

# Value of IP for health and growth

The economic benefits of  
strengthening the innovation  
environment in **China**

---

March 2024



# Executive summary

# OBJECTIVES AND APPROACH

**INTERPAT asked Charles River Associates (CRA) to identify and quantify the economic benefits from strengthening the environment for innovation in China.**

**The objective of the study is to:**

1. Set out the **policy framework** for supporting innovation in China and the current state of innovative activity
2. Undertake a **case study analysis** on countries with potential lessons from other countries which may represent an opportunity for China
3. Develop **scenarios** as to how innovative activity could change in China if policies adopted in other countries were pursued

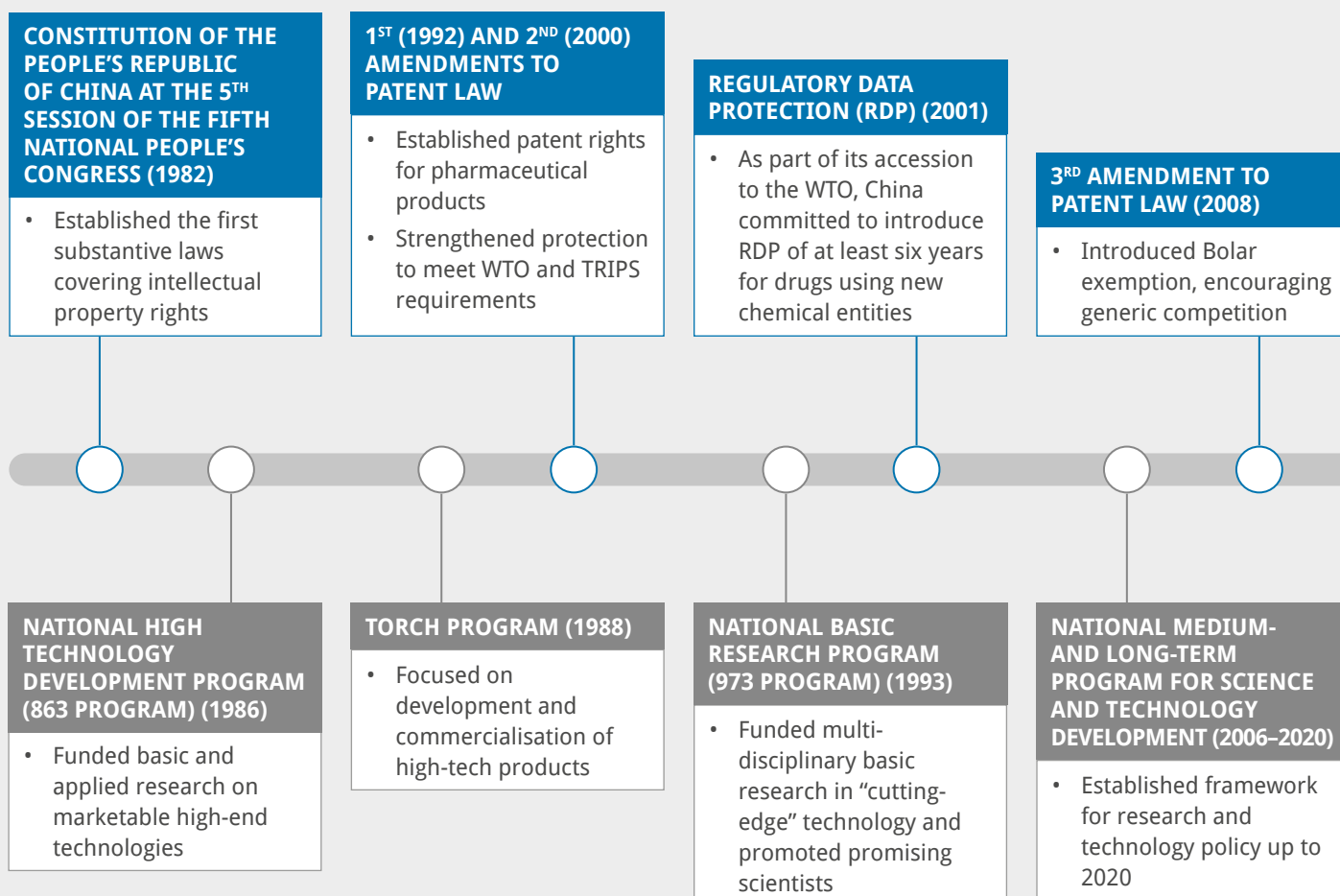
**The approach builds on a similar analysis applied to countries in Latin America (Argentina in 2018, Brazil in 2019, Mexico in 2020, Colombia in 2021)**

**The following approach was taken:**

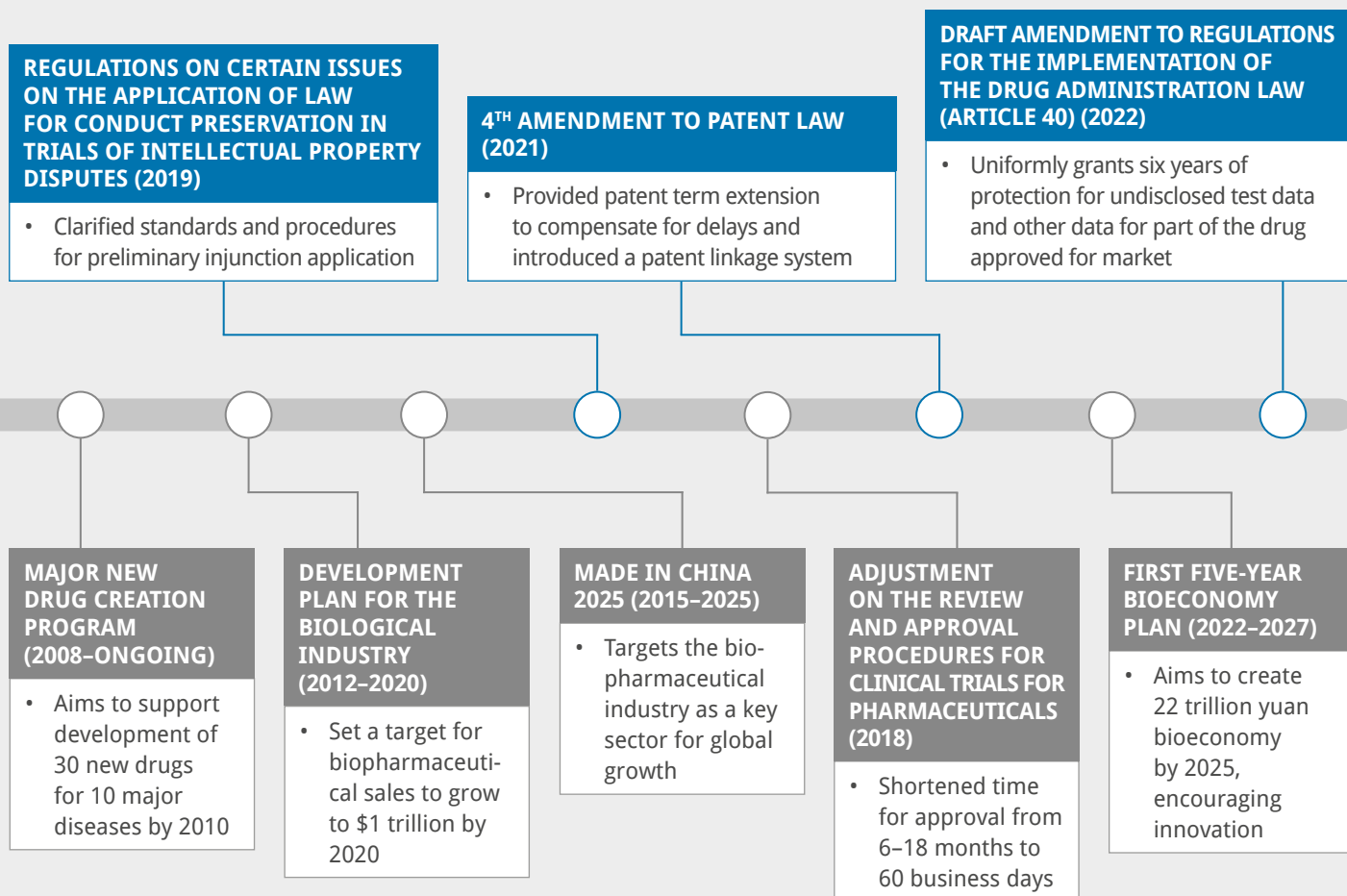
- Review the current intellectual property (IP) framework in China through **literature review** of academic publications, grey literature, and Chinese Official Statistics and International Databases
- Test key findings and hypotheses using an **iterative Delphi panel approach** with N=12 experts
- Establish **consensus** and **integrate** with findings from literature review
- Analyse **case studies** on other countries including Japan, Singapore, and South Korea selected based on criteria such as having observable outcomes from innovation and IP policy changes
- Develop **scenarios for growth** in research, R&D expenditure, employment, and patent granting
- **Refine and disseminate** findings

# CHINA HAS BECOME A MUCH MORE FAVOURABLE ENVIRONMENT FOR SUPPORTING BIOPHARMACEUTICAL INNOVATION

## CHANGES IN THE IP REGIME

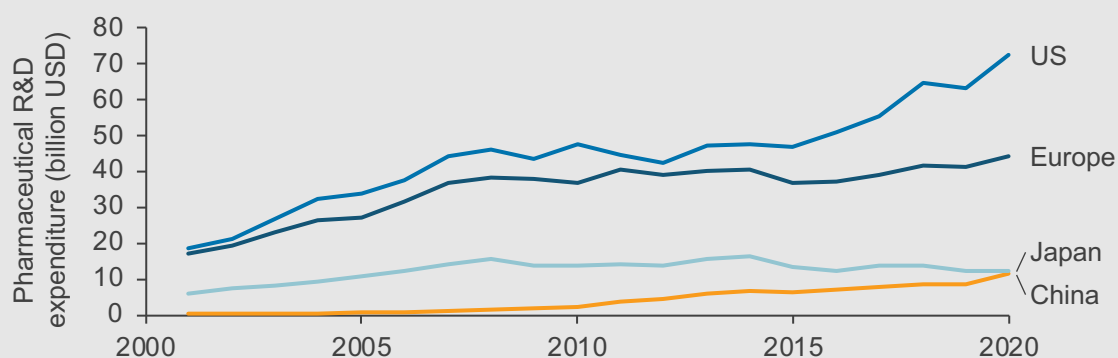


## CHANGES IN INNOVATION POLICY

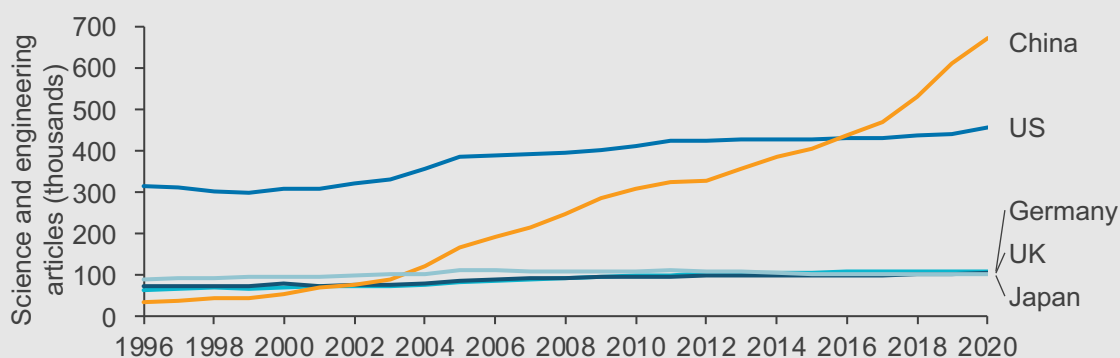


# IMPROVEMENTS IN THE INNOVATION ENVIRONMENT HAVE LED TO SUBSTANTIAL AND RAPID GROWTH IN INNOVATIVE AND ECONOMIC ACTIVITIES

China has become a leading global hub of drug innovation; a rapid increase in pharmaceutical R&D expenditure has been observed



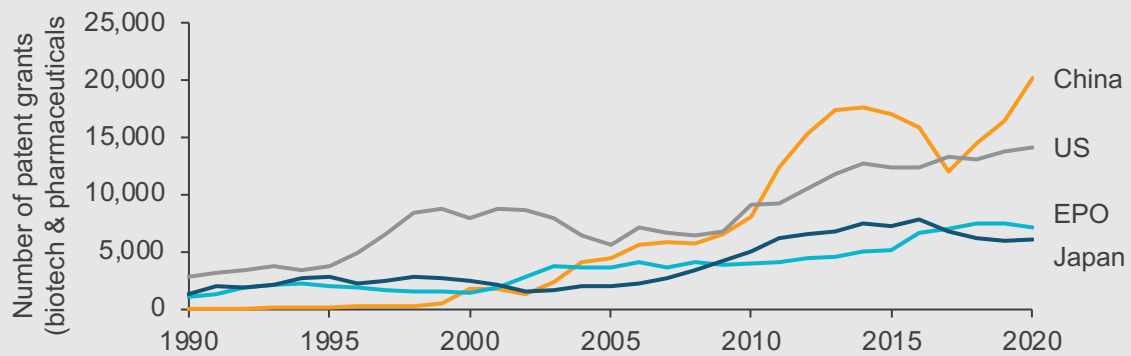
China has had strong academic R&D output in recent years and progress in facilitating collaboration between universities and industry



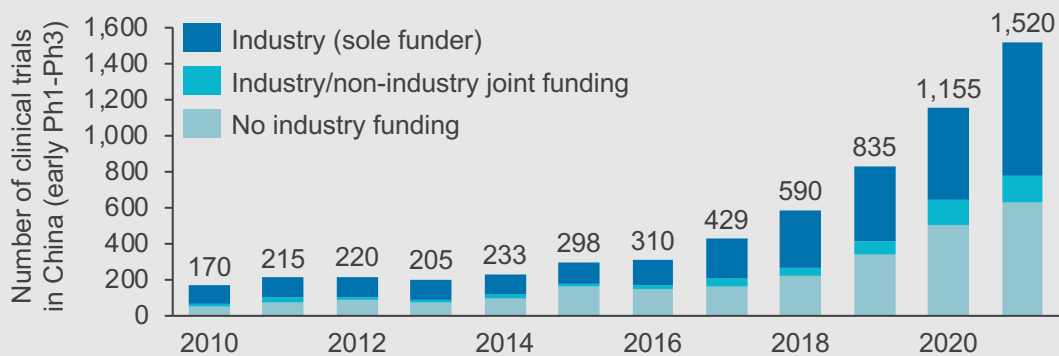
Abbreviations: EPO = European Patent Office



**Following improvements to the IP framework, the rise of innovative activity in China can be observed through the number of patent grants**

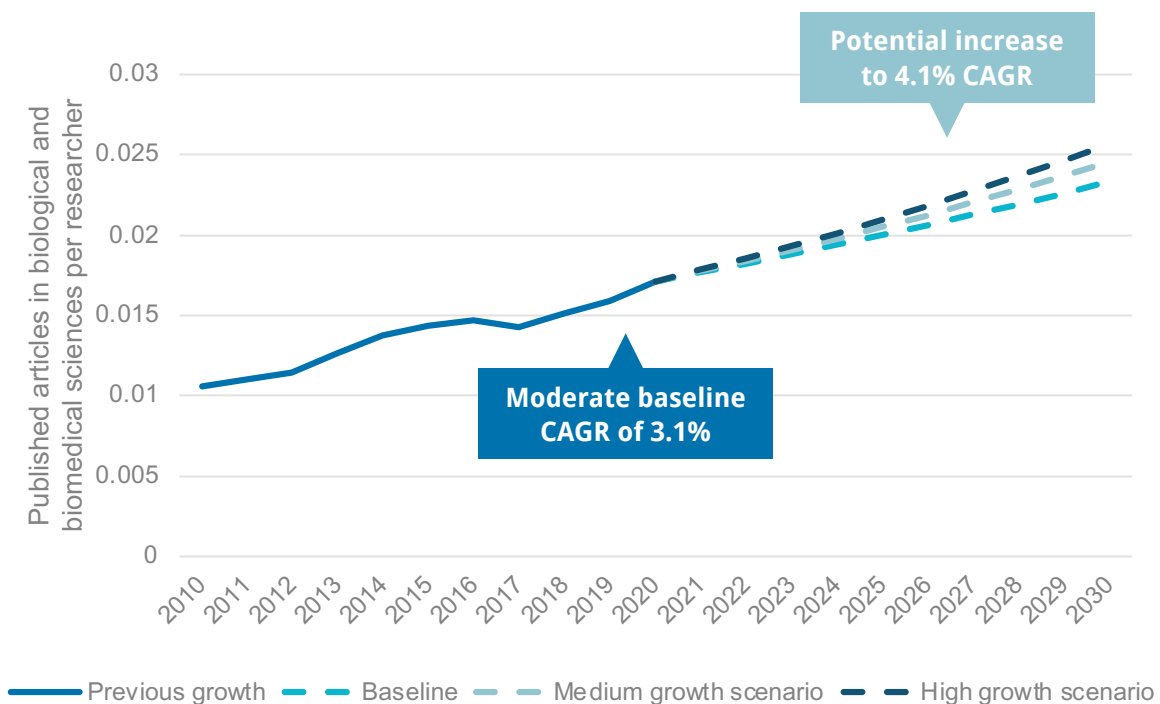


**Clinical development of new drugs has experienced a significant boom since 2010, enabling patients in China to access innovative therapies**



# GROWTH SCENARIOS FOR INNOVATIVE ACTIVITIES IN CHINA WERE ANALYSED BASED ON CASE STUDY COUNTRIES SINGAPORE, SOUTH KOREA, AND JAPAN

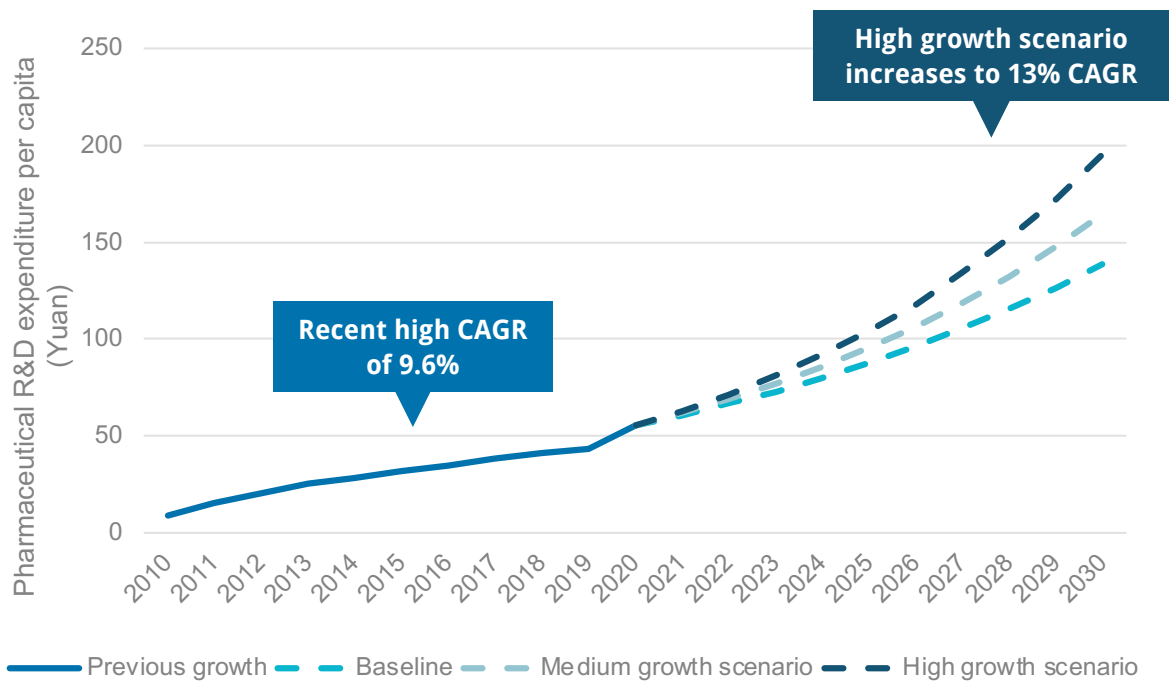
## BASIC RESEARCH GAINS



- Recent growth in biological and biomedical sciences publications has been relatively moderate in China.
- The medium and high growth scenarios suggest that there certainly could be improvements but these may be limited by relatively slow underlying growth.



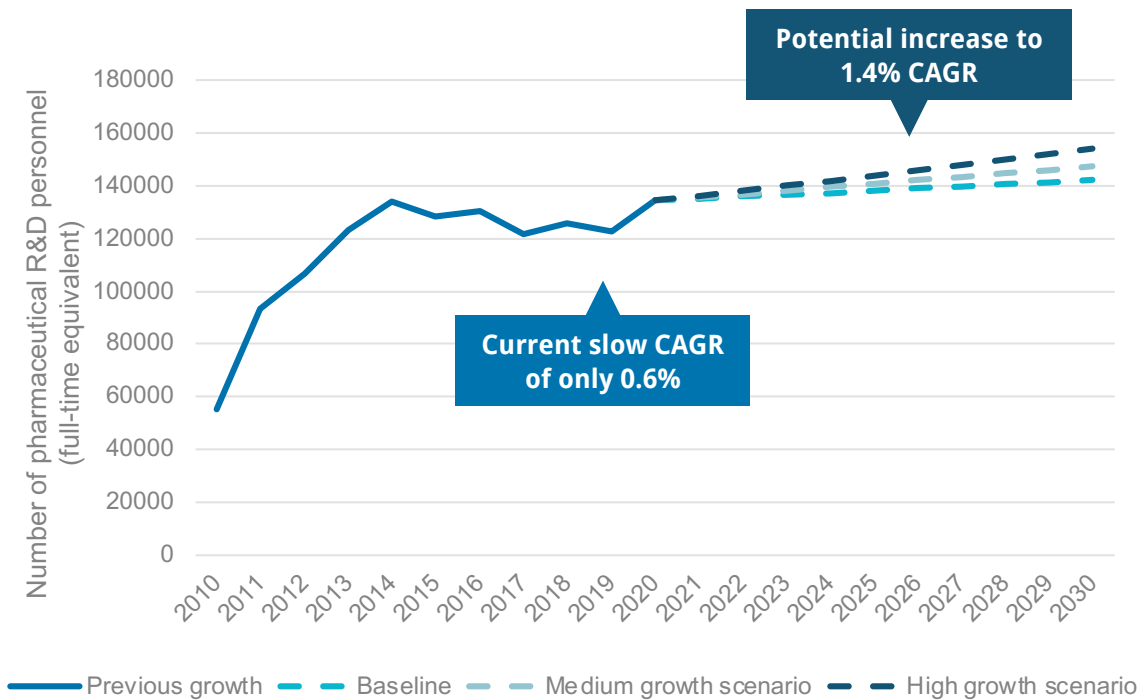
## PHARMACEUTICAL R&D EXPENDITURE GAINS



- Pharmaceutical R&D expenditure in China is already rapidly growing, so further changes based on alternative markets make it appear that growth in China would increase much faster.

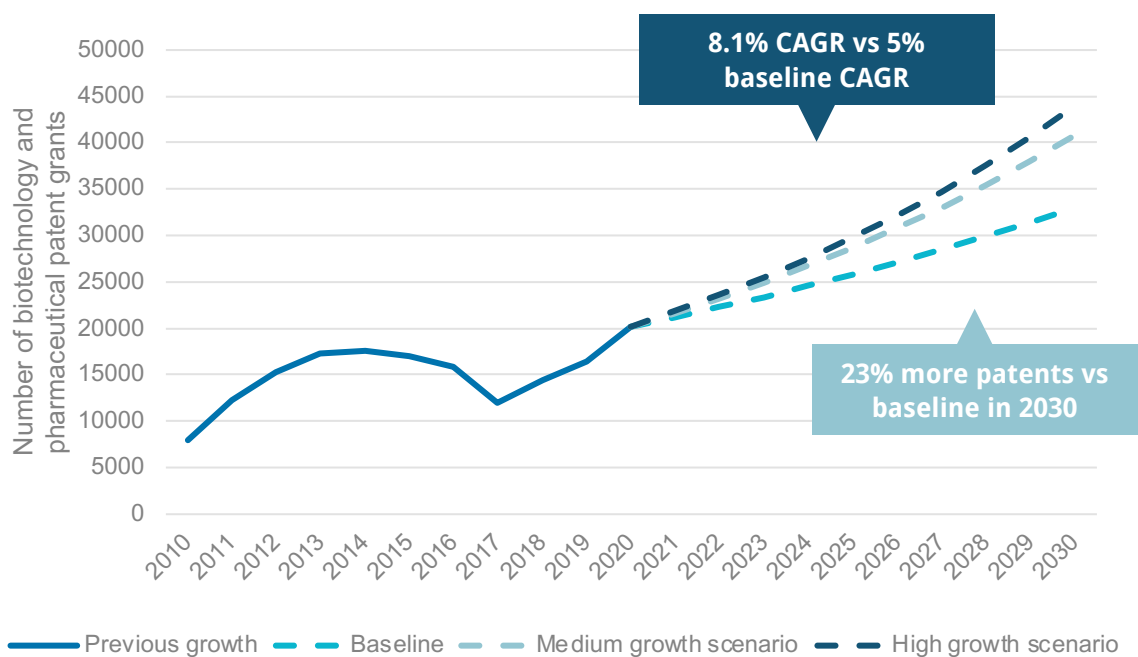
# BASED ON THE GROWTH SCENARIOS, POTENTIAL GAINS FROM IMPROVEMENT IN THE INNOVATION ENVIRONMENT COULD BE SIGNIFICANT FOR METRICS SUCH AS INVENTION PATENT GRANTS

## PHARMACEUTICAL EMPLOYMENT GAINS



- In recent years there has been limited growth in Chinese pharmaceutical employment, so even with a high growth scenario the gains for China appear modest.
- However, this is more reflective of the low baseline growth, and demonstrates the need for improvements to the innovation environment if growth in pharmaceutical employment is to return to pre-2014 levels.

## PATENT GRANT GAINS



- In all case study countries, improvements in the innovation environment led to a significant increase in patent grants, so the possible magnitude of gains for China is substantial even in a medium growth scenario.

# CONCLUSIONS

## 1. THE SCALE OF CHINA'S PROGRESS TO DATE

### **China has become a much more favourable environment for supporting biopharmaceutical innovation**

- China's biopharmaceutical sector is in a sustained period of rapid growth and has been supported by ongoing progress in innovation and IP policy since the 1980s.
- Several national innovation plans and amendments to the IP regime – including but not limited to the successive Amendments to Patent Law, the Major New Drug Creation Program (2008–ongoing) and the Development Plan for the Biological Industry (2012–2020) – have been a major contributor to these improvements.

### **Improvements in the innovation environment have led to substantial and rapid growth in innovative and economic activities**

- Across key metrics in innovative and economic activity, China has demonstrated extensive growth in the previous 20 years or so. It has narrowed the gap to the global leaders – particularly the US – in terms of investment in R&D, educational attainment, and clinical trials.

## 2. REMAINING GAPS IN THE INNOVATION ENVIRONMENT

### There remain some notable shortcomings to the innovation environment in China

- Although China has made substantial progress in terms of the innovation environment and resulting innovative and economic activities, there are still some significant areas for further improvement.
- This is especially the case with regards to the IP regime, and innovative activity could be further stimulated if the Chinese IP regime were improved in line with the US, EU, and Japan.

### The most significant gaps include provisions around regulatory data protection and patent term extensions

- A key barrier to investment in China has been the lack of transparency, and ambiguities in RDP-related policy. Fully implemented and enforced RDP with clarification on scope and wording would be a significant enabler of further innovative activities in China.
- There is also a need to strengthen the patent system to better align with international best practices. While this includes several issues (including patent linkage procedural issues and the protection of valid patents), there is a particular gap around patent term extensions

# CONCLUSIONS

## 3. THE BENEFITS OF FURTHER IMPROVEMENTS

### Addressing the remaining gaps in the innovation environment would lead to substantial benefits for China

- If the innovation policy environment were improved in a way that addresses the remaining barriers, the impact would be to encourage innovation from domestic and international pharmaceutical companies.
- This would deliver benefits across the innovation pathway, from early innovative activity around scientific publications and basic research, through to investment in R&D and employment of researchers, and ultimately leading to more clinical trials, patent applications, and new innovative therapies for patients.

### Based on the experience of other countries, our conclusion is that further improvements in China could lead to an acceleration in innovative and economic activity

- In order to assess potential gains from an improvement in the enablers of innovation, we applied the change in growth rates from case study countries where positive changes in the IP and innovation regime were introduced, to China's current baseline growth rate.
- While there are some significant challenges with this methodology, it nevertheless illustrated that the potential gains in China could be substantial for key metrics including pharmaceutical R&D expenditure and biopharma patent grants.

## 4. KEY POLICY IMPLICATIONS

### **Strengthening the IP regime could lead to further progress in China**

- China already has a significantly improved policy environment for biopharmaceutical innovation. It is crucial that China remains on this positive trajectory and that the risk of regressing towards a less favourable environment is minimised.
- To ensure this, there are a number of specific policy implications for how further progress in China could be brought about:

### **A patent regime to match China's aspirations for world-leading innovation**

- China has already become close to – or in some cases is – the global leader in terms of key metrics of economic and innovative activity. A patent regime that is as supportive of innovation as those in the EU, US, and Japan will likely be necessary if China is to attain consistently world-leading levels of innovative activity.
- This should include addressing ambiguity in terminology and scope and lack of effective implementation of patent term extensions, and the high patent invalidation rate and restrictive criteria.

### **Implemented RDP as a prerequisite for further international investment**

- The lack of strong RDP in China has discouraged some biopharmaceutical companies from investing more there. Fully implemented and enforced RDP is needed for China to become more attractive to international investment.

### **Innovation policy that enables accelerated future growth**

- Although gaps in innovation policy are less significant than in the past, the speed of future growth could be supported by targeted policy attention regarding the Negative List for Foreign Investment, prolonged innovative drug approval times, and comparatively low R&D tax incentives.





CRA International  
8 Finsbury Circus  
London, EC2M 7EA  
United Kingdom

March 2024

[www.interpat.org](http://www.interpat.org)