A numbers game

The dynamics around cancer treatment and clinical trials are shifting. Some drug-makers with packed pipelines are hoping that agility in the market will pay off. **By Benjamin Plackett**

In 2021, cancer accounted for almost 15% of all deaths around the world, making it the second most common cause of human death after cardiovascular diseases. By 2040, an estimated 28 million new cases of cancer will be diagnosed every year globally, up from around 20 million in 2020. Advances in diagnosis and treatment must keep up with the growing burden of cancer, and clinical trials are an important part of such work.

"In a perfect world, every cancer patient should get to be part of a clinical trial if they want to be," says Lola Rahib, an independent biomedical researcher and cancer patient advocate. This is, of course, not feasible, but it emphasizes the importance of decisions around which clinical trials to run and support, including which cancer types are prioritized and which patient demographics are studied.

Choices about which therapeutics and technologies to invest in can also be hugely consequential for cancer patients, especially at a time when the costs of medications are skyrocketing. The market size for oncology drugs is expected to reach US$409 billion by 2028, up from $223 billion last year, according to a report[1] by the IQVIA Institute for Human Data Science, an analytics and research company in Durham, North Carolina (see 'The rising costs'). IQVIA attributes this increase to the large volume of patented medications on the market and the number of new cancer treatments that have been introduced in the last five years.

An agile presence

Smaller companies have solidified themselves as key players in cancer clinical trials (see 'Emerging leaders'). IQVIA reports that emerging biopharmaceutical companies (classified as those with less than $500 million in annual sales and less than $200 million per year spent on R&D) were responsible for 60% of oncology trials in 2023, up from 33% in 2014. Large pharmaceutical companies (those with greater than $10 billion in annual sales) were responsible for 28% trial starts in 2023, down from 59% in 2014.

Many of these emerging companies are in China, which is quickly expanding its capacity to conduct cancer trials and research. A decade ago, Chinese companies were responsible for just 5% of new clinical trials, but by 2023, that figure had grown to 35%, the IQVIA report shows. Chinese companies now start more clinical trials than companies based in either the United States or European Union. This mirrors China's trajectory in cancer research. In 2024, China overtook the United States as the leading country for high-quality cancer-research output in the Nature Index, with a Share of 2,614.52 – a 19% increase on the previous year. The United States, whose cancer-related Share was 2,481.71 in 2024, recorded a more modest increase in output of 5% (see page S65).

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The surge in oncology research from Chinese companies might take some time to affect the market. The IQVIA report highlights Chinese pharmaceutical company Jiangsu Hengrui, based in Lianyungang, as having a very strong pipeline of cancer therapies but relatively modest revenues. With 45 "unique assets" (drug and drug candidates) in various stages of development, Jiangsu Hengrui has a more packed pipeline than world-leading firms such as Roche, which has 37, and Pfizer, which has 22. Yet Jiangsu Hengrui's cancer-drug revenues, at less than $800 million, are modest compared with many of its competitors, IQVIA reports. Rahib expects that Chinese pharmaceutical company revenues will increase rapidly in the coming years, as more of their therapeutics enter the market.

A question of priorities

Not all cancers are treated equally in clinical trials, both in funding and participation. Financial backing has been more readily available for research on cancers that affect large numbers of people, such as breast cancer, which received more than 11% of global public and charitable funding between 2016 and 2020, according to an analysis published in *The Lancet Oncology*[2], and blood cancers, which received almost 10%. Other forms of cancer attract far less, such as colorectal, which received 5% of funds over the period, and pancreatic, which received 3%.

Shiva Malek, who leads oncology research for Novartis Biomedical Research based in Cambridge, Massachusetts, says that pancreatic and colorectal cancers pose a particular challenge to researchers. Drugs that have looked promising in other cancers don't seem to work as well for pancreatic and colorectal cancers. "It's dismal," says Malek. "The make-up of the disease is just more complex. We often see those patients at later stages, so the cancer is far more complex."

With only about 10% of patients with pancreatic cancer surviving for five years after their diagnosis – one of the lowest survival rates for any kind of cancer – there is strong impetus to increase funding for the development of treatments. But a lack of success in the past has pushed many funders to other areas, says Rahib. This mentality needs to change, she says. "We need to invest more in the cancers with higher mortalities, like pancreatic cancer."

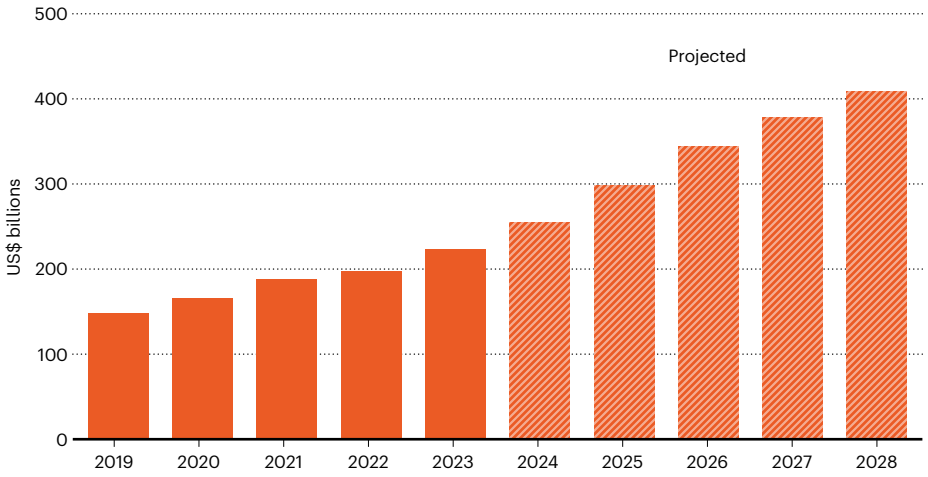
The growth in the oncology drug pipeline is driving increased competition for patient enrolment in clinical trials, including for 'difficult' cancers such as colorectal and pancreatic. A study[3] led by the Bloomberg New Economy International Cancer Coalition, a New York-based cancer research initiative, looked at patient enrolment data for cancer clinical trials starting in 2018 and 2022 and found that the need for participants had increased year on year. But participation rates remain low, with fewer than 5% of eligible patients enrolling in cancer clinical trials worldwide. This is despite the fact that interest in clinical trial participation is increasing, the authors say, which suggests that more needs to be done to make participation more accessible.

Benjamin Plackett is a science journalist based in London.

1. IQVIA. *Global Oncology Trends 2024: Outlook to 2028* (IQVIA, 2024).
2. McIntosh, S. A. *et al. Lancet Oncol.* **24**, 636–645 (2023).
3. Bloomberg New Economy International Cancer Coalition, McKinsey Cancer Center & Cure4Cancer. *Cancer Discov.* **14**, 2317–2323 (2024).

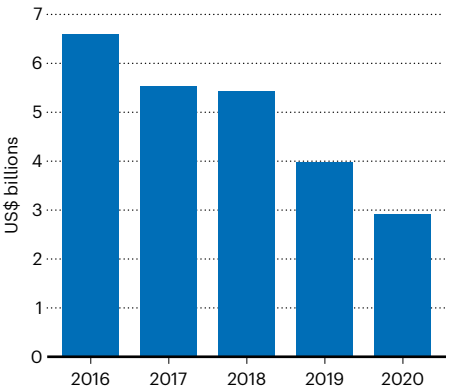
THE RISING COSTS

The market size for cancer medicine reached US$223 billion in 2023 — roughly 45% of which was contributed by the United States — and is projected to increase to $409 billion by 2028. The high cost of patented drugs and stream of new products are among the factors driving this growth.



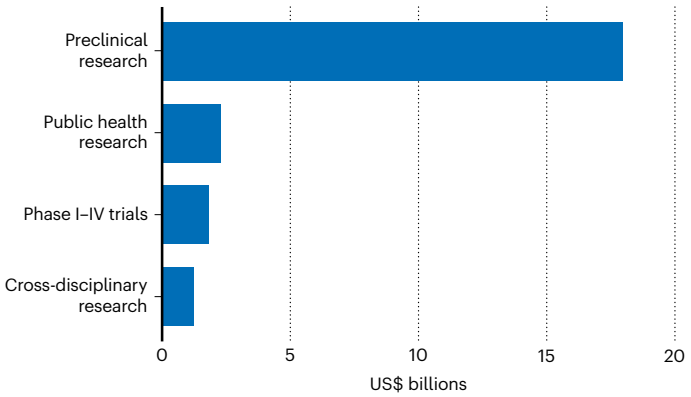
A DROP IN FUNDS

Global cancer research funding from public and philanthropic funders has dropped from about US$6.6 billion in 2016 to $2.9 billion in 2020. It's unclear whether this decline is due to research funds being redirected to pandemic-related projects, a reduction in available funding (such as fewer charitable donations), or is an extension of an existing trend.



TARGETED SPEND

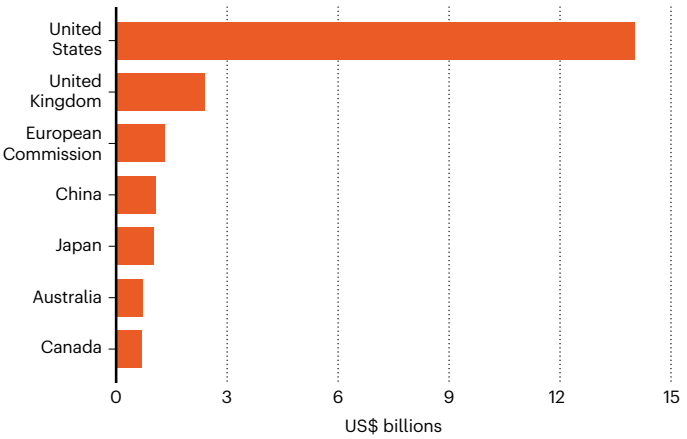
A breakdown of the estimated US$24.5 billion in public and philanthropic cancer funding in 2016–20 shows that clinical trials receive minimal funding from these sources. When classified by tumour type and site, breast cancer was the highest-funded cancer type, followed by haematological (blood), lung, colorectal and brain cancer.



Note: Cancer Research UK data not included.

NATIONAL FOCUS

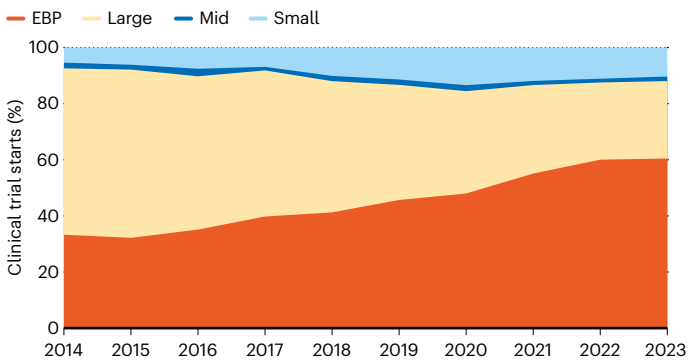
The United States provided 57.3% of the total cancer research funding from public and philanthropic sources for 2016–20. The United Kingdom* and European Commission, the next largest funders in this selected group, contributed just over 15%.



*UK funding includes $1.2 billion Cancer Research UK funding.

EMERGING LEADERS

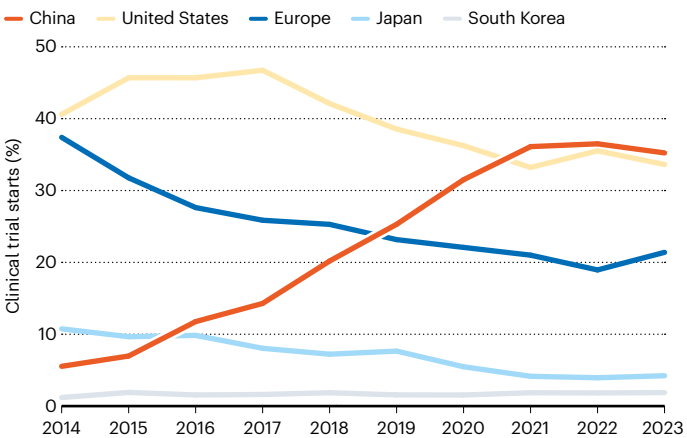
Emerging biopharmaceutical companies (EBPs) are the dominant segment among industry sponsors of oncology trials. From 2014 to 2023, EBPs almost doubled their share of new clinical trials, jumping from 33% to 60%. Large biopharmaceutical companies dropped from 59% to 28% over the same period.



Note: Company size is based on global annual sales: EBPs at less than US$500 million (and less than $200 million spend on R&D); small at $500 million to $5 billion; mid-sized at $5 billion to $10 billion; large at more than $10 billion.

MARKET SHIFT

Companies headquartered in China have rapidly expanded their share of new oncology trials, from 5% a decade ago to 35% in 2023. China now surpasses the United States as the country starting the most oncology trials.



SOURCES: IQVIA MIDAS (DEC. 2023); IQVIA INSTITUTE (APR. 2024); MCINTOSH, S. A. *ET AL. LANCET ONCOL.* **24**, 636–645 (2023); IQVIA INSTITUTE *GLOBAL ONCOLOGY TRENDS 2024*; IQVIA EMEA THOUGHT LEADERSHIP ANALYSIS; CITELINE TRIALTROVE

Correction
This Nature Index article gave an out-of-date name for Novartis Biomedical Research.

Corrected 22 May 2025