30-day mortality after receiving Systemic Anti-Cancer Therapy (SACT),
England, 2015-2016 data release
Frequently Asked Questions (FAQs)

March 2019

Q1. How is crude 30-day mortality after receiving SACT calculated?

A1. The crude mortality rate is calculated by identifying the total number of patients who died within 30 days of receiving SACT, divided by the total number of patients receiving SACT:

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\text{Crude rate (\%) = } \frac{\text{Total number of deaths within 30 days of receiving SACT}}{\text{Total number of patients receiving SACT}} \times 100
\]

So for example, if there are 100 breast patients treated at your trust in 2015, and 5 died within 30 days of their latest SACT administration, the crude mortality rate is 5/100, i.e. 5%.

Q2. How were the tumour groups chosen for inclusion in the workbook and why aren’t more tumour groups shown?

A2. In this workbook, we have evaluated “All adults” which includes all cancers excluding non-melanoma skin cancer. We have also generated data for a selection of tumour groups (AML, breast, colon, CTYA, SCLC, NSCLC and upper-GI OG) treated typically by SACT.

One of the aims of this workbook was to develop appropriate methodologies for a routine data feed and so we have initially included a limited number of tumour groups. This means we can establish the best approach in a more defined cohort and determine the value of this work to inform clinical practice before extending the data analysis to a wider range of tumours.

The tumour groups selected for the workbook reflect advice from the project clinical advisors. They are designed to address clinical need and help establish analytical
principles. For example, AML and CTYA groups were included to understand if non-solid, rare tumours introduced any additional complexity and challenges when analysing and reporting.

Q3. How can I access mortality data for tumour groups not presented separately in the workbook?

A3. Although only a selection of tumour groups is evaluated separately, the ‘All adults’ group contains details of all tumour groups (excluding non-melanoma skin cancer). This includes patients from the tumour groups which have been presented separately, e.g. NSCLC, and all other tumour groups which have not been presented separately, e.g. melanoma.

If trusts request the data for patient deaths in the ‘All adults’ categories, you will receive details of patients who died within 30 days of receiving SACT for all cancer diagnoses.

Q4. Why is the report based on 2015-2016 data?

A4. In this report, records of systemic anti-cancer therapy (SACT), submitted by NHS trusts in England to the SACT dataset are linked to cancer registrations using:

- NHS number
- Date of birth
- Postcode
- Gender
- Tumour sites (coded in ICD10 and morphology codes)
- Event dates (Cancer registry database: date of diagnosis, treatment dates; SACT dataset: start date of regimen or start date of SACT cycle)

The annual cohorts are defined as follows:

- 2015 cohort = patients diagnosed with cancer in England between 2010 and 2015 (inclusive) who had SACT regimens recorded in 2015.
- 2016 cohort = patients diagnosed with cancer in England between 2010 and 2016 (inclusive) who had SACT regimens recorded in 2016.

The latest cancer registry data available (as of December 2018) is to the end of 2016. Cancer registration is a complex process which involves many stages of quality control checks. This process takes time, and therefore the data is not
available until at least one year after clinical activity. Cancer registration data to the end of 2017 will be complete in February 2019.

Q5. Which dates are used to calculate the 30-day mortality?

A5. We identified the latest date from the following fields in the SACT database:
- Start date of cycle
- Start date of regimen

We calculated whether the patient had died within 30 days of this date. To find out more about definition of the 30-day period, please read:
- For better, for worse? A review of the care of patients who died within 30 days of receiving systemic anti-cancer therapy
- 30-day mortality after systemic anticancer treatment for breast and lung cancer in England: a population-based, observational study

Q6. Where do the dates of death come from?

A6. The dates of death come from the Office for National Statistics via NHS Digital’s Demographics Batch Service Bureau

Q7. I have received the data for those patients who died within 30 days, but there is one patient listed who is still alive. Please can we check this?

A7. Please send the patient details including NHS number, date of birth, name and address to the SACT Helpdesk via the secure file system and highlight the nature of the query. We will then check whether the NHS number and patient details match, and if so where the death is recorded. The dates of death used in the analysis come from the Office of National Statistics via NHS Digital’s Demographics Batch Service Bureau.

Q8. How do I interpret the funnel plot?

A8. A funnel plot is a means of visualising 30-day mortality rates post-SACT for all the trusts in England.
The volume of patients is on the horizontal axis. The more patients treated by your trust, the further to the right your trust will be.

The 30-day mortality post-SACT is on the vertical axis. The higher the mortality rate at your trust, the further up the graph it will appear.

The solid purple horizontal line shows the average mortality rate of all trusts.

Your trust is indicated by the green spot, other trusts are represented by the blue circles.

The orange lines represent the ±2 standard deviations (SDs) (roughly equivalent to 95% confidence intervals); the red lines represent the ±3 standard deviations (SDs) (roughly equivalent to 99.8% confidence intervals). They are higher on the left because when a trust treats a smaller number of patients, chance will have a greater impact on the rate, and therefore the confidence intervals will be wider to reflect this.

**Q9. What do the confidence intervals mean?**

A9. The confidence intervals reflect the distribution of trust mortality rates around the national average. The workbook highlights the mortality rates for ±2 standard deviations (SDs) (roughly equivalent to 95% confidence intervals) and ±3 standard deviations (SDs) (roughly equivalent to 99.8% confidence intervals).

- Trusts with rates above the upper, +3SD have a significantly higher than average 30-day post-SACT mortality rate.
- Trusts with rates below the lower, −3SD have a significantly lower than average 30-day post-SACT mortality rate.
- Trusts with rates within the confidence limits have an average 30-day post-SACT mortality rate.

**Q10. What is the expected mortality rate for these cancer diagnoses?**

A10. There is no expected mortality rate – the funnel plot presents the average mortality rate of all the trusts combined. There is also no ‘target’ mortality rate for these conditions. It is acknowledged that many of these drugs have a narrow therapeutic index, and that a certain level of risk needs to be accepted when prescribing these drugs.

Generally, lower rates are better as they reflect that in curative settings, complications are being identified and managed rapidly. In palliative settings they reflect that the clinician is aware when the patient is in the final stages of their
disease, and discuss with the patient whether other non-SACT treatment options are more appropriate.

However, persistently very low mortality or zero mortality rates may be indicative of a risk averse approach to prescribing, whereby patients who may potentially have benefitted from SACT are not receiving this treatment. Trusts who have persistently very low mortality or zero mortality rates may want to consider auditing their clinical practice for this reason.

Q11. Is my trust an outlier?

A11. Trusts are not being identified as outliers in this report. A high 30-day mortality rate is not indicative of poor clinical practice. This is because the report is not case-mix adjusted, and does not account for how sick patients are at different trusts and how this may impact results (i.e. it does not take performance status, co-morbidities etc. into account). The rates are designed to support case review and not act as a quality indicator. We recommend that they act as a trigger for case review and action for improvement if required. We suggest that data is used to support morbidity and mortality meetings as proposed by the UK Chemotherapy Board.

Q12. Can my trust access the underlying patient data for this report?

A12. You can request the NHS numbers for patients who died at your trust within 30 days of receiving SACT. To request this information please contact the SACT Helpdesk (SACT@phe.gov.uk).

Q13. I have the extract of patient data for those patients who died within 30 days, but can I request the patient data for the denominator group?

A13. No, only the details of those patients who died within 30 days are available. We conducted a Privacy Impact Assessment before starting this project to ensure patient confidentiality was maintained when sharing patient identifiable information. The Privacy Impact Assessment only allows us to share patient information to meet the aims of this project, i.e. supporting NHS trusts to review any patient deaths within 30 days of SACT.
We will assess whether it is possible to share NHS numbers for the denominator group in future versions of the workbook.

**Q14. Please can we have the GMC code for each responsible consultant so each consultant can review their own data?**

**A14.** No, only the NHS numbers of those patients who died within 30 days are available. This is because the Privacy Impact Assessment only allows us to share patient information in line with the aims of this project, i.e. supporting NHS trusts to review any patient deaths within 30 days of receiving SACT.

We will assess whether it is possible to share GMC code in future versions of the workbook.

**Q15. We think the data which has been submitted for our trust is incorrect – can we correct this?**

**A15.** No, we will not accept data re-submission, corrections or re-run the report. The report is a snapshot of the data at the present time. However, if you have identified errors in the data submitted to SACT we recommend that you make changes in your current practice to reduce such errors going forward.

**Q16. In our trust we treat many older patients with multiple co-morbidities – is the report adjusted to reflect this?**

**A16.** The patient groups are split by age, so your older patients (aged ≥70) will only be compared to other older patients. However, this report is not risk-adjusted for case-mix. Case mix, for example disease stage, other co-morbid conditions and patient performance status will have an important influence on outcomes and this should be considered when interpreting the results.

**Q17. We only treat palliative patients – will this affect our mortality rate?**

**A17.** The patient groups are split by intent of treatment, so your palliative patients will only be compared to other palliative patients. If the intent of treatment information
has not been provided, these patients will appear under treatment intent ‘not assigned’.

Q18. How can we compare our results with other trusts if it is not case-mix adjusted?

A18. The main purpose of this workbook is to highlight which patients died within 30 days of receiving SACT. This is designed to prompt clinical case note review and allow trusts to confirm that any complications were handled appropriately, that the best clinical decisions were made and that the patient was given the opportunity to contribute to these decisions.

Because of the lack of case mix adjustment, comparisons between other trusts are ‘indicative’ only. For example, if there is a trust which treats patients with a similar socio-economic, ethnicity and age profile it may be informative to compare results between trusts. It is unlikely to be useful to compare your results to a trust in a very different area which treats patients with a very different profile.

Q19. Some of the treatments we use are not harmful to patients at the end of life, for example anti-emetics. Are these treatments included in the report?

A19. Non-harmful, supportive treatments, hormones and non-chemo drugs are excluded from the report.

Q20. We treat very small numbers of patients for certain disease groups. Will this make a difference?

A20. If you only treat small numbers of patients and one dies within 30 days, your crude mortality rate will be higher. However, the funnel plot structure may account for this as the confidence limits will be wider for trusts treating a smaller number of patients.

Q21. Our patients are often treated for several years – would they appear more than once in the report?
A21. If a patient was treated in 2015 they will appear in this report in the total number of patients receiving SACT for 2015; if they did not die in 2015 and continued being treated in 2016 they will appear in the total number of patients receiving SACT for 2016.

Q22. We share care with another trust, will these patients appear twice?

A22. No, patients will only be counted under the trust from which they received their latest treatment.

Q23. Are patients from the previous mortality report included in this report as well?

A23. The previous mortality report presented 30-day mortality post-SACT for 2014. Patients who were treated in 2014 and continued being treated in 2015 will appear in this report in the total number of patients receiving SACT for 2015; if they did not die and continued being treated in 2016 they will appear in the total number of patients receiving SACT for 2016.

Q24. Does this report only look at patients who died?

A24. No, this report looks at the number of patients who died out of all of the patients who were treated with SACT. The total number of patients who were treated with SACT in a year will consist of patients who died within 30 days of their last SACT treatment, patients who died more than 30 days after their last SACT treatment and patients who are still alive. This report does do not look at any other outcomes, such as toxicity or admission to hospital.

Q25. Does the report exclude deaths that were within 30 days but were from causes unrelated to the patient’s cancer?

A25. No, it includes all deaths.
Q26. **Can I compare 2015 to 2016 rates?**

A26. We have adopted the two-proportions z-test to determine whether mortality rates change between 2015 and 2016 (based on the 95% confidence intervals ($\alpha=0.05$)). The results of the test are as follows:

- $|Z| \geq 1.96$
  - ‘**Decreased**’ if the crude rate of 2016 < the crude rate of 2015
  - ‘**Increased**’ if the crude rate of 2016 > the crude rate of 2015
- $-1.96 < Z < 1.96$
  - ‘Change not statistically significant’
- Number of patients who died within 30 days of receiving SACT AND number of patients who did not die within 30 days of receiving SACT in both 2015 and 2016 < 5
  - ‘Numbers too small for z-test’

Q27. **Why has the treatment intent for SCLC changed in different versions of the workbook?**

A27. In the workbook treatment intent was reassigned to “palliative” for all patients. This was because clinical advice indicated that SCLC should not be generally considered a disease that is curable.

Following trust comments on the workbook, we have reverted the data to treatment intent as submitted to the SACT dataset. Treatment intent is now consistent with all other tumour groups (Curative, Palliative, Intent not assigned, All intent).

Q28. **Why does the data in the workbook differ from our trust monthly SACT submissions for the same period?**

A28. The SACT data used in the workbook has been linked to the Cancer Registry Database to provide accurate diagnosis and morphology codes. This may result in patients being reassigned to different tumour groups, based on registry data, or excluded due to an inability to accurately link the patient’s tumour in the two datasets.

If you have any other questions please contact the SACT Helpdesk
(SACT@phe.gov.uk)