

# The number and proportion of cancer patients receiving drugs Cancer Research UK helped to develop

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# About this document

## Reference

This report should be referred to as follows:

Cancer Research UK – National Disease Registration Service partnership. The number and proportion of cancer patients receiving drugs Cancer Research UK helped to develop, by cancer site, 2015 to 2023.

## Authors

Kirstin Roberts, Martina Slapkova, Fahmina Fardus-Reid, Lucy Ironmonger for the Cancer Intelligence Team at Cancer Research UK.

## Acknowledgements

We would like to thank the Research Intelligence team at CRUK for their time and expertise in evaluating a large number of SACT drugs to determine whether CRUK was involved in their development.

This work uses data that has been provided by patients and collected by the NHS as part of their care and support. The data are sourced from NHS England and collated, maintained and quality assured by the National Disease Registration Service, which is part of NHS England.

## About Cancer Research UK

We're the world's leading cancer charity dedicated to saving and improving lives through research. We fund research into the prevention, detection and treatment of more than 200 types of cancer through the work of over 4,000 scientists, doctors and nurses. In the last 50 years, we've helped double cancer survival in the UK and our research has played a role in more than half of the world's essential cancer drugs. Our vision is a world where everybody lives longer, better lives, free from the fear of cancer.



Cancer Research UK is a registered charity England and Wales (1089464), Scotland (SC041666), the Isle of Man (1103) and Jersey (247).

# Abstract and key insights

Cancer Research UK funded research has made substantial contributions to the development of many of the systemic anti-cancer therapies (SACT) in use today.

The SACT dataset from the National Disease Registration Service provides the opportunity to calculate the number and proportion of patients in England who received a drug that CRUK has helped to develop. This helps us to understand the scale of the impact CRUK funded research has.

A key strength of this analysis is use of the SACT dataset, as it captures SACT information from all NHS trusts in England. However, the dataset used does not cover SACT drugs delivered in primary care, or outside of England, which could lead to an underestimation of the number of patients treated with a drug that CRUK has helped to develop. Despite this the results still give an understanding of the impact of CRUK's research into SACT.

The analysis assesses the top three SACT drugs used to treat patients in each year up to 2023 and by cancer site, which enabled us to describe trends in SACT use over time. For certain sites the results have been extrapolated from England to the UK. The report presents by site data on breast, bowel, lung, prostate and skin cancer. Analyses on other cancer sites are available, and these results can be discussed with Cancer Intelligence ([cancerintelligence@cancer.org.uk](mailto:cancerintelligence@cancer.org.uk)).

## **Key impact statements:**

- Drugs linked to Cancer Research UK's research are used to treat more than 140,000 cancer patients in the UK every year. This means 8 in 10 patients prescribed cancer drugs receive at least one drug that CRUK has helped to develop.
- Drugs linked to Cancer Research UK's research are used to treat more than 3,300 children and young people with cancer every year in the UK. This means more than 9 in 10 children and young people prescribed cancer drugs receive at least one drug that CRUK has helped to develop.
- Drugs linked to Cancer Research UK's research are used to treat more than 13,900 lung cancer patients in the UK every year. This means more than 8 in 10 lung cancer patients prescribed cancer drugs receive at least one drug that CRUK has helped to develop.

# Introduction

There is a long history of attempts to treat cancer systemically, with the use of chemicals to treat cancer proposed at the turn of the 20<sup>th</sup> century [1, 2, 3]. The use of systemic anti-cancer therapy (SACT) has developed continuously in the years since, leading to the range of SACTs available today, from chemotherapy to hormone treatments, targeted therapies, and immunotherapy [4]. These treatments have not only extended survival but also improved the quality of life for people with cancer. Overall, 29.8% of cancer diagnoses were treated with SACT in 2022 [5].

Many of the discoveries that led to today's SACT have been funded by Cancer Research UK (CRUK) or its predecessor organisations, the Cancer Research Campaign and Imperial Cancer Research Fund. As part of a reflection on the impact of these organisations, the Cancer Intelligence team at CRUK has previously published analysis that determined the role of CRUK-funded science in the development of SACT in use in 2019 [6].

This study builds on the previous work, now providing detailed cancer site breakdowns, and showing trends over time, from 2015 to 2023. This report provides an assessment of the contribution made by CRUK to the development of SACT drugs and enabled us to understand their use for cancer patients in England and visualise trends over time in the top three SACT drugs for each cancer site.

## Aims and objectives

1. Calculate the number and percentage of patients receiving SACT who receive at least one drug contributed to by CRUK, from 2015 to 2023 in England. Figures for all cancers and larger cancer sites will be extrapolated from England data to provide estimates for the UK.
2. Summarise the number of patients receiving each individual SACT drug, for all cancers and by cancer site, from 2015 to 2023.
3. Summarise the number of children and young people receiving each individual SACT drug, for all cancers, from 2015 to 2023.
4. Identify the top three SACT drugs used in each year, for all cancers and by cancer site.

# Methods

## **Defining CRUK's role in each SACT drug**

The determination of whether CRUK had contributed to a drug was carried out by the Research Intelligence team within CRUK. Their work created a list of cancer drugs from several sources<sup>1</sup> and carried out literature reviews to identify the origin for each individual drug. The role of CRUK was assessed as 'significant', 'helped' or 'no known role' at three different stages; underpinning research, drug discovery and clinical trials, with these classifications forming the basis of the overall assessment of whether CRUK contributed significantly, helped or played no known role in the development of the drug. Classifications were validated based on discussions with experts, and between members of the project working group.

## **Data sources**

Data for the project was taken from the National Disease Registration Service's SACT dataset which captures prescribing information of SACT in secondary and tertiary care (e.g. hospitals and specialist care centres) in England. However, the SACT database does not cover primary care (e.g. GP) prescriptions and so drugs that are often delivered in these settings such as hormone therapy are likely to be undercounted in this analysis [7].

## **Analysis**

SACT data was extracted for all regimens starting between 2015 and 2023 which were prescribed for a tumour with ICD10 site codes between C00–C97 and D00–D49. In the cohort, year was defined as the year the SACT regimen started. The SACT primary diagnosis variable was used to create three broad all cancer site flags, defined as: all C codes; all C codes excluding C44 (non-melanoma skin cancer [NMSC]); and all C and D codes. Additional broad cancer sites were defined to match the top twenty most common cancer sites on average across 2018, 2019 and 2021 in England, alongside kidney cancer restricted to ICD-10 C64, testicular cancer and non-melanoma skin cancer, as detailed in Appendix 1 [8].

The list of SACT drugs contributed to by CRUK was used to assess whether each patient was prescribed any regimen containing a drug contributed to by CRUK. Alternative names for each drug were also considered to be a match. Appendix 2

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<sup>1</sup> Sources included top 30 prescribed drugs in the SACT dataset, the WHO list of essential medicines, CRUK's About Cancer website, Great Ormond Street's list of cancer medicines for children, discussions with oncologists and patient involvement nurse specialists

details the list of drugs included.

This data was analysed to calculate the number and percentages of patients receiving SACT contributed to by CRUK. This was repeated for a subset of the cohort for children and young persons, defined as those who were aged under 25 at the end of each year.

The number of patients treated with each SACT drug, and the top 3 drugs prescribed in each year, by cancer site, were also calculated. SACT drugs were flagged if they were part of the set of drugs that CRUK research had played a role in developing.

Where a large number of patients were recorded, either for all-cancers or by cancer site, we have extrapolated results from England to the UK, making the assumption that these drugs were prescribed in a similar way across Wales, Scotland and Northern Ireland. Some of the statements involved simply using the wording 'more than' for the UK, which indicated that the UK figure would be at least as large as the England data.

# Results

## CRUK contribution to SACT drugs

In England there were 184,510 patients prescribed a SACT drug in 2023 and of these patients 147,160 (80%) were prescribed at least one drug that CRUK had a role in developing. 121,540 (66%) patients were prescribed at least one drug that CRUK played a significant role in developing.

Among children and young people, 3,310 (91%) were prescribed at least one drug that CRUK had a role in developing. 2,450 (68%) of children and young people were prescribed at least one drug that CRUK played a significant role in developing.

**Table 1: SACT drug prescription Jan 2023 – Dec 2023 in England and the role of Cancer Research UK funded science, excluding primary care**

|                                      | Patients prescribed any SACT drug in 2023 | Patients prescribed at least one SACT drug in 2023 that CRUK significantly contributed to developing |     | Patients prescribed at least one SACT drug in 2023 that CRUK significantly contributed to or helped to develop |     |
|--------------------------------------|-------------------------------------------|------------------------------------------------------------------------------------------------------|-----|----------------------------------------------------------------------------------------------------------------|-----|
|                                      |                                           | Number                                                                                               | %   | Number                                                                                                         | %   |
| All cancers combined, excluding NMSC | 184,510                                   | 121,540                                                                                              | 66% | 147,160                                                                                                        | 80% |
| Cancer in children and young people  | 3,620                                     | 2,450                                                                                                | 68% | 3,310                                                                                                          | 91% |

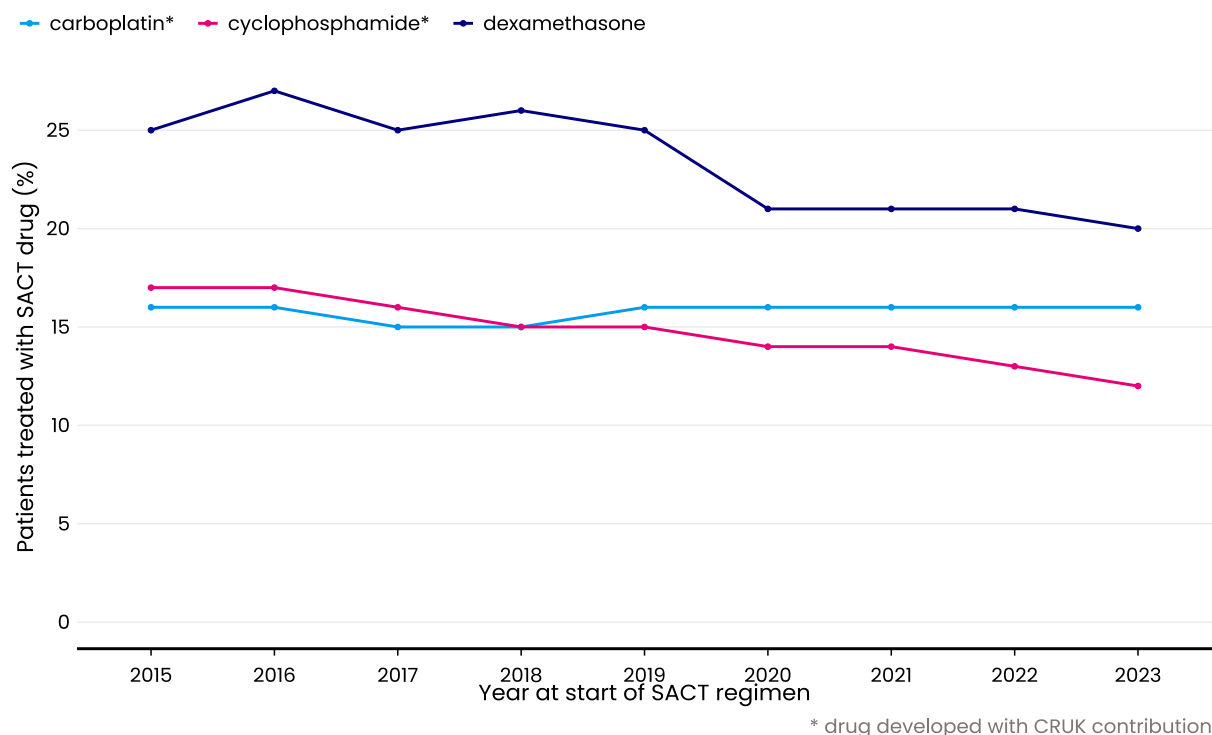
### Key impact statements:

- Drugs linked to Cancer Research UK's research are used to treat more than 140,000 cancer patients in the UK every year. This means 8 in 10 patients prescribed cancer drugs receive at least one drug that CRUK has helped to develop.
- Drugs linked to Cancer Research UK's research are used to treat more than 3,300 children and young people with cancer every year in the UK. This means more than 9 in 10 children and young people prescribed cancer drugs receive at least one drug that CRUK has helped to develop.
- Drugs linked to Cancer Research UK's research are used to treat more than 13,900 lung cancer patients in the UK every year. This means more than 8 in 10 lung cancer patients prescribed cancer drugs receive at least one drug that CRUK has helped to develop.

# Trends in top three SACT regimens over time

## All cancers

**Figure 1: Trends in top three SACT regimens over time, 2015 to 2023 in England: all cancers, excluding non-melanoma skin cancer**



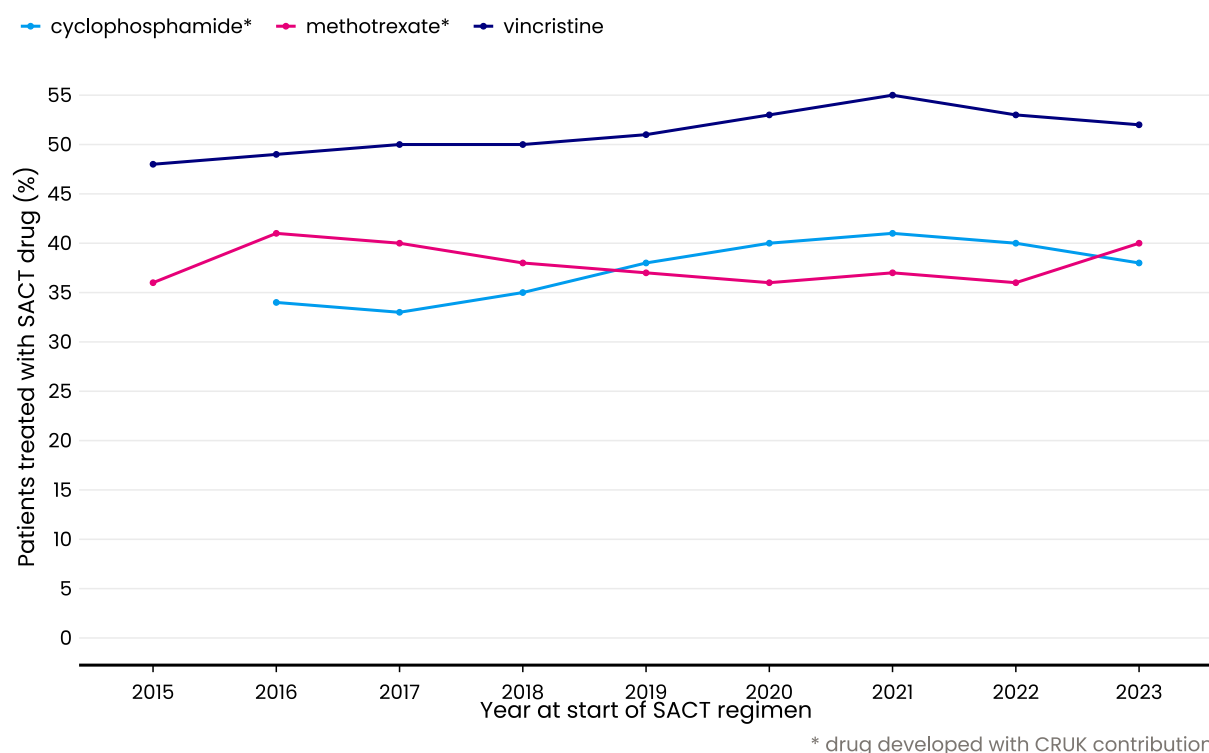
**Table 2: Number and proportion of patients treated with a top three SACT regimen, over time, from 2015 to 2023 in England: all cancers, excluding non-melanoma skin cancer**

| Drug name         | 2015<br>N (%)  | 2016<br>N (%)  | 2017<br>N (%)  | 2018<br>N (%)  | 2019<br>N (%)  | 2020<br>N (%)  | 2021<br>N (%)  | 2022<br>N (%)  | 2023<br>N (%) |
|-------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|---------------|
| dexamethasone     | 30,460<br>(25) | 35,820<br>(27) | 37,640<br>(25) | 41,130<br>(26) | 42,040<br>(25) | 33,720<br>(21) | 36,160<br>(21) | 36,450<br>(21) | 36,100 (20)   |
| cyclophosphamide* | 21,060<br>(17) | 22,760<br>(17) | 23,930<br>(16) | 24,230<br>(15) | 24,510<br>(15) | 21,680<br>(14) | 23,370<br>(14) | 23,300<br>(13) | 22,600 (12)   |
| carboplatin*      | 20,200<br>(16) | 21,290<br>(16) | 22,470<br>(15) | 23,430<br>(15) | 26,010<br>(16) | 24,560<br>(16) | 26,730<br>(16) | 28,330<br>(16) | 29,070 (16)   |

\* drug developed with CRUK contribution

Across all years, dexamethasone was the SACT drug used to treat the highest proportion of patients for all cancers, excluding non-melanoma skin cancer. CRUK was not involved in developing dexamethasone. Cyclophosphamide had the second highest treatment proportion between 2015 and 2017, overtaken by carboplatin between 2019 and 2023.

**Figure 2: Trends in top three SACT regimens over time for children and young persons, 2015 to 2023 in England: all cancers, excluding non-melanoma skin cancer**



**Table 3: Number and proportion of children and young people treated with a top three SACT regimen, over time, from 2015 to 2023 in England: all cancers, excluding non-melanoma skin cancer**

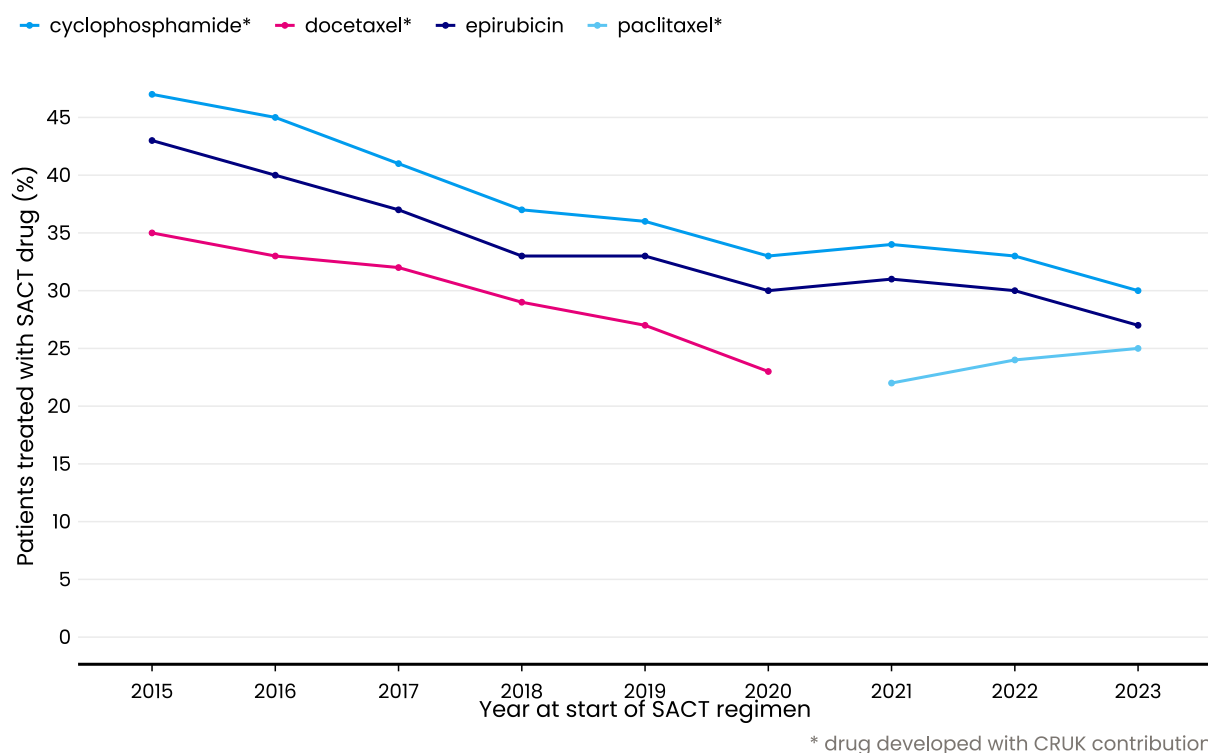
| Drug name         | 2015<br>N (%) | 2016<br>N (%) | 2017<br>N (%) | 2018<br>N (%) | 2019<br>N (%) | 2020<br>N (%) | 2021<br>N (%) | 2022<br>N (%) | 2023<br>N (%) |
|-------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| vincristine       | 1,070<br>(48) | 1,250<br>(49) | 1,520<br>(50) | 1,710<br>(50) | 1,680<br>(51) | 1,820<br>(53) | 1,890<br>(55) | 1,920<br>(53) | 1,870 (52)    |
| methotrexate*     | 800<br>(36)   | 1,040<br>(41) | 1,230<br>(40) | 1,310<br>(38) | 1,210<br>(37) | 1,230<br>(36) | 1,270<br>(37) | 1,290<br>(36) | 1,430 (40)    |
| cyclophosphamide* |               | 850<br>(34)   | 1,020<br>(33) | 1,210<br>(35) | 1,260<br>(38) | 1,360<br>(40) | 1,410<br>(41) | 1,450<br>(40) | 1,360 (38)    |

\* drug developed with CRUK contribution

Vincristine was used to treat the highest proportion of children and young people with any malignant cancer, excluding non-melanoma skin cancer. Methotrexate and cyclophosphamide fluctuated between the second and third highest SACT regimens from 2016.

## By cancer site

**Figure 3: Trends in top three SACT regimens over time, 2015 to 2023 in England: breast cancer**



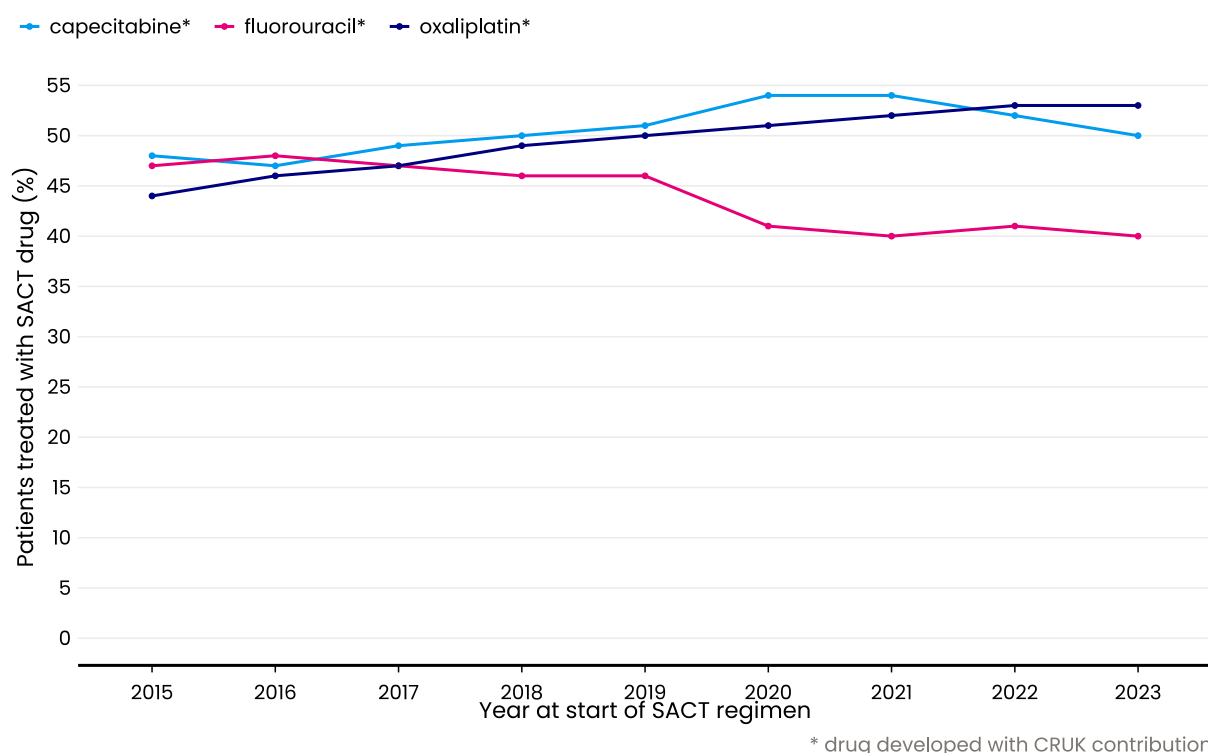
**Table 4: Number and proportion of patients treated with a top three SACT regimen, over time, from 2015 to 2023 in England: breast cancer**

| Drug name         | 2015<br>N (%)  | 2016<br>N (%)  | 2017<br>N (%)  | 2018<br>N (%)  | 2019<br>N (%)  | 2020<br>N (%)  | 2021<br>N (%)  | 2022<br>N (%)  | 2023<br>N (%) |
|-------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|---------------|
| cyclophosphamide* | 11,640<br>(47) | 12,220<br>(45) | 12,130<br>(41) | 11,650<br>(37) | 12,000<br>(36) | 10,360<br>(33) | 11,680<br>(34) | 11,350<br>(33) | 10,770 (30)   |
| epirubicin        | 10,620<br>(43) | 10,960<br>(40) | 11,050<br>(37) | 10,470<br>(33) | 10,920<br>(33) | 9,400<br>(30)  | 10,550<br>(31) | 10,360<br>(30) | 9,660 (27)    |
| paclitaxel*       |                |                |                |                |                |                | 7,610<br>(22)  | 8,420<br>(24)  | 8,880 (25)    |
| docetaxel*        | 8,780<br>(35)  | 9,090<br>(33)  | 9,660<br>(32)  | 9,200<br>(29)  | 8,780<br>(27)  | 7,120<br>(23)  |                |                |               |

\* drug developed with CRUK contribution

Cyclophosphamide and epirubicin were consistently used to treat the highest and second highest proportion of patients for breast cancer, respectively. The drug used to treat the third highest proportion of patient was docetaxel from 2015 to 2020, then paclitaxel from 2021.

**Figure 4: Trends in top three SACT regimens over time, 2015 to 2023 in England: bowel cancer**



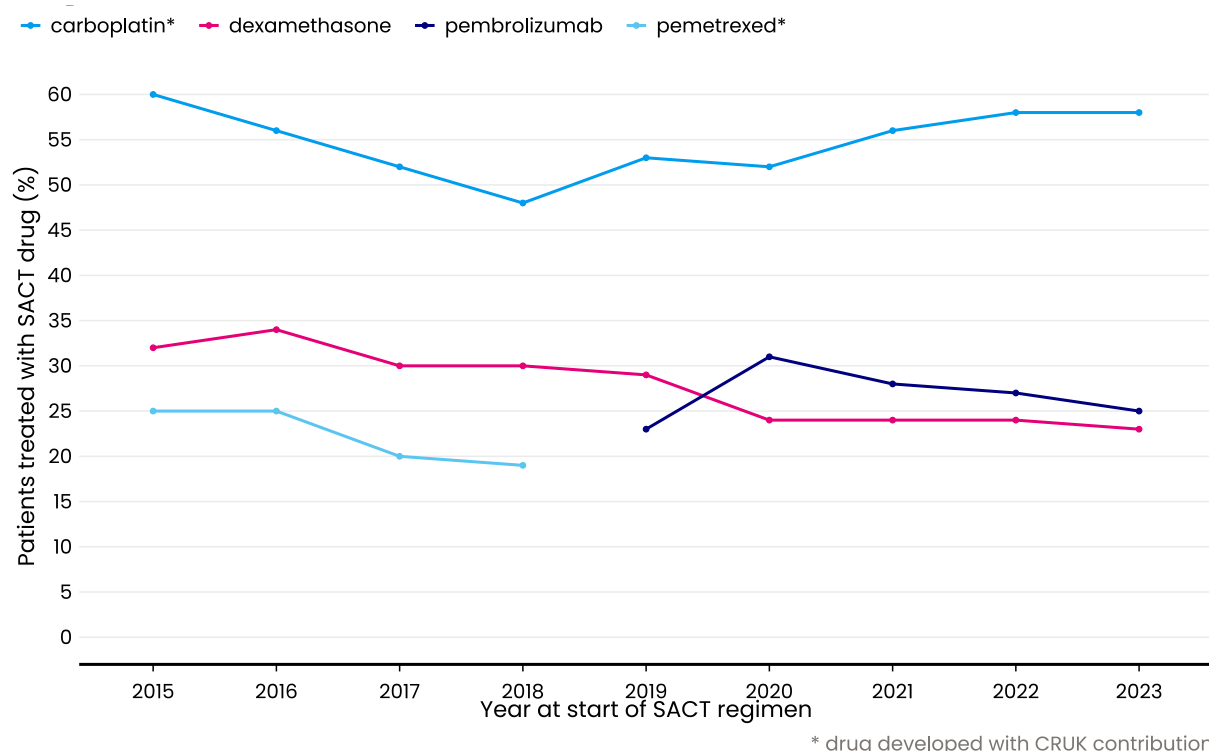
**Table 5: Number and proportion of patients treated with a top three SACT regimen, over time, from 2015 to 2023 in England: bowel cancer**

| Drug name     | 2015<br>N (%) | 2016<br>N (%) | 2017<br>N (%) | 2018<br>N (%) | 2019<br>N (%) | 2020<br>N (%) | 2021<br>N (%)  | 2022<br>N (%)  | 2023<br>N (%) |
|---------------|---------------|---------------|---------------|---------------|---------------|---------------|----------------|----------------|---------------|
| oxaliplatin*  | 7,040<br>(44) | 7,720<br>(46) | 8,350<br>(47) | 9,060<br>(49) | 9,500<br>(50) | 8,840<br>(51) | 10,760<br>(52) | 10,800<br>(53) | 11,260 (53)   |
| capecitabine* | 7,630<br>(48) | 7,830<br>(47) | 8,580<br>(49) | 9,300<br>(50) | 9,590<br>(51) | 9,460<br>(54) | 11,160<br>(54) | 10,530<br>(52) | 10,720 (50)   |
| fluorouracil* | 7,400<br>(47) | 8,030<br>(48) | 8,350<br>(47) | 8,520<br>(46) | 8,670<br>(46) | 7,240<br>(41) | 8,290<br>(40)  | 8,300<br>(41)  | 8,560 (40)    |

\* drug developed with CRUK contribution

There was an increase in the proportion of patients treated for bowel cancer with oxaliplatin from 44% to 53% from 2015 to 2023. The proportion treated with capecitabine increased to 54% in 2020 and 2021, then decreased to 50% in 2023. The proportion treated with fluorouracil decreased over time from 47% to 40%.

**Figure 5: Trends in top three SACT regimens over time, 2015 to 2023 in England: lung cancer**



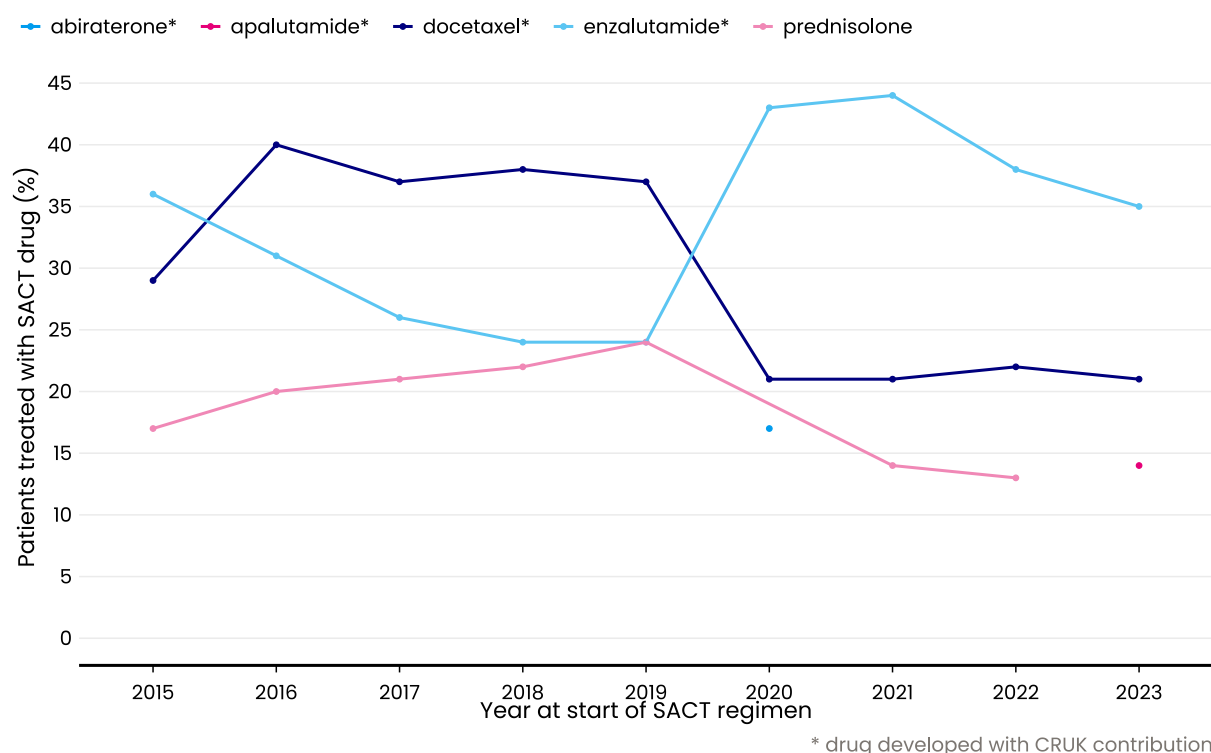
**Table 6: Number and proportion of patients treated with a top three SACT regimen, over time, from 2015 to 2023 in England: lung cancer**

| Drug name     | 2015<br>N (%) | 2016<br>N (%) | 2017<br>N (%) | 2018<br>N (%) | 2019<br>N (%) | 2020<br>N (%) | 2021<br>N (%) | 2022<br>N (%) | 2023<br>N (%) |
|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| carboplatin*  | 7,930<br>(60) | 7,880<br>(56) | 7,890<br>(52) | 7,710<br>(48) | 8,950<br>(53) | 7,910<br>(52) | 8,750<br>(56) | 9,320<br>(58) | 9,800 (58)    |
| pembrolizumab |               |               |               |               | 3,910<br>(23) | 4,650<br>(31) | 4,410<br>(28) | 4,310<br>(27) | 4,270 (25)    |
| dexamethasone | 4,190<br>(32) | 4,810<br>(34) | 4,580<br>(30) | 4,840<br>(30) | 4,810<br>(29) | 3,560<br>(24) | 3,700<br>(24) | 3,780<br>(24) | 3,980 (23)    |
| pemetrexed*   | 3,280<br>(25) | 3,500<br>(25) | 3,130<br>(20) | 3,060<br>(19) |               |               |               |               |               |

\* drug developed with CRUK contribution

Carboplatin was used to treat the highest proportion of patients for lung cancer from 2015 to 2023, ranging from 48 to 60% of patients. Dexamethasone was the drug used to treat the second highest proportion of patients until 2020, where the proportion of patients treated with pembrolizumab was higher.

**Figure 6: Trends in top three SACT regimens over time, 2015 to 2023 in England: prostate cancer**



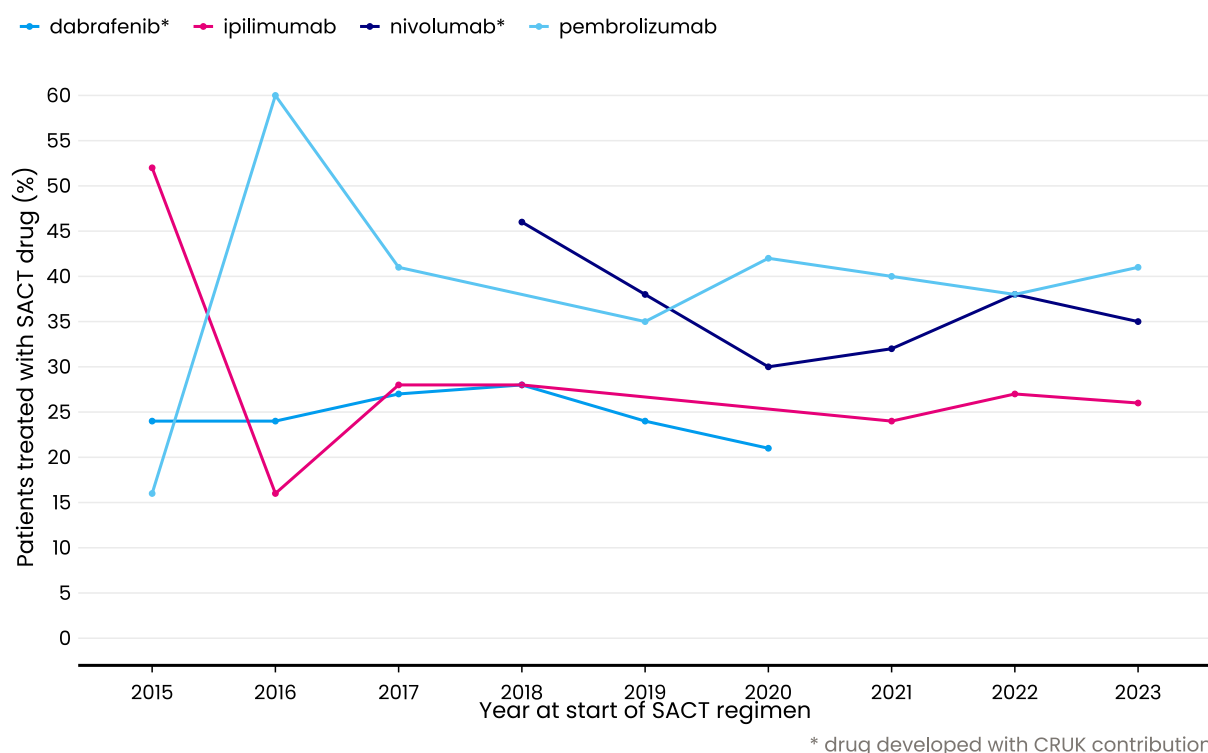
**Table 7: Number and proportion of patients treated with a top three SACT regimen, over time, from 2015 to 2023 in England: prostate cancer**

| Drug name     | 2015<br>N (%) | 2016<br>N (%) | 2017<br>N (%) | 2018<br>N (%) | 2019<br>N (%) | 2020<br>N (%) | 2021<br>N (%) | 2022<br>N (%) | 2023<br>N (%) |
|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| enzalutamide* | 2,550<br>(36) | 2,820<br>(31) | 2,820<br>(26) | 3,020<br>(24) | 2,990<br>(24) | 5,360<br>(43) | 6,330<br>(44) | 5,470<br>(38) | 5,440 (35)    |
| docetaxel*    | 2,040<br>(29) | 3,690<br>(40) | 4,040<br>(37) | 4,710<br>(38) | 4,620<br>(37) | 2,620<br>(21) | 3,000<br>(21) | 3,150<br>(22) | 3,280 (21)    |
| apalutamide*  |               |               |               |               |               |               |               |               | 2,170 (14)    |
| prednisolone  | 1,200<br>(17) | 1,820<br>(20) | 2,230<br>(21) | 2,680<br>(22) | 2,920<br>(24) |               | 2,060<br>(14) | 1,850<br>(13) |               |
| abiraterone*  |               |               |               |               |               | 2,170<br>(17) |               |               |               |

\* drug developed with CRUK contribution

Use of enzalutamide to treat patients with prostate cancer decreased from 2015 to 2019 from 36% to 24% of patients, increasing by 19 percentage points in 2020. The inverse pattern was seen for docetaxel, where the proportion of patients treated with the drug was consistent from 2016 to 2019, and decreased by 16 percentage points in 2020. Prednisolone treated the third highest proportion of patients, except for 2020 and 2023 where abiraterone and apalutamide use increased.

**Figure 7: Trends in top three SACT regimens over time, 2015 to 2023 in England: skin cancer**



**Table 8: Number and proportion of patients treated with a top three SACT regimen, over time, from 2015 to 2023 in England: skin cancer**

| Drug name     | 2015<br>N (%) | 2016<br>N (%) | 2017<br>N (%) | 2018<br>N (%) | 2019<br>N (%) | 2020<br>N (%) | 2021<br>N (%) | 2022<br>N (%) | 2023<br>N (%) |
|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| pembrolizumab | 260<br>(16)   | 1,280<br>(60) | 900<br>(41)   |               | 1,370<br>(35) | 1,640<br>(42) | 1,560<br>(40) | 1,560<br>(38) | 1,850 (41)    |
| nivolumab*    |               |               |               | 1,300<br>(46) | 1,480<br>(38) | 1,190<br>(30) | 1,240<br>(32) | 1,560<br>(38) | 1,610 (35)    |
| ipilimumab    | 840<br>(52)   | 340<br>(16)   | 610<br>(28)   | 790<br>(28)   |               |               | 920<br>(24)   | 1,120<br>(27) | 1,180 (26)    |
| dabrafenib*   | 390<br>(24)   | 510<br>(24)   | 600<br>(27)   | 780<br>(28)   | 930<br>(24)   | 800<br>(21)   |               |               |               |

\* drug developed with CRUK contribution

Use of pembrolizumab to treat skin cancer increased by 44 percentage points from 2015 to 2016, and from 2017, between 35 and 42% of patients have been treated with the drug. Ipilimumab use decreased by 36 percentage points between 2015 and 2016, and from 2017, between 24 and 28% of patients have been treated with the drug. Use of dabrafenib and nivolumab varied over time, with nivolumab treating the second highest proportion of patients from 2018.

# Discussion

## Key findings

This analysis found that in 2023 over 147,000 cancer patients in England received SACT drugs that had been developed through CRUK funded research. This means that 8 in 10 patients who receive SACT in England receive at least one drug that CRUK has helped to develop.

The proportion of patients receiving SACT contributed to by CRUK is higher among children and young people than the overall cancer population, at more than 9 in 10. This highlights the key role that CRUK has played in developing SACT drugs, which have been repurposed for children and young people, including funding many of the world's most successful trials of children's cancer treatment such as SIOPEX and ALLR3.

From 2015 and 2023, for each year and each cancer site, the three most used SACT drugs were identified. For bowel cancer patients, the top three SACT drugs remained the same over time, and all three, capecitabine, fluorouracil and oxaliplatin, benefited in their development by CRUK funded research. For breast, lung, prostate and skin cancer patients, the top three SACT drugs varied over time. As an example, five drugs were used to treat prostate cancer patients across this period, and four of these drugs were linked to CRUK's research.

## Strengths and limitations

The use of the SACT dataset is a key strength of this analysis. It is a mandated dataset for all NHS trusts in England that provide SACT, meaning the patient-level data can provide valuable insights into SACT provision in England (6). The data has been collected since April 2014, which allowed us to analyse nine full years of SACT data, from 2015 to 2023.

There are some limitations of the dataset that need to be considered when using and interpreting the analysis. Drugs delivered in primary care, such as hormone therapies, are not captured in the SACT dataset, as it collects SACT delivered in secondary and tertiary NHS settings. Where hormone therapies are reported, they are likely to be undercounted.

Due to the variable drug names captured in SACT, it is likely that some drugs will not be counted in all the cases where they are prescribed. This is likely to result in an underestimation of the number of patients receiving a drug that CRUK contributed to.

The SACT primary diagnosis variable has been used to define broad cancer site groupings. There are known data quality issues with this variable, so some sites

may have slight over- or under-estimations of patients treated with individual SACT drugs (6). We have been cautious when interpreting results where smaller numbers of patients are involved.

This analysis identified whether a patient was treated with a SACT drug, and does not consider specific details of the treatment, or subsequent patient outcomes.

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# Appendix

Appendix Table 1: Mapping ICD-10 codes to broad cancer sites

| Broad site groupings        | ICD-10 codes                                                      |
|-----------------------------|-------------------------------------------------------------------|
| All C and D codes           | C00-C97, D00-D49                                                  |
| All C (excluding C44) codes | C00-C97 (excluding C44)                                           |
| All C codes                 | C00-C97                                                           |
| Bladder                     | C67                                                               |
| Bowel                       | C18-C20                                                           |
| Brain and CNS               | C70-C72, C75.1-C75.3, D32-D33, D35.2-D35.4, D42, D43, D44.3-D44.5 |
| Breast                      | C50                                                               |
| Cancer of unknown primary   | C77-C80                                                           |
| Head and neck               | C00-C14, C30-C32                                                  |
| Kidney                      | C64                                                               |
| Leukaemia                   | C91-C95                                                           |
| Liver                       | C22                                                               |
| Lung                        | C33-C34                                                           |
| Melanoma skin cancer        | C43                                                               |
| Myeloma                     | C90                                                               |
| Non-Hodgkin Lymphoma        | C82-C86                                                           |
| Non-melanoma skin cancer    | C44                                                               |
| Oesophagus                  | C15                                                               |
| Ovary                       | C56-C57.4                                                         |
| Pancreas                    | C25                                                               |
| Prostate                    | C61                                                               |
| Renal                       | C64-C66, C68                                                      |
| Stomach                     | C16                                                               |
| Testicular                  | C62                                                               |
| Thyroid                     | C73                                                               |
| Uterus                      | C54-C55                                                           |
| Other malignant             | All remaining C codes                                             |
| Other non-malignant         | All remaining D codes                                             |

Appendix Table 2: SACT drugs available on the NHS in England, and that Cancer Research UK had a role in developing, 2025

| <b>Drug name</b>                                             | <b>Role of CRUK</b> |
|--------------------------------------------------------------|---------------------|
| 4th level ATC chemical subgroup (L02BG Aromatase inhibitors) | Significant         |
| 5-Fluorouracil                                               | Helped              |
| Abemaciclib                                                  | Significant         |
| Abiraterone                                                  | Significant         |
| Afatinib                                                     | Significant         |
| Aminogluthetimide                                            | Significant         |
| Anastrozole                                                  | Significant         |
| Apalutamide                                                  | Helped              |
| Arsenic trioxide                                             | Significant         |
| Bendamustine                                                 | Significant         |
| Bevacizumab                                                  | Helped              |
| Bicalutamide                                                 | Helped              |
| Binimetinib                                                  | Significant         |
| Brigatinib                                                   | Significant         |
| Busulfan                                                     | Significant         |
| Cabozantinib                                                 | Helped              |
| Capecitabine                                                 | Significant         |
| Capivasertib                                                 | Significant         |
| Carboplatin                                                  | Significant         |
| Carmustine                                                   | Significant         |
| Cetuximab                                                    | Significant         |
| Chlorambucil                                                 | Significant         |
| Cisplatin                                                    | Significant         |
| Cobimetinib                                                  | Significant         |
| Combretastatin                                               | Significant         |
| Cyclophosphamide                                             | Significant         |
| Dabrafenib                                                   | Significant         |
| Dacarbazine                                                  | Helped              |
| Dacomitinib                                                  | Significant         |
| Darolutamide                                                 | Helped              |
| Dasatinib                                                    | Significant         |
| Dexrazoxane                                                  | Significant         |
| Docetaxel                                                    | Significant         |
| Encorafenib                                                  | Significant         |
| Enzalutamide                                                 | Helped              |
| Erdafitinib                                                  | Significant         |
| Erlotinib                                                    | Significant         |

|                                   |             |
|-----------------------------------|-------------|
| Etoposide phosphate               | Significant |
| Exemestane                        | Significant |
| Fluorouracil                      | Helped      |
| Formestane                        | Significant |
| Gefitinib                         | Significant |
| Gemcitabine                       | Helped      |
| Gemtuzumab                        | Helped      |
| Goserelin                         | Helped      |
| Ibritumomab tiuxetan              | Helped      |
| Ifosfamide                        | Significant |
| IMA950                            | Significant |
| Imatinib                          | Helped      |
| Irinotecan                        | Helped      |
| Lapatinib                         | Significant |
| Letrozole                         | Significant |
| Lobaplatin                        | Helped      |
| Lomustine                         | Significant |
| Loncastuximab tesirine            | Significant |
| Melphalan                         | Significant |
| Methotrexate                      | Helped      |
| Mitoxantrone                      | Helped      |
| Mobocertinib                      | Significant |
| Nab-paclitaxel                    | Helped      |
| Necitumumab                       | Significant |
| Nedaplatin                        | Helped      |
| Neratinib                         | Significant |
| Nilotinib                         | Helped      |
| Nilutamide                        | Helped      |
| Niraparib                         | Significant |
| Nivolumab                         | Helped      |
| Obinutuzumab                      | Significant |
| Ofatumumab                        | Helped      |
| Olaparib                          | Significant |
| Osimertinib                       | Significant |
| Oxaliplatin                       | Significant |
| Paclitaxel                        | Helped      |
| Palbociclib                       | Significant |
| Panitumumab                       | Significant |
| PegargiminaseI                    | Significant |
| Pemetrexed                        | Significant |
| Pertuzumab                        | Significant |
| Pertuzumab + Trastuzumab (phesgo) | Significant |

|                        |             |
|------------------------|-------------|
| Pimasertib             | Helped      |
| Pixantrone             | Helped      |
| Pralsetinib            | Helped      |
| Pyrotinib              | Significant |
| Raltitrexed            | Significant |
| Refametinib            | Helped      |
| Rituximab              | Significant |
| Rituximab Biosimilar   | Significant |
| Rucaparib              | Significant |
| Satraplatin            | Helped      |
| Selpercatinib          | Helped      |
| Selumetinib            | Helped      |
| Sorafenib              | Helped      |
| Sotorasib              | Helped      |
| Talazoparib            | Significant |
| Tamoxifen              | Significant |
| Temozolomide           | Significant |
| Thiotepa               | Helped      |
| Tositumomab            | Helped      |
| Trametinib             | Significant |
| Trastuzumab            | Significant |
| Trastuzumab deruxtecan | Significant |
| Trastuzumab emtansine  | Significant |
| Trastuzumab ermostine  | Significant |
| Treosulphan            | Helped      |
| Vandetanib             | Helped      |
| Veliparib              | Helped      |
| Vemurafenib            | Significant |
| Vinblastine            | Significant |
| Vismodegib             | Significant |
| Vorozole               | Significant |