NATCAN
National Cancer Audit Collaborating Centre

Royal College of Surgeons of England

NATCAN Outlier Policy

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Document Author(s)	Marina Parry, Julie Nossiter, Kate Walker, David Cromwell and audit teams
Document Reviewer(s)	NATCAN Board
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Version	Date	Author/s	Description of Changes	Approved By
1.0	09.05.2025	Clare Peckitt	Initial draft created.	
1.1	06.06.2025	Marina Parry	Amended following NATCAN team review.	
1.2	16.06.2025	Marina Parry	Amended following NATCAN Board review	Julie on behalf of NATCAN Board following meeting on 11th June 2025
1.3	14.10.2025	Marina Parry	Amended to add request from HQIP related to correspondence being sent to clinical audit departments	
1.4	20.02.2026	Marina Parry	Amended to reflect updates to the HQIP outlier policy guidance and updates to appendix.	
1.5	08.06.2026	Julie Nossiter, Marina Parry	Policy updated and clarified (including NATCAN policy for repeat alerts - both non-mortality and mortality indicators). Audit Appendices updated & any variations noted.	

Contents

Purpose

This Outlier Policy for the National Cancer Audit Collaborating Centre (NATCAN) describes the process used by the national cancer audits for managing providers with indicator values that fall outside the expected range of performance (i.e, are flagged as an outlier).

It is designed to provide transparency about how indicators covered by the Outlier Policy will be presented, and describe how the audits will communicate with providers so that they can investigate and respond appropriately if flagged as an outlier (either with negative or positive performance). The main policy is relevant to all NATCAN audits and Appendix 1 is audit specific.

The principles used by NATCAN outlier policy are based on established practices and are consistent with HQIPs '*NCAPOP Outlier Guidance: Identification and management of outliers'* in England and Wales.

The NATCAN Outlier Policy is reviewed annually by the NATCAN Board.

Scope

The audits publish performance indicators of the quality of care received by people in England and Wales as part of the annual State of the Nation Reports. If the performance of a provider is found to fall outside the expected range for selected performance indicators during the analysis for the State of the Nation report, it is flagged as a potential outlier.

In rare circumstances, information might be provided to the audit outside the State of the Nation cycle which could suggest the presence of serious issues with clinical practice or a systems failure and that presents a risk of harm to patients. If this occurs, the audit will implement the escalation

process described in Table 3 in the "Cause for Concern" guidance published by HQIP in February 2019: https://www.hqip.org.uk/wp-content/uploads/2019/02/NCAPOP-Cause-for-Concern-Guidance-Final-E-and-W-Feb-2019.pdf

Definitions

Glossary

NATCAN: National Cancer Audit Collaborating Centre

HQIP: Healthcare Quality Improvement Partnership

Performance indicators

Indicators measure one aspect of how a provider performs, which will often be a process of care or outcome that is an important marker of quality. The indicators used by the audits are selected for being valid and reliable, and for having the ability to support NHS quality assurance / quality improvement activities.

Targets / expect levels of performance

The expected performance on an indicator may be defined in several ways. In some circumstances, it will be based on external sources such as an agreed standard. In other situations, the target will be defined in relation to the typical pattern of care achieved by providers, such as the average performance for England and Wales.

Risk adjustment

On some indicators, the indicator value of a provider will be influenced by the characteristics of the patients treated there. In these circumstances, an audit will take account of these differences in patient case-mix by risk adjusting the indicator values. This will ensure the evaluation of performance across providers is fair. For example, patient and tumour characteristics often taken into account during a risk adjustment process include: age at diagnosis, sex, disease severity, patient functional status and co-morbidity.

Procedure

This section summarises the steps that the audit teams will follow to detect and manage potential outlier providers.

1. Choosing appropriate Performance Indicator(s) to be used in the outlier process

- Appropriate Performance Indicator(s) (PIs) should be chosen for outlier assessment by audit teams and relevant stakeholders
- PI(s) chosen must
    - provide a valid measure of a provider's quality of care
    - be based on events that occur frequently enough to provide sufficient statistical power
- If data quality prevents any meaningful outlier analysis from being undertaken, then the provider could be considered as an alarm outlier to facilitate improvement
- In the rare circumstances in which information provided to the audit could reasonably suggest the presence of very serious issues with clinical practice or system failure that presents a risk of harm to patients, the audit will implement the cause for concern escalation process described in Table 3 in the following guidance published in February 2019: https://www.hqip.org.uk/wp-content/uploads/2019/02/NCAPOP-Cause-for-Concern-Guidance-Final-E-and-W-Feb-2019.pdf

2. Detecting a potential negative outlier provider

- Providers are most commonly identified as potential negative outliers using a control chart such as a funnel plot.
- Cancer audits typically assess the performance of many providers over a period of time using a funnel plot. In these plots, each dot represents an NHS organisation, and a solid horizontal line represents the expected level of performance (such as the average for England and Wales). The vertical axis indicates the indicator value, while the horizontal axis shows provider activity, with dots further to the right showing the providers that care for more patients.
- Random variation will always affect indicator values, and its influence is greater among small samples. This is shown by the funnel-shaped lines, known as control limits. These lines define the region within which we would expect the indicator values to fall if the performance of providers differed from the national average (target) because of random variation.
- The control limits in a funnel plot used by the cancer audits define differences from the national average performance corresponding to where we would expect 95% (within two standard deviations [SDs]) and 99.8% (within three SDs) of providers to lie.

- An **'alarm'** outlier is a provider with a performance indicator value more than three SDs in a negative direction from the national average.
- A **'repeat alert'** outlier is a provider with a performance indicator value more than two SDs (but less than 3 SDs) in a negative direction from the national average for two or more consecutive years (see Appendix for definitions for each audit). The condition that an estimate should be within the defined range more than once was added to reduce the chance that a provider is erroneously identified as a potential outlier.
- A '**one-year mortality alert'** outlier is a provider with a performance indicator value more than two SDs (but less than 3 SDs) in a negative direction from the nation average for one reporting period (one or more years). The audits will not formally notify the Care Quality Commission (CQC) of these providers due to the high risk of false positive signals, the limitations of certain national datasets, and the inability of NHS organisations to correct any local-level discrepancies or incomplete data required for risk adjustment. Instead, the audits will formally notify the CQC of '**repeat one-year mortality alerts'**.

3. Managing a potential negative 'alarm' outlier provider

If a provider is flagged as an alarm outlier, it does not necessarily indicate a problem with the quality of care given to patients. It is a statistical result and, therefore, triggers further analysis and investigation with the provider. The following Table 1 summarises the steps taken in managing a potential **'alarm'** outlier provider, including the actions required, the people responsible, and the time scales.

The national cancer audits do not require providers to submit patient data directly to NATCAN. The audits use national cancer datasets supplied by the National Disease Registration Service (NHS England) and the Welsh Cancer Network. HQIPs '*NCAPOP Outlier Guidance: Identification and management of outliers'* does not consider the situation where clinical audits do not collect data directly from providers. The process of data review by providers described in this policy is therefore specific to the cancer audits.

Table 1: Steps to manage a potential negative 'alarm' outlier provider

Step	Action required	Owner	Within working days from prior step
1	Provider with a possible performance indicator at alarm level require scrutiny of the data handling and analyses performed to determine whether: 'Alarm' status confirmed: • Potential 'alarm' status: ➢ ***proceed to step 2***	Audit team	10 (maximum from submitting draft 0 of State of the Nation [SotN] report)
2	Provider lead clinician and clinical audit departments (or equivalents) informed about potential 'alarm' status and asked to identify possible data errors or justifiable explanation(s). All communications regarding the outlier status of providers remain under embargo until after the SotN publication date. All relevant data and analyses to be made available to the lead clinician, while sending the minimum required. NOTE: All patient level data should be sent encrypted and securely to the provider lead clinician and, if returned to the audit team, remain encrypted.	Audit Clinical leads and Audit Team	5
3	Provider lead clinician to provide written response to audit team. If no response has been received in the proposed timeframe, the audit team will contact the relevant Cancer Alliance Clinical Chair to notify them of the provider outlier status.	Provider Lead Clinician	25

Step	Action required	Owner	Within working days from prior step
4	Review of provider lead clinician's response to determine: 'Alarm' status not confirmed: • It is confirmed that the data about the provider contained inaccuracies. Re-analysis of data based on information from provider no longer indicates 'alarm' status • Results for provider not included in audit reports and data tables / dashboards. The publication should include the rationale, stating that the provider is no longer a potential outlier. The provider should be asked to provide a formal response which will be published by the audit team. ➢ ***process closed*** 'Alarm' status confirmed: • Although it is confirmed that the originally supplied data were inaccurate, analysis still indicates 'alarm' status, or • It is confirmed that the originally supplied data were accurate, thus confirming the initial designation of 'alarm' status • The publication should include the results for the provider, stating that the provider is an outlier. The provider should be asked to provider a formal response which will be published by the audit team. ➢ ***proceed to step 5***	Audit clinical lead	20

Step	Action required	Owner	Within working days from prior step
5	Contact provider lead clinician, by phone as required, prior to sending written notification of confirmed 'alarm' to provider CEO and copied to provider lead clinician, medical director and clinical audit department (or equivalents). All relevant data and statistical analyses, including previous response from the provider lead clinician can be made available to provider medical director and CEO. For England: • The outlier confirmation letter should also include the details in Step 7 below, and a request that the Trust engage with their CQC team. • The outlier confirmation letter should also include the following sentence: "*Please ensure this outlier notification letter is circulated to the appropriate people within the trust or health board, for example (and not limited to), Chief Nursing Officer, Director of Nursing, clinical audit dept manager/lead, relevant clinical and medical director and trust chair within 5 working days of receipt of this letter."* • Relevant audit outlier policy should be provided to provider colleagues. • Notify the following of confirmed 'alarm' status in one email, including this completed attachment: ○ CQC (clinicalaudits@cqc.org.uk) and include the audit outlier policy, ○ NHSE (england.clinical-audit@nhs.net) and NHS England Cancer Programme, Lucy Danks (l.danks@nhs.net), ○ Relevant Cancer Alliance Clinical Chair, ○ HQIP associate director and project manager (www.hqip.org.uk/about-us/ourteam/), ○ HQIP NCAPOP Director of Operations, Jill Stoddart (jill.stoddart@hqip.org.uk), ○ NATCAN Director of Operations, Julie Nossiter (jnossiter@rcseng.ac.uk). For Wales: • Notify the following of confirmed 'alarm' status: ○ wgclinicalaudit@gov.wales ○ HQIP associate director and project manager (www.hqip.org.uk/about-us/our-team/)	Audit Clinical leads and Audit Team	5

Step	Action required	Owner	Within working days from prior step
6	• The audit team will proceed to public disclosure of comparative information that identifies providers as alarm level outliers (in State of the Nation Reports). • Providers identified as alarm level outliers will be asked for a formal response which will be published by the audit team as an addendum or footnote. • Publication of audit reports will not be delayed whilst waiting for such investigation to be completed. This can be added, online, when and if it subsequently becomes available. • Conversely, if there has been no response from the provider concerning their alarm outlier status, that will be published by the audit team. NOTE: Providers have the Right to Reply. Three elements to consider including: 1. Confirm data and results are correct 2. Reasons for the results 3. What has been done	Audit team	SotN report publication date or as soon as possible after
7	The CQC advise that during their routine local engagement with the providers, their inspectors will: • Encourage Trusts to identify any learning from their performance and provide the CQC with assurance that the Trust has used the learning to drive quality improvement • Ask the Trust how they are monitoring or plan to monitor their performance • Monitor progress against any action plan if one is provided by the trust If an investigation has been conducted in the Trust into an alarm outlier status, it is required that the CQC and audit provider would be provided with the outcome and actions proposed. Audits may wish to engage with CQC during the process. This will be published by the audit provider alongside the annual results. Further, if there were no response, the audit provider would publish this on record as an absence of response.	England = CQC Trust medical director Audit team	Determined by the CQC

4. Managing a potential negative 'repeat alert' outlier

If a provider is flagged as a 'repeat alert' outlier, it does not necessarily indicate a problem with the quality of care given to patients. It is a statistical result and, therefore, triggers further analysis and investigation with the provider.

Following the identification of a potential 'repeat alert' outlier, the steps to follow are dependent on the type of indicator. In NATCAN, non-mortality indicators follow steps 1-4 (Table 2).
Where the indicator is mortality related, steps 1-7 are completed and as per HQIP policy, the CQC will be informed. Any deviations from the NATCAN policy by individual audits are outlined in the Appendices.

Table 2: Steps to manage a potential negative 'repeat alert' outlier provider

Step	Action required	Owner	Within working days from prior step
1	Provider with a possible performance indicator at 'repeat alert' level require scrutiny of the data handling and analyses performed to determine whether: 'Repeat alert' status confirmed: • Potential 'repeat alert' status: ➢ ***proceed to step 2***	Audit team	10 (maximum from submitting draft 0 of State of the Nation [SotN] report)
2	Provider lead clinician and clinical audit departments (or equivalents) informed about potential 'repeat alert' status and asked to identify possible data errors or justifiable explanation(s). All communications regarding the outlier status of providers remain under embargo until after the SotN publication date. All relevant data and analyses to be made available to the lead clinician, while sending the minimum required. NOTE: All patient level data should be sent encrypted and securely to the provider lead clinician and, if returned to the audit team, remain encrypted.	Audit Clinical leads and Audit Team	5
3	Provider lead clinician to provide written response to audit team. If no response has been received in the proposed timeframe, the audit team will contact the relevant Cancer Alliance Clinical Chair to notify them of the provider outlier status.	Provider Lead Clinician	25

Step	Action required	Owner	Within working days from prior step
4	Review of provider lead clinician's response to determine: 'Repeat alert' status not confirmed: • It is confirmed that the data about the provider contained inaccuracies. Re-analysis of data based on information from provider no longer indicates 'repeat alert' status • Results for provider not included in audit reports and data tables / dashboards. The publication should include the rationale, stating that the provider is no longer a potential outlier. The provider should be asked to provide a formal response which will be published by the audit team. ➢ ***Process closed*** 'Repeat alert' status confirmed: • Although it is confirmed that the originally supplied data were inaccurate, analysis still indicates 'repeat alert' status, or • It is confirmed that the originally supplied data were accurate, thus confirming the initial designation of 'repeat alert' status • The publication should include the results for the provider, stating that the provider is an outlier. The provider should be asked to provider a formal response which will be published by the audit team. ➢ ***Non-mortality – process closed*** ➢ ***Mortality indicators proceed to step 5***	Audit clinical lead	20

Step	Action required	Owner	Within working days from prior step
5	***'Repeat alert' status confirmed for mortality indicators*** Contact provider lead clinician, by phone as required, prior to sending written notification of confirmed 'repeat alert' status to provider CEO and copied to provider lead clinician, medical director and clinical audit department (or equivalents). All relevant data and statistical analyses, including previous response from the provider lead clinician can be made available to provider medical director and CEO. For England: • The outlier confirmation letter should also include the details in Step 7 below, and a request that the Trust engage with their CQC team. • The outlier confirmation letter should also include the following sentence: "*Please ensure this outlier notification letter is circulated to the appropriate people within the trust or health board, for example (and not limited to), Chief Nursing Officer, Director of Nursing, clinical audit dept manager/lead, relevant clinical and medical director and trust chair within 5 working days of receipt of this letter."* • Relevant audit outlier policy should be provided to provider colleagues. • Notify the following of confirmed 'repeat alert' status in one email, including this completed attachment: ○ CQC (clinicalaudits@cqc.org.uk) and include the audit outlier policy, ○ NHSE (england.clinical-audit@nhs.net) and NHS England Cancer Programme, Lucy Danks (l.danks@nhs.net), ○ Relevant Cancer Alliance Clinical Chair, ○ HQIP associate director and project manager (www.hqip.org.uk/about-us/ourteam/), ○ HQIP NCAPOP Director of Operations, Jill Stoddart (jill.stoddart@hqip.org.uk), ○ NATCAN Director of Operations, Julie Nossiter (jnossiter@rcseng.ac.uk). For Wales: • Notify the following of confirmed 'repeat alert' status: ○ wgclinicalaudit@gov.wales ○ HQIP associate director and project manager (www.hqip.org.uk/about-us/our-team/)	Audit Clinical leads and Audit Team	5

Step	Action required	Owner	Within working days from prior step
6	***'Repeat alert' status confirmed for mortality indicators*** • The audit team will proceed to public disclosure of comparative information that identifies providers as 'repeat alert' level outliers for a mortality indicator (in State of the Nation Reports). • Providers identified as 'repeat alert' outliers will be asked for a formal response which will be published by the audit team as an addendum or footnote. • Publication of audit reports will not be delayed whilst waiting for such investigation to be completed. This can be added, online, when and if it subsequently becomes available. • Conversely, if there has been no response from the provider concerning their 'repeat alert' outlier status for a mortality indicator, that will be published by the audit team. NOTE: Providers have the Right to Reply. Three elements to consider including: 4. Confirm data and results are correct 5. Reasons for the results 6. What has been done	Audit team	SotN report publication date or as soon as possible after
7	***'Repeat alert' status confirmed for mortality indicators*** The CQC advise that during their routine local engagement with the providers, their inspectors will: • Encourage Trusts to identify any learning from their performance and provide the CQC with assurance that the Trust has used the learning to drive quality improvement • Ask the Trust how they are monitoring or plan to monitor their performance • Monitor progress against any action plan if one is provided by the trust If an investigation has been conducted in the Trust into a 'repeat alert' level outlier for a mortality indicator, it is required that the CQC and audit provider would be provided with the outcome and actions proposed. Audits may wish to engage with CQC during the process. This will be published by the audit provider alongside the annual results. Further, if there were no response, the audit provider would publish this on record as an absence of response.	England = CQC Trust medical director Audit team	Determined by the CQC

5. Managing a potential positive outlier

- A positive outlier is a provider with an estimate of a performance indicator more than three SDs in positive direction from the national average.
- Identification of positive outliers should be used to celebrate clinical excellence.
- Positive outliers should be contacted in writing and informed of their results.
- The clinical team will be encouraged to share learnings regarding their processes of care and provide opportunities for other centres to engage with the local team to see what elements of their pathway are transferrable.
- NHS England Cancer Programme, Lucy Danks (l.danks@nhs.net), to be informed of the positive outlier provider for each chosen performance indicator by the audit teams.

6. Actions when data issues are identified during the 'alarm' outlier management process

A provider flagged as a negative 'alarm' or a 'repeat alert' outlier on an indicator might provide evidence of data errors affecting their indicator value. They may have raised concerns about the number of patients included in the analysis or the data on the process of care / outcomes being measured, and provided evidence by provided aggregate statistics or by returning the patient-level dataset sent to them by the audit with additional data.

If a potential 'alarm' or 'repeat alert' outlier is judged by the audit team to be due to a data quality issue, the audit will not publish their results in the report, data tables / dashboards, or include them in control charts (funnel plots). The audit will publish a rationale for why the result was not published and that the audit is working with the trust to improve data quality. The value will not be included in organisational level statistics, such as the range of indicator values. Summary statistics for the overall cohort such as the national average will not be updated. This will be reviewed in future iterations of the policy.

References

NCAPOP-Outlier-Guidance_2025-Oct-Update-v2.pdf
NCAPOP-Cause-for-Concern-Guidance-Final-E-and-W-Feb-2019.pdf

Appendix 1: Audit Specific Outlier Policy Details

Audit	**All NATCAN audits running an outlier process**
Version	**1.5**
Document Author(s)	**NATCAN Team members**
Document Reviewer(s)	**NATCAN Executive Committee**
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Revision History

Version	Date	Author	Description of Changes	Approved By
1.2	13.06.2025	NATCAN Team members	Initial draft created.	
1.3	14.10.2025	NATCAN Team members	NLCA PIs added and detail of risk adjustment factors added for NOCA and NAoPri.	
1.4	20.02.2026	NOCA Team members, Marina Parry	Details of NOCA outlier process updated for SotN 2026. Date last updated and version referred to added to each appendix item.	
1.5	22.06.26	NATCAN Team members, Julie Nossiter	Amendment to description of appendix items. Details of outlier process updated for (NKCA, NPCA, NPaCA, NNHLA, NBOCA, NOGCA, NAoPri) updated for SotN 2026.	

This Appendix is to document the audit specific details of the outlier process.

1. National Kidney Cancer Audit

Table A1.1: Details of the National Kidney Cancer Audit outlier process

Audit Name	**National Kidney Cancer Audit (NKCA)**
Date last updated	09.06.2026 (v1.5)
Patient cohort	NKCA State of the Nation Report 2026: patients diagnosed from 1 January 2019 and 31 December 2023 in England and 1 January 2022 and 31 December 2024 in Wales
Outliers publication	With State of the Nation report 10.09.2026
Negative outlier process	Alarms NB:
Repeat alert definition	N/A
Any deviations from NATCAN Outlier Policy	Repeat alert outliers not investigated because the performance indicator encompasses five years of data (due to rare events), and consequently not well suited to identify repeat alert outliers.

Table A1.2: Details of the National Kidney Cancer Audit performance indicators used in outlier process

Indicator	**Description**	**Risk Adjustment (Y/N)**	**Missingness Concern**	**Rationale for use**
Percentage of people with kidney cancer who die within 30 days of SACT treatment	Proportion of people with kidney cancer who die within 30 days of receipt of systemic anti-cancer therapy treatment	Yes - age, gender, ethnicity, co-morbidity (Charlson score), deprivation (IMD quintile), year of diagnosis.	Missing data handled by multiple imputation.	Measure of care received

2. National Pancreatic Cancer Audit

Table A2.1: Details of the National Pancreatic Cancer Audit outlier process

Audit Name	**National Pancreatic Cancer Audit (NPaCA)**
Date last updated	10.06.2026 (v1.5)
Patient cohort	National Pancreatic Cancer Audit (NPaCA) State of the Nation Report 2026 Patients diagnosed with pancreatic cancer from 1 January 2022 to 31 December 2023 in England and 1 January 2023 to 31 December 2024 in Wales
Outliers publication	With State of the Nation report 10.09.2026
Negative outlier process	Alarms and repeat alerts
Repeat alert definition	More than two SDs (but less than 3 SDs) in a negative direction from the nation average for three consecutive years of reporting
Any deviations from NATCAN Outlier Policy	N/A

Table A2.2: Details of the National Pancreatic Cancer Audit performance indicators used in outlier process

Indicator	**Description**	**Risk Adjustment (Y/N)**	**Missingness Concern**	**Rationale for use**
1-year survival from diagnosis (adjusted)	Risk-adjusted 1-year survival from date of diagnosis among people with pancreatic cancer (excluding neuroendocrine tumours)	Yes - age, sex, IMD quintile, stage, performance status, receipt of disease-targeted treatment, RCS Charlson scores, year of diagnosis	Missing values for stage, performance status and IMD quintile imputed using multiple imputation	Longer-term survival outcomes can reflect appropriateness of treatment decisions and follow-up; risk-adjustment aims to account for differences in case-mix

3. National Non-Hodgkin Lymphoma Audit (NNHLA)

Table A3.1: Details of the National Non-Hodgkin Lymphoma Audit outlier process

Audit Name	**National Non-Hodgkin Lymphoma Audit (NNHLA)**
Date last updated	11.06.2026 (v1.5)
Patient cohort	National Non-Hodgkin Lymphoma Audit (NNHLA) State of the Nation Report 2026 Patients diagnosed with non-Hodgkin lymphoma from 1 January 2022 and 31 December 2023 in England and 1 January 2023 and 31 December 2024 in Wales for one-year survival; Patients diagnosed with non-Hodgkin lymphoma from 1 January 2021 to 31 December 2022 in England for two-year survival.
Outliers publication	With State of the Nation report 10.09.2026
Negative outlier process	Alarms
Repeat alert definition	
Any deviations from NATCAN Outlier Policy	Repeat alerts are not reported as outliers because two years of data are aggregated for these indicators due to small sample sizes at provider-level. Reporting repeat alerts involve the issue of overlapping data between two consecutive years of reporting.

Table A3.2: Details of the NNHLA performance indicators used in outlier process

Indicator	**Description**	**Risk Adjustment (Y/N)**	**Missingness Concern**	**Rationale for use**
Overall 1-year survival of people Diagnosed with NHL, reported by grade and subtype.	1-year survival for all NHL patients and by grade and subtype of lymphoma.	Yes. Indicator adjusted for age, sex, NHL subtype, staging, performance status, Charlson comorbidities index, diagnosis route and diagnosis year.	Multiple imputation with chained equations applied for missing data.	This is reflection of the quality of care of all the multi-disciplinary teams involved. Additionally, variation between providers has been identified.
Overall 2-year survival of people diagnosed with NHL, reported by grade and subtype.	2-year survival for all NHL patients and by grade and subtype of lymphoma.	Yes. Indicator adjusted for age, sex, NHL subtype, staging, performance status, Charlson comorbidities index, diagnosis route and diagnosis year.	Multiple imputation with chained equations applied for missing data.	This is reflection of the quality of care of all the multi-disciplinary teams involved. Additionally, variation between providers has been identified.

4. National Ovarian Cancer Audit (NOCA)

Table A4.1: Details of the National Ovarian Cancer Audit outlier process

Audit Name	**National Ovarian Cancer Audit (NOCA)**
Date last updated	20.02.2026 (v1.4)
Patient cohort	All women diagnosed with ovarian cancer (excluding borderline tumours) in NHS trusts in England and Health Boards in Wales in up to three calendar years.
Outliers publication	With State of the Nation report 2026 (11.06.2026)
Negative outlier process	Alarms and repeat alerts
Repeat alert definition	As per SOP v1.4. In addition, we also identify providers that are outside 2SD in the last three calendar years.
Any deviations from NATCAN Outlier Policy	Outlier reporting is at the level of the Gynaecological Cancer System, not the NHS Trust (England) or Health Board (Wales). Primary correspondence is with the clinical lead for a system's cancer centre or equivalent and copied to other providers in the system. Patient identifier data are returned to the relevant individual providers.

Table A4.2: Details of the National Ovarian Cancer Audit performance indicators used in outlier process

Indicator	**Description**	**Risk Adjustment (Y/N)**	**Missingness Concern**	**Rationale for use**
One-year survival	One-year survival reported for the Gynaecological Cancer System	Yes - age, deprivation, ethnicity, morphology, grade, stage at diagnosis, comorbidity and frailty.	Missing data for risk adjustment variables are imputed by chained equations.	This outcome indicator, with risk adjustment, reflects the overall quality of care provided in a Gynaecological Cancer System.

5. National Primary Breast Cancer Audit (NAoPri)

Table A5.1: Details of the National Primary Breast Cancer Audit outlier process

Audit Name	**National Primary Breast Cancer Audit (NAoPri)**
Date last updated	01.07.2025 (v1.2)
Patient cohort	Patients diagnosed with invasive breast cancer from 1 January 2021 to 31 December 2023 in England and Wales, included in NAoPri report
Outliers publication	Within State of the Nation report 10.09.2026
Negative outlier process	Alarms and repeat alerts
Repeat alert definition	As defined above p5-6
Any deviations from NATCAN Outlier Policy	N/A

Table A5.2: Details of the National Primary Cancer Audit performance indicators used in outlier process

Indicator	**Description**	**Risk Adjustment (Y/N)**	**Missingness Concern**	**Rationale for use**
3-year survival: percentage of patients who survived their breast cancer for at least 3 years from their initial breast cancer diagnosis.	3-year, breast cancer specific survival for patients with invasive disease diagnosed in 2021-2023	Yes. Indicator adjusted for age, grade, Charlson co-morbidity score, SCARF index, ER status, HER2 status, T-stage, and N-stage.	N	3-year survival selected to allow for sufficient number of events. Survival selected because it provides a measure of quality of care.

6. National Bowel Cancer Audit (NBOCA)

Table A6.1: Details of the National Bowel Cancer Audit outlier process

Audit Name	**National Bowel Cancer Audit (NBOCA)**
Date last updated	30.06.2025 (v1.2)
Patient cohort	National Bowel Cancer Audit (NBOCA) State of the Nation Report October 2025 – individual cohorts described in "Description" column of Table A2 (same for England and Wales)
Outliers publication	With State of the Nation report 09.10.2025
Negative outlier process	Alarms and repeat alerts
Repeat alert definition	More than two SDs (but less than 3 SDs) in a negative direction from the nation average for two consecutive years
Any deviations from NATCAN Outlier Policy	All repeat alert outliers (including non-mortality) follow the same process (Table 2) as alarm outliers.

Table A6.2: Details of the National Bowel Cancer Audit performance indicators used in outlier process

Indicator	**Description**	**Risk Adjustment (Y/N)**	**Missingness Concern**	**Rationale for use**
Adjusted 90-day mortality after major resection	Proportion of people with bowel cancer who die within 90-days of major resection between January and December 2023	Y	5 English NHS Trusts did not have sufficient completeness of risk adjustment variables to produce a risk-adjusted outcome	ACPGBI: Guidelines for the Management of Cancer of the Colon, Rectum and Anus (2017) – Surgical Management "Colorectal units should expect to achieve an operative mortality of less than 20% for emergency surgery and less than 5% for elective surgery for colorectal cancer." QI aim: Improving perioperative care.

Indicator	Description	Risk Adjustment (Y/N)	Missingness Concern	Rationale for use
Adjusted 30-day unplanned return to theatre after major resection	Proportion of people with bowel cancer who have an unplanned return to theatre within 30-days of their major resection between January and December 2023	Y	5 English NHS Trusts did not have sufficient completeness of risk adjustment variables to produce a risk-adjusted outcome	ACPGBI: Guidelines for the Management of Cancer of the Colon, Rectum and Anus (2017) – Surgical Management "Colorectal units should audit their leak rate for colorectal cancer surgery." QI aim: Improving perioperative care.
Adjusted 30-day unplanned readmission after major resection	Proportion of people with bowel cancer who have an emergency admission for any cause within 30-days of their major resection between January and December 2023	Y	5 English NHS Trusts did not have sufficient completeness of risk adjustment variables to produce a risk-adjusted outcome	Unplanned readmissions are regarded as a quality metric for surgical care. QI aim: Improving perioperative care.
Adjusted 18-month unclosed ileostomy after anterior resection	Proportion of people with rectal cancer who have an unclosed ileostomy 18-months after their anterior resection between April 2018 and March 2023	Y	5 English NHS Trusts did not have sufficient completeness of risk adjustment variables to produce a risk-adjusted outcome	ACPGBI: Guidelines for the Management of Cancer of the Colon, Rectum and Anus (2017) – Surgical Management "After low anterior resection, a temporary defunctioning stoma should be considered." "The permanent stoma rate following rectal cancer resection of colorectal units should be audited." QI aim: Improving perioperative care.

Indicator	Description	Risk Adjustment (Y/N)	Missingness Concern	Rationale for use
Severe acute toxicity after adjuvant chemotherapy for colon cancer	Proportion of people receiving adjuvant chemotherapy for stage III colon cancer with severe acute toxicity after surgery between 1 Apr 2021 and 31 Oct 2023	Y	2 English NHS Trusts did not have sufficient completeness of risk adjustment variables to produce a risk-adjusted outcome	Boyle JM, et al. Measuring variation in the quality of systemic anti-cancer therapy delivery across hospitals: A national population-based evaluation. Eur J Cancer. 2023 Jan;178:191-204. The delivery of adjuvant chemotherapy is a complex process which includes appropriate patient selection and optimisation, tailoring treatment doses, and the monitoring and management of toxicities. NBOCA have developed and evaluated the use of a national performance indicator to assess hospital variation in severe acute toxicity rates in order to stimulate and support quality improvement. QI aim: Improving oncological care.

Indicator	Description	Risk Adjustment (Y/N)	Missingness Concern	Rationale for use
Adjusted 2-year survival rate after major resection.	2-year survival rate after major resection between April 2021 and March 2022	Y	6 English NHS Trusts did not have sufficient completeness of risk adjustment variables to produce a risk-adjusted outcome	Shulman LN, et al. Survival As a Quality Metric of Cancer Care: Use of the National Cancer Data Base to Assess Hospital Performance. J Oncol Pract. 2018 Jan;14(1):e59-e72. "2-year all-cause mortality rate after major resection is an important quality metric of cancer care." QI aim: Improving oncological care.

7. National Oesophago-Gastric Cancer Audit (NOGCA)

Table A7.1: Details of the National Oesophago-Gastric Cancer Audit outlier process

Audit Name	**National Oesophago-Gastric Cancer Audit (NOGCA)**
Date last updated	10.06.2026 (v1.5)
Patient cohort	National Oesophago-Gastric Cancer Audit (NOGCA) State of the Nation Report September 2026 People diagnosed with OG cancer from 1 January 2022 to 31 December 2024 (3-year surgical cohort), England and Wales
Outliers publication	With State of the Nation report 10.09.2026
Positive outlier process	More than 3 SDs in a positive direction from the nation average
Negative outlier process	Alarms and repeat alerts
Repeat alerts definition	More than two SDs (but less than 3 SDs) in a negative direction from the nation average for three consecutive years of reporting
Any deviations from NATCAN Outlier Policy	N/A

Table A7.2: Details of the National Oesophago-Gastric Cancer Audit performance indicators used in outlier process

Indicator	**Description**	**Risk Adjustment (Y/N)**	**Missingness Concern**	**Rationale for use**
90-day survival after surgery with curative intent (adjusted)	Risk-adjusted proportion of people with OG cancer who survive at least 90-days after surgery	Y - age, sex, IMD quintile, stage, performance status, tumour site (C15 or C16), RCS Charlson Comorbidity Index, year of diagnosis	Missing values for stage, performance status and IMD quintile imputed using multiple imputation	Short-term postoperative survival can reflect quality of surgical and postoperative care

8. National Prostate Cancer Audit (NPCA)

Table A8.1: Details of the National Prostate Cancer Audit outlier process

Audit Name	**National Prostate Cancer Audit (NPCA)**
Date last updated	12.06.2026 (v1.3)
Patient cohort	National Prostate Cancer Audit (NPCA) State of the Nation Report 2026 Patients who received radical treatment between 1 September 2022 and 31 August 2023 in England and Wales and patients with metastatic disease who received SACT between 1 January and 31 December 2023 in England
Outliers publication	With State of the Nation report 08.10.2026
Negative outlier process	Alarms and repeat alerts
Repeat alerts definition	More than two SDs (but less than three SDs) in a negative direction from the national average for two of three consecutive years of reporting
Any deviations from NATCAN Outlier Policy	For the three complications indicators (GU after RP, GI after RT, GU after RT) trusts will not be regarded as outliers if they were also an outlier the previous year. This is because there is a two-year time lag in the treatment period used for the indicators, so any changes made a year ago will not be evident in the current indicator.

Table A8.2: Details of the National Prostate Cancer Audit performance indicators used in outlier process

Indicator	Description	Risk Adjustment (Y/N)	Missingness Concern	Rationale for use
Proportion of patients experiencing at least one GU complication requiring a procedural/surgical intervention within 2 years of radical prostatectomy	Proportion of patients experiencing at least one GU complication requiring a procedural/surgical intervention within 2 years of radical prostatectomy	Yes – age, risk score, co-morbidity (Charlson score) and deprivation (IMD quintile)	Patients with missing values for risk adjustment variables were allocated to a missing category for the respective variables	Measure of care received
Proportion of patients receiving a procedure of the large bowel and a diagnosis indicating radiation toxicity (GI complication) within 2 years of radical prostate radiotherapy	Proportion of patients receiving a procedure of the large bowel and a diagnosis indicating radiation toxicity (GI complication) within 2 years of radical prostate radiotherapy	Yes – age, risk score, co-morbidity (Charlson score) and deprivation (IMD quintile)	Patients with missing values for risk adjustment variables were allocated to a missing category for the respective variables	Measure of care received
Proportion of patients experiencing at least one GU complication requiring a procedural/surgical intervention within 2 years of radical prostate radiotherapy	Proportion of patients experiencing at least one GU complication requiring a procedural/surgical intervention within 2 years of radical prostate radiotherapy	Yes – age, risk score, co-morbidity (Charlson score) and deprivation (IMD quintile)	Patients with missing values for risk adjustment variables were allocated to a missing category for the respective variables	Measure of care received

9. National Lung Cancer Audit

Table A9.1: Details of the National Lung Cancer Audit outlier process

Audit name	National Lung Cancer Audit
Date last updated	09.06.2026 (v1.4)
Patient cohort	**England:** People diagnosed with Lung cancer between 1st January 2025 and 30th June 2025 **Wales:** People diagnosed with Lung cancer between 1st January 2025 and 31st December 2025
Outlier publication	With State of the Nation report 2027
Negative outlier process	Alarms and repeat alerts
Repeat alerts definition	More than two SDs (but less than 3 SDs) in a negative direction from the nation average for in two consecutive years The process for defining repeat alerts in two consecutive times periods is the organisation: • More than two SDs (but less than 3 SDs) in a negative direction from the nation average in the 2026 State of the Nation patient cohort (1st January 2024 to 30th June 2024). • More than two SDs (but less than 3 SDs) in a negative direction from the nation average using the data available for the 2027 State of the Nation report to define patient cohort (1st January 2024 to 31st December 2024). • More than two SDs (but less than 3 SDs) in a negative direction from the nation average using the data for 2025 analysed for the 2027 State of the Nation report (1st January 2025 to 30th June 2025).
Any deviations from NATCAN Outlier Policy	N/A

Table A9.2 Details of the National Lung Cancer Audit performance indicator used in outlier process

Indicator	Description	Risk Adjustment (Y/N)	Missingness concern	Rationale for use
One year survival	This indicator estimates the proportion of people diagnosed with lung cancer who are still	Y – age, sex, comorbidity, stage, performance	Missing data for risk adjustment variables are imputed by	Survival selected because it is an outcome indicator which (with risk adjustment)

	alive one year after their diagnosis.	status and tumour type.	chained equations.	provides a measure of the quality of care