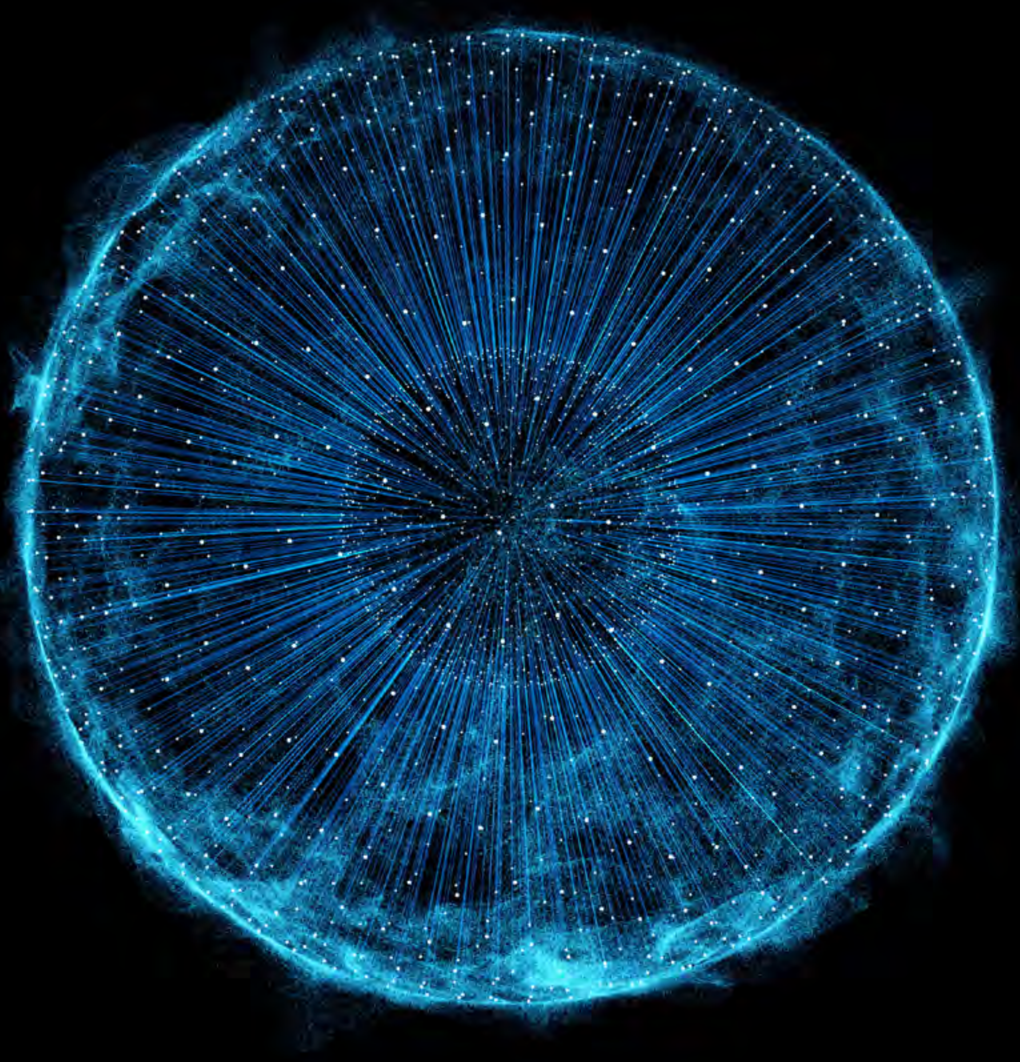
Deloitte. 德勤



2021 China Life Sciences and Health Care M&A Market Whitepaper

MAKING AN IMPACT THAT MATTERS since 1845

September 2021

Content

Preface

In 2020, M&A in China's Life Sciences and Healthcare (LSHC) industry experienced a resurgence of deal volume despite substantial economic, business and social disruptions caused by the COVID-19 outbreak in the first half of the year.

Tremendous public health efforts and quick emergency fiscal stimulus initiatives, together with strong exports activities, have helped China to recover quickly and resume GDP growth in Q3 2020 (versus a GDP decline of 3.3% for the rest of the world in the same period, according to IMF statistics). The pandemic was certainly also a strong reminder, of just how critical continued research and development and technological advances in LSHC sector are to society as a whole.

This report looks at M&A activity in China's LSHC industry in 2020 by sub-sectors and the 10 largest deals to understand the underlying drivers behind pre-existing key investment themes. It also evaluates PE/VC activity and the IPO financing landscape in China's LSHC market, which are a stimulus for pre-IPO stage M&A. Interestingly, although deal activity in the medical services sub-sector receded in 2020, COVID-19 and the pivotal switch from fast-follow to novel innovation bolstered M&A activity in the drugs and biotechnology sub-sectors, which saw increases in cross-border M&A transactions (with a resurgence of inbound investments) and vibrant domestic M&A activity in deal volume and value. There has been a gradual step change in the quantity and quality of domestic biotech, biopharma and medtech companies over the past few years and a rise in the amount of PE/VC and IPO capital funding investments, with momentum building on a wave of market liberalization that allowed more pre-revenue stage companies to go public, a series of national health policies, regulatory reform and streamlined drug administration approvals. Today, China is already the world's second-largest healthcare market and is expected to grow in significance on the global stage, a market that one cannot ignore and continuously attracting new global investors, and prominent innovative LSHC industry participants, in the post-pandemic era.

Looking ahead to 2021, the first year of China's 14th Five-Year Plan, this report assesses the most recent M&A trends identifying five main phenomena in China LSHC: 1) focus on preventive care, 2) the infusion of digitalization and innovation into life sciences, 3) the advances in CXO services, 4) a certain consolidation and integration of branded hospital groups, and finally 5) the opportunities and challenges in senior care.

We expect these themes to sustain over the long term and potentially act as triggers for increased M&A activity in China as the LSHC industry and its sub-sectors continue to advance, grow and consolidate in the years ahead.

Key Findings

In this report, we also looked back to our *2020 China LSHC M&A trends report* and see that on the four major traits identified at the time:

Leading Chinese biopharma and biotech players attracted global financial investors
Fast recovery from the pandemic, China has attracted many global funds to be injected into its LSHC market, especially in the biopharma and biotech fields. Additionally, many cross-border licensing deals also happened in 2020, especially for out-licensing deals.

Reflect from our previous report: we predicted the trend of biopharma to develop from me-too/me-better to first-in-class, and in fact that Chinese biopharma and biotech players have attracted investments from both local and global financial investors in 2020

Chinese biotech industry advancing at unprecedented speed
Driven by the policies, China's biotech industry is receiving strong attention from investors, industrial players, and cross-sector players. We have saw an increase in the R&D related deals in the China life science sector, especially in biotech innovation development field.

Reflect from our previous report: we predicted the growth of CXO services to support the R&D activities of pharma companies, and in 2020 we actually found that the biotech R&D related deals have an increase in 2020 and brought up the growth of local CXO companies

Proliferation of "Internet+" services in China
Impacted by the outbreak of COVID-19, the development of iHealth in China has been accelerated and became the biggest hotspot in the 2020 M&A market of China medical services field.

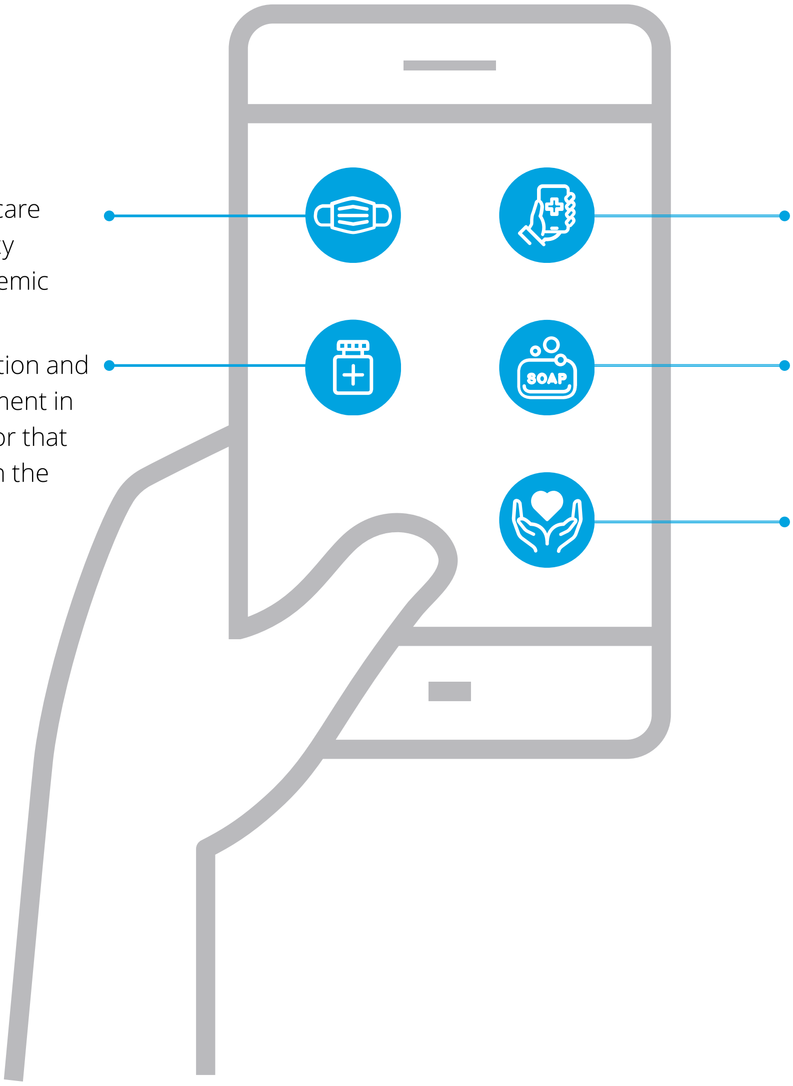
Reflect from our previous report: we predicted the trend of that COVID-19 will act as a catalyst for technology surge in health care, and in 2020 we have seen a rapid investment growth in iHealth services in China LSHC capital market.

Upsurge of "home-grown substitution" phenomenon in the high-value segment of China's medical devices market
Under the promotion of "home-grown to replace the imported ones", China's medical devices market has seen an upsurge of home-grown substitution compared to 2019.

Reflect from our previous report: we predicted the home-grown medical devices will continue as the theme for 2020, and as a result in 2020 there is an upsurge of home-grown substitution phenomenon in the China's medical devices market, especially in high-value segment.

Furthermore, we have seen more pre-revenue biotech-related companies successfully going public in HKEx and A share market, yet these pre-revenue listing companies are showing a diverged performance which is causing some concerns from the investors in fundraising for pre-revenue companies onwards. Besides that, we also observed a regional-based LSHC industry development ongoing in China and consolidating the PE/VC investments in the three major regions – Yangtze River Delta, Guangdong-Hong Kong-Macao Greater Bay Area, and Beijing-Tianjin-Hebei Region.

As eluded to earlier, we identified five trends that driving growth in China LSHC M&A market in 2021:



Disease preventive care business opportunity brought by the epidemic

Infusion of digitalization and innovation development in the life science sector that driving the growth in the fundraising

The advancement of CXO services to support the next-generation therapy and drug development

Consolidation and integration of branded hospitals group to enhance the brand effect in China nationally

The opportunities and challenges of the senior care sector in response to the aging population in China


OH
N

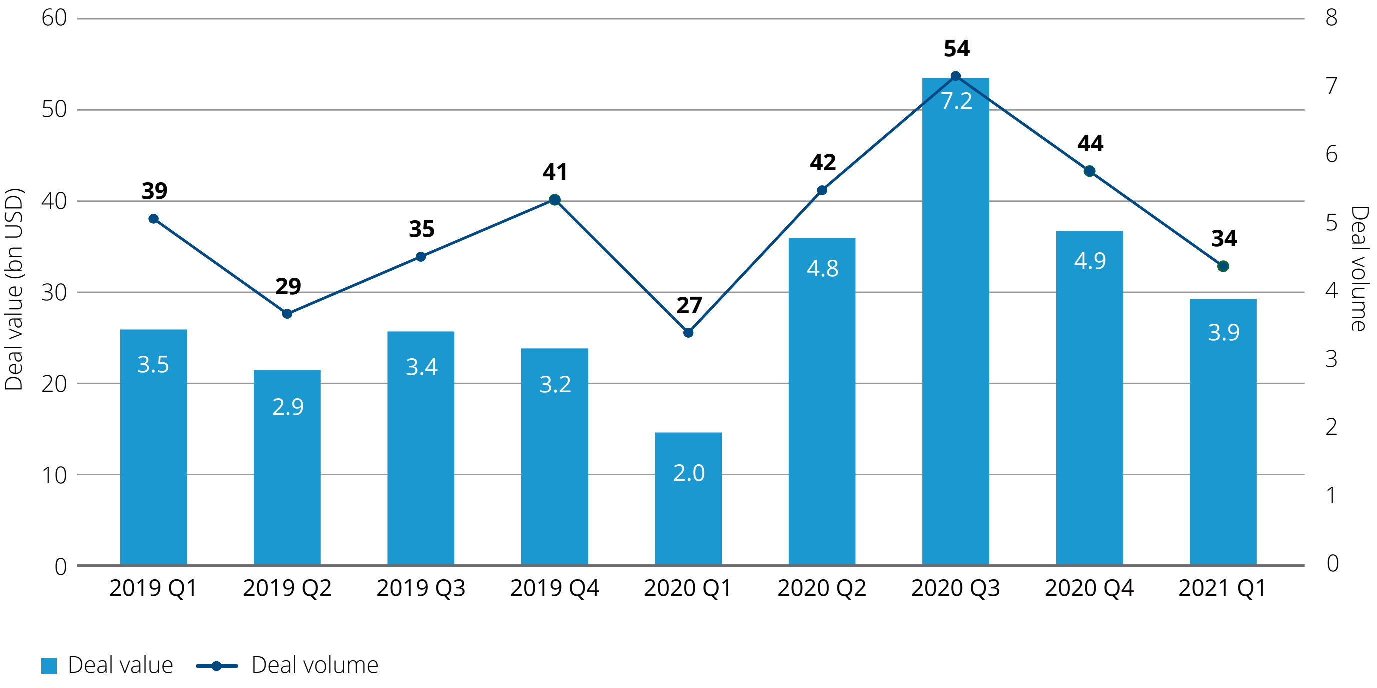
1. 2020 LSHC M&A in the rear-view mirror

1.1. Overview of China LSHC M&A in 2020

2020 was an active year for M&A transactions in China's LSHC industry. With the influence of COVID-19 and a series of favorable policies, a resurgence of M&A activity in H2 2020 led to a new record high in deals for the full year (Figure 1). In 2020, M&A volume in China's LSHC industry reached 169 deals (including mega transactions with a value of more than USD1 billion each), up 11.2% from 2019's level, and deal value reached USD 21.3 billion. Excluding mega deals, 2020 deal value was up 45.2% from the previous year.

Although affected by the COVID-19 pandemic, cross-border transactions remained quite active, with foreign investors, most often from the US, becoming more proactive in China's capital market. In H2 2020, as China entered its post-epidemic era, it recovered quickly to resume positive GDP growth in Q3 2020 and M&A deal activity also revived. By sub-sector, 2020 M&A transactions in LSHC were dominated by drugs and biotechnology.

Figure 1: LSHC M&A Q1 2019-Q1 2021 (excludes mega deals)



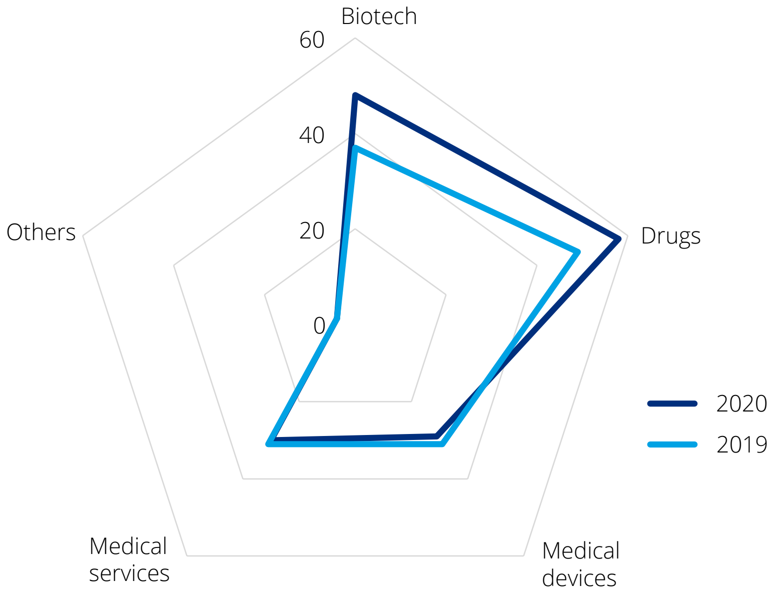
Note: Excludes 32 deals with value not disclosed and 10 deals with a value of more than USD1 billion each. See appendix for Mergermarket inclusion criteria.
Source: Mergermarket, Deloitte Research

- **LSHC M&A deals by sub-sector**
  Figure 2 shows 2020 and 2019 M&A deals in China's LSHC industry by sub-sector. Driven by the COVID-19 outbreak and vaccine policy guidelines, the government encouraged scientific and technological innovations to create major new drugs, and the market was optimistic about the drugs and biotechnology sub-sectors, where M&A deal activity remained sprightly. In 2020, these sub-sectors' combined deal volume reached in drugs and biotechnology reached 106 (including mega deals, 58 and 46 deals for drugs and biotechnology respectively), or 62.7% of the total, an increase of 23.3% from 86 deals in 2019. There were 63 M&A deals in medical devices, medical services, and the other sub-sectors in 2020, accounting for about 37.3% of total deal volume and flat with 2019's level.

  Representative deals in the biotech sub-sector in 2020 included a Beachhead Holdings-led consortiums' acquisition of a 31.4% stake of China Biologic Products (CBPO) to privatize the company; the contribution of more than USD1 billion by a group of investors in MGI Tech's Series B funding round; Sino Biopharmaceutical's purchase of a 15% stake in Sinovac LS; a Hillhouse Capital-led consortiums' acquisition of a 18% stake in I-MAB Biopharma; and Southern Shuanglin Bio-pharmacy's acquisition of Harbin PAFC Biotech.

  In the drugs sub-sector, representative deals included Zhejiang Traditional Chinese Medicine & Health's acquisition of a 20% stake in Zhejiang Conba; China Resources Pharmaceutical's purchase of a 16% stake in Boya Bio-pharmaceutical; Jizhong Energy Resources taking a 10% stake in North China Pharmaceutical; Viva Biotech's acquisition of an 80% stake in Zhejiang Langhua; and Hillhouse Capital's purchase of a 8% stake in Joincare.

Figure 2: LSHC M&A deal volume by sub-sector 2019 & 2020

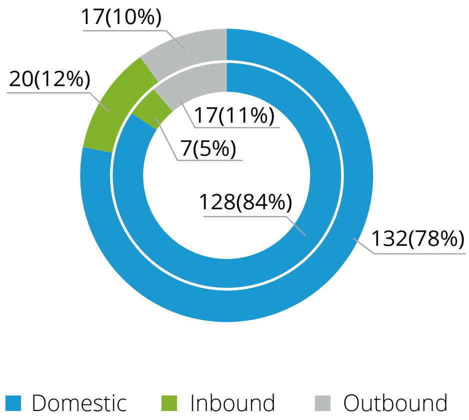


Note: Excludes 27 deals with value not disclosed. See appendix for Mergermarket inclusion criteria.
Source: Mergermarket, Deloitte Research

- **Cross-border vs. domestic deal flows**
  Despite the pandemic, cross-border M&A volume picked up in 2020, with 37 deals compared to 24 the year before (Figure 3). Foreign investors, mainly from the US, became more active in China's capital market. As a result of escalating trade tensions between China and the U.S., however, outbound transactions remained low at just 17 deals with a combined value of USD1.7 billion. Target companies with technological innovations, including cancer immunotherapy and biopharmaceutical research, are now popular acquisition targets in China for overseas enterprises.

  Domestic M&A transactions were quite stable in 2020, with deal volume reaching 132, up from 128 in 2019. Domestic M&A was also active in 2020, with China's internet medical services providers expanding as the online consultation, online pharmacy, internet hospital, and online medical payment segments were quickly opened up, and the digital medical market penetrate "Big Health".

Figure 3: Direction of LSHC M&A deal volume and proportion in 2019 (inner ring) and 2020 (outer ring)



Note: Excludes 27 deals with value not disclosed. See appendix for Mergermarket inclusion criteria.
Source: Mergermarket, Deloitte Research

- **Domestic deals – where they went, and why**
  In the domestic LSHC industry in 2020, fierce competition in the prescription drug market prompted companies to expand their product lines through mergers and acquisitions. At the same time, the implementation of the two-invoice system and volume-based procurement squeezed the space for small pharmaceutical enterprises, prompting leading players to take the opportunity to accelerate integration. These factors led to robust activity in domestic strategic transactions in 2020, with representative cases including Sino Biopharmaceutical's acquisition of Sinovac Life Science; Zhejiang Traditional Chinese Medicine & Health Industry Group's purchase of Zhejiang Conba Pharmaceutical; and the acquisition of Harbin PAFC Biotech by Southern Shuanglin Bio-pharmacy.

Finance investment transactions reached new highs in 2020, driven by the opening of the Science and Technology Innovation Board in Shanghai, the registration-based system of SSE's ChiNext, the positive influence of Hong Kong biotech stocks, and the easing of new refinancing regulations. Representative cases included the Beachhead Holdings consortium-China Biologic Products deal and MGI Tech's Series B funding; and Hillhouse Capital Management's acquisition of JD Health.

1.1.1. Top 10 PE/VC deals by value in 2020

The Hong Kong Stock Exchange (HKEx) and Shanghai's STAR were attractive IPO destinations for leading Chinese biotech and pharma players in 2020. China Biologic Products delisted its American Depository Receipts in the US, went private, and began preparations for a listing on STAR. Four of the top 10 PE/VC deals pertained to pre-IPO fundraisings related to HKEx or STAR listings. Half of the top 10 deals were in the drugs and biotechnology sub-sectors, with two deals (JD Health and DXY) involving digital medical platforms. Hillhouse Capital was heavily involved in most LSHC sub-sectors, participating in half of the top 10 deals.

Table 1: Top 10 China LSHC PE/VC deals by value in 2020

Date announced	Sector	Deal value (USD mn)	Target	Bidder	Notes
19 Nov. 2020	Biotech	1,452	China Biologic Products (CBPO)	Beachhead Holdings; CITIC Capital China; PW Medtech Group; Parfield International; HH Sum-XXII Holdings; V-Sciences Investments	• Delisted from NASDAQ; planning to list on SSE STAR • CBPO has strong production capability and qualifications in China
28 May 2020	Biotech	1,000	MGI Tech	IDG Capital; China Renaissance Holdings; CITIC Private Equity; Dingfeng Asset; Green Pine Capital; Co-Stone Asset; GTJA Innovation Investment; GF Xinde Investment; Huatai Zijin; CITIC Goldstone Fund; Shanghai Sailing M&A Investment; TI-Capital; Shanghai Growth-FOF; Beka Asset Management; SGIIC S.A	• Pre-IPO fundraising; SSE STAR IPO application submitted in Dec. 2020 • MGI could become the first domestically listed company focused on gene sequencer production • Deal set recent-year record for the largest PE financing in domestic genetics
17 Aug. 2020	Medical Services	830	JD Health	Hillhouse Capital	• Pre-IPO funding; HKEx listing in Dec. 2020 was the largest IPO in the history of China's internet healthcare sub-sector • JD Health is a sub-group of JD Group that focuses on medical and healthcare provision • Since the COVID-19 outbreak, JD Health has served more than 1.7 million patients
1 Sep. 2020	Medical Devices	513	MicroPort MedBot	E Fund; CITIC Private Equity Funds; Hillhouse Capital; Grand Flight Investment; Jiaxing Biolink Hongrun	• Pre-IPO funding; planned HKEx listing in 2021 to raise USD700mn-USD1 billion • Target has many products involving leading-edge technology, creating huge fundraising demand
28 Dec. 2020	Medical Services	500	LinkMed Co. (DXY)	Tencent; Trustbridge Partners; Hillhouse Capital	• DXY's 5th round of financing in the past 10 years • Tencent's investment shows the potential and prospects for cooperation are highly-valued by both parties

Date announced	Sector	Deal value (USD mn)	Target	Bidder	Notes
24 Aug. 2020	Medical Devices	438	Dirui Industrial	Huade Xinrun Equity Investment (28%); Dongguang Hengshun Investment (12%); private investors (13%)	• Dirui listed on Shenzhen's ChiNext in Sep. 2014 • The company is a leading manufacturer of medical testing devices and reagents in China • Transaction is an important step by China Resources to improve its industrial layout in the medical field
4 Sep. 2020	Biotech	418	I-MAB Biopharma	GIC Private; Avidity Partners; OrbiMed; The Invus Group; Hillhouse Capital; Perceptive; Cormorant Asset; Sphera Funds; Lake Bleu Capital; Octagon Capital; Alyeska Investment	• Pre-IPO funding for secondary listing on HKEx • I-MAB out-licensed its innovative drug Lemzoparlimab to AbbVie on 4 Sep. 2020 in the largest authorized transaction in global biotechnology for five years
13 Jul. 2020	Drugs	310	Joincare Pharmaceutical Group Industry Co.	Hillhouse Capital	• As of 2020, Joincare has four inhalation products that have entered the NDA stage • Gaoji Medical, a company under Hillhouse focused on strategic investments and operations in medical and healthcare, can cooperate with Joincare in sales channels for respiratory products, other chronic disease drugs, and OTC products to boost synergy
4 Jun. 2020	Biotech	310	Everest Medicines	HBM Healthcare Investments; Hillhouse Capital; RA Capital; Decheng Capital; Rock Springs Capital; CBC Group; Pavilion Capital; Janchor Partners; Cormorant Asset Management; Janus Henderson Investors; Guoxin Guotong Fund; Jiashan SDIC; Octagon Capital	• In Apr. 2020, Everest made a big breakthrough with the launch of Trodelvy, the first TROP-2 antibody conjugate drug approved by the FDA for breast cancer patients • Existing product lines cover four major areas: tumors, immune diseases, infectious diseases, and heart and kidney diseases
2 Apr. 2020	Medical Services	304	Shougang Hospital Co.	Shouyi Medical Health Investment Management Co.	• In Mar. 2017, Shougang hospital took the lead in building the first Level III hospital care center in China • Shougang Medical plans to make Shougang Hospital its flagship hospital and jointly build the northern medical district of China with multiple hospitals

Source: Mergemarket, public information, Deloitte Research

1.1.2. Top 10 M&A deals by value in 2020

2020 saw a continuous stream of corporate consolidations, including five deals related to drug development and supply, two involving mixed-ownership reform in traditional Chinese medicine (TCM), and two in blood products. Most of the biggest M&A deals were domestic, showing the vitality and robustness of China's LSHC sector.

Table 2: Top 10 China LSHC M&A deals by value in 2020

Date announced	Sector	Deal value (USD mn)	Target	Bidder	Seller	Notes
7 Dec. 2020	Biotech	515	Sinovac Life Sciences	Sino Biopharmaceutical	Sinovac Biotech	• Sinovac made significant advances with the development of its COVID-19 vaccine CoronaVac, becoming one of the few enterprises in China to have self-developed and produced a COVID-19 vaccine • Sino Biopharmaceutical has been eager to find new growth points in recent years • Transaction will help its transformation as a traditional pharmaceutical company
30 May 2020	Drugs	462	Zhejiang Conba Pharmaceutical	Zhejiang Traditional Chinese Medicine & Health Industry Group (Zhejiang TCM&H)	Conba Group	• Zhejiang Conba has completed layouts for the planting, production and processing of TCM; Zhejiang TCM&H has an advantage in TCM distribution which Zhejiang Conba could leverage with • The acquisition of Zhejiang Conba enables Zhejiang TCM&H to build an entire industrial chain including R&D, manufacturing, distribution, import and export, based on the platform advantages of Zhejiang Conba
15 May 2020	Biotech	443	PAFC Biotech	Southern Shuanglin Bio-pharmacy		• Transaction enables Southern Shuanglin Bio-pharmacy to advance its business development, consolidation, and sustainable profitability enhancement • It also enables Southern Shuanglin to achieve synergies with the target in these areas to enhance its blood production capacity, boosting its market position in the blood products segment
13 Oct. 2020	Drugs	392	Boya Bio-pharmaceutical	China Resources Pharmaceutical	GTJA Investment Group	• Enables Boya Bio to obtain full support across funding, technology, and channel from China Resources Pharmaceutical • Acquisition of Boya Bio could be an important step for China Resources Pharmaceutical to enter blood products segment

Date announced	Sector	Deal value (USD mn)	Target	Bidder	Seller	Notes
13 Jun. 2020	Medical Devices	371	Maxim Biotechnologies	Beijing Strong Biotechnologies, China National Pharmaceutical Investment	Taikang Insurance Group; CDH Investments; De Fu Equity; GL Instrument Investment	• Transaction enables Beijing Strong Biotechnologies to enrich its product lines, improve its market influence and risk resistance • Maxim can leverage the existing customer resources of Beijing Strong Biotechnologies to expand its businesses
5 Sep. 2020	Drugs	370	North China Pharmaceutical	Jizhong Energy Resources	Jizhong Energy Group	• Acquisition based on overall strategic adjustment of Jizhong Energy Resources • Promotes Jizhong Energy Resources to adjust its asset structure and equity structure, which will help the company's diversified development
9 Aug. 2020	Drugs	367	Zhejiang Langhua Pharmaceutica	Viva Biotech	Ninhua Group, Nuobai Investments; Zhining Investments; private investors	• Strategic integration that will help Viva Biotech's vertical integration and expansion of CDMO business • Enables Viva Biotech to broaden customer diversification and geographic coverage • Provides synergies for Zhejiang Langhua to become many active pharmaceutical ingredient (API) supplier and the client's preferred CDMO partner
7 Apr. 2020	Drugs	345	Yichang Humanwell	Humanwell Healthcare	Private investors	• Prior to this transaction, Yichang Humanwell was a subsidiary of Humanwell Healthcare • Will incentivize core management of Yichang Humanwell and Humanwell Healthcare • Enables Yichang Humanwell to accelerate internationalization and enhance competitiveness
21 Dec. 2020	Biotech	322	Takeda Pharmaceutical Company (non-core prescription pharmaceutical products)	Hasten Biopharmaceutic	Takeda	• Will enable Hasten to increase presence and further sharpen its focus and resources in fast-tracking innovation in China • Enables Takeda to reduce debt
7 Apr. 2020	Drugs	287	Taiji Group Co.	China National Traditional Chinese Medicine Co.; Chongqing Fuling; State-owned Assets Investment and Operation Group Co.		• Enables China National Traditional Chinese Medicine to strengthen competitiveness in pharmaceutical commerce and TCM • Will help boost competitiveness of Taiji Group by bringing in strategic investor as largest shareholder in mixed ownership reform

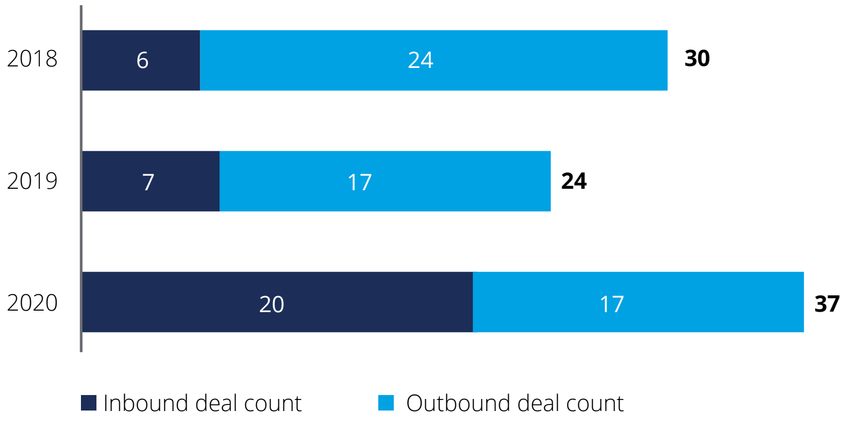
Source: Mergermarket, public information, Deloitte Research

1.2. Leading Chinese biopharma and biotech players are attracting global investors

Despite disruptions from the pandemic, cross-border deal volume increased from 2019 and even exceeded 2018's level, primarily driven by inbound transactions (Figures 4 & 5).

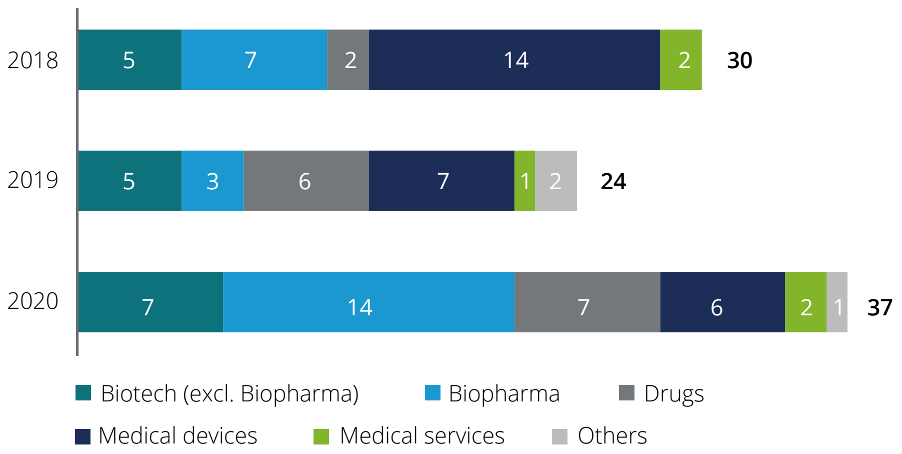
China was among the first few countries to quickly recover from COVID-19, and leading Chinese biotech and biopharma players have attracted global capital. The biopharma and biotech sub-sectors contributed most to the rebound. Nine inbound deals involved fundraisings by global PE/VC houses, with an average deal size of more than USD150 million. The global capital influx demonstrates the confidence of international PE in the biopharma and biotech sub-sectors in China. At the time this report was written, two of the investment targets, Connect Biopharma Holdings and Gracell Biotechnologies Inc., had listed on NASDAQ, MicroPort CardioFlow Medtech and JW Therapeutics (Shanghai) had completed IPOs on HKEx, and Harbour BioMed and CANbridge Life Sciences had submitted HKEx IPO applications.

Figure 4: Cross-border deal volume by type 2018-2020



Note: Excludes 23 deals with value not disclosed. See appendix for Mergermarket inclusion criteria.
Source: Mergermarket, Deloitte Research

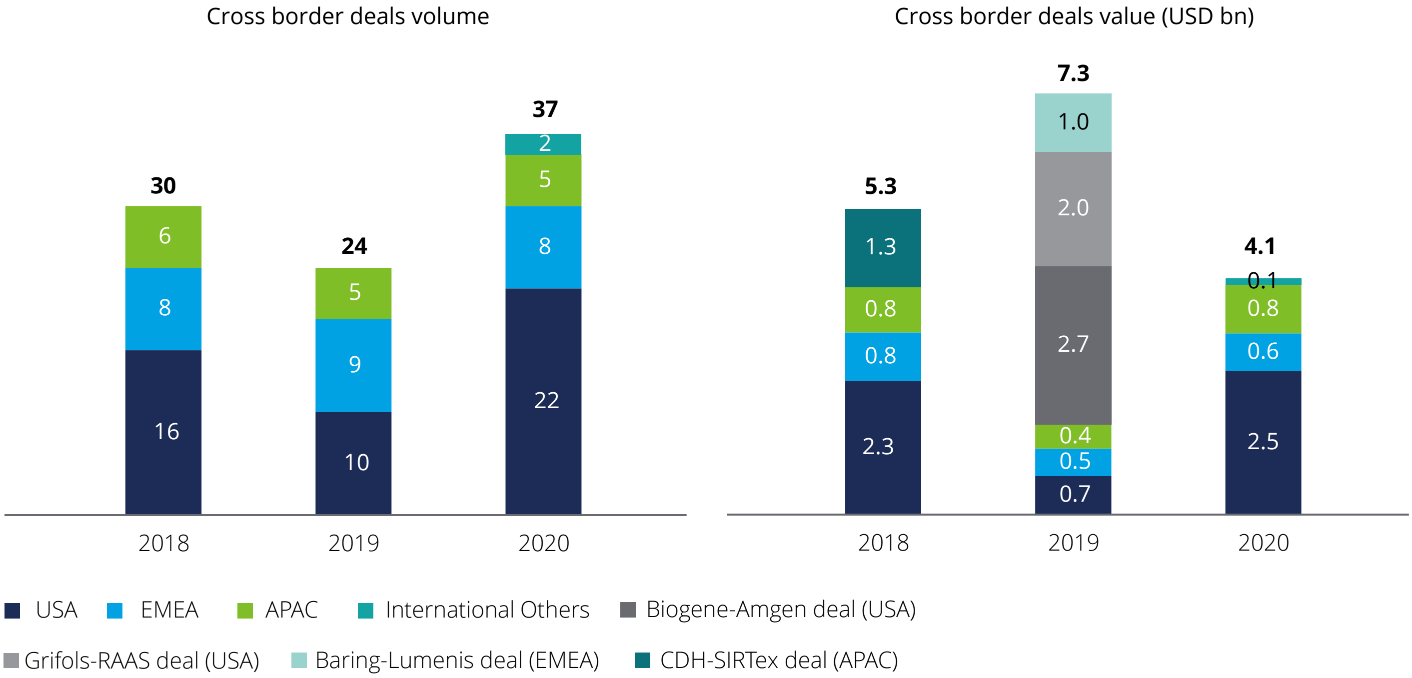
Figure 5: Cross border deal volume by target sub-sector 2018-2020



Note: Excludes 23 deals with value not disclosed. See appendix for Mergermarket inclusion criteria.
Source: Mergermarket, Deloitte Research

Outbound transactions held steady, with similar deal volume to 2019, but lower deal value because 2019 deal value was skewed by three mega deals with a total value of USD5.7 billion. Excluding mega deals of more than USD1 billion, cross border deal value in 2020 surged from 2019's level and exceeded its 2018 peak (Figure 6).

Figure 6: Cross-border deal volume and value by region from 2018 to 2020



Note: Excludes 48 deals with value not disclosed; mega deals over USD1 billion shown separately.

The three mega cross-border deals in 2019 were:

1. Amgen's acquisition of a 20.5% stake in Beigene for USD2.7 billion; Beigene to commercialize Xgeva, Kyprolis, and Blincyto in China[1]
2. Shanghai RAAS's purchase of a 45% stake in Grifols Diagnostic Solutions, becoming Grifols' exclusive distributor of plasma-derived products and transfusion diagnostic solutions in China[2]
3. The agreement of Baring Private Equity Asia, through affiliated private equity funds, to acquire Lumenis from XIO Group; enterprise value of more than USD1 billion[3]

See appendix for Mergermarket inclusion criteria.
Source: Mergermarket, Deloitte Research

In additional to direct M&A, 2020 was also a strong year for cross-border licensing deals in China's LSHC market, with a total of 145 deals, including 122 in-licensing deals and 23 out-licensing deals[4,5] . The top in-licensing deal was Junshi's collaboration with Revitope to explore next generation immunotherapies with precision-targeted T-cell engaging antibodies[6]. The top out-licensing deal was I-MAB's collaboration with AbbVie on the development and commercialization of I-MAB's anti-CD47 monoclonal antibody, lemzoparlimab[7]. US companies accounted for half of all in-licensing (as transferor) and out-licensing (as transferee) deals by value (Tables 3 & 4). 2020 also saw a surge in the out-licensing of local pharmaceutical companies' innovative drugs, with 23 deals versus just 3 in 2019 (Figure 7).

These trends show China's biopharmaceutical market continues to attract interest and investment from global biotech giants, and that the ability to out-license in international markets has become a key competency for domestic biopharma companies.

Table 3: Top 10 in-licensing deals by value in 2020

Transferee	Transferor	Products	Upfront payment (USD mn)	Milestone payment (USD mn)	Total payment (USD mn)
Junshi	Revitope Oncology	Next generation immunotherapies with precision-targeted T-cell engaging antibodies	Not revealed	Not revealed	810 + royalties
BeiGene	Assembly Biosciences	ABI-H0731, ABI-H2158, and ABI-H3733	40	500 + royalties	540 + royalties
LianBio	Navire Pharma	Infigratinib; BBP-398	26.5	505 + royalties	532 + royalties
Cstone	LegoChem Biosciences	ABL202	10	353.5 + royalties	363.5 + royalties
Huadong Medicine	ImmunoGen Inc	Mirvetuximab Soravtansine	40	265 + royalties	305 + royalties
Grand Pharma	Telix Pharmaceuticals	TLX591, TLX250, TLX101, TLX591-CDx, TLX250-CDx, TLX599-CDx	25	225 + royalties	250 + royalties
Zai Lab	Cullinan Oncology	CLN-081	20	211 + royalties	231 + royalties
Inmagene	Affibody	ABY-035	10	215 + royalties	225 + royalties
Fosun	BioNTech SE	BNT162	135	85	220
3D Medicine	Aravive	AVB-500	12	207 + royalties	219 + royalties

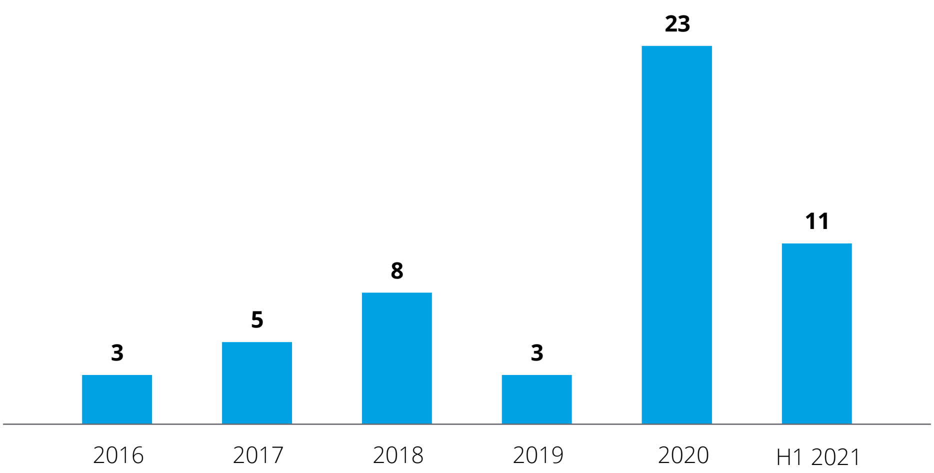
Source: Public information, Deloitte Research

Table 4: Top 10 out-licensing deals by value in 2020

Transferee	Transferor	Products	Upfront payment (USD mn)	Milestone payment (USD mn)	Total payment (USD mn)
AbbVie Inc	I-Mab	Lemzoparlimab (TJC4)	180	2,760 + royalties	2,940 + royalties
Roche	Innovent	Bispecific antibodies, cell therapy	140	1,960 + royalties	2,100 + royalties
EQRx	Cstone	Sugemalimab, CS1003	150	1,150 + royalties	1,300 + royalties
Eli Lilly & Co	Innovent	Sintilimab	200	825 + royalties	1,025 + royalties
AbbVie Inc	Jacobio	JAB-3068; JAB-3312	45	810	855
Binacea Pharma	Henlius	HLX-35	5	763 + royalties	768 + royalties
Bayer	Hua Medicine	dorzagliatin	45	627 + royalties	672 + royalties
LEO Pharma A/S	Oneness Biotech & Microbio	FB825	40	530 + royalties	570 + royalties
Eli Lilly & Co	Fochon Pharmaceuticals	FCN-338	40	400 + royalties	440 + royalties
LG Chem Ltd.	TransThera	TT-01025	Not revealed	Not revealed	350 + royalties

Source: Public information, Deloitte Research

Figure 7: Out-licensing deal volume 2016-H1 2021



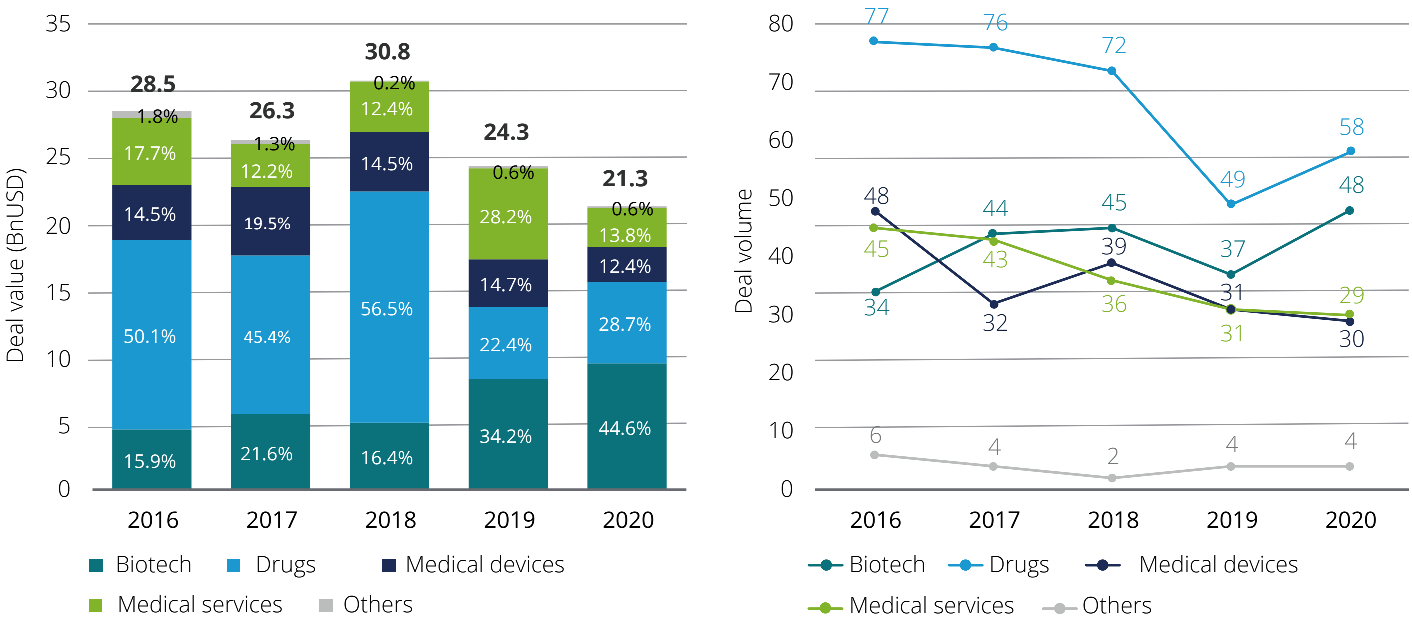
Source: Pharmacube, public information, Deloitte Research

1.3. Chinese biotech industry advancing at unprecedented speed

In our last report of Outlook on biopharma innovation trends in China, we noted the increasing emphasis the Chinese government has placed on encouraging healthcare innovation. We predicted that "2020, while not a record year for life sciences and heathcare investments, will continue to be promising as the industry maintains its vitality". It is fair to say we were conservative as the momentum of innovation did not stop in the face of COVID-19's adversity. The government has encouraged smart technology development to help fight the coronavirus. Innovation has become the new normal in China's pharmaceutical market. In 2015, it took China five to seven years longer to approve new medicines than it took other leading countries. Since then government reforms have encouraged and accelerated innovation in the sector, including by almost tripling the number of new medicine appraisal staff. China's trend of innovation follows that worldwide: globally, there were 139 new drug targets in 2020, 39% more than in the previous year and the largest number since 2011[8].

Zooming into M&A activity in each LSHC sub-sector reveals that biotechnology and drugs were the only two sub-sectors to record higher deal value and volume in 2020 (Figure 8).

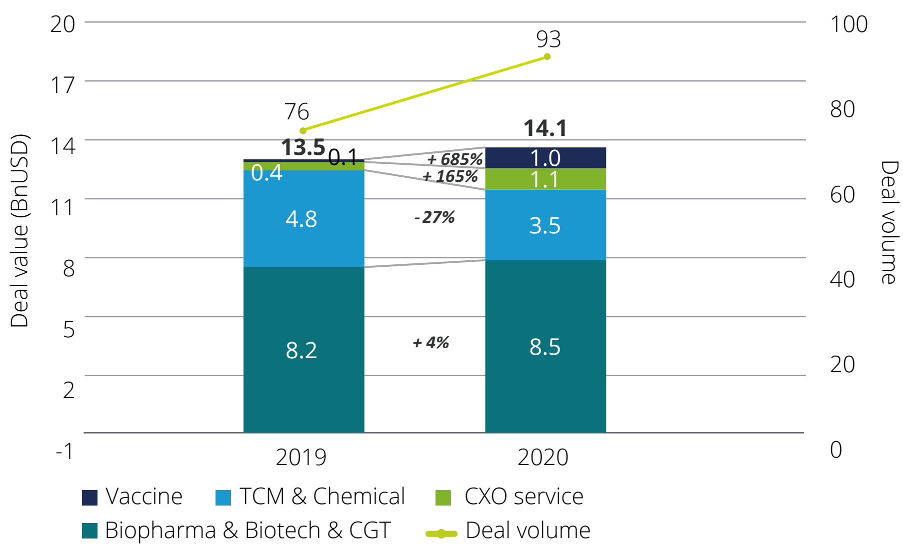
Figure 8: Deal value and volume of China LSHC M&A transactions by sub-sector 2016-2020



Note: Excludes 82 deals with value not disclosed. See appendix for Mergermarket inclusion criteria.
Source: Mergermarket, Deloitte Research

Innovation in China's life science and biopharma development has transformed from "quick follower" to "general innovation", and it is on the way to becoming a world leader. Volume-based procurement (VBP) has continued to drive out small and mid-sized generics and biosimilars manufacturers that lacked the capacity to invest in generic quality consistency evaluations or in house API and found their profitability squeezed. Driven by favorable policy support and a burgeoning cell and gene therapy market, companies are increasingly focusing on innovative drugs and extending their R&D capacity and product pipelines. Strengthening innovative drug R&D and extending product pipelines were what drove M&A activity in the biopharma and biotech sub-sectors in 2020 (Figure 9).

Figure 9: Change in life sciences R&D related M&A transaction value and volume 2019-2020



Note: Excludes 14 deals with value not disclosed. See appendix for Mergermarket inclusion criteria.
Source: Mergermarket, Deloitte Research

Three factors in the development of innovations in China's biopharma market are attributable to the abovementioned trends:

1. A series of medical reforms have accelerated the speed of novel biologics development and promoted R&D investment

In recent years, government authorities have introduced a series of reforms to accelerate the commercial launch of novel biologics, including:

- Revisions to the *Measures for the Administration of Drug Registration*
- A shorter evaluation and approval process for clinical trial applications
- Joining the International Council for Harmonization of Technical Requirements for Pharmaceuticals for Human Us
- Increasing the number of clinical trial institutes and centers, and practicing register management
- Revisions to patent law to safeguard patents and extend protection periods
- Strengthening evaluation and approval capacity to facilitate scientific supervision

Continuous innovation in biopharma will rely on talent and technology acquisitions and long-term government and policy support for R&D investment. A trend of overseas Chinese talent returning to China in recent years has contributed to the accumulation of knowledge and know-how. R&D expense super deductions and preferential policies for biopharma R&D investment will give local biopharma companies incentives to innovate.

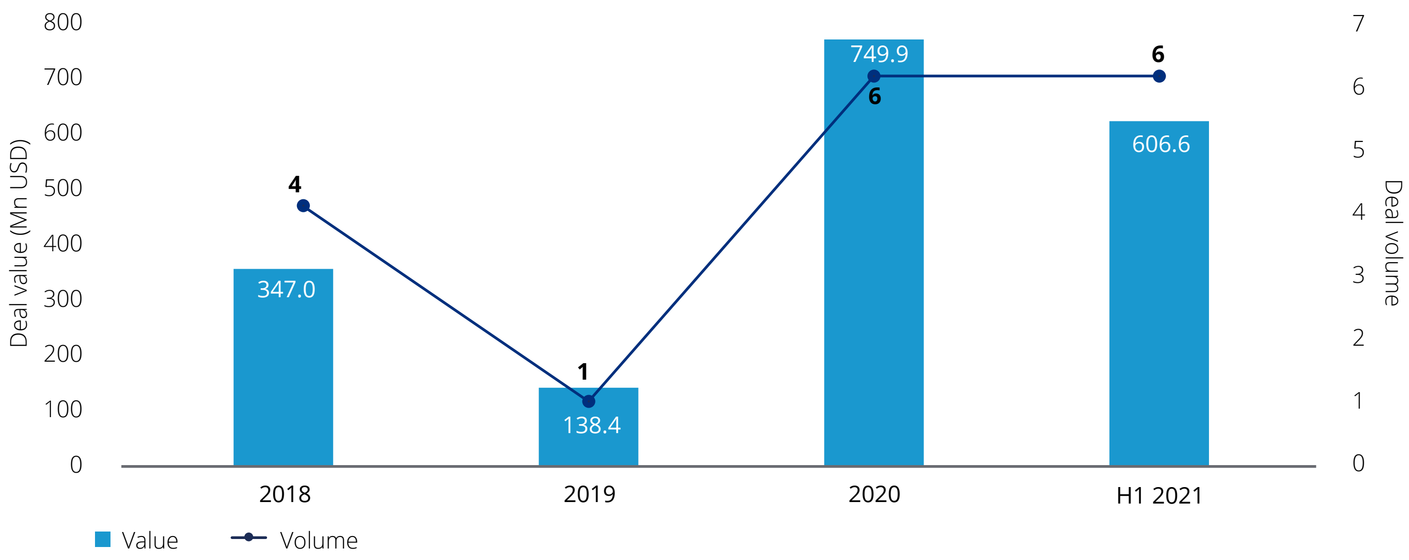
2. The cell and gene therapy (CGT) market in China is burgeoning, attracting domestic and foreign capital

China's CGT market has great commercialization potential with respect to its available patient volume and number of CGT clinical trials (2nd most after the US). Benefiting from a comprehensive regulatory framework and more than 3,100 registered patents[9], CGT has seen substantial investment inflows, which has accelerated product development in China (Figure 10). As of 29 March 2021, 20 CGT products have been approved for clinical trials, comprising 16 cell therapy products and four gene therapy products[10].

In 2020, CGT investment volume reached 41 deals (Table 5) with an overall value of more than USD2.4 billion[11]. Most of the investments were concentrated in 2H 2020, as a result of the COVID-19 outbreak in 1H 2020. The development of CGT is receiving more attention from industry participants and investors. Of all the the companies involved, 43% are dedicated to cell therapy development and 57% focus on gene therapy[12].

Many researchers in CGT are commercializing their patents and establishing their own biotech ventures. For instance, EdiGene, founded in 2015 by Wensheng Wei, professor at the School of Life Science of Peking University, has commercialized research in high-throughput gene screening using CRISPR-Cas9 technology. The venture has attracted USD10 million in Series A, USD 35 million in Series pre-B, USD70 million in Series B, and USD 62 million in Series B+ fundraisings[13]. In addition, many overseas players with innovative technology and high-profile teams are attracting large investments. For instance, JW therapeutics, a joint venture between Juno and WuXi AppTec, raised USD90 million and USD100 million in Series A and Series B fundraisings, and went public on HKEx in November 2020[14].

Figure 10: China CGT-related M&A value and volume 2018-H1 2021



Note: Excludes 1 deal with value not disclosed. See appendix for Mergermarket inclusion criteria.
Source: Mergermarket, Deloitte Research

Table 5: CGT-related investment activity in 2020

Date	Company	Investment Round	Value
19/02/2020	Stemirna	A+	RMB30m
20/02/2020	ImmuneOnco	Pre-B	RMB45m
21/02/2020	Junsai Biotechnology	Pre-A	Over RMB10m
31/03/2020	Legend Biotechnology	Equity sale	USD150m
03/04/2020	Ribo Life Science	C2	RMB470m
08/04/2020	Neurophth	A	RMB130m
04/06/2020	Westlake Therapeutics	Pre-A	Around RMB100m
05/06/2020	Legend Biotechnology	NASDAQ Listing	USD423.8m
08/06/2020	GeneCradle	Angel	Not revealed
09/06/2020	JW Therapeutics	B	USD100m
15/06/2020	Immvira	B	USD58m

Date	Company	Investment Round	Value
22/06/2020	Bendao Gene	Pre-A	Over RMB10m
10/07/2020	Immunotech Biopharm	HKEx Listing	HKD1b
17/07/2020	iRegene Therapeutics	Pre-A	Over RMB10m
03/08/2020	Jiayin Biotechnology	B	Over USD10m
04/08/2020	GeneCradle	Strategy	Not revealed
05/08/2020	Lepu Biopharma	B	RMB1.3b
25/08/2020	ImmuneOnco	Pre-B+	RMB70m
31/08/2020	Adlai Nortye	C	Around USD100m
07/09/2020	Hrain Biotechnology	B+	RMB200m
28/09/2020	Virogin Biotech	C	USD62m
30/09/2020	Innorna	Angel	Over RMB10m
03/10/2020	EdiGene	B	RMB450m
10/10/2020	ImmuneOnco	B	USD25m
16/10/2020	Immuno China	C+	RMB100m
23/10/2020	Sirnaomics	D	USD105m
29/10/2020	Gracell	C	USD100m
02/11/2020	Reforgene Medicine	A	Around RMB100m
02/11/2020	Carsgen	C	USD186m
03/11/2020	JW Therapeutics	HKEx Listing	HKD2.2b
06/11/2020	Abogen	A	RMB150m
16/11/2020	Pregene	B	RMB140m
19/11/2020	Juventas	Strategy	RMB450m
01/12/2020	HuaDao Biopharma	C	Around RMB200m
07/12/2020	Innorna	Strategy	RMB35m
10/12/2020	Tricision Biotherapeutics	Pre-A	Over RMB10m
11/12/2020	Grit Biotechnology	A	Over RMB100m
22/12/2020	Immuno China	C++	Not revealed
22/12/2020	Gen Assist	A	Over RMB10m
23/12/2020	NeoCura	A	RMB250m
30/12/2020	Correct Sequence	Angel	RMB40m

Source: Public information, Deloitte Research

3. Rising local innovation capability in biopharma elevates China's position in global biopharmaceuticals R&D

China has helped many countries during the pandemic, especially via its supply of COVID-19 vaccines, assisting these countries to ease public health crises. The world's first COVID-19 vaccine to gain regulatory approval was the inactivated vaccine from Sinopharm's National Biotec Group's Beijing Institute of Biological Products. In addition to the Sinopharm vaccine, several domestic COVID-19 vaccines have been approved as of March 2021; others have entered clinical trials and could reach the market soon. As of 31 May 2021, seven domestic COVID-19 vaccines have been approved or authorized under emergency rules.

China has developed more COVID-19 vaccine products than any other country (Table 6). In addition, with policy reform and government support, its biopharma companies have injected substantial resources into innovative R&D. This has elevated China's position in global biopharmaceuticals R&D and strengthened the local market's innovative capability.

Table 6: COVID-19 vaccines approved or authorized for emergency use worldwide (as of 19 June 2021)

Country	Developer	Products
China	Anhui Zhifei	RBD-Dimer
China	CanSino	Ad5-nCoV
China	Kangtai Biological/Minhai Biotechnology	SARS-CoV-2 Vaccines (Vero Cell)
China	Sinopharm (BIBP - Beijing)	BBIBP-CorV
China	Sinopharma (WIBP - Wuhan)	Inactivated (Vero Cells)
China	Sinovac	CoronaVac
China	Chinese academy of medical sciences	SARS-CoV-2 Vaccines (Vero Cell)
India	Bharat Biotech	Covaxin
India	Serum Institute of India	Covishield
Iran	Shifa Pharmed Industrial Co	COVID-19 Inactivated Vaccine
Japan	Takeda	TAK-919
Kazakhstan	Kazakhstan RIBSP	QazVac
Russia	Chumakov Center	KoviVac
Russia	FBRI	EpiVacCorona
Russia	Gamaleya	Sputnik V
UK	Oxford/AstraZeneca	AZD1222
US	Moderna	mRNA-1273
US/Germany	Pfizer/BioNTech	BNT162b2

Note: Janssen's product was suspended by multiple countries so is not included
Source: McGill COVID19 Vaccine Tracker Team, public information, Deloitte Research

Notable transactions in life sciences R&D include:

Biotech & biopharma

- A consortium led by Hillhouse Capital agreed to acquire a 18% stake in I-MAB Biopharma[15]. The fund will support I-MAB in promoting R&D of innovative drugs and global clinical trials, and to expand its commercialization capabilities in China[16]. I-MAB out-licensed its innovative drug Lemzoparlimab to AbbVie on 4 September 2020.
- Hillhouse Capital agreed to acquire an 8% stake in Joincare Pharmaceutical[17]. This investment was the first step in Hillhouse and Joincare establishing a cooperative relationship. In the next strategic cooperation phase, Hillhouse will help Joincare introduce innovative drug products for key therapeutic areas that are under research, and a high-level global R&D technology platform[18].
- Janchor Partners led a USD310m Series C round for US-based drug development company Everest Medicines[19]. The financing will be used to advance the clinical R&D of innovative drug products and establish a strong commercialization infrastructure for the next stage.

Vaccines

- Sino Biopharmaceutical announced it would acquire Sinovac Life Science, creator of the COVID-19 vaccine CoronaVac, making it one of the few enterprises in China to have self-developed and produced such a vaccine. The investment is expected to fund the further development, capacity expansion, and production of CoronaVac, and help Sino Biopharmaceutical transform from a traditional pharmaceutical company[20].

CXO services

- Viva Biotech agreed to acquire Zhejiang Langhua Pharmaceutical. This strategic integration will give full play to the business synergies of Viva Biotech and Zhejiang Langhua in R&D, design, and production in the global pharmaceutical market. It will help Viva Biotech's vertical integration and expansion of Contract R&D and Production Organization (CDMO) business[21].

CGT

- A management-led consortium proposed to acquire a stake in Cellular Biomedicine, a China- and US-based company offering cell therapies for cancer and degenerative diseases. The investment will support cell therapy clinical R&D[22].

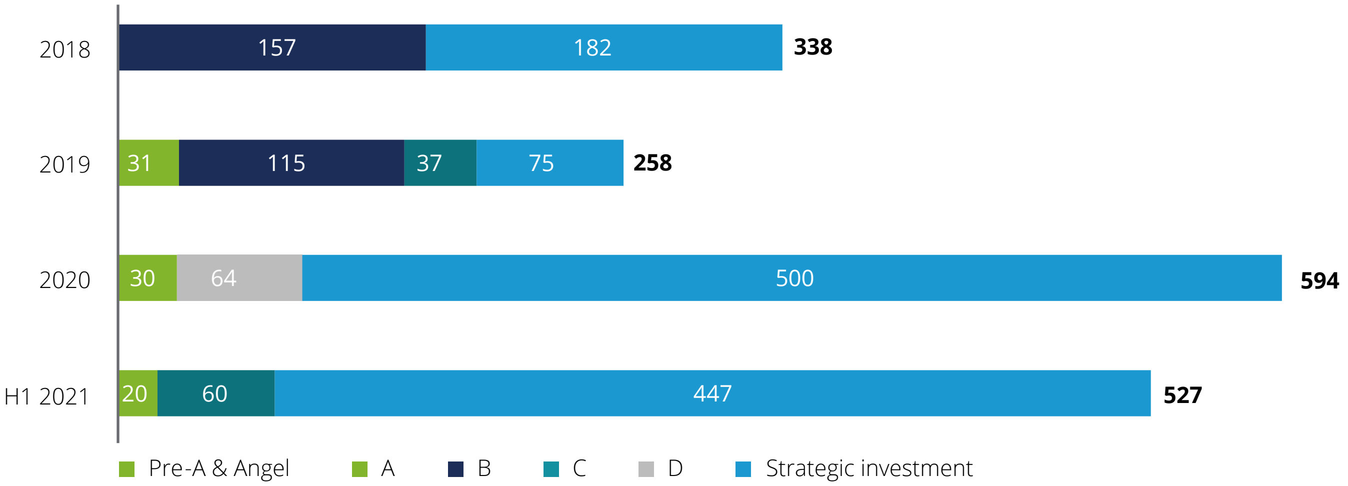
Tech giants double down investment in digital health transformation

In 2021, Deloitte surveyed 150 respondents from biopharma companies operating in China on their opinions and expectations for digital development. Three-quarters of the surveyed companies are increasing or ready to increase investment in online channel development[23].

Of the companies willing to increase investment in new digital channels, domestic enterprises would rather develop their own online channels; foreign-funded enterprises tend to favor cooperative development with digital health platforms; large enterprises would prefer a combination of building their in-house digital platforms and partner with third parties. In addition, the application of artificial intelligence (AI) has redefined the entire biopharma industrial chain, attracting tech giants' interest in deploying the technology in novel biological development.

In the past three years, tech giants have doubled down their investments in digital health transformation (Figure 11). Fundraising value doubled from 2019 to 2020, partially due to the COVID-19 outbreak, and in 1H 2021 alone, USD527 million was raised, almost as much as in the whole of 2020.

Figure 11: Fundraising involving BATJ (Baidu, Alibaba, Tencent and JD) investors 2018-June 2021 (USD mn)

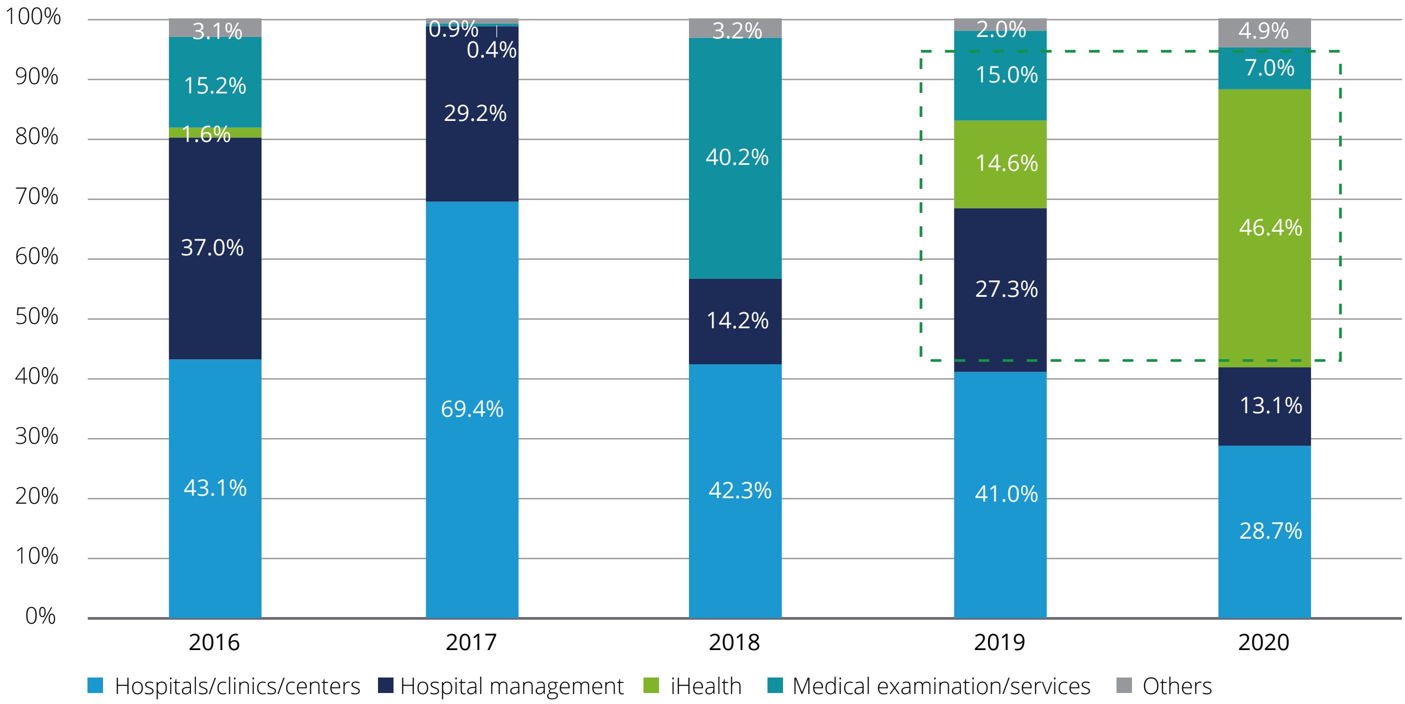


Source: Wind, Deloitte Research

1.4. The proliferation of "Internet+" services in China

In 2020, the iHealth sub-sector was the hotspot in M&A (Figure 12), representing 46.4% of total deal value in medical services, up from 14.6% in 2019. This spike signaled escalating demand for online medical consultations a result of restrictions on physical visits to hospitals, clinics and other health centers during the pandemic. 98% of M&A value in iHealth related to online platform services.

Figure 12: Medical services sub-sector M&A value and volume 2016-2020



Note: Excludes 14 deals with value not disclosed. See appendix for Mergermarket inclusion criteria.
Source: Mergermarket, Deloitte Research

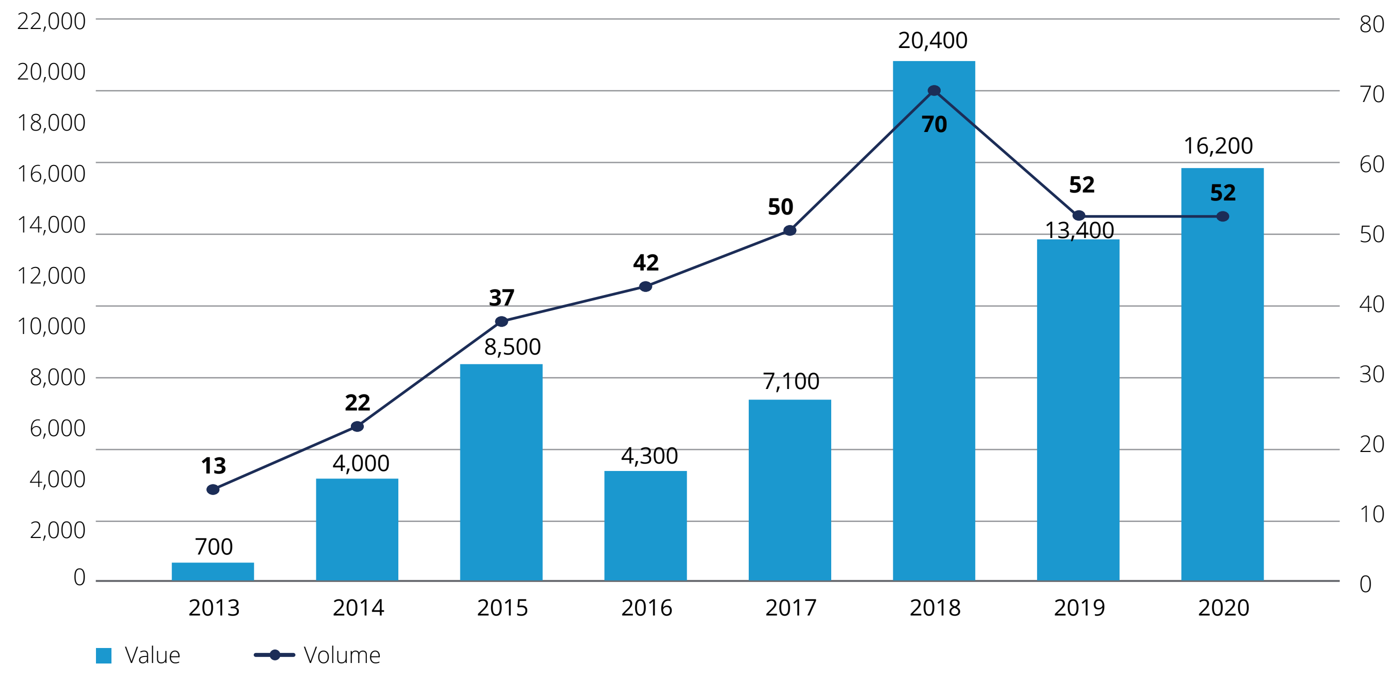
There are several key trends in digital healthcare development in China[24]:

- China is striving to develop a comprehensive healthcare system, particularly to fulfil the needs of its aging population and chronic disease patients
- Improving living standards have increased public awareness and a consensus on the need for "early prevention, early detection, and early treatment"
- The need for new payment models was much discussed in 2020 due to the COVID-19 outbreak, especially for chronic disease management
- The growing need for digital health management arises from people's awareness of active health management in recent years

In addition to online healthcare services, investment in internet hospitals was another hot topic in China's LSHC capital market in 2020. The COVID-19 outbreak accelerated digitalization in medical services, from medical consultations to hospital revisits for chronic disease patients, and the trend of establishing internet hospitals accelerated in China's medical services market. Many giant Chinese tech companies, led by "the BATs", are investing more in the deployment of healthcare businesses such as online platforms and internet hospitals. Our research of investment and fundraising for internet hospitals found it to be highly policy-oriented and have three phases (Figure 13)[25]:

- **Initial occurrence and exploration (2000-2014):** Investors began exploring the digital healthcare market and started to invest, with the number of related investments and fundraisings doubling from 11 in 2013 to 22 in 2014
- **Exploration and reshuffling (2015-2017):** The value of investments and fundraisings slowed slightly due to unclear policies and regulations in digital healthcare. The volume of investments and fundraisings still grew steadily
- **Expansion and breakthrough (2018-2020):** Starting from 2018, government authorities began establishing a clear view and open attitude to encourage digital healthcare development. Investment and fundraising volume and value increased, with a peak in 2018

Figure 13: Digital healthcare investment and fundraising volume and value 2013-2020 (RMB mn)



Source: JUZI.com, Deloitte Research

In 2020, the COVID-19 epidemic further accelerated growth of digital healthcare and development of internet hospitals. Government agencies issued several policies to support internet hospitals and digital healthcare development and implementation. The role of online medical delivery grew in response to COVID-19, with a sharp increase in the use of online platforms at the height of the pandemic. Policymakers responded to the crisis, with some cities, such as Hangzhou and Chengdu, allowing direct medical insurance reimbursement of payments for online medical services or prescriptions.

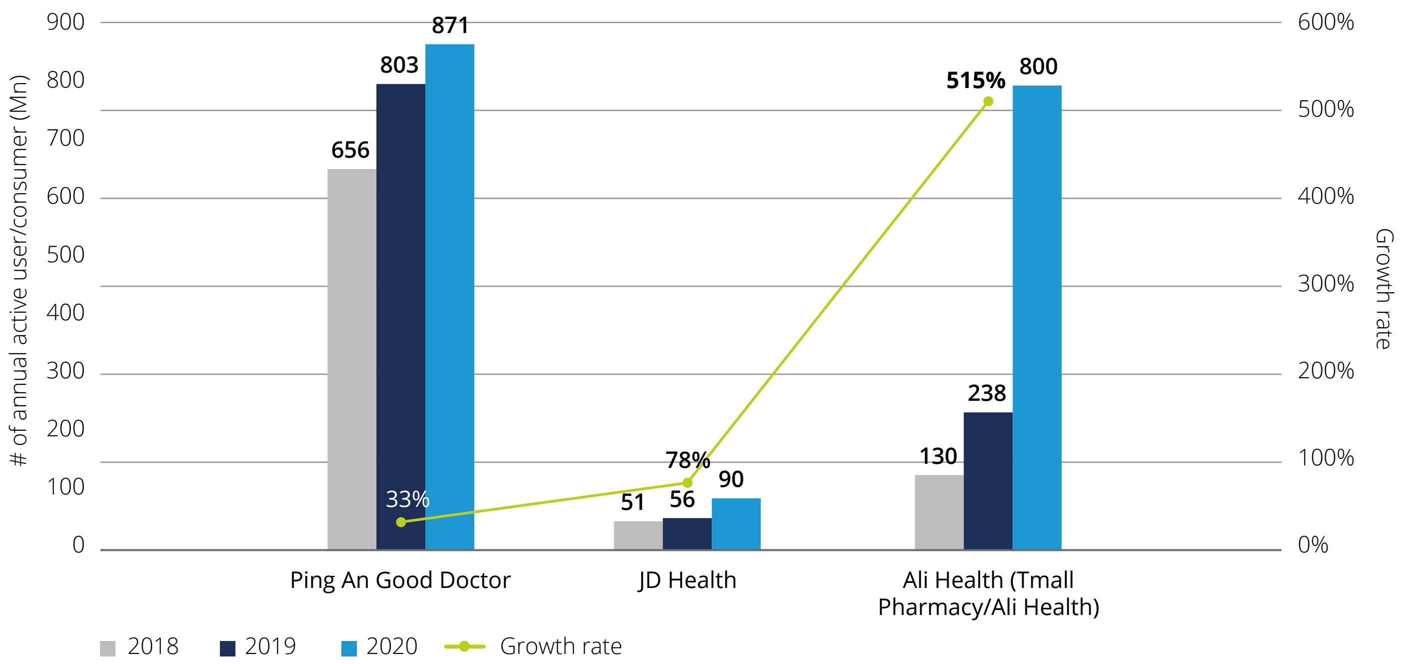
Given the potential benefits of digital health, it is no surprise that the Chinese government has made clear its support for the continued development of digital health services. The latest 14th Five-Year Plan, for 2021 to 2025, states that the government "will include eligible telemedicine services in the scope of health insurance payments and implement settlements for medical treatments in other areas". Along with promoting telemedicine and internet hospitals, the plan pledges to "promote medical imaging assisted interpretation, clinical-assisted diagnosis, and other applications that use big data to increase the ability to supervise medical institutions and medical behaviors"[26]. Historically, industries and businesses that align with the nation's strategic goals are more likely to secure assistance from the government, and the explicit support for telemedicine makes it an attractive proposition for investors.

China has the infrastructure to rapidly develop digital health services, with a strong internet penetration rate and the world's largest 5G network[27]. As a result, telehealth is expected to grow rapidly over the next decade[28]. Traditionally, healthcare in China has been delivered via large hospitals or medical centers, and given China's huge population, these can become extremely crowded[29]. At the height of the COVID-19 epidemic in China in early 2020, there was surge in teleconferencing to enable patients with non-COVID-19 issues to avoid having to visit hospitals. Since then, many patients have decided they actually prefer teleconferencing, giving a permanent boost to digital healthcare. An increasing number of services are available for Chinese people wishing to access online consultations and healthcare. From late 2019 to mid-2020, the number of telemedicine providers in China exploded from fewer than 150 to around 600[30].

The active user and consumer growth of every major online medical platform in China accelerated during the pandemic, with Ali Health posting a growth rate of more than 500% (Figure 14). The boom of iHealth in China is exemplified by Ping An's Good Doctor platform. Its number of newly registered users increased from 30.3 million in 2015 to 372.8 million in 2020, with a growth rate of more than 1,000%[31]. It received over 700,000 visits a day, equivalent to the combined daily number of visits to 70 Grade A tertiary hospitals.

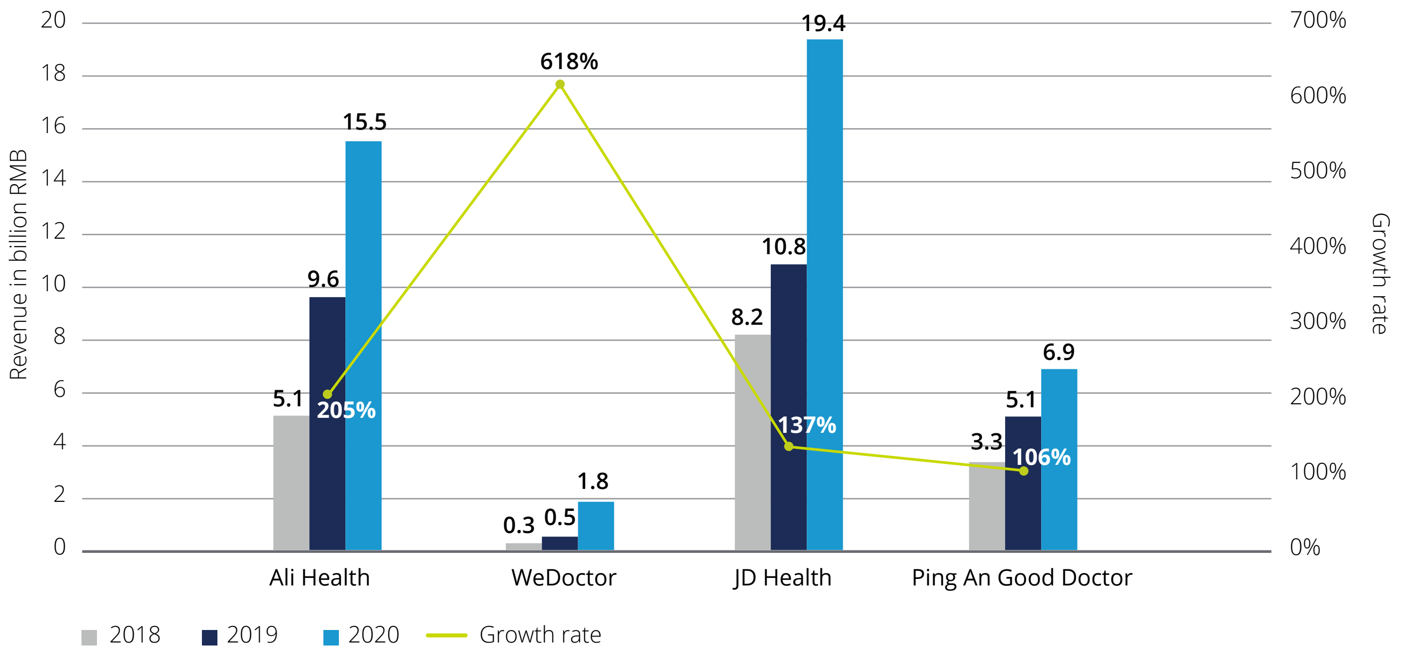
Was this uptick temporary or is the increase in use of digital services permanent? From 2018 to 2020, the average revenue growth of four major online medical platforms (JD Health, Ping An Good Doctor, Ali Health, and WeDoctor) was more than 100% (Figure 15). This illustrates the fast growth of iHealth in China's LSHC market, and the sub-sector is likely to attract funds from an increasing number of investors and cross-sector players. In 2020, there were more than 40 cross-sector investments in China's LSHC market, and in H1 2021 there were over 20[32].

Figure 14: Annual active users of online medical platforms in China 2018-2020



Note: Excludes WeDoctor, which does not reveal MAU or annual active user numbers.
Source: Ping An Good Doctor annual report, Ali Health annual report, JD Health annual report, Deloitte Research

Figure 15: Revenue of major online medical platforms in China 2018-2020



Source: Ping An Good Doctor annual report, Ali Health annual report, JD Health annual report, WeDoctor Global Offering, Deloitte Research

This rise in digital healthcare has helped ease geographic inequalities and barriers in accessing medical resources faced by citizens in rural and remote areas. Top-tier city hospitals are usually better equipped and resourced than their rural counterparts, result in rural citizens facing a difficulty in health management than their urban compatriots. Digital health services can narrow this gap, allowing people in remote areas to enjoy resources and expertise previously only available in top-tier city hospitals. Local rural doctors can refer cases for remote digital diagnosis by specialists when needed. Telemedicine can reduce China's heavy reliance on hospitals, which are expected to be "jacks of all trades", delivering the bulk of healthcare services.

However, digital technology is not just about helping rural patients access care remotely. It can also be used to improve the delivery of rural healthcare in by local doctors themselves (Figure 16). Digital technology can facilitate remote training and upskilling, and rural doctors can use online smart diagnostics, allowing them to leverage the knowledge of colleagues across China and the world.

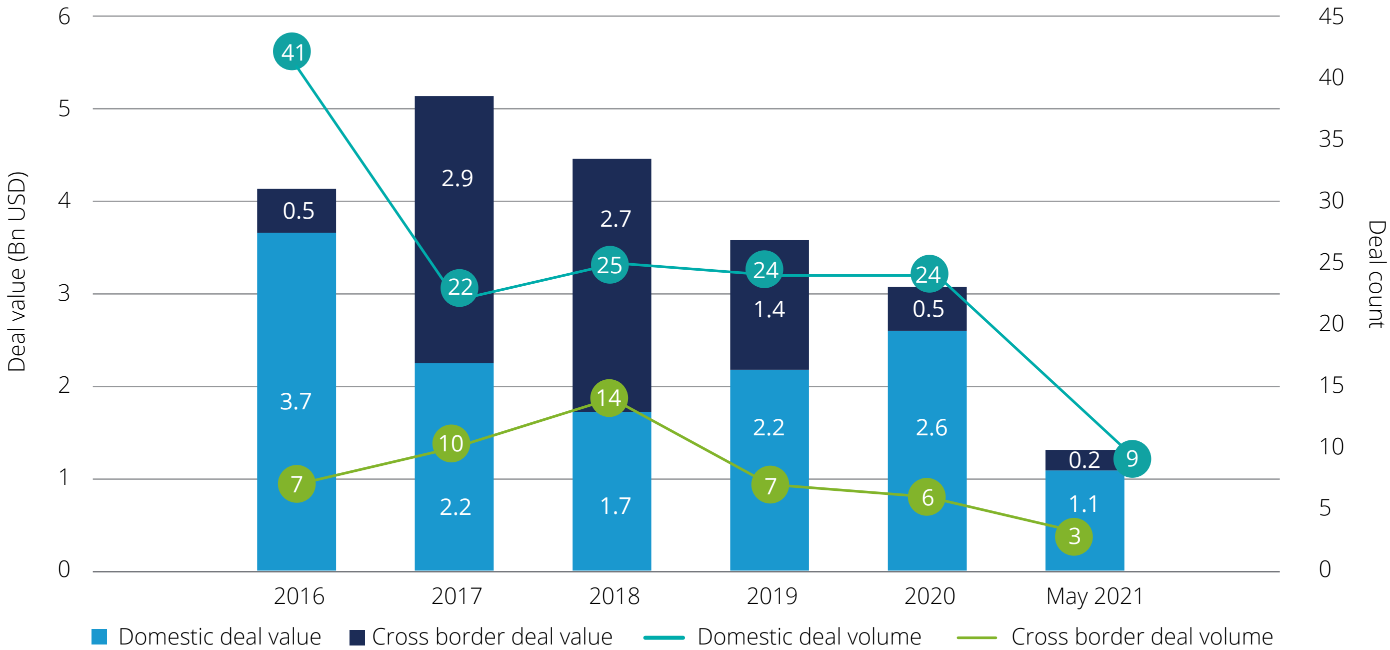
Figure 16: Types of online medical platforms in China

Source: Deloitte Research

1.5. Surge in "home-grown substitution" phenomenon in the high-value medical devices market

The focus of M&A in China's medical device sub-sector has shifted from cross-border to domestic deals in the past five years, especially in deal value (Figure 17), driven by the promotion of home-grown medical devices to replace imported ones. Historically, foreign brands have dominated the medical device sub-sector, especially high value medical devices. However, as we noted in last year's report, there has been growth in home grown devices. Although not its stated goal, centralized procurement policy has accelerated this trend towards increased domestic production as price pressure has shifted demand towards more affordable local suppliers.

Figure 17: Medical devices M&A value and volume by deal type 2016-May 2021



Note: Excludes 21 deals with value not disclosed. See appendix for Mergermarket inclusion criteria.
Source: Mergermarket, Deloitte Research

In November 2020, the government introduced a bidding system for coronary stents, purchasing enough to meet more than 70% of estimated hospital demand. This prompted the average price of stents to plummet 90% from the previous year's level. In addition, 70% of the stent varieties in the VBP round were from local companies, showing how home-grown medical devices are replacing imported ones. Many large foreign manufacturers with the capacity and deep pockets to compete are likely to have opted out of low margin competition[33].

Provincial governments followed suit, with various VBP programs for intraocular lenses, artificial hip joints, knee joints, hernia meshes, staplers, and medical film:

- Jiangsu province reported price falls of 50% to 96% across various categories of medical devices
- Guizhou, Chongqing, Yunnan, and Henan provinces announced a medical device centralized procurement alliance, since reporting average price falls of more than 60%

Other policies, such as lower registration fees and government research support, are also designed to spur domestic production. Hospitals are encouraged to purchase locally made goods, and in some cases cannot obtain state insurance disbursements for imported devices[34]. Some provinces have also published catalogues listing types of medical equipment permitted to be imported.

The home-grown medical devices theme observed last year has expanded from low-to-mid value products, where China has long enjoyed a comparative advantage, to include high value medical devices. From 2009 to 2019, foreign brands' market share of high-value medical devices fell from 80% to 70%. In 2020, 701 medical devices had achieved more than 70% domestic production (Table 7)[35] .

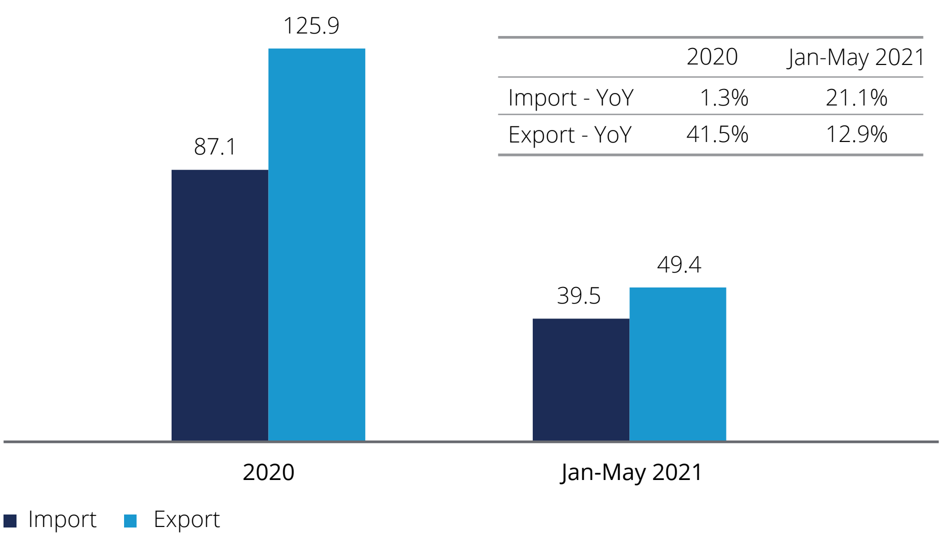
The increasingly prominent role of home-grown manufactures is also seen in imports and exports. Historically, China has had roughly equal amounts of both. However, medical device export value grew YoY 41.5% in 2020, but import value only rose 1.3% (Figure 18)[36] . In 2020, China exported 271,000 ventilators, 119 million infrared thermometers, and more than a billion coronavirus testing kits[37].

Table 7: Domestic ratios of tier-II medical devices by number in 2020

% of domestic products	# of Products
0	62
0-10	10
10-20	28
20-30	41
30-40	48
40-50	68
50-60	56
60-70	76
> 70	701
Total	**1,034**

Source: *Review of National Medical Device Industry Data*, China Food & Drug Administration Magazine, Deloitte Research

Figure 18: China's import and export value of medical devices 2020 & Jan-May 2021 (RMB bn)



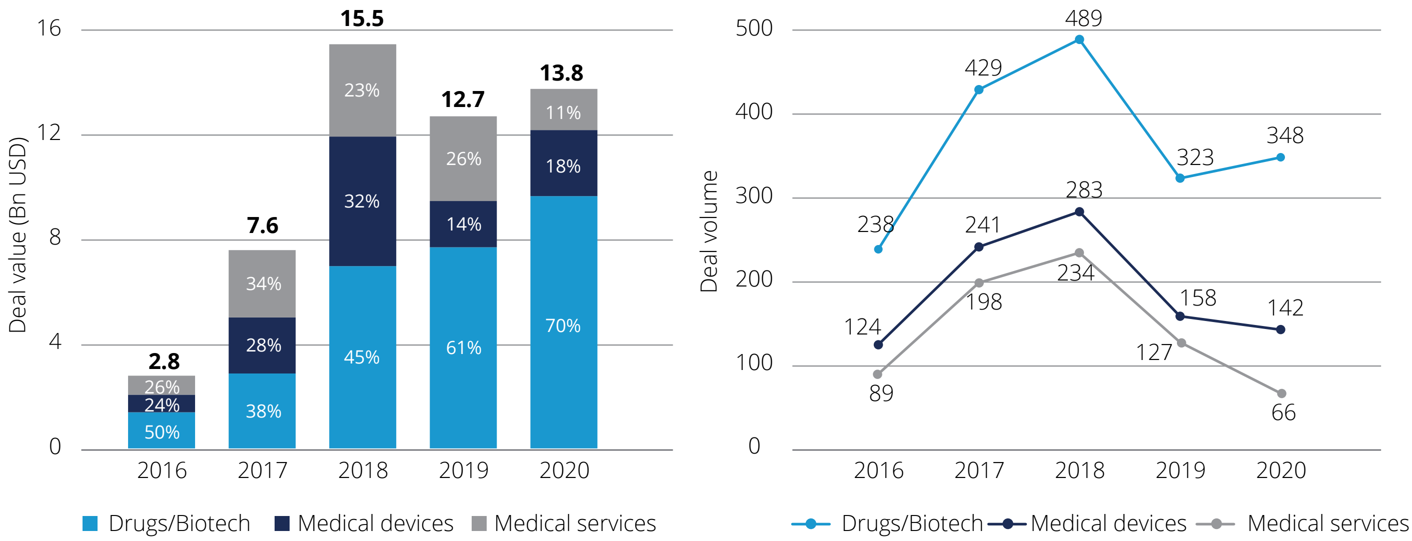
Source: General Administration of Customs, Deloitte Research


100
80
60
40
20
0
Jan
Feb
March
April
May
June
July
Aug
Sep
Oct
Nov
Dec

2. PE/VC and IPO financings in China's LSHC market

Despite the COVID-19 outbreak, PE/VC investments in 2020 reached more than USD13.8 billion, exceeding 2019's level. Specifically, deal value in drugs/biotech and medical devices grew 25.5% and 42.4% (Figure 19). Drugs/biotech has been the frontrunner in attracting PE/VC financings, and medical device companies are receiving more attention and interest from capital markets, with 12 IPOs across HKEx and STAR in 2020.

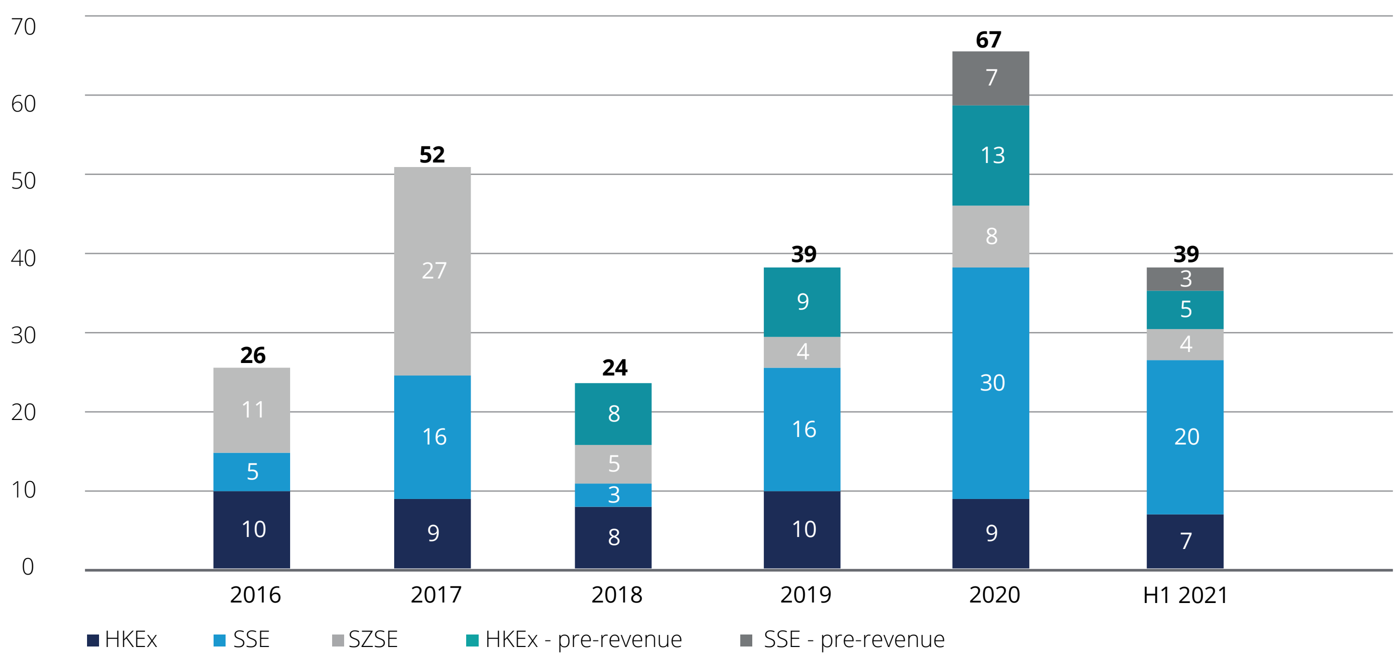
Figure 19: China LSHC PE/VC investment activity by value and volume by sub-sector 2016-2020



Note: Deal volume includes 2,368 deals with value not disclosed.
Source: Wind, Deloitte Research

Following in the footstep of HKEx, SSE STAR market and Shenzhen Stock Exchange (SZSE) introduced pre-revenue listing regulations in 2019 and 2021 respectively. China's LSHC capital market rode the second wave of investment activities in 2020, with a peak in pre-revenue biotech IPOs. HKEx had 22 IPOs raising RMB 67.2 billion that year, up 66.6% from 19 IPOs raising RMB40.4 billion in 2019. There were 45 A-share IPOs raising RMB 61.5 billion, up 246.8% from 20 IPOs raising RMB17.7 billion in 2019 (Figure 20).

Figure 20: LSHC listings on HKEx, SSE, & SZSE by volume 2016-H1 2021



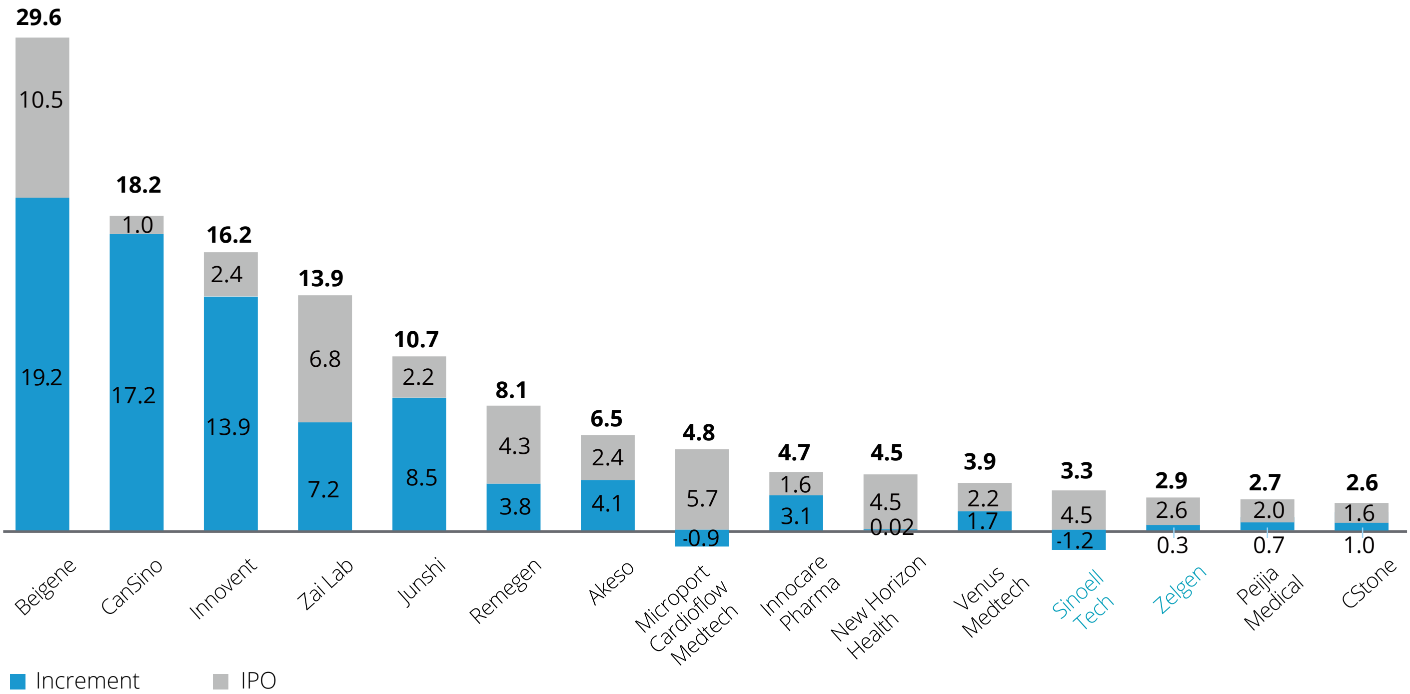
Note: SSE STAR Market established in July 2019; 1st pre-revenue listing in 2020.
Source: Wind, Deloitte Research

2.1. Divergent performance of listed pre-revenue biotech companies on HKEx and STAR

Since 2018, PE and VC have gained new options to exit pre-revenue biopharma and biotech investments via IPO. Subsequent stock market performance has been divergent. Of the 15 SSE STAR and HKEx listed biotech companies, 13 have grown market cap substantially since going public (Figure 21), yet only three have turned a profit – BeiGene and Innovent (2018 HKEx IPOs) and Junshi (2019 HKEx IPO) – all of them leading local players in China's PD-1/ PD-L1 market.

The pre-revenue companies with market cap growth have either made progress with innovative drugs, i.e. the submission of New Drug Applications (NDAs) or commercial launches (e.g. PD-1/PD-L1 and CGT), or achieved R&D breakthroughs in relation to COVID-19 vaccines and treatments.

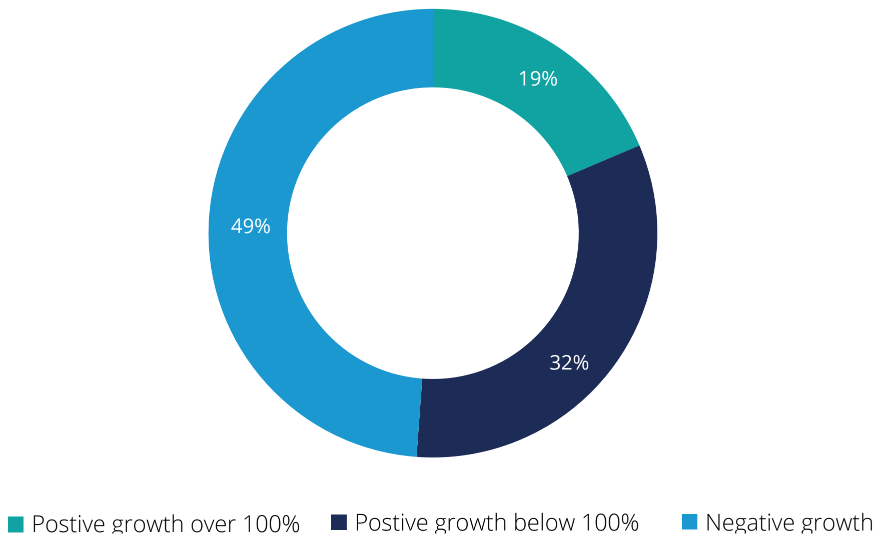
Figure 21: The top 15 HKEx and SSE STAR pre-revenue biotech listings by market cap (as of June 2021; USD bn)



Note: HKEx listings in black text, SSE STAR listings in green text
Source: Wind, Deloitte Research

Investors' enthusiasm towards pre-revenue biotech start-ups has not faded, but they have become more sensible and cautious in picking long-term winners able to sustain the biotech and biopharma R&D and commercialization cycle. According to the most recent financial reports, only five pre-revenue listed companies are currently profitable, and the market capitalization of nearly half of those on HKEx and SSE STAR have fallen since their trading debuts (as of H1 2021; Figure 22). The capacity to build a broad pipeline portfolio and commercial launches has become a core competency for biotech companies.

Figure 22: Change in market cap of pre-revenue HKEx and SSE listed companies from debut to 30 June 2021



Source: Wind, Deloitte Research

2.2. Region-based LSHC industry development is consolidating investment flows

In 2020, China's LSHC industry developed along regional lines, including the Yangtze River Delta (YRD), Guangdong-Hong Kong-Macao Greater Bay Area (GBA), and Beijing-Tianjin-Hebei (BTH). Provincial government agencies are collaborating to develop region-based LSHC industrial chains. Investment activities in 2018 and 2020 (Table 8) show that Beijing and Shanghai are the most active venues by deal volume and value, with the figures for both nearly double those of the 3rd-placed location. That said, the 3rd, 4th, and 5th most active venues are provinces in the YRD, GBA, and BTH, showing the consolidation of industry participants and investment flows in these regions.

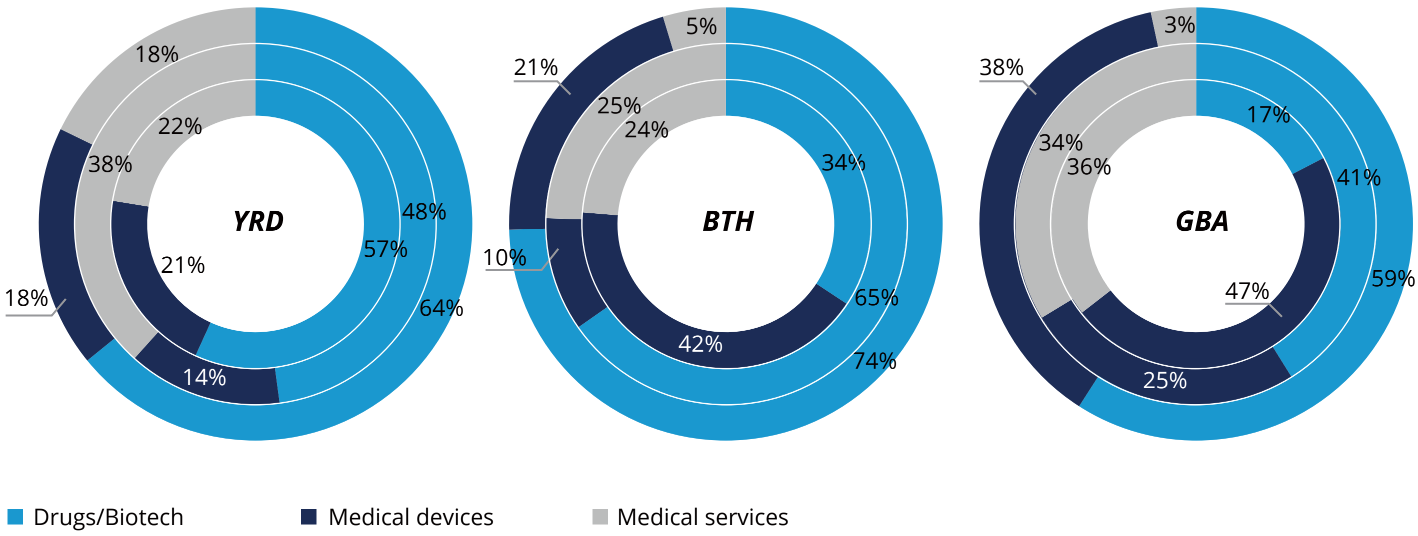
Table 8: Regional investment activity by value and volume 2018-2020

City/Province	Total value(USD mn)	Total volume
Beijing	10,303.1	376
Shanghai	10,223.6	467
Jiangsu	5,465.6	340
Guangdong	3,852.5	308
Zhejiang	3,567.9	217
Jilin	1,523.4	16
Hebei	1,424.3	13
Shandong	1,204.2	69
Hubei	760.9	66
Sichuan	746.8	75
Heilongjiang	370.0	3
Henan	339.8	20
Yunnan	338.8	16
Hunan	326.6	26
Tianjin	304.1	20
Hong Kong	282.4	4
Chongqing	234.1	11
Shaanxi	227.5	17
Fujian	117.9	16
Ningxia	100.0	3
Inner Mongolia	95.4	4
Jiangxi	78.4	10
Shanxi	74.8	9
Tibet	71.3	6
Gansu	66.2	8
Anhui	38.7	19
Hainan	29.5	5
Liaoning	27.0	19
Guangxi	8.1	5
Qinghai	2.4	2
Guizhou	1.8	2

Note: Volume includes 143 deals with value not disclosed.
Source: Wind, Deloitte Research

By region, the YRD received the most investments in 2018 to 2020 by deal value and volume (Figure 22). As the region with most talent and largest number of innovation centers, the YRD is leading China's LSHC development, resulting in more fund flows to companies there, particularly in drugs and biotech. In 2020, 136,000 new biotech or biotech-related companies were registered in the region, with an annual increase of 30.6%. Furthermore, biopharma production value reached RMB383.3 billion in Shanghai in 2019. In 2020, biopharma production value potentially exceeded RMB 600 billion across Jiangsu; core business income from pharmaceuticals industry production reached RMB 215 billion in Zhejiang and RMB 200 billion in Anhui[38].

Figure 23: Value of investment activity in 2018 (inner ring), 2019 (middle ring) and 2020 (outer ring)



Note: Volume includes 143 deals with value not disclosed
Source: Wind, Deloitte Research

Given the region's future, capital market investors tends to favor YRD LSHC companies. As of H1 2021, 190 of the China LSHC companies listed on SZSE, SSE, or HKEx, or recognized as China Concept Stocks, are based in the YRD (Table 9), nearly double the number in BTH and more than in the GBA. This once again proves the leading position of YRD in China's LSHC market in terms of development and fundraising.

Table 9: Number of listed companies by region, as of H1 2021

Region	No. of listed companies
YRD	190
GBA	126
BTH	90

Note: Includes SZSE, SSE, and HKEx listed companies, and China Concept Stocks
Source: Wind, Deloitte Research

There are two major investment traits in China's LSHC m arket:

- **Domestic investors driving activity:** All of the top 10 PE and VC investors to successfully exit from 2016 to H1 2021 were domestic investors, showing the dynamic appeal of China's LSHC industry to the local capital market.
- **LSHC companies raised larger funds pre-IPO on SSE or SZSE boards during 2016 to 2020:** All of the top 10 listings by funds raised went public in the past three years (2018 to H1 2021). Among these, five were biopharma companies and three were from the pre-revenue biotech segment, showing the capital market's preference for biotechnology investments is getting stronger in recent years.

Although investment volume and value decreased from 2019 to 2020 due to COVID-19, a rebound started in Q3 2020 and has continued since then due to China being a more stable market than those still struggling with controlling the disease and preventing its spread. This has meant more investors, regardless of whether they are domestic, overseas, or cross-sectoral, are being attracted to China's LSHC market, especially digitalization and biotechnology plays.


VERVIEW
ENERGY READINGS
SYSTEM
OPERATIONAL

3. China LSHC M&A trends in H1 2021 and forecast

Although there were still small outbreaks of COVID-19 in some parts of China in H1 2021, the pace of M&A in its LSHC industry returned to normal, with 90 deals worth more than USD9.7 billion, representing increases of 20% in volume and 32% in value. The pandemic has promoted China's application of next-generation technologies in certain healthcare offerings, a trend that will continue and is having a corresponding impact on M&A and PE/VC activity in China's LSHC industry in the post-pandemic era.

In the near term, we expect an overall growth of M&A in the China LSHC market, especially in innovation development that aligns with the requirements of the 14th Five-Year Plan and the digitalization of healthcare services and distribution channels.

3.1. Business opportunities driven by COVID-19 in the post-pandemic era

Last year, we discussed the vital role digital health played in disease prevention during the pandemic. In the post-pandemic era, there are still unmet needs in disease prevention and iHealth services. Historically, there has been global underinvestment in R&D on preventing infectious diseases[39]. This is unsurprising, as investments in disease prevention have multiple positive externalities, and areas with positive externalities tend to be under-invested.

Nevertheless, as the Chinese economy grows and incomes rise, citizens will place increasing emphasis on preventive healthcare measures and medicines. Two-thirds of Chinese people believe that healthcare professionals should focus most of their time and resources on preventive care[40]. The Chinese government has responded, emphasizing a shift from disease treatment towards disease prevention[41]. In May 2021, the national government inaugurated the National Bureau for Disease Control and Prevention. This marked a transformation from disease control institutions simply controlling diseases to comprehensively safeguarding and promoting overall health[42].

3.2 Digitalization and innovation driving growth in life sciences fundraising

In H1 2021, investment and fundraising volume and value reached 128 deals worth USD3.4 billion, with the largest single transaction value of up to USD230 million. During the same period, 40 investment M&A deals were completed with a total value of USD 508 million, marking a slight decline from the same period in 2020. This was mainly due to the high base created by 2020's boom in biotechnology and biopharmaceutical investment M&A. Looking ahead, the global economy will continue its slow recovery and M&A investors will remain cautious, although life sciences should continue to be highly popular, driven by two main factors:

- **Digitalization penetrating the entire biomedical industry chain: from R&D and production to marketing**
  Followed by the digitalization trend in 2020, pharmaceutical companies are cooperating with technology companies to digitally empower R&D and production; while tech giants are expanding their coverage in LSHC by injecting more funds into the sector. In H1 2021, there were more than 10 investments by technology firms in China LSHC (Table 10).

Table 10: Key local tech players' investments in China's LSHC sector in H1 2021

Region	# of LSHC investment
Tencent	5
Baidu	2
Ali	1
36Kr	1
Xiaohongshu	1
ByteDance	1

Source: Wind, Deloitte Research

In addition, the application of AI in life sciences has shortened the R&D cycle and reduced costs through big data analysis, accelerating the discovery of therapeutic targets and new generation therapies. The construction of data centers improves production efficiency, enabling manufacturers to seize market share. It also supports product promotion via big data analysis of consumer profiles, enabling accurate launch products and identifying market pain points to direct the development of innovative drugs.

- **Innovation development buoying the pharmaceutical industry on wave of VBP**

  The frequency of VPB is accelerating the development of novel drugs in China's LSHC market. VBP is essentially a "winner takes all" situation, where the winning bidder can earn solid revenue due to China's vast market (albeit at low product margins) , but firms that cannot compete on price lose out. In this new world, pharmaceutical companies must change direction from developing "me-too" and "me-better" products to creating first-in-class, novel products that enable them to keep margins high.

  The quest for innovation and novel drugs will fuel M&A activity. To remain competitive in a VBP world, Chinese pharmaceutical companies, which have traditionally focused on generics, will be looking at M&A to add more agile, innovative capabilities to their offerings. China is still at the beginning of its transformation from generics to innovation. As a result, in the short term, M&A activity might be held back by a lack of quality targets. But as the trend of increasing R&D investment continues, we expect more M&A activity driven by a desire to acquire new, innovative drugs.

3.3. Localizing every aspect of medical devices

Medical device M&A in H1 2021 reached USD1.36 billion from 13 deals, with value up 25% and volume rising 23.5% from H1 2020. Despite tough economic conditions, M&A activity in the medical devices industry remained relatively steady in H1 2021. In contrast, PE/VC investment in medical devices surged to USD4 billion from 64 deals, reflecting the optimism of capital markets for the medical devices industry in the post-pandemic era. M&A in the industry is trending towards vertical and horizontal integration. These transactions will enable companies to familiarize themselves with and introduce leading-edge technologies from overseas, apply new technologies and methods, enrich product lines, and provide services throughout the industry chain[43].

Currently, most domestic manufactures are SMEs producing capacity-centered lower-value added devices, and high-end medical devices still depend mainly on imports. This pattern creates huge response risks around national public health emergencies[44]. Securing government funding is therefore extremely important, as is taking advantage of policies encouraging domestic manufacturing. Under the "Made in China 2025" policy, 50% of mid-to-high-end medical devices used in Chinese county-level hospitals should have been Chinese-made in 2020, with the goal rising to 70% in 2025 and 95% in 2030[45]. To achieve this, registration fees for research, market entry approval, and downstream procurement support have been reduced for domestically manufactured products[46]. What's more, local provincial governments often compete against one other to secure high-tech manufacturing by helping manufacturers establish facilities in their desired medical device industrial zones through settlement bonuses or favorable loans.

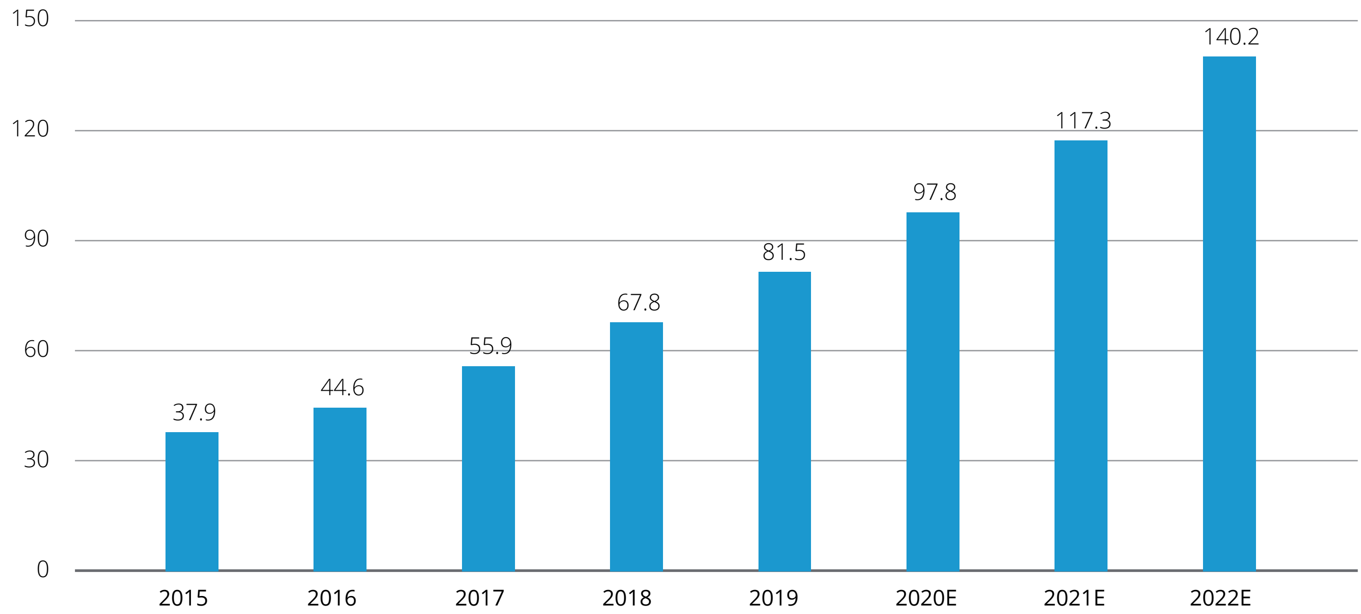
Although import substitution of medical devices is in full swing, the market valuations of leading domestic companies remain low compared to those of the global giants. At the same time, foreign firms are looking to keep costs down, while being more responsive to local market demands. China is an increasingly important market in its own right, and will only grow as its aging population increases the number of people with chronic illnesses and incomes rise. Such supportive factors, coupled with advanced technology, an expanding market, and favorable policies, mean China's medical devices industry is set to enter a golden age of investment, and the scale of leading companies will expand even more via M&A.

At the same time, many medical device manufacturers have embarked on or are embarking on digital transformation. China's economy has moved from being dominated by imitation to having the infrastructure and resources to reward innovation. For instance, China's 5G network supports innovation in the medical devices sector, including Internet of Medical Things (IoMT), smart hospitals, and the development of wireless body area sensor networks.

3.4. The growth of CXO services

Pharmaceutical companies are increasingly using CXO services that allow companies to outsource various aspects of drug research, development, and manufacturing. CXO is a gamut of services, including Contract Research Organizations (CRO), Contract Manufacturing Organizations (CMO), Contract Development and Manufacturing Organizations (CDMO), and Site Management Organizations (SMO). In just three years, from 2019 to 2022, China's pharmaceutical CXO market is expected to nearly double in size from RMB81.5 billion to RMB140.2 billion (Figure 24)[47] .

Figure 24: China CXO market size 2015-2022e (RMB bn)



Source: AskCI, Deloitte Research

Drug development is expensive and only a small percentage of promising drugs will eventually receive final approval and enter the market. The average cost of bringing a new drug to market is around USD1.5 billion. Outsourcing CXO is often cheaper than in-house development and allows companies to stay leaner. Given the large expenses associated with drug development, judicial use of CXO services can save substantial sums.

China is well-positioned to develop world-leading CXO companies. It benefits from well-established infrastructure, complete industrial chains and large economies of scale, while still enjoying lower labor costs than the US and Europe, making Chinese CXO services increasingly attractive to overseas firms. China's large population also offers huge potential to accelerate clinical trials[48].

As precision medicine calls for ever more precise criteria for clinical trial recruitment, this size will become more advantageous. Recruitment in China can often be two or three times faster, and cheaper than it is in the US[49]. At the same time, in recent years the Chinese government has overhauled regulations to make clinical trials faster and more transparent.

CXO companies in China have large room for development. They will also benefit from strong demand from domestic firms as Chinese pharmaceutical companies increasingly look away from generics towards innovation. From 2019 to 2024, pharmaceutical R&D expenditure is expected to grow at a compound rate of nearly 18% – far exceeding the global average and fueling local demand for CXO services[50].

Therefore, we expect M&A activity in this area as CXO firms consolidate to offer a more comprehensive suite of services.

3.5. Hospital integration to create brand effect

In H1 2021, there were 20 medical services deals, of which 65% involved hospitals. There is a trend of hospitals integrating and operating as a group to create a brand effect in offering medical services in China.

- **Hospital management companies consolidating general hospitals**
  Hospital management giants in specialist fields are seeking opportunities to integrate resources, expand their service scope, and diversify by acquiring small and mid-sized general hospitals, especially those less able to survive during the pandemic and a tough competitive landscape. Hospital management giants also have superior resources in volume, cash flow, and performance. After the completion of these deals, small and mid-sized general hospitals can leverage the injected resources to innovate medical practices. After its acquisition by Hygeia Healthcare, for example, Suzhou Yongding Hospital added IoT, 5G, and AI innovations to its management systems and telemedicine.

  Capital investment in hospital management has been popular since 2015, with total deal value of USD8.4 billion, and this looks set to continue in the post-pandemic era. Large hospital management organizations cooperating with general hospitals with a strong background to create brand effect is set to become one of the most influential forces in the industry, and some small and mid-sized hospitals with weak financials and less branding support might struggle to survive.

- **Specialist hospitals emphasize branding**
  The competitive advantages of specialist hospitals is in the services they provide, with consumption upgrading the main driver. After years of development, the largest specialist hospitals have established leading positions in their dominant fields of a segmented industry, with good reputations and recognition, becoming the preferred service brand for patients and doctors in corresponding fields. Branding is the ideal moat for medical services organizations[51].

  In H1 2021, 25% of hospital M&A transactions were related to specialist hospitals, as they strived to integrate unique resources and strengthen brand effect through deals. In 2021 H2 and beyond, specialist hospitals are set to enter a period of integration as giants in segmented fields continue to expand through M&A and PE/VC activity. Also, technical barriers could emerge to create competitive differentiation.

On the pathway of hospital integration, we also observed the issue of the public hospital privatization. In recent years, many public hospitals, especially in low-tier cities, are going privatization in order to reduce the financial burden of local government and to improve the medical service efficiency as expected. However, as a result, many of these hospitals have ended up reverted back to public after being private for a few years.

Notable transactions related to public hospital privatization failure include:

- Shinva Medical Instrument sold 70% stake and liabilities of Zibo Zichuan District Hospital West on January, 2021 to Zibo Banyang Urban Asset Operation. The purpose of the sale is to reduce the operating risk and soothe funding pressures and return the Zibo Zichuan District Hospital back to public welfare property.
- In 2010, Luoyang was identified as a national pilot city of public hospital reform and 14 municipal public hospitals, including Luoyang First people's Hospital, Luoyang Third People's Hospital and Luoyang Second TCM hospitals, carried out property right system reform and changed from public to private hospitals.

  In response to the *13th Five-Year Plan for Deepening the Reform of The Medical and Health System*, in October 2018, The People's Government of Luoyang City signed a property rights transfer agreement with Luoyang First people's Hospital and Luoyang Second TCM hospitals respectively, the two hospitals officially returned to the public hospital; in March 2019, The People's Government of Luoyang City signed a property rights transfer agreement with Luoyang Third People's Hospital to restore the hospital's public welfare properties.

- Since 2000, Suqian government has carried out public hospital reform and statistics show that 133 of the 135 public hospitals in Suqian have completed the reform of property rights system as of 2005.

  In 2011, Suqian government planned to recover the property rights of the privatized hospital and decided to rebuild the First People's Hospital of Suqian as failed to buy-back from Jinling Pharmaceutical. In July 2016, the new Suqian First People's Hospital was officially opened with an investment of nearly RMB 2 billion.

The reason behind can be summarized into three major reasons[52]:

1. Profit-driven operation style
Due to the feature that the capital market is profit-driven, many of the privatized hospitals are reported to raise the drug price and medical service fee, which is contrary to the core concept of "serving for patients". And this eventually led to a "medical rejection" phenomenon as more patients are not able to afford the medical expense.

2. Failed to improve the medical efficiency
The privatization has also led to the medical overuse as many private hospital sometimes may perform over-examination instead of only taking necessary ones. In addition, the efficiency of health care practitioners are also reduced due to the shrink of their benefits and payment.

3. Failed to meet medical fairness
The privatization of public hospitals does not break the wall of unfair distribution in medical resources within the region, especially for low-tier cities and counties, which will harm the public welfare in healthcare.

In the long run, it is extremely important to find the balance in fairness of the hospital development and the reasonable distribution of medical resources between the rural and urban area. In June 2021, the State Council has issued the Guiding Opinion on the High-quality Development of Public Hospitals, emphasized the importance of public-welfare oriented and public hospital as the main health care provider supported by the private hospitals. The Opinion has put public hospitals in a higher position in leading the medical services providers. The 14th Five-Year Plan also put a clear vision of the enhancement in the public hospital development as well as the liaison between national medical institutions and regional ones. Under such trends, we expect to see more large public hospitals will consolidate the hospitals within the region via partnership or acquisition instead of going private.

Notable transactions in public hospital privatization during 2020 to H1 2021 include:

- Junyao Medical has agreed to acquire a 51% stake in Shuyang County Center Hospital. This acquisition presents the new layout of Junyao group in the health industry, and gradually implemented the positioning of "double core main business" with the main retail business as the core and cultivating the medical and health business, so as to realize the future development strategy of "big consumption + big health".
- JH Management (a wholly-owned subsidiary of CR Medical) has agreed to acquire around 80% stake in Huaiyin Hospital. The acquisition will help CR Medical obtain scarce medical business resources and will be the starting point for its medical business expansion in the Yangtze River Delta.
- Yorhe Fluid Intelligent Control has agreed to acquire 100% stake in Kunming Medical Oncology Hospital. The transaction will enable Yorhe Fluid Intelligent Control to improve its layout in the oncology treatment field.
- Hanshang Group has agreed to acquire a 31% stake in Reproductive Medicine Center, Tongji Medical College of Huazhong University of Science and Technology. This transaction is in line with Hanshang Group's strategy to acquire quality targets and expand market coverage of medical industry.

3.6. Changing population structure set to usher in new senior care needs

According to the Seventh National Population Census of the People's Republic of China, its population aged 60 and above is now 264 million, up 5.4% from the previous national census and representing 18.7% of the total population. Remarkably, the population aged 65 and above has now reached 191 million, up 4.6% from the previous census and accounting for 13.5% of the total population[53]. In recent years, China's elderly population has been increasing rapidly, creating huge demand for senior care services. However, due to resistance to changing traditional senior care conventions, a shortage of professional nursing personnel, a challenging geographical layout, price positioning, and sub-optimal facilities, China's senior care centers now face high vacancy rates[54].

In H1 2021, there were just two transactions with a combined value of USD284.4 million in the offline senior care center sub-sector, suggesting investors are on the fence about its prospects. However, this indifference may have catalyzed another sub-sector – smart senior care. From January to June 2021, PE/VC investment in smart senior care totaled USD132.6 million from seven deals (Table 11).

With the in-depth development of "Internet+" and mobile healthcare, telemedicine will be widely used in senior care in the post-pandemic era[55] and innovations in chronic disease management will increase. This could herald a new wave of capital investment in smart senior care.

Table 11: Investments in smart senior care in H1 2021

Announced	Fundraising company	Fundraising round	Amount raised (RMB mn)
Feb. 24, 2021	Gloria Spectrum Precise Medical	B	150
Mar. 18, 2021	Jinqi medical	Strategy	60
Mar. 22, 2021	Jianhai Science And Technology	B	150
Apr. 2, 2021	Shengmei Biological	B	300
Apr. 14, 2021	Feiershao Akmpath Biological	A+	10
Jun. 17, 2021	Red Cloud Bio	B	100

Source: Wind, Deloitte Research


100
80
60
40
20

Conclusion

The dramatic transformation seen in the global LSHC market in 2020 is set to continue, especially in China. We have witnessed the acceleration in the application of digital tools and technology throughout the LSHC value chain, and massive government incentives including several new policies and regulatory reforms. Furthermore, 2020 saw many pivotal events in China, including the start of the 14th Five-Year Plan and the release of statistics from the Seventh National Census. With all these changes and developments, China's capital market has seen a large number of investors, at home and from overseas, flow into LSHC to sustain its growth. According to UNCTAD, China received the 2nd most FDI inflows of any country in the world in 2019 and 2020[56]. In addition, with the promotion of the "dual circulation" economy, domestic industry participants and investors are becoming more proactive, with several mega-sized fundraising deals completed or ongoing.

This report reflects on M&A deals and investment trends in 2020 and H1 2021, and shares our expected growth drivers in the LSHC capital market, which will be driven by two main factors:

- **Industry upgrading driven by innovation breakthroughs**
  Innovation is a major emphasis of the 14th Five-Year Plan announced in 2020. The government aims to make China the world's leading LSHC market. To that end, authorities have been promoting innovation development, including through registration benefits for innovative or first-in-class products and rectifying market competition based on me-too/me-better products and the uneven quality of market participants by rolling out national practices including VBP, strict standards for evaluation consistency, and the one-invoice system.
- **Online-offline integration**
  The epidemic has prompted an ongoing acceleration in healthcare digitalization. Digital technology has been adopted across China's entire LSHC value chain, from R&D and manufacturing, to the distribution of medical services offerings and health management. This comprehensive industry shift online has resulted in dynamic investments by PE and VC, large corporations, and cross-sector players. In 2020, government authorities released several policies and regulations to support the establishment and development of internet hospitals, telemedicine, and online medical services.

Following the two key drivers are five main trends in China LSHC M&A that are likely to sustain in 2021 and thereafter:

- **Preventive care:** the pandemic has stimulated public awareness of prevention and raised demand for preventive materials and services. More businesses will shift focus to developing preventive care and products to fulfill these needs
- **The infusion of digitalization and innovation in life sciences:** digital technology is supporting and rapidly accelerating innovation development in life sciences, especially the utilization of big data, AI, and virtual connections
- **Advances in CXO services:** thanks to China's fast recovery from the pandemic, its CXO services have been used extensively by companies across the world, prompting advances in CXO service offerings with the development of cutting-edge treatments like cell and gene therapy
- **Consolidation and integration of branded hospital groups:** with digital technology breaking down geographic boundaries, more small-to-mid-sized hospitals and clinics are consolidating to operate as branded hospital groups to parlay their brand effect at the national level
- **The opportunities and challenges in senior care:** the aging population in China has been increasing rapidly in recent years, bringing opportunities and challenges to senior care businesses, from chronic disease management equipment and materials to care services and health monitoring

While the above five areas constitute immediate investment areas in China, the government and its regulators might decide to further emphasize some of those or eventually specify some of the operating framework, which in turn could modify this outlook. It will certainly be very important, more than ever, for the market actors to fully understand and grasp the countrywide objectives and ambitions, when making investment and M&A decisions. In the near term, we expect these five trends to create more investments opportunities for PE/VC, large corporations, and cross-sector players. The promising growth of China's LSHC capital market in 2020 is likely to continue in 2021 and 2022.

Appendix

Mergermarket M&A deal database inclusion/exclusion criteria

Deal size

Transactions with a deal value greater than or equal to USD 5 million are included, except for some minority stake acquisitions where a higher threshold applies (see point 1.3). If the consideration is undisclosed, deals are included on the basis of a reported or estimated deal value greater than or equal to USD 5 million.

If the deal value is not disclosed and cannot be confirmed to be greater than or equal to USD 5 million, the deal is included if the target's turnover/revenue is greater than or equal to USD 10 million.

If neither the deal value nor the target revenue is disclosed, Mergermarket will use other indicators to determine inclusion, including but not limited to:

- Number of employees of the target company – typically 100 employees is used as a base, though this number will vary depending on geography
- Assets under management exceeding USD 200 million for asset management firms
- Value of assets/deposits exceeding USD 50 million for banks

Stake acquisitions

Where the stake acquired is greater than or equal to 30% of the entire share capital, or 10% where the target is based in Asia-Pacific, and the deal value is at least USD 5 million, the deal will be included.

Where the stake acquired is less than 30%, or 10% where the target is based in Asia-Pacific, the deal will only be included if the deal value is at least:

- USD 100 million provided there is also evidence of an advisory mandate
- USD 500 million in the absence of evidence of an advisory mandate

Deal types included

- Acquisitions of part or the whole of another entity. Stake acquisitions in accordance with the rules set out under point stake acquisitions
- Acquisitions/divestments of business units, companies, divisions and trading assets of another entity
- Mergers
- De-mergers and spin-offs, where the shares of a subsidiary are distributed to the parent company shareholders and the subsidiary becomes a listed company. Partial de-mergers and partial spin-offs are also included.

  The announcement date of such transactions is based on when the board of directors of the parent company approves the deal
- Auctions – only the winning bid, where a binding agreement is in place, is recorded
- Joint ventures, where at least one party is injecting an operational asset other than cash
- Reverse takeovers
- Debt-for-equity swaps
- Acquisitions of or offers for preferred shares, provided the shares form part of the economic interest in the target company
- Property transactions where a property company, with the exception of a property holdco, is acquired or merged with another entity
- Privatisations

Deal types excluded

- Joint ventures where the only asset contributed is cash
- Property/real estate transactions restricted to land, buildings, portfolios or sale and leaseback agreements

- Equity carve-outs
- Transactions involving undeveloped oil and gas fields and undeveloped mines
- Acquisitions of brands, rights and/or licenses (including Government-awarded telecom spectrum licenses)
- Acquisitions of individual assets (i.e. dry bulk vessel) and asset portfolios
- On-sales/subsequent sales/back-to-back transactions which are inter-conditional
- Share buybacks in the form of open market purchases or tender offers
- Equity placements where shareholders' interests in total remain the same
- Internal restructurings where the effective change of control does not meet inclusion criteria
- Acquisition of options and warrants
- Dual listing collapses

Additional information

Market capitalization of pre-revenue companies on SSR STAR and HKEx from day of listing to 30 June 2021

Stock code	IPO date	Company	Market cap.(RMB bn)		Growth rate
			Day of listing	30 Jun. 2021	
6185.HK	28 Mar. 2019	CanSino	6.5	134.8	1,978%
1801.HK	31 Oct. 2018	Innovent	16.5	109.9	568%
1877.HK	24 Dec. 2018	Junshi	15.1	67.9	350%
9969.HK	23 Mar. 2020	InnoCare Pharma	11.2	35.6	217%
6160.HK	08 Aug. 2018	BeiGene	71.4	211.1	195%
9939.HK	22 May 2020	Kintor Pharmaceutical	7.3	20.3	180%
9926.HK	24 Apr. 2020	Akeso	16.9	42.6	151%
9688.HK	28 Sep. 2020	Zai Lab	46.2	107.7	133%
688185.SH	13 Aug. 2020	CanSino	68.8	134.8	96%
688329.SH	29 Mar. 2021	Suzhou Iron Technology	2.2	4.2	93%
9966.HK	12 Dec. 2019	Alphamab Oncology	10.9	19.4	78%
9995.HK	09 Nov. 2020	Remegen	28.5	48.3	69%
2500.HK	10 Dec. 2019	Venus Medtech	15.2	23.8	56%
2616.HK	26 Feb. 2019	CStone	10.8	16.8	56%
1167.HK	21 Dec. 2020	Jacobio Pharmaceuticals	9.3	14.0	51%
6855.HK	28 Oct. 2019	Ascentage	7.0	9.9	41%
9996.HK	15 May 2020	Peijia Medical	14.4	20.1	39%
6978.HK	10 Jul. 2020	Immunotech Biopharm	7.0	8.2	18%
2126.HK	03 Nov. 2020	JW Therapeutics	7.2	8.3	16%
1952.HK	09 Oct. 2020	Everest Medicines	18.1	19.1	6%
6996.HK	20 Nov. 2020	Antengene	10.4	10.7	3%
2171.HK	18 Jun. 2021	Carsgen Therapeutics	14.1	14.4	2%

Stock code	IPO date	Company	Market cap.(RMB bn)		Growth rate
			Day of listing	30 Jun. 2021	
2181.HK	31 May 2019	Mabpharm	4.4	4.3	-2%
6606.HK	18 Feb. 2021	New Horizon Health	29.2	28.3	-3%
688266.SH	23 Jan. 2020	Suzhou Zelgen	17.9	17.0	-5%
688319.SH	08 Jun. 2021	Olymvax	16.2	15.2	-6%
2142.HK	10 Dec. 2020	Harbour BioMed	7.2	6.3	-11%
2160.HK	04 Feb. 2021	Microport Cardioflow Medtech	37.1	32.7	-12%
688578.SH	02 Dec. 2020	Shanghai Allist	17.4	14.8	-14%
6622.HK	29 Apr. 2021	Zhaoke Ophthalmology	6.4	5.3	-17%
2170.HK	08 Feb. 2021	Suzhou Basecare Medical	6.2	5.1	-18%
1477.HK	10 Jul. 2020	Ocumension Therapeutics	19.2	14.3	-25%
2696.HK	25 Sep. 2019	Henlius	24.1	17.2	-28%
688221.SH	28 Oct. 2020	Frontier Biotechnologies	10.8	7.6	-29%
1875.HK	08 Nov. 2019	ToT Biopharma	3.2	2.2	-30%
688520.SH	22 Jun. 2020	Sinocell	31.8	21.6	-32%
6998.HK	07 Oct. 2020	Genor	11.8	7.7	-35%
688180.SH	15 Jul. 2020	Junshi	113.0	67.9	-40%
2552.HK	14 Sep. 2018	Hua Medicine	7.6	4.1	-46%
3681.HK	12 Nov. 2019	Sinomab Bioscience	5.4	2.9	-46%
688177.SH	21 Feb. 2020	Bio-Thera	24.9	10.9	-56%
688277.SH	07 Jul. 2020	TINAVI	36.0	15.1	-58%
1672.HK	01 Aug. 2018	Ascletis	13.7	3.2	-76%

Source: Wind, Deloitte Research

Top 5 PE/VC and industry dealmakers in China's LSHC market by volume 2018-2020

Top 5 PE/VC with HQs in China	
Sequoia Capital	55
Qiming	44
Legend Capital	43
Hillhouse Capital Group	42
Lilly Asia Ventures	39

Top 5 PE/VC with HQs outside China	
OrbiMed	23
ARCH Ventures	13
Vivo Capital	11
Temasek	11
Goldman Sachs	7

Top 5 industry players	
Tencent	20
Fosun	20
CMB International	18
Baidu	16
Wuxi AppTec	14

Source: Wind, Deloitte Research

Endnotes

1. Amgen Enters Into Strategic Collaboration With BeiGene To Expand Oncology Presence In China, https://www.amgen.com/newsroom/press-releases/2019/10/amgen-enters-into-strategic-collaboration-with-beigene-to-expand-oncology-presence-in-china
2. Grifols and Shanghai RAAS close their strategic alliance in China, https://www.grifols.com/en/view-news/-/news/grifols-and-shanghai-raas-close-their-strategic-alliance-in-china
3. Baring Private Equity Asia Agrees to Acquire Lumenis, https://lumenis.com/aesthetics/news/baring-private-equity-asia-agrees-to-acquire-lumenis/
4. GBI database
5. Pharmacube, http://www.pharmcube.com/index/NMPA/detailOUT
6. Junshi & Revitope, https://www.birmingham.ac.uk/partners/enterprise/news/latest/birmingham-spinout-revitope-oncology-inc-announces-10m-investment.aspx
7. Abbvie & I-MAB, https://news.abbvie.com/news/press-releases/abbvie-and-i-mab-enter-into-global-strategic-partnership-for-differentiated-immuno-oncology-therapy.htm
8. Deloitte, 中国生物医药创新趋势展望/China Biopharma Innovation Trends, https://www2.deloitte.com/content/dam/Deloitte/cn/Documents/life-sciences-health-care/deloitte-cn-lshc-china-biopharma-innovation-trends-zh-210520.pdf, May 2021
9. Deloitte, 中国生物医药创新趋势展望/China Biopharma Innovation Trends, https://www2.deloitte.com/content/dam/Deloitte/cn/Documents/life-sciences-health-care/deloitte-cn-lshc-china-biopharma-innovation-trends-zh-210520.pdf, May 2021
10. Deloitte, 中国生物医药创新趋势展望/China Biopharma Innovation Trends, https://www2.deloitte.com/content/dam/Deloitte/cn/Documents/life-sciences-health-care/deloitte-cn-lshc-china-biopharma-innovation-trends-zh-210520.pdf, May 2021
11. https://xueqiu.com/5603603160/171846755
12. https://xueqiu.com/5603603160/171846755
13. Deloitte, Winning in the cell and gene therapies market in China, https://www2.deloitte.com/cn/en/pages/life-sciences-and-healthcare/articles/four-matrices-of-excellence-to-excel-in-china-cell-and-gene-therapies-market.html
14. Wind
15. https://www.i-mabbiopharma.com/en/article-565.aspx
16. https://new.qq.com/rain/a/20200905A0F2LF00
17. http://static.sse.com.cn//disclosure/listedinfo/announcement/c/2020-07-13/600380_20200713_17.pdf
18. https://robo.datayes.com/v2/details/news/73356925
19. http://www.decheng.com/news/2020.6.4.html
20. https://baijiahao.baidu.com/s?id=1685408857891333644&wfr=spider&for=pc
21. https://www.vivabiotech.com.cn/news/48.html
22. https://pe.pedaily.cn/202102/466938.shtml
23. Deloitte, 2021 China LSHC Industry Survey Results: 'State of Industry', https://www2.deloitte.com/cn/en/pages/life-sciences-and-healthcare/articles/lshc-industry-survey-results-2020.html, February 2021
24. Deloitte, Digital health whitepaper, https://www2.deloitte.com/content/dam/Deloitte/cn/Documents/technology/deloitte-cn-consulting-deloitte-axa-digital-health-whitepaper-en-201130.pdf
25. Deloitte, Internet Hospitals in China: The new step into digital healthcare, https://www2.deloitte.com/content/dam/Deloitte/cn/Documents/life-sciences-health-care/deloitte-cn-lshc-internet-hospitals-in-china-the-new-step-into-digital-healthcare-en-210315.pdf?nc=1, 16 March 2021
26. Xinhua News, 中华人民共和国国民经济和社会发展第十四个五年规划和2035年远景目标纲要, http://www.gov.cn/xinwen/2021-03/13/content_5592681.htm, 13 March 2021
27. CGTN, MIIT: China builds world's largest 5G network, https://news.cgtn.com/news/2021-04-19/MIIT-China-has-built-world-s-largest-5G-network-ZAuNMEfjb2/index.html, 20 April 2021

28. The Economist Intelligence Unit
29. The Economist Intelligence Unit
30. Anir Chowdhury, CGTN, Telemedicine can help in fight against COVID-19, https://news.cgtn.com/news/2021-02-05/Telemedicine-can-help-in-fight-against-COVID-19-XDMiDCYOys/index.html, 5 February 2021
31. Ping An Healthcare and Technology 2020 annual report, https://staticpacific.blob.core.windows.net/press-releases-attachments/1289468/HKEX-EPS_20210317_9661233_0.PDF
32. Wind
33. https://www.uschamber.com/sites/default/files/024001_us_china_decoupling_report_fin.pdf
34. https://www.ft.com/content/ea032bba-5f33-11e8-9334-2218e7146b04
35. Review of National Medical Device Industry Data, Ke Zheng, Qiaoxian Guan, and Jiarui Xu, China Food & Drug Administration Magazine, http://med.china.com.cn/content/pid/257585/tid/1026, February 2021
36. General Administration of Customs, http://www.customs.gov.cn/customs/302249/zfxxgk/2799825/302274/302275/3511738/index.html, 14 January 2021
37. http://fangtan.customs.gov.cn/tabid/1106/Default.aspx
38. Deloitte, "中国生物医药创新趋势展望/China Biopharma Innovation Trends",, https://www2.deloitte.com/content/dam/Deloitte/cn/Documents/life-sciences-health-care/deloitte-cn-lshc-china-biopharma-innovation-trends-zh-210520.pdf, May 2021
39. Not the last pandemic: Investing now to reimagine public-health systems by Matt Craven, Adam Sabow, Lieven Van der Veken, and Matt Wilson, McKinsey, https://www.mckinsey.com/industries/public-and-social-sector/our-insights/not-the-last-pandemic-investing-now-to-reimagine-public-health-systems, 21 May 2021
40. 'Big health' and the future of medicine in China, Andy Ho, World Economic Forum, https://www.weforum.org/agenda/2017/06/big-health-future-medicine-china/. 19 June 2017
41. Healthy China 2030 (from vision to action), WHO, https://www.who.int/healthpromotion/conferences/9gchp/healthy-china/en/
42. China inaugurates national disease control and prevention bureau, CGTN, https://news.cgtn.com/news/2021-05-13/China-inaugurates-national-disease-control-and-prevention-bureau-10eaOSmBMpW/index.html, 13 May 2021
43. https://www.sohu.com/a/452073148_505926
44. https://www.xianjichina.com/news/details_254339.html
45. Epidemic-related medical equipment and local industry development insights, Tian, Y. (2020, March), retrieved from http://med.china.com.cn/content/pid/167632/tid/1026
46. Deloitte. (2020). 2020 China life sciences and health care M&A trends.
47. AskCI, "2021年中国医药CRO行业市场现状及发展趋势预测分析", https://www.askci.com/news/chanye/20210210/1438571359148.shtml, 10 February 2021
48. http://www.pmlive.com/pharma_intelligence/Chinas_clinical_trial_shake-up_1274617
49. https://globalforum.diaglobal.org/issue/october-2019/how-china-is-changing-the-clinical-development-landscape/
50. http://finance.sina.com.cn/tech/2021-04-20/doc-ikmyaawc0781590.shtml
51. 浩悦资本：医疗服务投资展望，细分赛道龙头军团千帆竞发冲刺IPO, https://www.cn-healthcare.com/articlewm/20200923/content-1148159.html
52. 林辉煌, 公立医院私有化：动力与困境, http://www.opentimes.cn/html/Abstract/10415.html
53. 国家统计局：第七次全国人口普查公报 (第五号) , http://www.stats.gov.cn/tjsj/tjgb/rkpcgb/qgrkpcgb/202106/t20210628_1818824.html
54. https://www.qianzhan.com/analyst/detail/220/210531-6ba12361.html
55. https://robo.datayes.com/v2/details/news/16292499
56. https://unctad.org/system/files/official-document/wir2021_en.pdf

Contacts

Authors

Kenneth Law
Financial Advisory Director
China Life Sciences & Health Care
Email: kelaw@deloitte.com.cn

Tony Lin
Research Assistant Manager
China Life Sciences & Health Care
Email: tonyclin@deloitte.com.cn

Deloitte China LSHC Industry Leadership Team

Jens Ewert
Industry Leader
China Life Sciences & Health Care
Email: jensewert@deloitte.com.cn

Lawrence Jin
Audit & Assurance Leader
China Life Sciences & Health Care
Email: lawrjin@deloitte.com.cn

Andrew Yu
Consulting Leader
China Life Sciences & Health Care
Email: andryu@deloitte.com.cn

Bill Yang
Financial Advisory Leader
China Life Sciences & Health Care
Email: bilyang@deloitte.com.cn

Travis Zhu
Risk Advisory Leader
China Life Sciences & Health Care
Email: trazhu@deloitte.com.cn

James Zhao
Tax and Legal Leader
China Life Sciences & Health Care
Email: jazhao@deloitte.com.cn

Office locations

Beijing
12/F China Life Financial Center
No. 23 Zhenzhi Road
Chaoyang District
Beijing 100026, PRC
Tel: +86 10 8520 7788
Fax: +86 10 6508 8781

Changsha
20/F Tower 3, HC International Plaza
No. 109 Furong Road North
Kaifu District
Changsha 410008, PRC
Tel: +86 731 8522 8790
Fax: +86 731 8522 8230

Chengdu
17/F China Overseas
International Center Block F
No.365 Jiaozi Avenue
Chengdu 610041, PRC
Tel: +86 28 6789 8188
Fax: +86 28 6317 3500

Chongqing
43/F World Financial Center
188 Minzu Road
Yuzhong District
Chongqing 400010, PRC
Tel: +86 23 8823 1888
Fax: +86 23 8857 0978

Dalian
15/F Shenmao Building
147 Zhongshan Road
Dalian 116011, PRC
Tel: +86 411 8371 2888
Fax: +86 411 8360 3297

Guangzhou
26/F Yuexiu Financial Tower
28 Pearl River East Road
Guangzhou 510623, PRC
Tel: +86 20 8396 9228
Fax: +86 20 3888 0121

Hangzhou
Room 1206
East Building, Central Plaza
No.9 Feiyunjiang Road
Shangcheng District
Hangzhou 310008, PRC
Tel: +86 571 8972 7688
Fax: +86 571 8779 7915

Harbin
Room 1618
Development Zone Mansion
368 Changjiang Road
Nangang District
Harbin 150090, PRC
Tel: +86 451 8586 0060
Fax: +86 451 8586 0056

Hefei
Room 1201 Tower A Hua Bang ICC Building
No.190 Qian Shan Road
Government and Cultural
New Development District
Hefei 230601, PRC
Tel: +86 551 6585 5927
Fax: +86 551 6585 5687

Hong Kong
35/F One Pacific Place
88 Queensway
Hong Kong
Tel: +852 2852 1600
Fax: +852 2541 1911

Jinan
Units 2802-2804, 28/F
China Overseas Plaza Office
No. 6636, 2nd Ring South Road
Shizhong District
Jinan 250000, PRC
Tel: +86 531 8973 5800
Fax: +86 531 8973 5811

Macau
19/F The Macau Square Apartment H-L
43-53A Av. do Infante D. Henrique
Macau
Tel: +853 2871 2998
Fax: +853 2871 3033

Mongolia
15/F, ICC Tower, Jamiyan-Gun Street
1st Khoroo, Sukhbaatar District
14240-0025 Ulaanbaatar, Mongolia
Tel: +976 7010 0450
Fax: +976 7013 0450

Nanjing
40/F Nanjing One IFC
347 Jiangdong Middle Road
Jianye District
Nanjing 210019, PRC
Tel: +86 25 5790 8880
Fax: +86 25 8691 8776

Ningbo
Room 1702 Marriott Center
No.168 Heyi Road
Haishu District
Ningbo 315000, PRC
Tel: +86 574 8768 3928
Fax: +86 574 8707 4131

Sanya
Floor 16, Lanhaihuating Plaza
(Sanya Huaxia Insurance Center)
No. 279, Xinfeng street
Jiyang District
Sanya 572099, PRC
Tel: +86 898 8861 5558
Fax: +86 898 8861 0723

Shanghai
30/F Bund Center
222 Yan An Road East
Shanghai 200002, PRC
Tel: +86 21 6141 8888
Fax: +86 21 6335 0003

Shenyang
Unit 3605-3606,
Forum 66 Office Tower 1
No. 1-1 Qingnian Avenue
Shenhe District
Shenyang 110063, PRC
Tel: +86 24 6785 4068
Fax: +86 24 6785 4067

Shenzhen
9/F China Resources Building
5001 Shennan Road East
Shenzhen 518010, PRC
Tel: +86 755 8246 3255
Fax: +86 755 8246 3186

Suzhou
24/F Office Tower A, Building 58
Suzhou Center
58 Su Xiu Road, Industrial Park
Suzhou 215021, PRC
Tel: +86 512 6289 1238
Fax: +86 512 6762 3338 / 3318

Tianjin
45/F Metropolitan Tower
183 Nanjing Road
Heping District
Tianjin 300051, PRC
Tel: +86 22 2320 6688
Fax: +86 22 8312 6099

Wuhan
Unit 1, 49/F
New World International Trade Tower
568 Jianshe Avenue
Wuhan 430000, PRC
Tel: +86 27 8538 2222
Fax: +86 27 8526 7032

Xiamen
Unit E, 26/F International Plaza
8 Lujiang Road, Siming District
Xiamen 361001, PRC
Tel: +86 592 2107 298
Fax: +86 592 2107 259

Xi'an
Room 5104A, 51F Block A
Greenland Center
9 Jinye Road, High-tech Zone
Xi'an 710065, PRC
Tel: +86 29 8114 0201
Fax: +86 29 8114 0205

Zhengzhou
Unit 5A10, Block 8, Kailin Center
No.51 Jinshui East Road
Zhengdong New District
Zhengzhou 450000, PRC
Tel: +86 371 8897 3700
Fax: +86 371 8897 3710

MAKING AN IMPACT THAT MATTERS since 1845

About Deloitte
Deloitte refers to one or more of Deloitte Touche Tohmatsu Limited ("DTTL"), its global network of member firms, and their related entities (collectively, the "Deloitte organization"). DTTL (also referred to as "Deloitte Global") and each of its member firms and related entities are legally separate and independent entities, which cannot obligate or bind each other in respect of third parties. DTTL and each DTTL member firm and related entity is liable only for its own acts and omissions, and not those of each other. DTTL does not provide services to clients. Please see www.deloitte.com/about to learn more.

Deloitte is a leading global provider of audit and assurance, consulting, financial advisory, risk advisory, tax and related services. Our global network of member firms and related entities in more than 150 countries and territories (collectively, the "Deloitte organization") serves four out of five Fortune Global 500® companies. Learn how Deloitte's approximately 330,000 people make an impact that matters at www.deloitte.com.

Deloitte Asia Pacific Limited is a company limited by guarantee and a member firm of DTTL. Members of Deloitte Asia Pacific Limited and their related entities, each of which are separate and independent legal entities, provide services from more than 100 cities across the region, including Auckland, Bangkok, Beijing, Hanoi, Hong Kong, Jakarta, Kuala Lumpur, Manila, Melbourne, Osaka, Seoul, Shanghai, Singapore, Sydney, Taipei and Tokyo.

The Deloitte brand entered the China market in 1917 with the opening of an office in Shanghai. Today, Deloitte China delivers a comprehensive range of audit & assurance, consulting, financial advisory, risk advisory and tax services to local, multinational and growth enterprise clients in China. Deloitte China has also made—and continues to make—substantial contributions to the development of China's accounting standards, taxation system and professional expertise. Deloitte China is a locally incorporated professional services organization, owned by its partners in China. To learn more about how Deloitte makes an Impact that Matters in China, please connect with our social media platforms at www2.deloitte.com/cn/en/social-media.

Designed by CoRe Creative Services. RITM0824898

This is printed on environmentally friendly paper