



NLCA

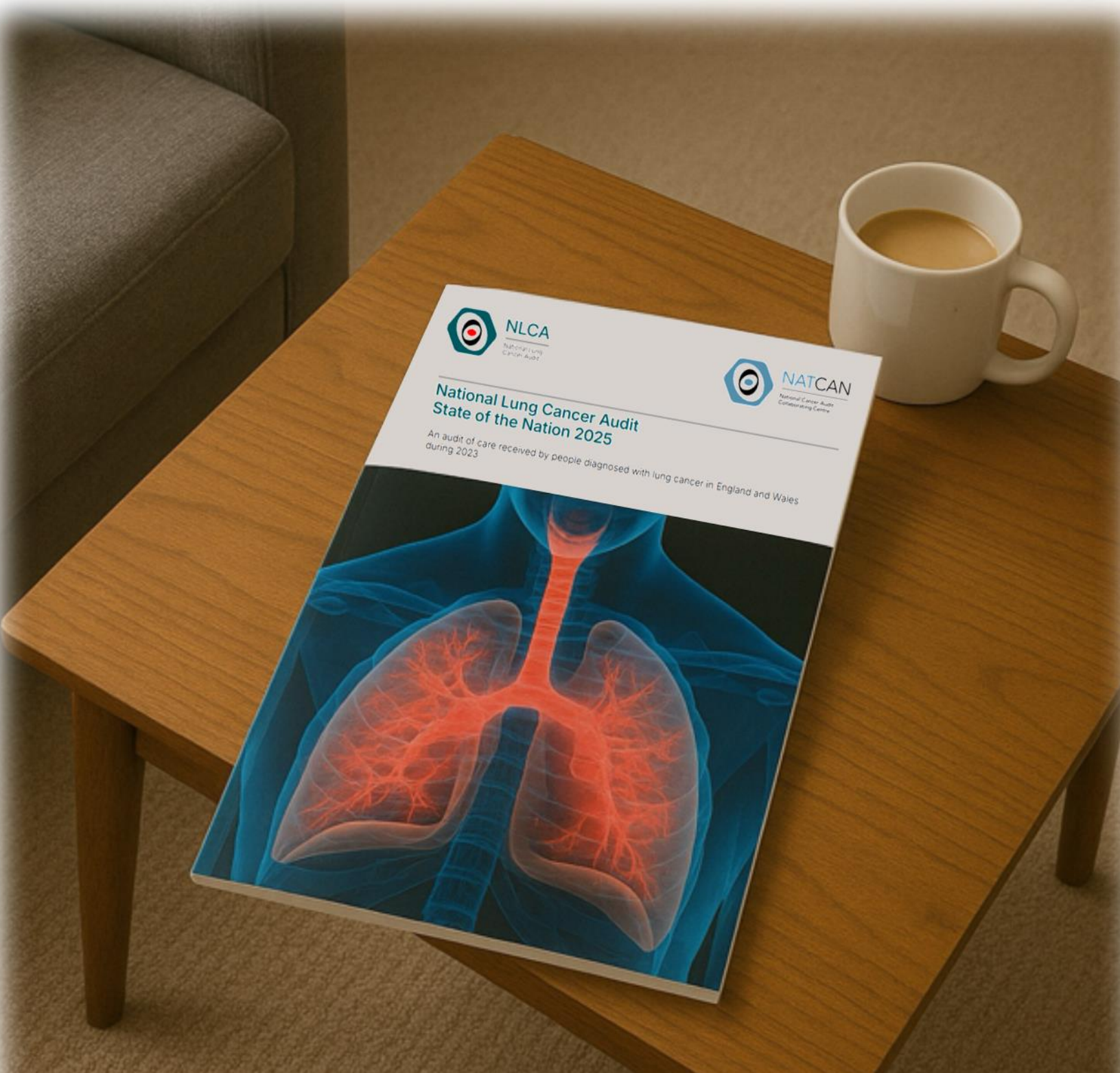
National Lung
Cancer Audit



NATCAN

National Cancer Audit Collaborating Centre

A patient guide to statistics used in the National Lung Cancer Audit



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1. Welcome

This guide is here to help you better understand the numbers and statistics used in lung cancer care. The National Lung Cancer Audit (NLCA) receives information about patients diagnosed with lung cancer in England and Wales and the care they receive. The NLCA then combines this information to build a picture of lung cancer care at a trust, regional and national level. The NLCA then makes reports to share this and often uses statistics to share results.

2. Why are statistics used in lung cancer care?

Every person's experience with lung cancer matters. When we bring those experiences together using statistics, we can understand what care looks like in trusts, regions and across the country to understand what's working well, where improvements are needed, and how to give everyone the best chance of a good outcome. Statistics help us turn real patient experiences into evidence that drives better care for the future.

What are statistics?

Statistics are numbers that help us understand things about groups of people or things. They show us patterns, like how many people have lung cancer, how often something happens like surgery for lung cancer, or how well a treatment works.

For example, if 100 people have lung cancer and 60 of them feel better after treatment, the statistics help us see that the treatment helped 60 out of 100 people, which we can write as 6 out of 10 patients or 60%.

What are statistics in cancer care?

Statistics are ways of collecting and summarising real information about patients, such as:

- How many people are diagnosed

- What treatments people receive (like surgery or chemotherapy)
- How well people do after treatment
- How care differs between hospitals or regions
- How things are changing over time

This information is collected through cancer audits, like NLCA.

Why are they important?

We use statistics to:

1. Spot patterns and trends

- Example: Looking to see whether more people are surviving lung cancer now compared to 10 years ago

2. Compare care between hospitals

- This helps identify where care is working well, and where it might need to improve.

3. Make care fairer

- By looking at data by age, sex, ethnicity, or location, we can see if some groups are less likely to receive certain treatments and then we can recommend changes.

4. Inform patients and the public

- Clear statistics help people understand what to expect and ask informed questions about their care.

5. Improve treatment decisions

- When doctors know how different treatments have worked for people with similar health and cancer types, they can make better decisions about what's likely to help you.

Statistics turn patient experiences into evidence that improves future care. Every number represents real people and the more we understand those numbers, the better we can care for the next patient.

3. Common statistical words and what they mean

Term	What It Means
Average (mean)	Add up all the numbers and divide by how many there are.
Median	The middle number when all numbers are in order.
Percentage (%)	Out of 100. For example, 25% means 25 people out of 100.
Risk	The chance something might happen, for example, the life-time risk of getting lung cancer
Survival rate	How many people are still alive after a certain amount of time.
Trend	How something changes over time.

Numerators and Denominators

In statistics, we often talk about a denominator and a numerator. The denominator means the whole group of people we are looking at. The numerator means the smaller group or part of the group within that whole who have what we are measuring. We use these numbers to work out percentages.

For example:

If we want to know how many people with lung cancer had surgery, the denominator is all the people with lung cancer (the whole), and the numerator is the people who had surgery (the part).

4. Understanding survival rates

What is a survival rate?

A survival rate tells us how many people are alive after a certain time following a diagnosis or treatment.

For example:

A 1-year survival rate of 70% means that if 100 people are diagnosed and 70 are alive after 1 year, the 1-year survival rate is 70%.

Why does it matter?

It helps:

- Healthcare professionals to understand which treatments are working
- Hospitals to compare results over time
- Improve care for future patients

Please remember, survival rates are about groups, not individual people.

Tip: Survival rates are like weather forecasts, they show the bigger picture, but your experience might be different.

5. What a percentage means

Percentages help us describe information in a way that's easy to compare.

For example: If we say 30% of patients had surgery, that means 30 out of every 100 people with lung cancer received surgery.

Other examples:

- 5 out of 10 patients = 50% (or a half)



- 1 out of 4 patients = 25% (or a quarter)



6. Understanding averages

When we describe groups of people using numbers, there are different ways to find a "typical" value or the average. The three most common are **mean**, **median**, and **mode**:

Mean

The mean is what most people call the average. You add up all the numbers and then divide by how many numbers there are.

Example: If the ages of five patients are 60, 65, 68, 70, and 72, the mean age is $(60 + 65 + 68 + 70 + 72) \div 5 = 67$.

60

65

68

70

72

Median

The median is the middle number when all the numbers are arranged from smallest to largest.

Example: For the ages 60, 65, 68, 70, and 72, the median is 68 because it's in the middle. Half the patients are younger than 68, and half are older.

The median is often used for things like age because it isn't affected by very young or very old ages.

60

65

68

70

72

Mode

The mode is the number that appears most often in a group.

Example: If the ages are 60, 65, 65, 68, and 70, the mode is 65 because it appears twice.



Each of these numbers helps describe a group in a different way. Sometimes one is more useful than the others depending on the information.

7. Understanding graphs and charts

You might see:

- Bar charts - to compare numbers between groups (for example, number of surgeries at different hospitals)
- Line graphs - to show changes over time (like survival rates improving over years)
- Pie charts - to show parts of a whole (such as percentage of patients receiving different treatments)
- Scatter plots - to show how data points are spread out and compare results across different hospitals or trusts.

Example: In NLCA, scatter plots help show how lung cancer outcomes vary across trusts, making it easy to spot which hospitals are performing better or worse.

What are control limits?

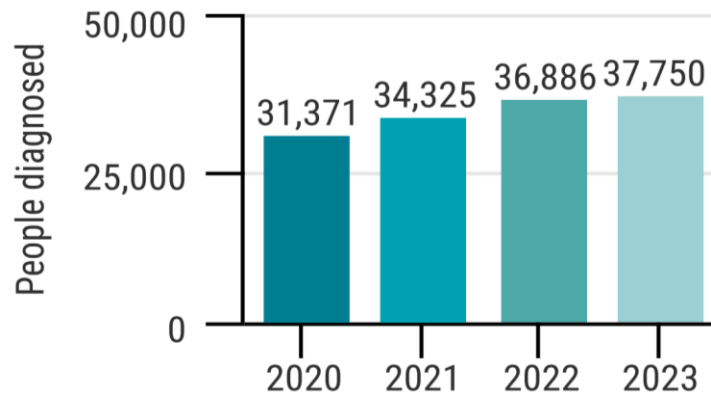
In some scatter plots, you may see dotted lines above and below the main average line - these are called **control limits**.

- They help show whether a trust's results are within the expected range or **significantly different** from the average.
- If a point lies **outside** the control limits, it suggests that something may be different about that hospital's care, either better or worse, and it may need further investigation.

Control limits help make sense of variation and are an important tool in improving the quality of care.

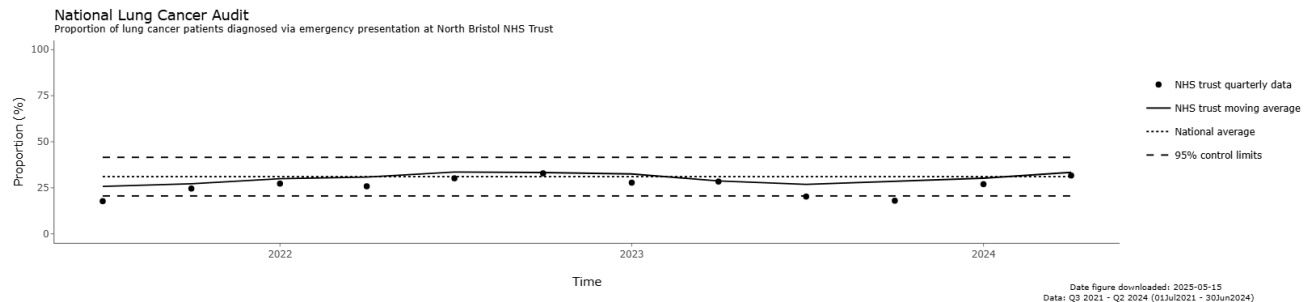
Bar chart

Here is a bar chart showing the number of people diagnosed with lung cancer by the year of diagnosis.



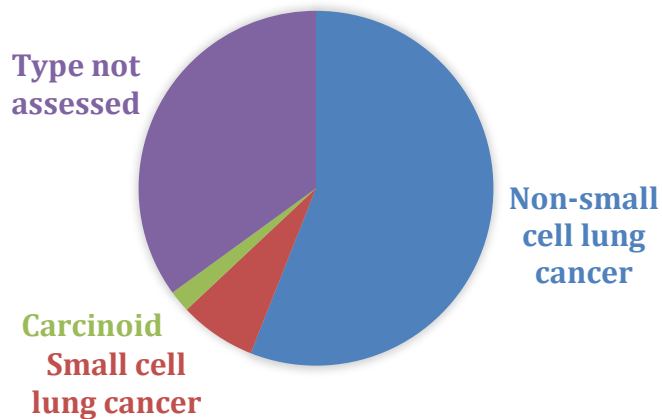
Line graph

Here is a line graph showing the proportion of patients with lung cancer who were diagnosed after an emergency admission to hospital over time, 2021-2024. We can see how this is changing slightly over time.



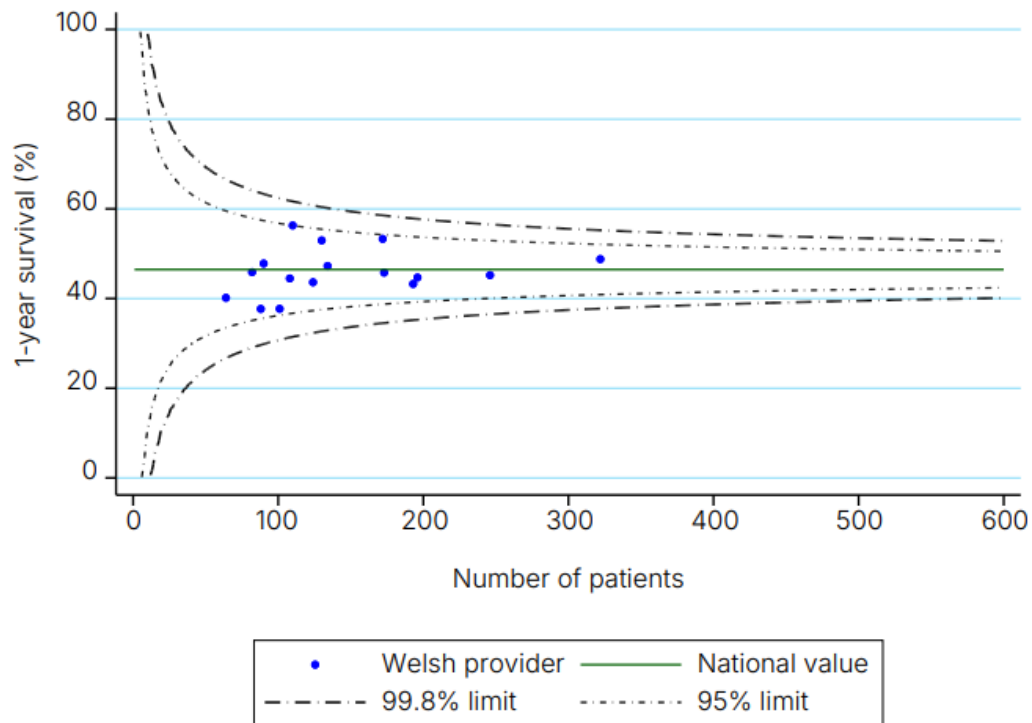
Pie chart

Here is a pie chart showing the proportion of each type of lung cancer of patients diagnosed. This allows us to quickly see that the most common type of lung cancer is non-small cell lung cancer.



Scatter plot

Here is a scatter plot showing one-year survival after lung cancer diagnosis, each dot is a different hospital. The position of each dot or hospital depends on the average one-year survival of their patients (height, up/down) and the number of patients with lung cancer they looked after during the year (across, left/right). This allows us to see that hospitals in Wales have similar survival of their lung cancer patients. The dashed lines are control limits, they help show whether a trust's results are within the expected range or significantly different from the average. Here, all the dots (hospitals) fall within the control limits, meaning no hospital has a 1-year survival rate that is unusually high or low compared to the others.



8. What these numbers don't tell you

Statistics are helpful, but they can't tell you everything. They don't:

- Predict exactly what will happen to you
- Explain why certain people get different treatments
- Show how someone feels or what support they need

That's why lung cancer care should always be based on you - not just the numbers.

9. Where Can I Learn More or Get Help?

If you'd like to understand more:

- Talk to your doctor or nurse
- Visit the National Lung Cancer Audit website: www.lungcanceraudit.co.uk
- Look up trusted cancer support organisations like:
 - Macmillan Cancer Support: www.macmillan.org.uk
 - Roy Castle Lung Cancer Foundation: www.roycastle.org

- Cancer Research UK: www.cancerresearchuk.org

10. Key Messages to Remember

- Statistics help us understand lung cancer care so we can improve it.
- They describe groups of people, not individuals.
- **You are not a number. Your care is personal.**

11. Glossary

Audit	A way of checking how well healthcare is being delivered by collecting and reviewing information about patient care.
Bar chart	A graph that uses rectangular bars to show and compare numbers across different groups.
Control limits	Lines on a graph that show what range of results we would normally expect. Results outside this range may suggest something unusual.
Data	Information that is collected, such as patients' ages, treatments, and outcomes.
Denominator	The number in the whole group. Usually the numerator (the number who have the thing we are measuring) is compared to it.
Diagnosis	The process of identifying a disease, like lung cancer, based on symptoms, tests, or scans.
Emergency admission	When someone goes to hospital suddenly because they need urgent medical care, for example going to Accident & Emergency departments.
Line graph	A graph that connects points with lines to show how something changes over time.
Mean (average)	A way of finding the average by adding numbers together and dividing by how many there are.
Median	The middle number when all the values are arranged in order. Half the values are above it and half are below.
Mode	The number that appears most often in a group.
National Lung Cancer Audit (NLCA)	A national project that collects and reviews data to improve lung cancer care across the NHS.

Numerator	The number in the part of that group who have the characteristic we are measuring, usually compared to the denominator (the number in the whole group).
Outcome	The result of treatment or care, such as how well a patient recovers or how long they live.
Pie chart	A circular chart divided into slices to show how a whole is divided into parts.
Scatter plot	A type of graph that shows individual results across different hospitals or trusts, helping to spot patterns or differences in care.
Statistical variation	Differences in data that happen naturally or due to different ways care is provided.
Statistic	A number that summarises or describes information, such as how many people had surgery or what the median age was.
Survival rate	The percentage of people who are still alive after a certain period of time following a diagnosis or treatment.
Treatment	Medical care given to a patient, such as surgery, chemotherapy, or radiotherapy.
Trust	A group of hospitals that work together in the NHS.