

**Article title:** Association of Launch Price and Clinical Value With Reimbursement Decisions for Anticancer Drugs in China

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### Supplementary file 1

#### Text S1. Price negotiation in China

In China, the Center for Drug Evaluation, National Medical Products Administration (CDE, NMPA), is responsible for drug approval, and the National Healthcare Security Administration (NHSA) is responsible for price negotiation and reimbursement decisions. To address the issue of high prices and promote patient access, as well as ensure the sustainability of the medical insurance fund, China formally launched the national reimbursement-linked price negotiation in 2017. Since then, China has conducted six rounds of price negotiations directly with pharmaceutical companies until January 2023, resulting in the inclusion of a large number of successfully negotiated new drugs in the NRDL (Table S1).

The process of price negotiation over the years is generally similar and can be roughly divided into the preparation stage, application stage, expert review stage, negotiation stage, and results announcement stage.<sup>1,2</sup> Taking 2022 as an example,<sup>3</sup> in the preparation stage, the NHSA released a working plan and guidelines, as well as convened expert committees for price negotiation. In the application stage, pharmaceutical companies would file for negotiation to get drugs reimbursed, based on which the NHSA would conduct an initial eligibility screening. The NHSA would then announce candidate drugs under consideration for reimbursement based on the screening results. It is important to note that since 2019, pharmaceutical companies have had the right to decide whether their drugs would participate in price negotiations.

At the review stage, expert committees assessed whether drugs were suitable for price negotiation or other pathways through joint reviews. For drugs eligible for price negotiation, experts determined drug specifications, reference drugs, and reimbursement conditions. At the negotiation stage, pharmaceutical companies submitted dossiers for evaluation by experts. These experts determined the drug price range

through budget impact analysis, cost-effectiveness analysis, and an insurance fund pressure test. Subsequently, the NHSA conducted price negotiations with pharmaceutical companies, and the agreed-upon price was established. During the results announcement stage, the NHSA released the updated version of the NRDL, which included drugs that had undergone successful price negotiations. Drugs listed in the NRDL were reimbursed by the NHSA.

References

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**Table S1. Outcomes of price negotiations in China from 2017 to 2022**

| Year of negotiation | Drugs to be negotiated | Drugs negotiated successfully |               |                 | Anticancer drugs negotiated successfully |               |                 |
|---------------------|------------------------|-------------------------------|---------------|-----------------|--|---------------|-----------------|
|                     |                        | Total                         | New additions | Re-negotiations | Total                                    | New additions | Re-negotiations |
| 2017                | 44                     | 36                            | 36            | 0               | 15                                       | 15            | 0               |
| 2018                | 18                     | 17                            | 17            | 0               | 16                                       | 16            | 0               |
| 2019                | 150                    | 97                            | 70            | 27              | 18                                       | 8             | 9               |
| 2020                | 162                    | 119                           | 96            | 23              | 30                                       | 14            | 16              |
| 2021                | 117                    | 94                            | 67            | 27              | 38                                       | 18            | 20              |
| 2022                | 147                    | 121                           | 108           | 13              | 22                                       | 13            | 9               |

Note: Authors’ analysis of data from the NHSA. We did not include traditional Chinese medicines for the treatment of cancer in this analysis.

**Table S2. Overview of variables**

| Variables                  | Definition and explanation                      | Operationalization | Data Source |
|----------------------------|---|--------------------|-------------|
| <i>Dependent variables</i> |   |                    |             |
| Reimbursement lag          | Time from market authorization to reimbursement | Numeric            | NMPA, NHSA  |

|                              |   |  |   |
|------------------------------|---|--|---|
| Reimbursement status         | Whether the indication was listed in the NRDL by 2023   | Categorical: 0 = not listed; 1 = listed  | NHSA                                    |
| <i>Explanatory variables</i> |   |  |   |
| Launch price                 | Treatment price of indications over the expected treatment durations at launch  | Numeric  | The Drugdataexpy                        |
| Added survival               | Added overall or progression-free survival life-months gained of indications supported by randomized controlled trials                  | Numeric  | Publications of pivotal clinical trials |
| Quality of life              | The comparable quality of life of the study drug in relation to its comparator of indications supported by randomized controlled trials | Categorical: 0 = reduction or not available, 1 = no difference, 2 = improvement  | Publications of pivotal clinical trials |
| Overall response rate        | Overall response rate of indications supported by single-arm clinical trials  | Numeric  | Publications of pivotal clinical trials |
| <i>Control variables</i>     |   |  |   |
| Drug type                    | The category of included indications specific to anticancer drugs   | Categorical: 0 = small targeted molecule, 1 = targeted monoclonal antibody, 2 = immunotherapy, 3 = endocrine therapy & chemotherapy for indications supported by randomized controlled trials; 0 = small targeted molecule, 1 = targeted monoclonal antibody for indications supported by single-arm clinical trials | Drug labels and expertise               |
| Cancer site                  | Disease area  | Categorical: 0 = blood, 1 = lung, 2 = breast, 3 = other for therapeutic indications supported by randomized controlled trials; 0 = hematological, and 1 = non-hematological for therapeutic indications supported by single-arm clinical trials  | Drug labels                             |
| Domestic                     | Whether the drug was developed in China or imported from abroad   | Categorical: 0 = imported, 1 = domestic.   | Drug labels                             |
| Priority review              | Market authorization pathway that expedites the review process for drugs  | Categorical: 0 = non-priority review, 1 = priority review  | CDE, NMPA                               |
| Conditional approval         | Conditional marketing authorization for drugs   | Categorical: 0 = non-conditional, 1 = conditional  | CDE, NMPA                               |
| Line of therapy              | The order in which different therapies are given to people as their disease progresses  | Categorical: 0 = other lines, 1 = first-line   | Drug labels or clinical trials          |
| Administration route         | Route of administration   | Categorical: 0 = oral, 1 = intravenous   | Drug labels                             |
| Reference drug               | The reference drug chose in randomized controlled trials of the study anticancer drug   | Categorical: 0 = placebo, 1 = active   | Publications of pivotal clinical trials |
| Blind                        | The blind method used in the clinical trial   | Categorical: 0 = no, 1 = yes   | Publications of pivotal clinical trials |

Notes: CDE, NMPA, Center of Drug Evaluation, National Medical Products Administration; NHSA, National Healthcare Security Administration; NRDL, National Reimbursement Drug List.

**Table S3. Information on 93 indications of anticancer drugs supported by randomized controlled trials in China.**

| No. | Generic name          | Indication  | Approval date | Reimbursement status | Reimbursement date | Reimbursement lag (days) | Treatment price at launch (CNY) | Survival (months) | Quality of life | Clinical trial number | Reference drug | Blind | Domestic | Administrati on route | Line of therapy | Priority review | Drug type                    | Cancer site |
|-----|-----------------------|---|---------------|----------------------|--------------------|--------------------------|---------------------------------|-------------------|-----------------|-----------------------|----------------|-------|----------|-----------------------|-----------------|-----------------|------------------------------|-------------|
| 1   | Lorlatinib            | NSCLC   | 2022/4/27     | reimbursed           | 2023/3/1           | 308                      | 492,750                         | NA                | improvement     | NCT03052608           | positive       | no    | no       | oral                  | first-line      | no              | small targeted molecule      | lung        |
| 2   | Brigatinib            | NSCLC   | 2022/3/24     | reimbursed           | 2023/3/1           | 342                      | 701,113                         | 13                | improvement     | NCT02737501           | positive       | no    | no       | oral                  | first-line      | no              | small targeted molecule      | lung        |
| 3   | Rezvilutamide         | prostate cancer                                     | 2022/3/24     | reimbursed           | 2023/3/1           | 342                      | 606,899                         | NA                | improvement     | NCT03520478           | positive       | no    | yes      | oral                  | first-line      | no              | endocrine therapy            | prostate    |
| 4   | Trastuzumab Emtansine | early stage breast cancer                           | 2020/1/21     | reimbursed           | 2023/3/1           | 1,135                    | 656,796                         | NA                | NA              | NCT01772472           | positive       | no    | no       | intravenous           | non-first-line  | no              | targeted monoclonal antibody | breast      |
| 5   | Trastuzumab Emtansine | advanced breast cancer                              | 2021/6/22     | reimbursed           | 2023/3/1           | 617                      | 516,054                         | 4                 | NA              | NCT00829166           | positive       | no    | no       | intravenous           | non-first-line  | no              | targeted monoclonal antibody | breast      |
| 6   | Ripretinib            | gastrointestinal stromal tumor                      | 2021/3/30     | reimbursed           | 2023/3/1           | 701                      | 628,729                         | 8.5               | improvement     | NCT03353753           | placebo        | yes   | no       | oral                  | non-first-line  | no              | small targeted molecule      | gastric     |
| 7   | Utidelone             | breast cancer                                       | 2021/3/11     | reimbursed           | 2023/3/1           | 720                      | 88,800                          | 3.8               | NA              | NCT02253459.          | positive       | no    | yes      | intravenous           | non-first-line  | yes             | chemotherapy                 | breast      |
| 8   | Brentuximab           | cutaneous T-cell lymphoma                           | 2021/4/13     | reimbursed           | 2023/3/1           | 687                      | 572,000                         | 13.2              | no difference   | NCT01578499           | positive       | no    | no       | intravenous           | non-first-line  | no              | targeted monoclonal antibody | blood       |
| 9   | Degarelix             | prostate cancer                                     | 2018/9/11     | reimbursed           | 2023/3/1           | 1,632                    | 44,100                          | NA                | NA              | NA                    | positive       | no    | no       | intravenous           | first-line      | no              | endocrine therapy            | prostate    |
| 10  | Venetoclax            | acute myeloid leukemia                              | 2020/12/2     | reimbursed           | 2023/3/1           | 819                      | 331,075                         | 5.1               | no difference   | NCT02993523           | positive       | yes   | no       | intravenous           | first-line      | yes             | small targeted molecule      | blood       |
| 11  | Dalpiciclib           | breast cancer                                       | 2021/12/31    | reimbursed           | 2023/3/1           | 425                      | 135,002                         | 8.5               | NA              | NCT03927456           | positive       | yes   | yes      | oral                  | non-first-line  | no              | small targeted molecule      | breast      |
| 12  | Palbociclib           | breast cancer                                       | 2018/7/31     | reimbursed           | 2023/3/31          | 1,704                    | 682,420                         | 13.1              | no difference   | NCT01740427           | positive       | yes   | no       | intravenous           | first-line      | no              | immunotherapy                | breast      |
| 13  | Sugemalimab           | NSCLC   | 2021/12/20    | not reimbursed       | 2023/12/31         | 741                      | 247,500                         | 5.1               | NA              | NCT03789604           | positive       | yes   | yes      | intravenous           | first-line      | no              | immunotherapy                | lung        |
| 14  | Sugemalimab           | NSCLC   | 2022/5/31     | not reimbursed       | 2023/12/31         | 579                      | 321,750                         | 3.2               | NA              | NCT03728556           | placebo        | yes   | yes      | intravenous           | non-first-line  | no              | immunotherapy                | lung        |
| 15  | Yttrium-90            | metastatic colorectal cancer                        | 2022/1/30     | not reimbursed       | 2023/12/31         | 700                      | NA                              | 0.5               | no difference   | NCT00724503           | positive       | yes   | no       | intravenous           | first-line      | no              | radiotherapy                 | colorectal  |
| 16  | Ramucirumab           | gastric or gastroesophageal junction adenocarcinoma | 2022/3/16     | not reimbursed       | 2023/12/31         | 655                      | 135,000                         | 0.8               | NA              | NCT02898077           | positive       | yes   | no       | intravenous           | non-first-line  | no              | targeted monoclonal antibody | gastric     |
| 17  | Irinotecan            | pancreatic adenocarcinoma                           | 2022/4/12     | not reimbursed       | 2023/12/31         | 628                      | NA                              | 5.2               | no difference   | NCT01494506           | positive       | no    | no       | intravenous           | non-first-line  | no              | chemotherapy                 | esophageal  |
| 18  | Procabazine           | hodgkin's lymphoma                                  | 2022/4/19     | not reimbursed       | 2023/12/31         | 621                      | 19,723                          | NA                | NA              | NA                    | positive       | no    | no       | oral                  | first-line      | no              | chemotherapy                 | blood       |
| 19  | Afatinib              | squamous cell carcinoma of the lung                 | 2017/2/21     | reimbursed           | 2018/9/30          | 586                      | 39,758                          | 1.1               | improvement     | NCT01523587           | positive       | no    | no       | oral                  | non-first-line  | yes             | small targeted molecule      | lung        |
| 20  | Afatinib              | lung adenocarcinoma with EGFR mutations             | 2017/2/21     | reimbursed           | 2018/9/30          | 586                      | 130,775                         | -0.36             | improvement     | NCT01121393           | positive       | no    | no       | oral                  | first-line      | yes             | small targeted molecule      | lung        |
| 21  | Azacitidine           | myelodysplastic syndromes                           | 2017/4/24     | reimbursed           | 2018/9/30          | 524                      | 330,750                         | 9.5               | NA              | NCT00071799           | positive       | no    | no       | intravenous           | first-line      | yes             | chemotherapy                 | blood       |
| 22  | Anlotinib             | NSCLC   | 2018/5/8      | reimbursed           | 2018/9/30          | 145                      | 74,400                          | 3.3               | improvement     | NCT02388919           | placebo        | yes   | yes      | oral                  | non-first-line  | yes             | small targeted molecule      | lung        |
| 23  | Osimertinib           | NSCLC   | 2017/3/22     | reimbursed           | 2018/9/30          | 557                      | 728,640                         | 4.3               | improvement     | NCT02151981           | positive       | no    | no       | oral                  | non-first-line  | yes             | small targeted molecule      | lung        |

| No. | Generic name | Indication   | Approval date | Reimbursement status | Reimbursement date | Reimbursement lag (days) | Treatment price at launch (CNY) | Survival (months) | Quality of life | Clinical trial number | Reference drug | Blind | Domestic | Administrati on route | Line of therapy | Priority review | Drug type                    | Cancer site   |
|-----|--------------|--|---------------|----------------------|--------------------|--------------------------|---------------------------------|-------------------|-----------------|-----------------------|----------------|-------|----------|-----------------------|-----------------|-----------------|------------------------------|---------------|
| 24  | Pazopanib    | renal cell carcinoma                                       | 2017/2/21     | reimbursed           | 2018/9/30          | 586                      | 408,480                         | 2.4               | no difference   | NCT00334282           | placebo        | yes   | no       | oral                  | first-line      | no              | small targeted molecule      | renal         |
| 25  | Regorafenib  | metastatic colorectal cancer                               | 2017/3/22     | reimbursed           | 2018/9/30          | 557                      | 97,199                          | 2.5               | no difference   | NCT01584830           | placebo        | yes   | no       | oral                  | non-first-line  | yes             | small targeted molecule      | colorectal    |
| 26  | Regorafenib  | gastrointestinal stromal tumor                             | 2017/3/22     | reimbursed           | 2018/9/30          | 557                      | 185,483                         | 3.9               | no difference   | NCT01271712           | placebo        | yes   | no       | oral                  | non-first-line  | yes             | small targeted molecule      | gastric       |
| 27  | Regorafenib  | hepatocellular carcinoma                                   | 2017/12/5     | reimbursed           | 2018/9/30          | 299                      | 270,761                         | 2.8               | no difference   | NCT01774344           | placebo        | yes   | no       | oral                  | non-first-line  | no              | small targeted molecule      | hepatobiliary |
| 28  | Ceritinib    | NSCLC  | 2018/5/31     | reimbursed           | 2018/9/30          | 122                      | 476,589                         | -2                | improvement     | NCT01828112           | positive       | no    | no       | oral                  | non-first-line  | yes             | small targeted molecule      | lung          |
| 29  | Vemurafenib  | melanoma   | 2017/3/10     | reimbursed           | 2018/9/30          | 569                      | 293,040                         | 3.9               | NA              | NCT01006980           | positive       | no    | no       | oral                  | first-line      | yes             | small targeted molecule      | skin          |
| 30  | Ibrutinib    | mantle-cell lymphoma                                       | 2017/8/24     | reimbursed           | 2018/9/30          | 402                      | 933,120                         | 6.8               | NA              | NCT01646021           | positive       | no    | no       | oral                  | non-first-line  | yes             | small targeted molecule      | blood         |
| 31  | Ibrutinib    | chronic lymphocytic leukemia or small lymphocytic lymphoma | 2017/8/24     | reimbursed           | 2018/9/30          | 402                      | 1,992,600                       | 2.6               | improvement     | NCT01578707           | positive       | no    | no       | oral                  | non-first-line  | yes             | small targeted molecule      | blood         |
| 32  | Ixazomib     | multiple myeloma   | 2018/4/12     | reimbursed           | 2018/9/30          | 171                      | 496,800                         | 2                 | no difference   | NCT01564537           | positive       | yes   | no       | oral                  | non-first-line  | yes             | small targeted molecule      | blood         |
| 33  | Alectinib    | NSCLC  | 2018/8/12     | reimbursed           | 2020/1/1           | 507                      | 752,378                         | 23.9              | NA              | NCT02075840           | positive       | no    | no       | oral                  | first-line      | yes             | small targeted molecule      | lung          |
| 34  | Olaparib     | ovarian cancer   | 2018/8/22     | reimbursed           | 2020/1/1           | 497                      | 1,545,839                       | 12.9              | no difference   | NCT01874353           | placebo        | yes   | no       | oral                  | non-first-line  | yes             | small targeted molecule      | ovarian       |
| 35  | Pyrotinib    | breast cancer  | 2018/8/12     | reimbursed           | 2020/1/1           | 507                      | 405,600                         | 11.1              | NA              | NCT02422199           | positive       | no    | yes      | oral                  | non-first-line  | yes             | small targeted molecule      | breast        |
| 36  | Fruquintinib | metastatic colorectal cancer                               | 2018/9/4      | reimbursed           | 2020/1/1           | 484                      | 81,252                          | 2.7               | NA              | NCT02314819           | placebo        | yes   | yes      | oral                  | non-first-line  | yes             | small targeted molecule      | colorectal    |
| 37  | Ruxolitinib  | myelofibrosis  | 2017/3/10     | reimbursed           | 2020/1/1           | 1,027                    | 627,850                         | NA                | improvement     | NCT00934544           | placebo        | no    | no       | intravenous           | first-line      | yes             | small targeted molecule      | blood         |
| 38  | Pertuzumab   | early HER2-positive breast cancer                          | 2018/12/17    | reimbursed           | 2020/1/1           | 380                      | 357,200                         | NA                | no difference   | NCT01358877           | positive       | yes   | no       | intravenous           | non-first-line  | no              | targeted monoclonal antibody | breast        |
| 39  | Pertuzumab   | early or locally advanced ERBB2-positive breast cancer     | 2019/8/16     | reimbursed           | 2020/1/1           | 138                      | 94,000                          | NA                | NA              | NCT02586025           | positive       | yes   | no       | intravenous           | non-first-line  | yes             | targeted monoclonal antibody | breast        |
| 40  | Dabrafenib   | melanoma   | 2019/12/18    | reimbursed           | 2021/3/1           | 439                      | 414,720                         | 8.2               | improvement     | NCT01597908           | positive       | no    | no       | oral                  | first-line      | yes             | small targeted molecule      | skin          |
| 41  | Dabrafenib   | melanoma (adjuvant therapy)                                | 2019/12/18    | reimbursed           | 2021/3/1           | 439                      | 456,192                         | NA                | NA              | NCT01682083           | placebo        | yes   | no       | oral                  | non-first-line  | yes             | small targeted molecule      | skin          |
| 42  | Enzalutamide | prostate cancer  | 2019/11/18    | reimbursed           | 2021/3/1           | 469                      | 1,307,573                       | 10.7              | improvement     | NCT02003924           | placebo        | yes   | no       | oral                  | non-first-line  | yes             | endocrine therapy            | prostate      |
| 43  | Flumatinib   | chronic myeloid leukemia                                   | 2019/11/22    | reimbursed           | 2021/3/1           | 465                      | 176,880                         | NA                | NA              | NCT02204644           | positive       | no    | yes      | oral                  | first-line      | yes             | small targeted molecule      | blood         |
| 44  | Camrelizumab | non-squamous NSCLC   | 2020/6/17     | reimbursed           | 2021/3/1           | 257                      | 217,800                         | 7.39              | NA              | NCT03134872           | positive       | no    | yes      | intravenous           | first-line      | yes             | immunotherapy                | lung          |
| 45  | Camrelizumab | oesophageal squamous cell carcinoma                        | 2020/6/17     | reimbursed           | 2021/3/1           | 257                      | 118,800                         | 2.1               | improvement     | NCT03099382           | positive       | no    | yes      | intravenous           | non-first-line  | yes             | immunotherapy                | gastric       |
| 46  | Lenvatinib   | hepatocellular carcinoma                                   | 2018/9/4      | reimbursed           | 2021/3/1           | 909                      | 287,280                         | 1.3               | no difference   | NCT01761266           | positive       | no    | no       | oral                  | first-line      | yes             | small targeted molecule      | hepatobiliary |
| 47  | Niraparib    | ovarian cancer   | 2019/12/26    | reimbursed           | 2021/3/1           | 431                      | 1,574,370                       | 15.5              | no difference   | NCT01847274           | placebo        | yes   | yes      | oral                  | non-first-line  | yes             | small targeted molecule      | ovarian       |
| 48  | Trametinib   | melanoma (adjuvant therapy)                                | 2019/12/18    | reimbursed           | 2021/3/1           | 439                      | 304,128                         | NA                | NA              | NCT01682083           | placebo        | yes   | no       | oral                  | non-first-line  | yes             | small targeted molecule      | skin          |

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|-----|--------------|---|---------------|----------------------|--------------------|--------------------------|---------------------------------|-------------------|-----------------|-----------------------|----------------|-------|----------|-----------------------|-----------------|-----------------|------------------------------|---------------|
| 49  | Trametinib   | melanoma  | 2019/12/18    | reimbursed           | 2021/3/1           | 439                      | 552,960                         | 6.4               | improvement     | NCT01584648           | positive       | yes   | no       | oral                  | first-line      | yes             | small targeted molecule      | skin          |
| 50  | Inetetamab   | breast cancer   | 2020/6/17     | reimbursed           | 2021/3/1           | 257                      | 146,880                         | 5.85              | NA              | NA                    | positive       | no    | yes      | intravenous           | non-first-line  | yes             | targeted monoclonal antibody | breast        |
| 51  | Abemaciclib  | advanced breast cancer (plus either anastrozole or letrozole) | 2020/12/29    | reimbursed           | 2022/1/1           | 368                      | 588,998                         | 13.42             | no difference   | NCT02246621           | positive       | yes   | no       | oral                  | first-line      | yes             | small targeted molecule      | breast        |
| 52  | Abemaciclib  | advanced breast cancer (plus fulvestrant)                     | 2020/12/29    | reimbursed           | 2022/1/1           | 368                      | 585,898                         | 9.4               | no difference   | NCT02107703           | positive       | yes   | no       | oral                  | non-first-line  | yes             | small targeted molecule      | breast        |
| 53  | Apalutamide  | prostate cancer   | 2020/8/12     | reimbursed           | 2022/1/1           | 507                      | 1,615,950                       | 14                | no difference   | NCT01946204           | placebo        | yes   | no       | oral                  | non-first-line  | yes             | endocrine therapy            | prostate      |
| 54  | Apalutamide  | prostate cancer   | 2020/8/12     | reimbursed           | 2022/1/1           | 507                      | 1,568,070                       | NA                | no difference   | NCT02489318.          | positive       | yes   | no       | oral                  | first-line      | yes             | endocrine therapy            | prostate      |
| 55  | Eribulin     | breast cancer   | 2019/7/12     | reimbursed           | 2022/1/1           | 904                      | 119,400                         | 0.9               | NA              | NCT02225470           | positive       | no    | no       | oral                  | non-first-line  | no              | chemotherapy                 | breast        |
| 56  | Obinutuzumab | follicular lymphoma   | 2021/6/1      | reimbursed           | 2022/1/1           | 214                      | 172,000                         | NA                | no difference   | NCT01332968           | positive       | no    | no       | intravenous           | first-line      | yes             | targeted monoclonal antibody | blood         |
| 57  | Dacomitinib  | NSCLC   | 2019/5/15     | reimbursed           | 2022/1/1           | 962                      | 87,166                          | 7.1               | reduction       | NCT01774721           | positive       | no    | no       | oral                  | first-line      | yes             | small targeted molecule      | lung          |
| 58  | Daratumumab  | multiple myeloma (plus lenalidomide and dexamethasone)        | 2021/4/27     | reimbursed           | 2022/1/1           | 249                      | 3,070,740                       | 27                | no difference   | NCT02076009           | positive       | no    | no       | intravenous           | non-first-line  | yes             | targeted monoclonal antibody | blood         |
| 59  | Daratumumab  | multiple myeloma (plus bortezomib and dexamethasone)          | 2021/4/27     | reimbursed           | 2022/1/1           | 249                      | 1,120,065                       | 9.6               | no difference   | NCT02136134           | positive       | no    | no       | intravenous           | non-first-line  | yes             | targeted monoclonal antibody | blood         |
| 60  | Darolutamide | nonmetastatic, castration-resistant prostate cancer           | 2021/2/2      | reimbursed           | 2022/1/1           | 333                      | 349,286                         | 22                | improvement     | NCT02200614           | placebo        | yes   | no       | oral                  | non-first-line  | yes             | endocrine therapy            | prostate      |
| 61  | Donafenib    | hepatocellular carcinoma                                      | 2021/6/8      | reimbursed           | 2022/1/1           | 207                      | 90,926                          | 1.8               | NA              | NCT02645981           | positive       | yes   | yes      | oral                  | first-line      | yes             | small targeted molecule      | hepatobiliary |
| 62  | Fluzoparib   | ovarian carcinoma   | 2021/6/22     | reimbursed           | 2022/1/1           | 193                      | 134,389                         | 7.4               | no difference   | NCT03863860           | placebo        | yes   | yes      | oral                  | non-first-line  | yes             | small targeted molecule      | ovarian       |
| 63  | Niratinib    | breast cancer   | 2020/4/27     | reimbursed           | 2022/1/1           | 614                      | 195,915                         | NA                | reduction       | NCT00878709           | placebo        | yes   | no       | oral                  | non-first-line  | no              | small targeted molecule      | breast        |
| 64  | Pomalidomide | multiple myeloma  | 2020/11/10    | reimbursed           | 2022/1/1           | 417                      | 67,200                          | 4.6               | improvement     | NCT01311687           | positive       | no    | yes      | oral                  | non-first-line  | yes             | small targeted molecule      | blood         |
| 65  | Sulfatinib   | extrapancreatic neuroendocrine tumors                         | 2020/12/29    | reimbursed           | 2022/1/1           | 368                      | 129,321                         | 5.4               | no difference   | NCT02588170.          | placebo        | yes   | yes      | oral                  | first-line      | yes             | small targeted molecule      | other         |
| 66  | Sulfatinib   | pancreatic neuroendocrine tumors                              | 2021/6/16     | reimbursed           | 2022/1/1           | 199                      | 139,035                         | 7.2               | no difference   | NCT02589821           | placebo        | yes   | yes      | oral                  | non-first-line  | no              | small targeted molecule      | other         |
| 67  | Blinatumomab | acute lymphoblastic leukemia                                  | 2020/12/2     | not reimbursed       | 2023/12/31         | 1,124                    | 1,275,000                       | 3.7               | improvement     | NCT02013167           | positive       | no    | no       | intravenous           | first-line      | yes             | targeted monoclonal antibody | blood         |
| 68  | Durvalumab   | NSCLC   | 2019/12/6     | not reimbursed       | 2023/12/31         | 1,486                    | 169,078                         | 2.4               | NA              | NCT03043872           | positive       | no    | no       | intravenous           | first-line      | no              | immunotherapy                | lung          |
| 69  | Nivolumab    | NSCLC   | 2018/6/15     | not reimbursed       | 2023/12/31         | 2,025                    | 148,000                         | 3.2               | NA              | NCT01642004           | positive       | no    | no       | intravenous           | non-first-line  | no              | immunotherapy                | lung          |
| 70  | Nivolumab    | squamous-cell carcinoma of the head and neck                  | 2019/9/29     | not reimbursed       | 2023/12/31         | 1,554                    | 74,000                          | 2.4               | improvement     | NCT02105636           | positive       | no    | no       | intravenous           | non-first-line  | yes             | immunotherapy                | head and neck |

| No. | Generic name                       | Indication                                    | Approval date | Reimbursement status | Reimbursement date | Reimbursement lag (days) | Treatment price at launch (CNY) | Survival (months) | Quality of life | Clinical trial number | Reference drug | Blind | Domestic | Administrati on route | Line of therapy | Priority review | Drug type                    | Cancer site   |
|-----|------------------------------------|---|---------------|----------------------|--------------------|--------------------------|---------------------------------|-------------------|-----------------|-----------------------|----------------|-------|----------|-----------------------|-----------------|-----------------|------------------------------|---------------|
| 71  | Nivolumab                          | gastric or gastro-oesophageal junction cancer | 2020/3/11     | not reimbursed       | 2023/12/31         | 1,390                    | 74,000                          | 1.12              | NA              | NCT02267343           | placebo        | yes   | no       | intravenous           | non-first-line  | yes             | immunotherapy                | gastric       |
| 72  | Nivolumab                          | malignant pleural mesothelioma                | 2021/6/8      | not reimbursed       | 2023/12/31         | 936                      | 222,000                         | 4                 | NA              | NCT02899299           | positive       | no    | no       | intravenous           | first-line      | yes             | immunotherapy                | other         |
| 73  | Nivolumab                          | advanced or recurrent oesophageal cancer      | 2021/8/25     | not reimbursed       | 2023/12/31         | 858                      | 277,044                         | 2.2               | no difference   | NCT02872116           | positive       | no    | no       | intravenous           | first-line      | no              | immunotherapy                | gastric       |
| 74  | Nivolumab                          | adjuvant therapy for esophageal cancer        | 2022/6/23     | not reimbursed       | 2023/12/31         | 556                      | 508,750                         | NA                | no difference   | NCT02743494           | positive       | yes   | no       | intravenous           | non-first-line  | no              | immunotherapy                | gastric       |
| 75  | Nivolumab                          | esophageal squamous cell carcinoma            | 2022/6/23     | not reimbursed       | 2023/12/31         | 556                      | 277,044                         | 2.5               | no difference   | NCT03143153           | positive       | no    | no       | intravenous           | first-line      | no              | immunotherapy                | gastric       |
| 76  | Pembrolizumab                      | melanoma                                      | 2018/7/20     | not reimbursed       | 2023/12/31         | 1,990                    | 179,180                         | 2.4               | improvement     | NCT01704287           | positive       | yes   | no       | intravenous           | non-first-line  | yes             | immunotherapy                | skin          |
| 77  | Pembrolizumab                      | nonsquamous NSCLC                             | 2019/3/28     | not reimbursed       | 2023/12/31         | 1,739                    | 501,704                         | 11.3              | improvement     | NCT02578680           | positive       | yes   | no       | intravenous           | first-line      | yes             | immunotherapy                | lung          |
| 78  | Pembrolizumab                      | squamous NSCLC                                | 2019/11/22    | not reimbursed       | 2023/12/31         | 1,500                    | 358,360                         | 5.5               | improvement     | NCT02775435           | positive       | yes   | no       | intravenous           | first-line      | yes             | immunotherapy                | lung          |
| 79  | Pembrolizumab                      | locally advanced or metastatic NSCLC          | 2019/9/29     | not reimbursed       | 2023/12/31         | 1,554                    | 322,524                         | 7.8               | NA              | NCT02220894           | positive       | no    | no       | intravenous           | first-line      | yes             | immunotherapy                | lung          |
| 80  | Pembrolizumab                      | esophageal cancer                             | 2020/6/17     | not reimbursed       | 2023/12/31         | 1,292                    | 215,016                         | 3.6               | no difference   | NCT02564263           | positive       | no    | no       | intravenous           | non-first-line  | yes             | immunotherapy                | gastric       |
| 81  | Pembrolizumab                      | squamous cell carcinoma of the head and neck  | 2020/12/8     | not reimbursed       | 2023/12/31         | 1,118                    | 179,180                         | 4.2               | no difference   | NCT02358031           | positive       | no    | no       | intravenous           | first-line      | yes             | immunotherapy                | head and neck |
| 82  | Pembrolizumab                      | colorectal cancer                             | 2021/6/8      | not reimbursed       | 2023/12/31         | 936                      | 573,376                         | 8.3               | improvement     | NCT02563002           | positive       | no    | no       | intravenous           | first-line      | yes             | immunotherapy                | colorectal    |
| 83  | Pembrolizumab                      | advanced oesophageal cancer                   | 2021/9/1      | not reimbursed       | 2023/12/31         | 851                      | 394,196                         | 2.6               | no difference   | NCT03189719           | positive       | yes   | no       | intravenous           | first-line      | yes             | immunotherapy                | gastric       |
| 84  | Ipilimumab                         | malignant pleural mesothelioma                | 2021/6/8      | not reimbursed       | 2023/12/31         | 936                      | 112,000                         | 4                 | NA              | NCT02899299           | positive       | no    | no       | intravenous           | first-line      | yes             | immunotherapy                | other         |
| 85  | Atezolizumab                       | hepatocellular carcinoma                      | 2020/10/27    | not reimbursed       | 2023/12/31         | 1,160                    | 360,800                         | 5.8               | improvement     | NCT03434379           | positive       | no    | no       | intravenous           | first-line      | yes             | immunotherapy                | hepatobiliary |
| 86  | Atezolizumab                       | small-cell lung cancer                        | 2020/2/11     | not reimbursed       | 2023/12/31         | 1,419                    | 229,600                         | 2                 | improvement     | NCT02763579           | positive       | yes   | no       | intravenous           | first-line      | no              | immunotherapy                | lung          |
| 87  | Atezolizumab                       | NSCLC   | 2021/4/27     | not reimbursed       | 2023/12/31         | 978                      | 262,400                         | 7.1               | NA              | NCT02409342           | positive       | no    | no       | intravenous           | first-line      | yes             | immunotherapy                | lung          |
| 88  | Atezolizumab                       | nonsquamous NSCLC                             | 2021/6/22     | not reimbursed       | 2023/12/31         | 922                      | 295,200                         | 4.5               | NA              | NCT02657434           | positive       | no    | no       | intravenous           | first-line      | no              | immunotherapy                | lung          |
| 89  | Atezolizumab                       | II-III NSCLC                                  | 2022/3/16     | not reimbursed       | 2023/12/31         | 655                      | 524,800                         | NA                | NA              | NCT02486718           | placobo        | no    | no       | intravenous           | non-first-line  | no              | immunotherapy                | lung          |
| 90  | Gilteritinib                       | acute myeloid leukemia                        | 2021/1/30     | not reimbursed       | 2023/12/31         | 1,065                    | 630,001                         | 3.7               | NA              | NCT02421939           | positive       | no    | no       | oral                  | non-first-line  | yes             | small targeted molecule      | blood         |
| 91  | Radium-223 dichloride              | prostate cancer                               | 2020/8/26     | not reimbursed       | 2023/12/31         | 1,222                    | NA                              | 3.6               | improvement     | NCT00699751           | placebo        | yes   | no       | intravenous           | non-first-line  | yes             | radiotherapy                 | prostate      |
| 92  | LONSURF;Trifluridine and Tipiracil | colorectal cancer                             | 2019/8/29     | not reimbursed       | 2023/12/31         | 1,585                    | 68,771                          | 0.7               | NA              | NCT01955837           | placebo        | yes   | no       | intravenous           | non-first-line  | no              | chemotherapy                 | colorectal    |
| 93  | inotuzumab ozogamicin              | acute lymphoblastic leukemia                  | 2021/12/20    | not reimbursed       | 2023/12/31         | 741                      | 499,100                         | 1.5               | NA              | NCT01564784           | positive       | no    | no       | intravenous           | non-first-line  | no              | targeted monoclonal antibody | blood         |

Notes: NSCLC, non-small cell lung cancer. NA: not available. Reimbursement lag for unreimbursed drugs was calculated from the date of their regulatory approval to December 31, 2023. It's important to note that this lag may extend beyond the presented data, as these drugs may remain unreimbursed after the cutoff date.

**Table S4. Information on 42 indications of anticancer drugs supported by single-arm clinical trials in China.**

| No. | Generic name           | Indication  | Approval date | Reimbursement status | Reimbursement date | Reimbursement lag | Treatment price at launch (CNY) | ORR | Clinical trial number                     | Domestic | Administration route | Line of therapy | Drug type                    | Conditional approval | Cancer site       |
|-----|------------------------|---|---------------|----------------------|--------------------|-------------------|---------------------------------|-----|---|----------|----------------------|-----------------|------------------------------|----------------------|-------------------|
| 1   | Lorlatinib             | NSCLC   | 2022/4/27     | reimbursed           | 2023/3/1           | 308               | 506,250                         | 48% | NCT01970865                               | no       | oral                 | non-first-line  | small targeted molecule      | no                   | non-hematological |
| 2   | Brentuximab            | Hodgkin's lymphoma                                  | 2020/5/12     | reimbursed           | 2023/3/1           | 1,023             | 396,000                         | 75% | NCT00848926                               | no       | intravenous          | non-first-line  | targeted monoclonal antibody | no                   | hematological     |
| 3   | Brentuximab            | systemic anaplastic large-cell lymphoma             | 2020/5/12     | reimbursed           | 2023/3/1           | 1,023             | 308,000                         | 86% | NCT00866047                               | no       | intravenous          | non-first-line  | targeted monoclonal antibody | no                   | hematological     |
| 4   | Savolitinib            | NSCLC   | 2021/6/22     | reimbursed           | 2023/3/1           | 617               | 253,959                         | 43% | NCT02897479                               | yes      | oral                 | first - line    | small targeted molecule      | yes                  | non-hematological |
| 5   | Olverembatinib         | chronic myeloid leukemia in chronic phase           | 2021/11/24    | reimbursed           | 2023/3/1           | 462               | 487,500                         | NA  | NCT03883087                               | yes      | oral                 | non-first-line  | small targeted molecule      | yes                  | hematological     |
| 6   | Olverembatinib         | chronic myeloid leukemia in accelerated phase       | 2021/11/24    | reimbursed           | 2023/3/1           | 462               | 438,750                         | NA  | NCT03883100                               | yes      | oral                 | non-first-line  | small targeted molecule      | yes                  | hematological     |
| 7   | Carfilzomib            | multiple myeloma                                    | 2021/7/9      | reimbursed           | 2023/3/1           | 600               | 243,542                         | 36% | NCT03029234                               | no       | intravenous          | non-first-line  | small targeted molecule      | yes                  | hematological     |
| 8   | Pralatrexate           | peripheral T-Cell lymphoma                          | 2020/8/26     | not reimbursed       | 2023/12/31         | 1,222             | NA                              | 52% | NCT03349333                               | no       | intravenous          | non-first-line  | small targeted molecule      | yes                  | hematological     |
| 9   | Avapritinib            | gastrointestinal stromal tumor                      | 2021/3/30     | not reimbursed       | 2023/12/31         | 1,006             | NA                              | 88% | NCT02508532                               | no       | oral                 | first - line    | small targeted molecule      | yes                  | non-hematological |
| 10  | Axicabtagene ciloleuce | large B-cell lymphoma                               | 2021/6/22     | not reimbursed       | 2023/12/31         | 922               | 1,200,000                       | 79% | FKC876-2018-001                           | yes      | intravenous          | non-first-line  | small targeted molecule      | no                   | hematological     |
| 11  | Pralsetinib            | NSCLC   | 2021/3/23     | not reimbursed       | 2023/12/31         | 1,013             | 486,000                         | 57% | NCT03037385                               | no       | oral                 | non-first-line  | small targeted molecule      | yes                  | non-hematological |
| 12  | Pralsetinib            | thyroid cancer                                      | 2022/3/8      | not reimbursed       | 2023/12/31         | 663               | 486,000                         | 89% | NCT03037385                               | no       | oral                 | non-first-line  | small targeted molecule      | yes                  | non-hematological |
| 13  | Ivosidenib             | leukemia  | 2022/1/30     | not reimbursed       | 2023/12/31         | 700               | 286,179                         | 42% | NCT02074839                               | no       | oral                 | first - line    | small targeted molecule      | yes                  | hematological     |
| 14  | Relmacabtagene         | large B-cell lymphoma                               | 2021/9/1      | not reimbursed       | 2023/12/31         | 851               | 1,290,000                       | 60% | NCT04089215                               | yes      | intravenous          | first - line    | small targeted molecule      | yes                  | hematological     |
| 15  | Envafolimab            | solid tumor   | 2021/11/24    | not reimbursed       | 2023/12/31         | 767               | 215,280                         | 39% | CTR20181127                               | yes      | intravenous          | non-first-line  | targeted monoclonal antibody | yes                  | non-hematological |
| 16  | Larotrectinib          | solid tumor   | 2022/4/8      | not reimbursed       | 2023/12/31         | 632               | NA                              | 67% | NCT02122913<br>NCT02637687<br>NCT02576431 | no       | oral                 | non-first-line  | small targeted molecule      | no                   | non-hematological |
| 17  | Sintilimab             | relapsed or refractory classical Hodgkin's lymphoma | 2018/12/24    | reimbursed           | 2020/1/1           | 373               | 188,112                         | 80% | NCT03114683                               | yes      | intravenous          | non-first-line  | targeted monoclonal antibody | yes                  | hematological     |
| 18  | Almonertinib           | EGFR T790M advanced or metastatic NSCLC             | 2020/3/17     | reimbursed           | 2021/3/1           | 349               | 723,240                         | 69% | NCT02981108                               | yes      | oral                 | first - line    | small targeted molecule      | yes                  | non-hematological |
| 19  | Camrelizumab           | relapsed or refractory classical Hodgkin's lymphoma | 2019/5/29     | reimbursed           | 2021/3/1           | 642               | 534,600                         | 77% | NCT03155425                               | yes      | intravenous          | non-first-line  | targeted monoclonal antibody | yes                  | hematological     |
| 20  | Toripalimab            | advanced or metastatic Melanoma                     | 2018/12/17    | reimbursed           | 2021/3/1           | 805               | 72,000                          | 17% | NCT03013101                               | yes      | intravenous          | non-first-line  | targeted monoclonal antibody | yes                  | non-hematological |
| 21  | Tislelizumab           | relapsed or refractory classical Hodgkin's lymphoma | 2019/12/26    | reimbursed           | 2021/3/1           | 431               | 277,888                         | 77% | NCT03209973                               | no       | intravenous          | first - line    | targeted monoclonal antibody | yes                  | hematological     |



| No. | Generic name              | Indication  | Approval date | Reimbursement status | Reimbursement date | Reimbursement lag | Treatment price at launch (CNY) | ORR    | Clinical trial number | Domestic | Administration route | Line of therapy | Drug type                    | Conditional approval | Cancer site       |
|-----|---------------------------|---|---------------|----------------------|--------------------|-------------------|---------------------------------|--------|-----------------------|----------|----------------------|-----------------|------------------------------|----------------------|-------------------|
| 22  | Tislelizumab              | advanced or metastatic urothelial bladder cancer        | 2020/4/9      | reimbursed           | 2021/3/1           | 326               | 106,880                         | 25%    | NCT04004221           | no       | intravenous          | non-first-line  | targeted monoclonal antibody | yes                  | non-hematological |
| 23  | Zanubrutinib              | mantle cell lymphoma                                    | 2020/6/2      | reimbursed           | 2021/3/1           | 272               | 584,777                         | 84%    | NCT03206970           | yes      | oral                 | first - line    | small targeted molecule      | yes                  | hematological     |
| 24  | Zanubrutinib              | chronic lymphocytic leukemia/small lymphocytic lymphoma | 2020/6/2      | reimbursed           | 2021/3/1           | 272               | 296,626                         | 85%    | NCT03206918           | yes      | oral                 | non-first-line  | small targeted molecule      | yes                  | hematological     |
| 25  | Orelabrutinib             | mantle cell lymphoma                                    | 2020/12/25    | reimbursed           | 2022/1/1           | 372               | 162,992                         | 78%    | NCT03494179           | yes      | oral                 | non-first-line  | small targeted molecule      | yes                  | hematological     |
| 26  | Orelabrutinib             | chronic lymphocytic leukemia/small lymphocytic lymphoma | 2020/12/25    | reimbursed           | 2022/1/1           | 372               | 161,912                         | 74%    | NCT03493217           | yes      | oral                 | non-first-line  | small targeted molecule      | yes                  | hematological     |
| 27  | Daratumumab               | multiple myeloma  | 2019/7/4      | reimbursed           | 2022/1/1           | 912               | 604,080                         | 29%    | NCT01985126           | no       | intravenous          | non-first-line  | targeted monoclonal antibody | yes                  | hematological     |
| 28  | Ensartinib                | NSCLC   | 2020/11/7     | reimbursed           | 2022/1/1           | 420               | 388,886                         | 52%    | NCT03215693           | yes      | oral                 | non-first-line  | small targeted molecule      | yes                  | non-hematological |
| 29  | Furmonertinib             | EGFR T790M advanced or metastatic NSCLC                 | 2021/3/2      | reimbursed           | 2022/1/1           | 305               | 332,572                         | 74%    | NCT03452592           | yes      | oral                 | non-first-line  | small targeted molecule      | yes                  | non-hematological |
| 30  | Fluzoparib                | ovarian cancer  | 2020/12/11    | reimbursed           | 2022/1/1           | 386               | 182,950                         | 70%    | NCT03509636           | yes      | oral                 | first - line    | small targeted molecule      | yes                  | non-hematological |
| 31  | Pamiparib                 | advanced high-grade ovarian cancer                      | 2021/4/30     | reimbursed           | 2022/1/1           | 246               | 173,250                         | 68%    | NCT03333915           | yes      | oral                 | non-first-line  | small targeted molecule      | yes                  | non-hematological |
| 32  | Disitamab vedotin         | gastric cancer  | 2021/6/8      | reimbursed           | 2022/1/1           | 207               | 364,500                         | 24%    | NCT03556345           | yes      | intravenous          | non-first-line  | targeted monoclonal antibody | yes                  | non-hematological |
| 33  | Cadonilimab               | cervical cancer   | 2022/6/28     | not reimbursed       | 2023/12/31         | 551               | 317,280                         | 31%    | NCT04380805           | yes      | intravenous          | non-first-line  | targeted monoclonal antibody | yes                  | non-hematological |
| 34  | Serplulimab               | solid tumor   | 2022/3/22     | not reimbursed       | 2023/12/31         | 649               | 167,640                         | 31%    | NCT03941574           | yes      | intravenous          | non-first-line  | targeted monoclonal antibody | yes                  | non-hematological |
| 35  | Duvelisib                 | lymphoma  | 2022/3/16     | not reimbursed       | 2023/12/31         | 655               | 106,500                         | 42%    | NCT01882803           | no       | oral                 | non-first-line  | small targeted molecule      | yes                  | hematological     |
| 36  | Pemigatinib               | cholangiocarcinoma                                      | 2022/3/29     | not reimbursed       | 2023/12/31         | 642               | 665,470                         | 50%    | NCT04256980           | no       | oral                 | non-first-line  | small targeted molecule      | no                   | non-hematological |
| 37  | Dinutuximab beta          | neuroblastoma   | 2021/8/12     | not reimbursed       | 2023/12/31         | 871               | 2,383,920                       | NA     | NCT01704716           | no       | intravenous          | non-first-line  | targeted monoclonal antibody | no                   | non-hematological |
| 38  | Iodine[131I] metuximab    | hepatic carcinoma                                       | 2021/4/30     | not reimbursed       | 2023/12/31         | 975               | NA                              | 8%     | NA                    | yes      | intravenous          | non-first-line  | targeted monoclonal antibody | no                   | non-hematological |
| 39  | Penpulimab                | classical Hodgkin lymphoma                              | 2021/8/3      | not reimbursed       | 2023/12/31         | 880               | 273,000                         | 89%    | NCT03722147           | yes      | intravenous          | non-first-line  | targeted monoclonal antibody | yes                  | hematological     |
| 40  | Selinexor                 | multiple myeloma  | 2021/12/4     | not reimbursed       | 2023/12/31         | 747               | 134,610                         | 25%    | NCT02336815           | no       | oral                 | non-first-line  | small targeted molecule      | yes                  | hematological     |
| 41  | Zimberelimab              | classical Hodgkin lymphoma                              | 2021/8/25     | not reimbursed       | 2023/12/31         | 858               | NA                              | 91%    | NCT03655483           | yes      | intravenous          | non-first-line  | targeted monoclonal antibody | yes                  | hematological     |
| 42  | Sacituzumab govitecan-hzi | breast cancer   | 2022/6/10     | not reimbursed       | 2023/12/31         | 569               | 284,000                         | 38.80% | NCT04454437           | no       | intravenous          | non-first-line  | targeted monoclonal antibody | yes                  | non-hematological |

Notes: ORR, overall response rate. NSCLC, non-small cell lung cancer. NA: not available. Reimbursement lag for unreimbursed drugs was calculated from the date of their regulatory approval to December 31, 2023. It's important to note that this lag may extend beyond the presented data, as these drugs may remain unreimbursed after the cutoff date.