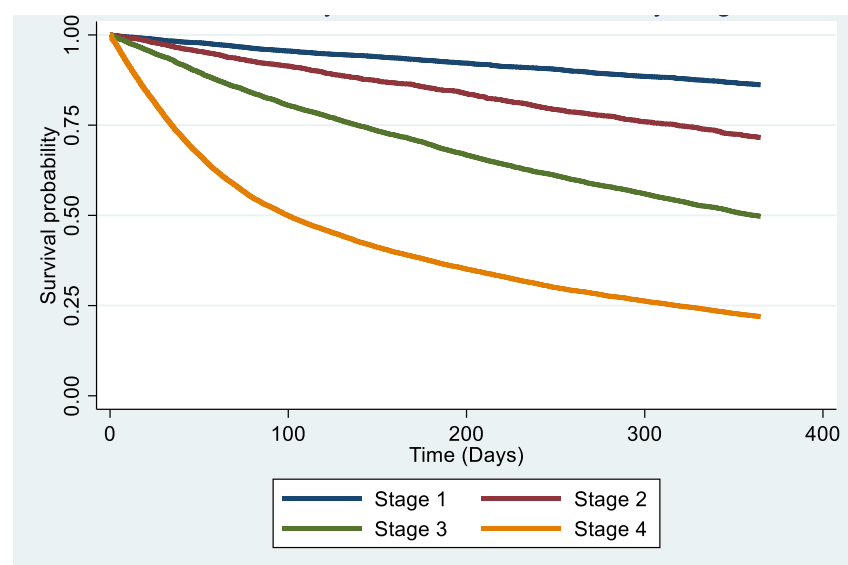
**Fig 5a. Kaplan-Meier survival estimate for patients with lung cancer in England in 2019**



<sup>5</sup> See <https://nlca.rcp.ac.uk/AnnualReport>

Survival by stage is shown in Fig 5b. The median survival for patients with stage IV disease in England in 2019 is 100 days. The median for stage III disease was 362 days, while the median was not yet reached for stages I and II.

**Fig 5b. Kaplan-Meier survival estimates for patients with lung cancer in England according to stage in 2019**

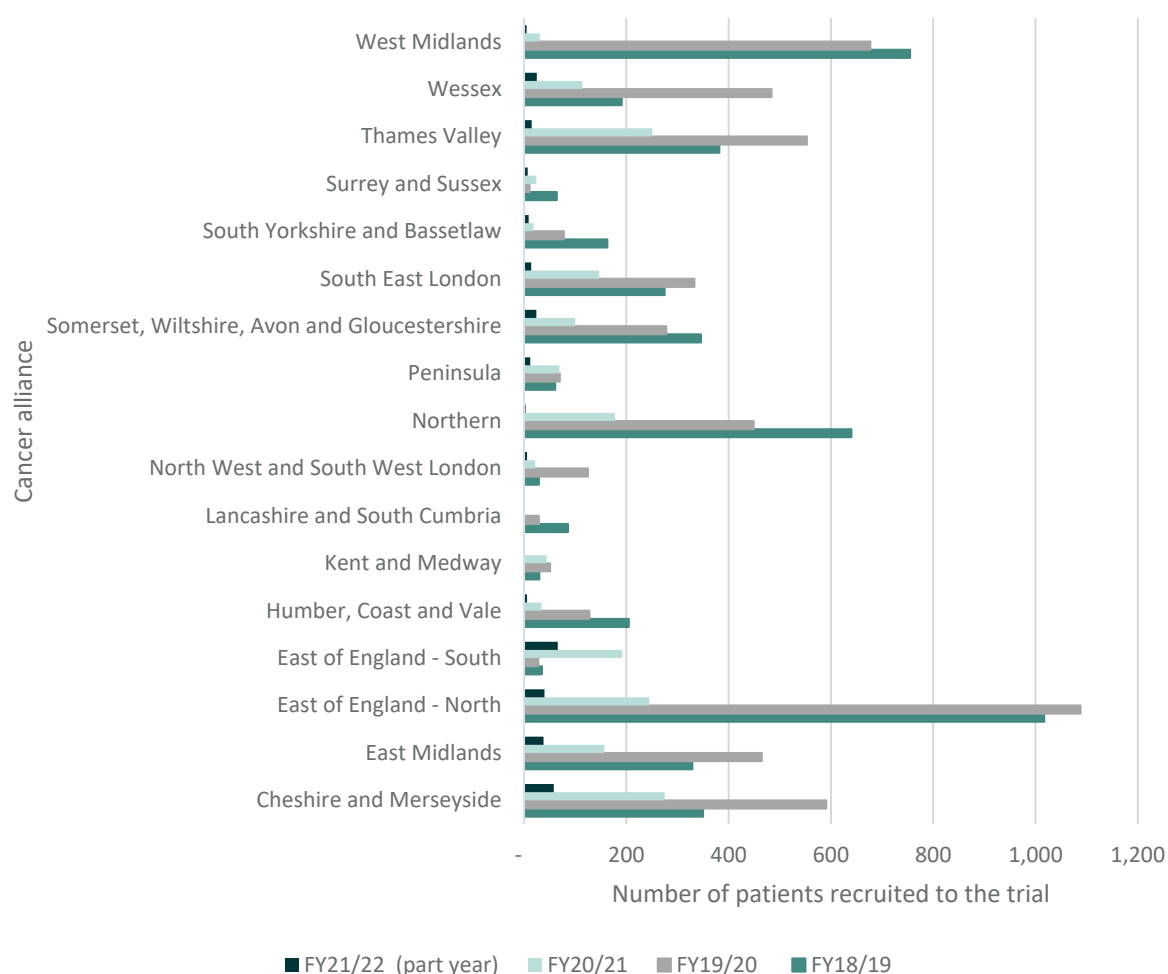


## 4.14 Other results

Clinical trial uptake is reported for the first time after data were received from the National Institute of Health Research. The number of recruits into portfolio listed clinical trials are presented by cancer alliance according to financial years in Figs 6a and 6b. The results for three cancer alliances are reported separately due to their high recruitment numbers to avoid distorting the charts (Fig 6b). The data are presented based on current NHS trust/alliance configurations.

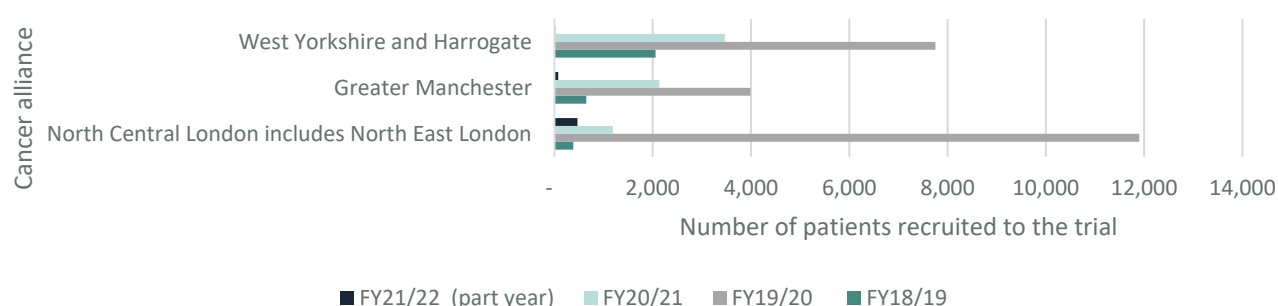
Dramatic increases in recruitment in 2019/20 are explained by the opening of successful low dose CT screening studies and in particular the SUMMIT study in North Central London, the Yorkshire lung screening trial in West Yorkshire and Harrogate and CT screening in Manchester. Patients in clinical trials are known to have better outcomes after adjustment for confounders and cancer alliances with low trial recruitment should review their clinical trial portfolio. There is a drop-off of recruitment to lung cancer clinical trials in 2020/21 reflecting the impact of COVID-19, and in many centres the reallocation of research resources to COVID-19 studies.

**Fig 6a. Recruitment to lung cancer clinical trials in England by cancer alliance and financial year (FY)\***



\*FY21/22 includes data to 11/06/2021

**Fig 6b. Recruitment to lung cancer clinical trials in England by cancer alliance (largest three) and financial year (FY)\***



\*FY21/22 includes data to 11/06/2021

Unfortunately, information on biomarker testing for patients with NSCLC was not available via the RCRD. The NLCA has asked that linkage be established between the RCRD and the molecular testing dataset (which will be obtained directly from the Genomic Laboratory Hubs) for all patients so this can be routinely reported in the future. Results from a previous spotlight audit on molecular testing in patients with advanced NSCLC were [published in 2021](#).<sup>7</sup>

## 4.15 Recommendations – England

Ref No	Recommendation	Standard	Key audience
E1.	Trusts should review their data completeness in the Cancer Services and Outcomes Dataset as this is the main source for the Rapid Cancer Registration Dataset. PS and stage should be recorded in at least 95% of cases	<a href="#">Clinical Advice to Cancer Alliances for the Commissioning of the Whole Lung Cancer Pathway</a> . <sup>8</sup> the MDT should participate in the NLCA	Multidisciplinary team Clinical lead Cancer manager
E2.	Cancer alliances and clinical commissioning groups (CCGs) should examine the route of referral and stage at presentation for their population and look at ways to increase the numbers of patients diagnosed who are presenting with early-stage disease	<a href="#">NICE quality statement 1 (QS17)</a> . <sup>1</sup> 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	Commissioner Cancer alliance
E3.	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	This audit shows that only 28% of patients are diagnosed with stage I/II disease in 2020. The NHS Long Term Plan seeks to diagnose at least 75% of (all) cancers at stage I/II by 2028	UK National Screening Committee
E4.	Cancer alliances with lower than expected curative-intent treatment rates for stage I/II PS 0–2 NSCLC should review their processes for selection of patients for such treatment, in order that a rate of at least 85% is achieved	<a href="#">NICE quality statement 5 (QS17)</a> . <sup>1</sup> adults with NSCLC stage I or II and good PS have treatment with curative intent	Cancer alliance Multidisciplinary team Clinical lead Cancer manager

## 4.16 Commentary on the 2019 and 2020 results for England

The past 2 years have been extremely challenging for the NHS and it is a significant achievement to be able to publish this annual report. The results in this report have been generated using the new RCRD made available by PHE due to pressures of the COVID-19 pandemic. Enormous credit should be given to hospital trusts, cancer alliances and NCRAS for making these data available.

The RCRD is available much faster than the gold standard NLCA dataset, with a lag of 4 months, but only provides data on patients registered via trust COSD datasets. This significant change in methodology has several important implications for the interpretation of the data in this annual report: (i) the dataset is smaller than previously with 83% of patients included in the 2019 cohort compared with 2018, (ii) the patients 'missing' from the RCRD have a poorer prognosis so the 2019 and 2020 data may represent a selected cohort of patients with better outcomes, (iii) 'trust first seen' was not available and patients were allocated to trusts according to their COSD submission. Therefore, it was agreed by the NLCA board that trust-level data would not be reported and an outlier process was not conducted.

In view of these points, comparison of results from the 2019 and 2020 RCRD with previous years should be drawn with caution. However, it is reasonable to look for variation within 2019/2020 and compare data from 2019 and 2020 as the datasets have been obtained, cleaned and analysed in the same way.

Data completeness remains high for the datasets, particularly for PS and stage. As in previous years, however, variation persists in key indicators between organisations. For example, in 2019, the curative treatment rate for patients with early-stage disease and good performance status varied at alliance level between 75% and 93%. Increasing the proportion of patients treated with curative intent in all trusts up to the best performing trusts will significantly improve outcomes for patients with lung cancer.

The COVID-19 pandemic has [impacted](#)<sup>9</sup> all aspects of the lung cancer pathway. This is reflected in the 2020 data presented in this report. Importantly, the number of patients diagnosed in 2020 fell by approximately 2,000 compared with 2019. This reduction in incidence is likely to be patients who have not presented to secondary care with lung cancer due to the pandemic as death certificate only diagnoses are not included in this cohort. It may also reflect patients with an unknown diagnosis of lung cancer, who died from COVID-19.

Table 1 highlights the clinical impact that COVID-19 has had on key lung cancer metrics. In addition to the reduction of the number of lung cancer diagnoses, there is a stage shift to patients with more advanced disease and more patients diagnosed via the emergency route, both of which are associated with poorer outcomes. Performance status is also known to be a powerful predictor of prognosis and fewer patients had a PS 0–1 in 2020 (47% in 2020 vs 52% in 2019). As expected, there was a significant drop in pathological diagnosis rates in 2020 and the proportion of patients assessed by a nurse specialist, reflecting clinician redeployment and less diagnostic capacity in 2020. These factors have led to a 10% drop off in surgical resection rates in eligible patients, which prior to 2020 had been increasing and takes us back to a surgical resection rate from 10 years ago. The curative intent treatment rate in patients with early-stage disease and good performance was significantly reduced from 81% in 2019 to 73% in 2020. This is explained by the fall in surgical resection rates which has only partly been compensated for by an increase in radical radiotherapy, including SABR. The proportion of eligible patients receiving systemic therapy is also lower. It remains to be seen whether these poor results in 2020 in many key metrics will translate into overall worse survival for the 2020 cohort. Survival data from the 2020 cohort will be published when available.

We can see from these results in key performance indicators that previous progress in lung cancer care has been reversed by the pandemic. We support an urgent action plan for lung cancer to harness support and resources to rectify these adverse effects on lung cancer patients. The recovery will include continued expansion of the lung health check programme and implementing nationwide lung cancer screening, supporting lung cancer awareness and early diagnosis, rapid diagnosis and treatment, guaranteeing adequate workforce, prioritising research, and ensuring that rapid high-quality data are available for organisations to implement improvement initiatives and identify pathway problems. It is also worth remembering that healthcare accounts for only a proportion of the variation in overall survival and that addressing social determinants of health will also have a significant impact.<sup>10</sup>

Despite the pandemic, important areas for quality improvement can be identified. One key area is data completeness. If the RCRD is to be used routinely then case ascertainment and data completeness at alliance level should be improved. Data completeness in 2020 for PS and stage at alliance level ranged from 58% to 91%. Another notable finding was that five out of 21 cancer alliances were able to maintain treatment with curative intent rates above 80% during the pandemic. The NLCA contacted clinical leads of organisations with high levels of data completeness and curative treatment rates and we are grateful to them for providing their insights.



**Learning from a trust with high data completeness in 2020: Dr Jennifer Graves, consultant respiratory physician, Dorset County Hospital NHS Foundation Trust**

'We have worked extremely hard to develop our lung cancer pathway to meet the National Optimal Lung Cancer Pathway over the past few years. Dorset was part of a project that received some funding to improve cancer outcomes and specifically develop the lung cancer pathways. As part of this we were able to employ a lung cancer navigator and have extra lung CNS support. In addition, I was given specific, funded time in my job plan to be the lung cancer lead. We implemented pre-MDT meetings and ensured that patients were moved forward on the pathway as soon as their results became available.

As a lung cancer team we were determined that the care we offered our patients during the COVID-19 pandemic should be as unaltered as possible. We continued face-to-face clinics and endoscopic procedures with full PPE. We were concerned about the decrease in 2-week wait referrals and so we communicated with GPs and patients via webinars and communications via the CCG, including Facebook and BBC South, to ensure they knew the differences between lung cancer and COVID-19 symptoms and to offer reassurance that we were still willing and able to see patients.

The lung navigator and the lung CNS undertake regular gap analysis and any data gaps are flagged to me and I ensure that the coordinator is provided with the correct information. I think it is important to be judged on accurate data and my team know that this is an important part of our work. I couldn't be more proud of how the lung cancer team works together and they have exceeded my expectations over the past year and a half.'

**Learning from a cancer alliance with high curative intent treatment rate in 2020: Dr Anju Mirakhur, consultant respiratory physician, Blackpool Teaching Hospitals NHS Foundation Trust**

'The Blackpool lung MDT was keen to ensure patients referred with suspected lung cancer received prompt care as close as possible to the pre-pandemic state.

All new fast-track (FT) referrals were triaged by two dedicated lung cancer respiratory consultants. Those with computerised tomography (CT) evidence of lung cancer were seen face to face with appropriate social distancing measures and PPE. Prior to this, forward planning of investigations took place in close collaboration with the radiology department. Bronchoscopy/endobronchial ultrasound (EBUS) was only performed for a malignant indication with one list per week to minimise aerosol generating procedures, British Thoracic Society guidance was closely followed.

Our lung radiologists enabled FT patients to be accommodated as near as possible to the pre-pandemic state. CT guided biopsies continued to be performed, with the necessary infection control requirements.

Our pathology colleagues ensured specimens were processed the same day, and close communication with the lung cancer respiratory consultants ensured prompt MDT discussion and onward referral of patients.

The thoracic surgeons moved their operating theatres in order to maintain one list for lung cancer patients every day. National and cancer alliance guidelines for prioritisation were followed. As per agreement across our cancer alliance, curative systemic oncological treatments were given priority. Telephone and video consultations were adopted to allow shielding patients to remain at home, and combined with the instigation of pharmacy delivery of non-intravenous medications, this ensured treatments could continue. The layout of the oncology unit was also changed to maintain capacity. Senior staff were not redeployed with many working additional shifts to cover staff shortages.

The clinical oncologists used the Royal College of Radiologists 2020 document on reduced radiotherapy fractionation in lung cancer patients treated with curative intent during the pandemic. A dedicated linear accelerator was also utilised to treat RED patients at the end of every day to reduce cross-infection and to allow treatments to continue.

Despite the constraints imposed by the COVID-19 pandemic, the lung MDT has worked extremely hard together as a team across all its sub-specialties to ensure curative intent treatments were compromised as little as possible. Combined with new ways of working, including virtual MDTs, video and telephone consultations, and facilitating vaccination for our patients and staff, the above measures allowed us to continue treating our patients. Central to this was the dedication and hard work of our lung cancer nurse specialists.'

## 5 Wales report

The Wales standard dataset was available for 2019 and is unchanged from previous years. Due to the use of the rapid cancer registration dataset for England, it was agreed to analyse and report the Welsh data separately and not provide comparisons with England. This section aims to understand the current quality of care and outcomes for patients with lung cancer in Wales.

### 5.1 Methods

Full details of the NLCA annual report methodology are available at <https://nlca.rcp.ac.uk/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 2019.

All 11 lung cancer MDTs in Wales contributed patient data to this audit. Welsh data were collected through the Cancer Network Information System Cymru (CANISC) and a pseudo-anonymised extract of patient-level data was submitted to the NLCA for analysis. This extract is not linked to any other data sources. No formal outlier process was conducted.

### 5.2 Results – Wales

#### Data completeness

For this audit period, data were collected on all patients diagnosed with lung cancer between 1 January 2019 and 31 December 2019. There were 2,240 patients diagnosed with lung cancer in 2019. Details were submitted on 2,262 patients, of whom 22 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. This compares with 2,252 in 2018 (2,228 once exclusions were made).

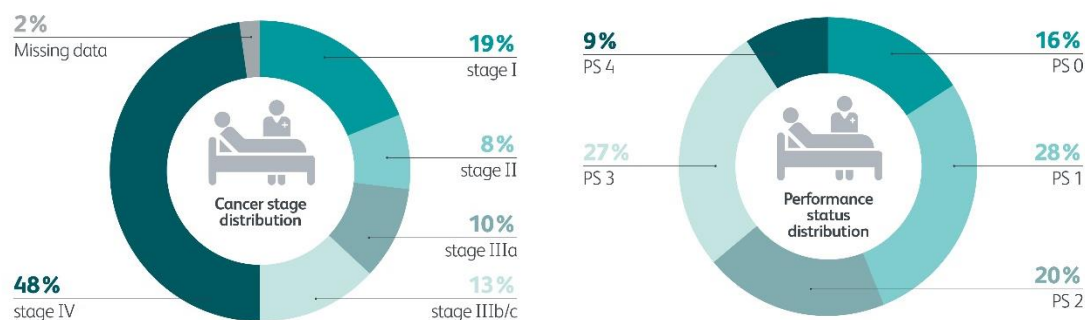
For the overall patient population across Wales:

- > performance status (PS) was recorded in 99% of patients (compared with 98% in 2018)
- > disease stage was recorded in 99% of patients (the same as in 2018)
- > forced expiratory volume in 1 second (FEV1) was recorded in 92% of patients with stage I/II and PS 0–1 lung cancer (compared with 90% in 2018).

#### Demographic analysis

In Wales, the median age at diagnosis for non-small-cell lung cancer (NSCLC) was 74 years, for small-cell lung cancer (SCLC) it was 70 years and for carcinoid tumours it was 67 years. Forty-seven cases (2%) of lung cancer occurred in patients under the age of 50. SCLC made up 8.5% of lung cancer cases in 2019, compared with 9.7% in 2018. Overall, 48% of lung cancer patients were female and 52% were male.

Fig 7 shows the stage distribution and demonstrates that around half of patients presented with incurable stage IV disease. The proportion of patients presenting with stage IA disease varies between 7% and 20%, which may reflect management in the community setting rather than secondary care. 44% of patients presented with a PS 0–1.

**Fig 7. Distribution of stage and performance status in patients with NSCLC in 2019 in Wales**

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

Overall, 87% of patients with stage I/II and PS 0–1 in Wales received a pathological diagnosis, just below the suggested standard of 90%. Across health boards in Wales, adjusted for case-mix, the percentage of patients with stage I/II disease and PS 0–1 who received a pathological diagnosis varied from 64% to 100%.

### Lung cancer nurse specialist assessment

In total, 90% of patients in Wales were assessed by a lung cancer nurse specialist (LCNS), this is an increase from 88% in 2018 and now meets the audit standard of 90% for the very first time. Data completeness for this field in the Welsh dataset was excellent at 95%. However, information is not available on whether the specialist nurse was present at time of diagnosis. Variation in nursing provision across MDTs in Wales was evident with a range of 71–96% of patients being assessed by a lung cancer nurse specialist.

### Surgical resection

15.8% of patients with NSCLC underwent surgery in Wales. This is similar to the previous year (2018), which was 15.5%, but below the current audit target of 17%. Surgical resection rates, according to the hospital where the patient was first seen, varied between 10.5% and 20.4%.

Resection rate in patients with early-stage disease (stage I/II) was 42%. When limited to patients with a PS of 0–2 the surgical rate was 55%. Despite there being only 11 MDTs in Wales, this important metric (surgery for stage I/II NSCLC and a PS of 0–2) varied between 34% and 77%. Ideally, the management of patients with stage I/II NSCLC should be interpreted in the context of patients who also received curative intent radiotherapy, however, SABR and radical radiotherapy data are not currently available in the Welsh cohort.

### Chemotherapy in small-cell lung cancer (SCLC)

65% of patients with SCLC received chemotherapy in 2019 in Wales. This is the same as in 2018 and below the audit standard of 70%. The NLCA also set a standard that at least 80% of patients should receive their chemotherapy within 14 days of their pathological diagnosis. This was only achieved for 4% of newly diagnosed SCLC patients.

### Systemic anticancer therapy (SACT) for patients with stage IIIB–IV non-small-cell lung cancer and performance status 0–1

54% of patients with advanced NSCLC and good PS in Wales received SACT. This is similar to the previous year, which was 55%, but significantly lower than the audit target of 65%. This metric is also lower in Wales compared with England (67%)<sup>10</sup> and merits further investigation and action.

A summary of key indicators against NLCA benchmarks is shown in Table 2.

**Table 2. Wales 2018 and 2019 comparison of key indicators against benchmarks**

Key indicators*	NLCA benchmark figures	2018	2019
Number of patients <sup>†</sup>	N/A	2,228	2,240
Proportion of patients with stage IV disease	N/A	45%	48%
Proportion of patients with PS 0–1	N/A	45%	44%
Proportion of patients with pathological confirmation of lung cancer for stage I/II and PS 0–1	≥90%	87%	86%
Proportion of patients with NSCLC undergoing surgery	>17%	15.5%	15.8%
Proportion of patients with SCLC receiving chemotherapy	>70%	65%	65%
Proportion of patients with NSCLC stage IIIB–IV and PS 0–1 who received systemic anticancer therapy	>65%	55%	54%
Proportion of patients seen by lung CNS	≥90%	88%	90%
Diagnosis via emergency presentation	N/A	39%	29%
Median survival	N/A	249 days	235 days

\*abbreviations and scientific terms are explained in the glossary on page 34. Curative treatment rate in patients with stage I/II and PS 0–1 and median time from diagnosis to treatment are not included as they are not measured in Wales

<sup>†</sup>does not count patients who are excluded from the analysis

## Survival

The 1-year survival for patients in Wales was 42%, compared with 40% for the 2018 cohort. Median survival was 235 days. Variation between health boards continues, with adjusted 1-year survival varying between 37% and 52%.

## Other results

### Active treatment rate

Overall, 50% of lung cancer patients in Wales received active treatment (any one of surgery, SACT or radiotherapy) in 2019. This is a lower proportion than in 2018 (52% in Wales and 59% in England).<sup>11</sup>

### Emergency presentation

Overall, 29% of patients with lung cancer presented via an emergency route and this varied between 10% and 42% according to lung cancer MDT. This represents a significant improvement compared with 39% in 2018.

### Stage III lung cancer

Of the 41 patients in Wales in 2019 with stage III SCLC, 85% received active treatment. However, in patients with stage III NSCLC, only 55% received any active treatment.

There are many more analyses undertaken on the 2018 data than are included in this report. All of the analyses are available in the data information sheet in the 2018 annual report.<sup>11</sup>

## 5.3 Recommendations for Wales

Ref. No	Recommendation	Standard	Key audience
W1.	Health boards should examine the route of referral and stage at presentation for their population and look at ways to increase the numbers of patients diagnosed who are presenting with early-stage disease	<a href="#">NICE quality statement 1 (QS17)</a> : <sup>1</sup> 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 needed	Health boards
W2.	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	This audit shows that 48% of patients in Wales are diagnosed with stage IV disease in 2019. The NHS Long Term Plan seeks to diagnose at least 75% of all cancers at stage I/II by 2028	UK National Screening Committee
W3.	Health boards with lower than expected surgical resection rates should review their processes for selection of patients for surgery, in order that a rate of at least 17% is achieved	<a href="#">NICE quality statement 5 (QS17)</a> : <sup>1</sup> adults with NSCLC stage I or II and good PS have treatment with curative intent	Health boards Multidisciplinary team Clinical lead Cancer manager

## 5.4 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. We also would like to thank Stephanie Price, Julie Cowling and Anne Lane, information specialists at Wales Cancer Network for their contribution.

The results of the 2019 cohort remain mixed and remarkably consistent when compared with 2018. Data completeness remains good with all health boards meeting audit standards for performance status, stage and FEV1 in stage I/II, PS 0–1 patients.

Wales has managed to reach the target of 90% of lung cancer patients being assessed by a lung cancer nurse specialist, a significant benefit to our patients and a testament to the dedication of our nurses and the investment from the health boards.

Pathological confirmation was achieved in 87% of patients with early-stage disease and a performance status of 0–1. The range was 84%–92% and the audit target was ≥90%, which suggests it is possible to achieve this high standard.

NSCLC resection rate (15.8%), chemotherapy in SCLC (65%) and systemic anticancer therapy for stage IIIB–IV, PS 0–1 NSCLC patients (54%) remain below the audit standards and have remained static for the past few years. There was no formal outlier process this year, but on these measures, Wales does not appear to be performing as well as England.

There will be multiple reasons for this apparent gap, including data capture errors. However, only 4% of SCLC patients received their chemotherapy within 14 days, which suggests data processing alone will



not explain the underperformance. These findings have been consistent over a number of years and need a systematic investigation led by the Welsh Cancer Network to explain these findings.

The static nature of these key performance indicators despite many improvement initiatives suggests that in addition to continuous improvement more radical changes are needed, eg lung health checks and rapid diagnostic hubs. Recovery planning after the pandemic would be an opportunity to trial some of these initiatives.

**Dr Gareth Collier**

Respiratory physician

## 6 Reflections on 20 years of the NLCA – Dr Jesme Fox, medical director, Roy Castle Lung Cancer Foundation

It is an honour to comment on this NLCA annual report. I have been privileged to be part of the NLCA story, almost since its beginning. Over these 2 decades, it has matured to become the gold standard in clinical audit, widely regarded nationally and internationally as a model of the very best practice.

Clinical data have always been vital in monitoring and ensuring quality in diagnostics, treatment and care. But the past 20 months of COVID-19 have underlined just how important data are when assessing the impact of such drastic and dramatic changes to society and to health services.

All of us involved in lung cancer care have been aware that COVID-19 has wrought havoc across the entire pathway. We saw the Targeted Lung Health check programme paused between April and July 2020. People with potential symptoms of lung cancer have heeded stay at home messages and not presented to their GP. We have seen restricted access to diagnostic services and big reductions in clinic referrals for investigation. There has been a necessity to alter treatment pathways, focusing on fewer hospital visits and infection control, dealing with the reality of health services focused on and consumed by COVID-19. We have been aware of all of this reality but now, with this NLCA report, we have the data to show the actual impact. It makes for challenging reading.

There have been many challenges for the audit team in compiling this report. For England, analysing the Rapid Cancer Registration Dataset (RCRD) for 2019 and 2020 has ensured data which is more up to date than in previous years – a really positive step. Comparing the 2019 RCRD (pre-pandemic) with the 2018 full registration dataset, has been crucial in understanding dataset differences. The incidence of lung cancer recorded in the 2019 RCRD was found to be 83% of that recorded in the 2018 full registration dataset. A 1-year survival of 46% was found in the 2019 RCRD and 39% in the 2018 full dataset. This implies that many lung cancer cases were missing in the 2019 RCRD and that those missing cases were of poor prognosis. Investigation and location of these missing patients in the RCRD will be vital when using the RCRD in future NLCAs.

As we look to the NLCA comparison of data in the 2019 RCRD and 2020 RCRD, we find the impact of COVID-19. There is a significant drop in curative treatment rate from 81% in the 2019 data, to 73% in the 2020 data, with a drop in the surgical resection rate for NSCLC patients from 20% in 2019, to 15% in 2020. Worryingly, this 2020 rate is similar to that seen a decade ago. Furthermore, comparing the data for lung cancer patients diagnosed in England in the 2020 RCRD with those in the 2019 RCRD, we find those in 2020 to have lower performance status, be less likely to have a pathological diagnosis and be more likely to be diagnosed by emergency presentation – a factor we know to be associated with poorer prognosis. We keenly await the 2019 and 2020 lung cancer median survival data comparison to give a fuller picture of the impact on the pandemic.

As we look to data from Wales (2019 data only), 2,240 lung cancer cases were recorded in 2019. This showed a surgical resection rate of 16% for non-small-cell lung cancer patients; a chemotherapy in small-cell lung cancer rate of 65% and systemic anticancer therapy rate in stage IIIB–IV patients with PS 0–1 of 54%. These figures have remained fairly static over recent years and are below standards set by the audit. We will need to wait until the 2020 data for Wales is available to assess the impact of COVID-19 here.

This will be the final NLCA annual report compiled by the team at the RCP. I acknowledge the sheer volume of work required in developing this report – from the project team, clinical leads, data analysts and many more. This has been a major team effort and I applaud the speed at which the report has been compiled.

Ultimately, the audit is about lung cancer patients. It is about striving to raise standards across all lung cancer teams to improve treatment and patient outcomes. COVID-19 has had a devastating impact on lung cancer. Our hope has to be in early detection, with the implementation of a national Lung Cancer Screening Programme and in recovery of diagnostic, treatment and care services. To that end, monitoring this recovery through the data of future National Lung Cancer Audits will be vital. I very much hope that government and those with influence in health policy and planning will continue to recognise the crucial role which this audit plays in driving up quality of care for those affected by this often distressing disease.

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## Document purpose

<b>Document purpose</b>	To disseminate results on the quality of care for patients diagnosed with lung cancer in the period between 1 January and 31 December 2019 in England, Wales and Guernsey and between 1 January and 31 December 2020 England only.
<b>Title</b>	National Lung Cancer Audit annual report (for the audit period 2019 England, Wales and Guernsey, and 2020 England only)
<b>Author</b>	Royal College of Physicians, Care Quality Improvement Department
<b>Publication date</b>	January 2022
<b>Target audience</b>	NHS staff in lung cancer multidisciplinary teams; hospital managers and chief executives; commissioners; lung cancer researchers; patients and their carers.
<b>Description</b>	This is the 16th 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 2019 for England, Wales and Guernsey, and 1 January and 31 December 2020 for England only. It covers many processes of care across the entire patient pathway.
<b>Related publications</b>	<i>NICE guideline: Lung cancer: diagnosis and management, 2019:</i> <a href="http://www.nice.org.uk/guidance/ng122">www.nice.org.uk/guidance/ng122</a> <i>NICE quality standard for lung cancer in adults, 2019:</i> <a href="http://www.nice.org.uk/guidance/qs17">www.nice.org.uk/guidance/qs17</a> <i>National Lung Cancer Audit annual report 2018 cohort:</i> <a href="https://nlca.rcp.ac.uk/Home/Data">https://nlca.rcp.ac.uk/Home/Data</a>
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## Glossary

<b>Anticancer therapy (active treatment)</b>	a term used to define treatments for lung cancer that influence the tumour itself, not just on symptoms. In lung cancer patients, these are most often surgery, systemic anticancer therapy (SACT) eg chemotherapy, radiotherapy or a combination of these
<b>Bronchoscopy</b>	a procedure for examining the airways by inserting an instrument (bronchoscope) into the trachea and lungs via the nose or mouth. This enables a small piece of lung tissue to be removed for pathological diagnosis (bronchial biopsy)
<b>Case-mix adjustment</b>	a statistical method of comparing quality of care between organisations that takes into account important and measurable patient characteristics, for example age, sex, disease stage, social deprivation and general health
<b>CNS</b>	cancer nurse specialist
<b>COSD</b>	the Cancer Outcomes and Services Dataset (COSD) is the national standard for reporting on cancer in the NHS in England. Trusts submit a data file to the National Cancer Registration and Analysis Service (NCRAS) every month
<b>CT scan</b>	the abbreviated term for computerised tomography. These tests produce detailed images of the body using X-ray images that are enhanced by a computer
<b>Data completeness</b>	the percentage of all required data currently available in a dataset
<b>EBUS</b>	endobronchial ultrasound, a minimally invasive method of diagnosing lung cancer like a bronchoscopy but allows for tissue samples to be removed with the same instrument
<b>FEV1</b>	a measurement of lung capacity used by doctors to determine how healthy a patient's lungs are, and can be measured as an absolute amount, or as a percentage predicted
<b>Financial year</b>	a year used for taxing or accounting purposes (for example the British tax year, reckoned from 6 April)
<b>Gold standard dataset</b>	a dataset provided by NCRAS. It is usually available around 18 months after the end of diagnosis period. It links together a number of cancer datasets and is quality assured prior to release
<b>HES data</b>	Hospital Episode Statistics data. These include information relating to the patient as well as clinical information about the diagnosis and dates of admission and discharge
<b>Immunotherapy</b>	systemic treatment that encourages the patient's immune system to fight their cancer
<b>LCNS</b>	lung cancer nurse specialist
<b>MDT</b>	multidisciplinary team
<b>Median survival</b>	the amount of time after which 50% of the people in a group of patients diagnosed with the disease have died and 50% are still alive
<b>Molecular testing</b>	identifying specific genetic abnormalities in a cancer to guide treatment
<b>NCRAS</b>	the National Cancer Registration and Analysis Service (NCRAS) is part of Public Health England and is responsible for all cancer registration in England
<b>NLCA</b>	National Lung Cancer Audit



<b>Non-small-cell lung cancer (NSCLC)</b>	a group of types of lung cancer sharing certain characteristics, which makes up 85–90% of all lung cancers. Includes squamous carcinoma and adenocarcinoma.
<b>Organisational audit</b>	a snapshot audit that looks at an organisation's staffing levels and the level of patient access to diagnostics and types of treatment
<b>Outlier</b>	a trust whose result for a certain measure lie either two (alert level) or three (alarm level) standard deviations from the mean, national, result
<b>Pathological diagnosis</b>	refers to a diagnosis of cancer based on pathological examination of a tissue (histology) or fluid (cytology), as opposed to a diagnosis based on clinical assessment or non-pathological investigation (eg CT scan)
<b>Pathway</b>	refers to the process of care that a patient experiences, from the point of diagnosis through to and following treatment
<b>Performance status (PS)</b>	a systematic method of recording the ability of an individual to undertake the tasks of normal daily life compared with that of a healthy person
<b>Radiotherapy</b>	the treatment of cancer using radiation, which is most often delivered by X-ray beams (external beam radiotherapy) but can be given internally (brachytherapy)
<b>Radical radiotherapy</b>	radical radiotherapy means using high doses of this treatment to try to cure the cancer
<b>RCRD</b>	Rapid Cancer Registration Dataset. This dataset provides a quick, indicative source of cancer data compared to the usual standard registration process, which relies on additional data sources, enhanced follow-up with trusts and expert processing by cancer registration officers.
<b>Systemic anticancer therapy (SACT)</b>	treatments for cancer given by mouth or injection, including chemotherapy, immunotherapy and biologic therapy
<b>Stereotactic ablative body radiotherapy (SABR)</b>	a modern radiotherapy delivery technique, designed to destroy the cancer by maximising the radiotherapy dose to the tumour while minimising side effects
<b>Small-cell lung cancer (SCLC)</b>	a subtype of lung cancer making up around 10–15% of all lung cancers. See also non-small-cell lung cancer
<b>Spotlight audit</b>	an audit that focuses on a smaller cohort of patients to understand a specific issue in treatment or care
<b>Stage</b>	the stage of a cancer describes the size of a tumour and how far it has spread from where it originated.
<b>Stage I, II, IIIA–C and IV</b>	lung cancer stages include I, II, IIIA–C and IV. Roman numerals are usually used for each stage which may be further divided using letters, eg stage IIIA. The stage is used to inform appropriate treatment options. Patients with stage I–IIIA disease are typically considered for curative treatments, eg surgery. Patients with stage IIIB–IV lung cancer, locally advanced or metastatic disease, are typically considered for palliative treatments, eg SACT.
<b>Surgical resection</b>	an operation to remove abnormal tissues or organs

## Acknowledgements

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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.

# National Lung Cancer Audit

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