

# Between state and market – what role for strategic Chinese financing vehicles in developing new antimicrobials?

**COVID-19 has refocused global attention on infectious diseases, and the role of the state in research and development (R&D) to solve societal problems – such as the under-supply of new antimicrobials. These have characteristics of a ‘public good’ that is socially important but insufficiently supplied by the market.**

**Antimicrobial resistance (AMR) requires global R&D responses. China is an increasingly important science power with a history of strategic industrial and innovation policy. ‘Government guidance funds’ (GGFs) – strategic industry financing mechanisms – have invested around US\$0.88 trillion over the last decade, including in pharma and biotech.**

**Our research examines GGFs’ support to developing antimicrobials. It finds that GGFs are responsive to policy changes but have a weak social mandate and limited ability to support ‘public goods’-type investments, such as antimicrobials. However, they are likely to be an important future R&D funding source, and a possible space for engagement by international organisations.**

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## Key messages

- GGFs’ funding is substantial, and they have been major investors in pharma and biotech (P&B); however, they do not invest in antimicrobials and have limited ability to prioritise social goals in investment decisions.
- GGFs are highly sensitive to changing policy, making them an important strategic investment vehicle whose priorities and portfolios may be adjusted in response to changing policy.
- Institutional reforms will be needed for GGFs to play a more effective role. With a more explicit social mandate and supporting reforms, they could potentially play a greater role achieving social goals such as antimicrobial development.
- GGFs deserve further research attention as part of China’s changing strategic funding of R&D, and as a possible space for engagement by international organisations, for their potential contribution to global public goods.

## Background

### What role for China's GGFs in developing new antimicrobials?

Population health relies on the availability of functioning antimicrobials, both in routine care and to support many complex medical interventions, including surgery and cancer treatments. AMR already causes global mortality comparable to HIV/AIDS and malaria combined, and its impacts are expected to increase. Developing novel antimicrobials is complex and risky, has a long lead time, and is unprofitable, as new drugs must be rationed to slow the development of resistance. R&D for new antimicrobials has been declining since the 1980s and there is an insufficient pipeline of novel antimicrobials, which are needed as older drugs lose their effectiveness. Big pharma companies have withdrawn from antimicrobial R&D, and small innovative companies struggle with high levels of risk and failure.

Antimicrobials have many characteristics of a 'public good' leading to calls from some developed countries and several international initiatives for greater support to antimicrobial development. This could be through innovation and industrial policies, as well as novel incentive mechanisms, such as 'subscription' funding models intended to mimic market incentives, while limiting use of newly developed drugs and conserving their efficacy. The rapid development of vaccines during the COVID-19 pandemic highlights the potential of such coordinated policies and of a greater role for the state in addressing public health threats.

As an emerging economy transitioning from a planned towards a market economy, China has employed a range of measures to support innovation and R&D. One novel financing instrument mainly introduced in the last decade is GGFs (政府引导基金), which bring together government and non-government capital to invest in cutting-edge and strategic industries, including P&B. GGFs sit somewhere between state and market, being managed by professional fund managers, but with a mandate to be responsive to government policy priorities. The Chinese government has taken measures to address AMR since the early 21st century, and the country's 2016 National Action Plan committed to developing novel antimicrobials. China has increasingly used the language of public goods to describe the potential contribution of its R&D and manufacturing capacity to global health.

Our research analysed GGFs' support for developing new antimicrobials, given their importance in China's strategic industrial development, and their hybrid identity, combining market approaches and state guidance.

### Key findings

Our research maps GGFs' investments in P&B using data from a commercial database, and interviews key informants to better understand GGFs' decision-making processes, how they promote social value, and their potential to support the development of drugs with strong 'public good' characteristics, such as antimicrobials. The main findings are as follows:

#### **GGFs have invested significantly in P&B, but little funding has gone to antibiotics or drugs with a critical 'public goods' character.**

- GGFs have invested in a variety of industries, with P&B ranking second by number of investments, with a disclosed investment of over USD 6.53 billion between 2000 and 2021.
- P&B is fourth in overall investment volumes and has spiked after government set P&B as a priority sector.
- Within P&B, oncology and chronic disease treatments receive the most support; little has been invested in antibiotics or drugs with a 'public goods' character.

#### **GGFs are sensitive to government policy, but constrained by market logic, limiting their ability to contribute to social goals, in this case drugs with a 'public goods' character. GGFs lack incentives to invest in antimicrobials due to the absence of a market or mechanisms to create demand in the absence of a market.**

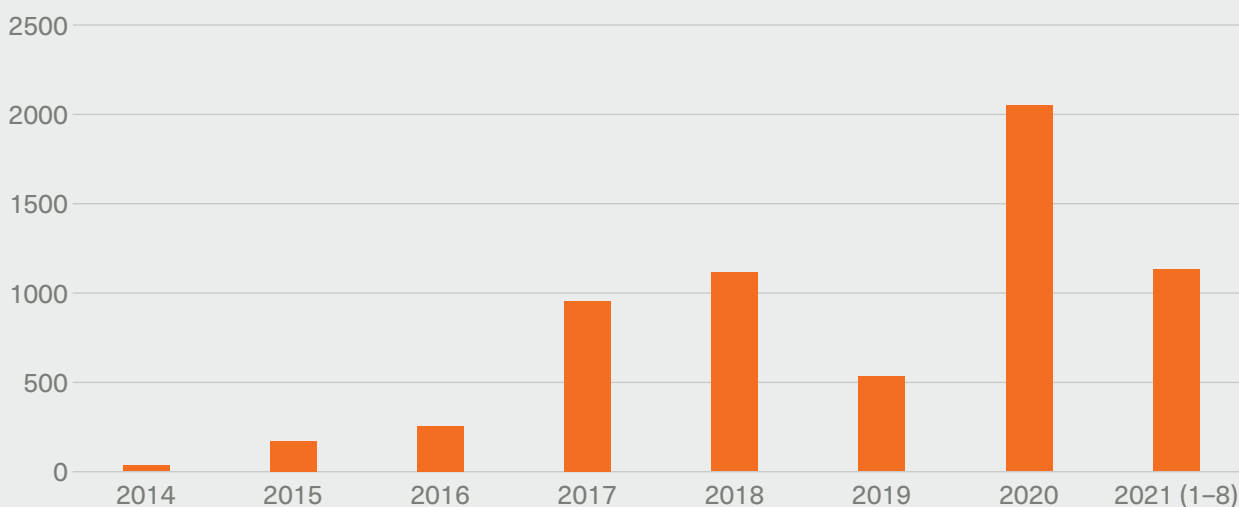
- GGFs' investments are responsive to changing government policy in supporting P&B innovation. Examples include changes in investment decisions following updating of government drug purchasing lists, regulatory reforms to accelerate authorisation of innovative drugs, and reforms to hospital payment systems.
- They are also responsive to changes in government priorities for P&B development as set out in industrial policy guidance – investment decisions follow changes in priorities, which in turn reflect changing clinical demand.
- Despite GGFs' responsiveness to policy, their ability to push early-stage innovations is limited. Interviewees point to major constraints, including market constraints (GGFs' need to generate adequate returns and the absence of specific financing conditions or

**Figure 1 GGFs' investments by cases and size in different sectors from 2000 to August 2021**



Source: PEDATA

**Figure 2 GGFs' investments in P&B from 2014 to August 2021**



Source: PEDATA

flexibilities), risk aversion, and an inadequate human resources and talent pool.

- There are constraints specific to antimicrobials that reduce the incentive for GGFs to invest: (1) the absence of clear a policy steer from central government; and (2) the absence of demand for new antimicrobials. China has not yet experimented with novel demand mechanisms like those starting to be trialled in some developed countries, and broader efforts to control AMR are reducing prescription volumes and shrinking the market.

**Overall, GGFs' may play a role as part of broader, mission-driven policy in P&B and other sectors, but this is limited by their lack of a clear social mandate and a range of contextual factors – in addition to the institutional constraints outlined above. To date, their 'mission' has tended to be industrial catch-up; that may change along with central government's changing strategic priorities.**

- The scope and focus of individual GGFs is set by government when they are established, but after this, government tends to be hands-off, relying on policy signals to help orient GGFs' investment decisions.

## How the US-China trade war catalysed GGFs' support to China's semiconductor industry

GGFs' investments in semiconductors underline how important policy is in shaping their behaviour. Following the 2018 US ban on technology exports to China, investment in semiconductors (from both government and GGFs) soared from 0.95 billion to 31.1 billion USD between 2018 and 2019, according to Deloitte. Investment aims to substantially increase China's share of global chip manufacturing, with China's global share of manufacturing capacity projected to increase from 21% to 45%.

- GGFs can play a major role in developing new sectors or products where there is a strong policy push – an example cited by many interviewees was GGFs' contribution to developing China's semiconductor sector.
- GGFs' focus in P&B is changing as COVID-19 reorients government thinking and underlines the sector's strategic, social and commercial importance. However, it remains to be seen whether an increasing leadership discourse of P&B and public goods presages change in how GGFs are used.
- GGFs do not directly shape markets but can respond to market-shaping efforts. This makes them a potential agent in mission-driven approaches to innovation, but in combination with parallel reforms to create markets, or – conceivably – use of market-like

mechanisms that create demand for products like antimicrobials.

- GGF staff state that most GGFs lack a clear mandate to pursue specific goals and do not specifically consider social aims in their investment decisions. However, recent policy changes may push GGFs to have a more explicit social or public goods focus going forward.

## Practical implications

- Researchers: GGFs are a significant, and potentially increasingly important, part of China's strategic funding arsenal, despite their limitations. GGFs deserve attention as they study China's approach to strategic investment in R&D, given government's changing investment priorities in response to deteriorating relations with major developed economies, and increasing stress on domestic economic self-reliance, especially in tech.
- International organisations: China has the potential to contribute to global public goods, through R&D and supplying commodities (such as pharmaceuticals and medical devices) to global markets and low- and middle-income countries. The Chinese leadership has signalled some willingness to do this. What role can Chinese GGFs play, and how can international/multilateral organisations support them to play a greater role, including through institutional and policy reforms?
- Developed country governments: GGFs are a comparatively new component of China's strategic industrial funding landscape, but one that is likely to become more important as central government pursues domestic tech development and self-reliance. They have shown their importance in strategic areas of tech, such as semiconductors, and we anticipate that they will play a similar role in other areas.



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This brief is an output of the project: 'Mapping capabilities and developing policy positions to influence funding and practice to develop and strengthen the pipeline of AMR discovery R&D in UK and China'. The project is kindly supported by University of Warwick and the UKRI Research England Policy Support Fund. The output is based on research conducted through the UKRI-MRC project: '[CHNUK: Integrated platforms from science to policy in response to antibacterial resistance](#)' (MR/S014934/1).