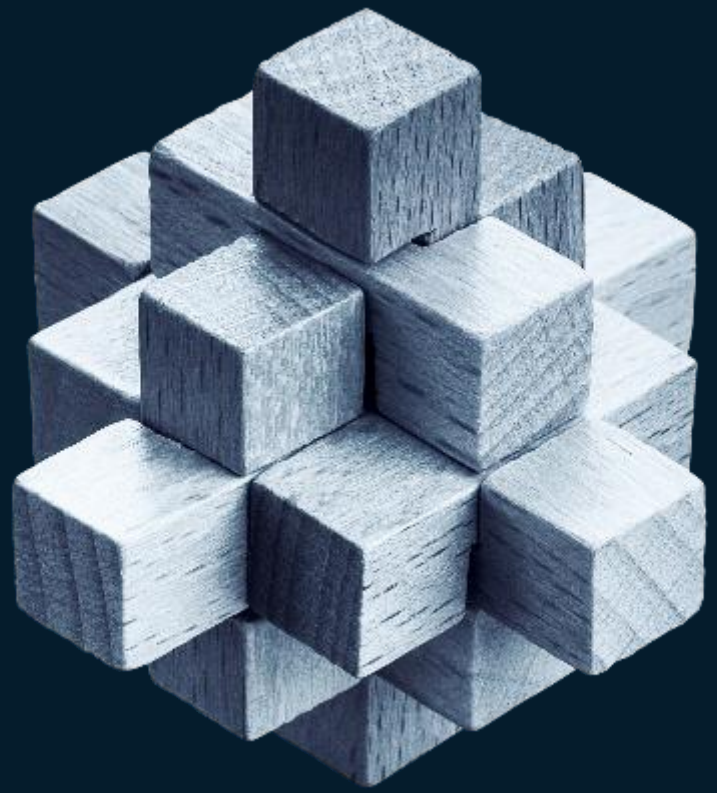
McKinsey & Company

China MedTech – Continuing the journey towards a globally leading market

November, 2021



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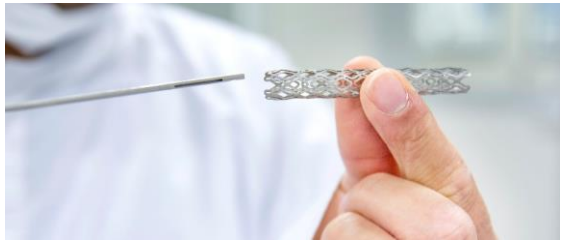

VBP driving business transformation

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New era for MNC localization

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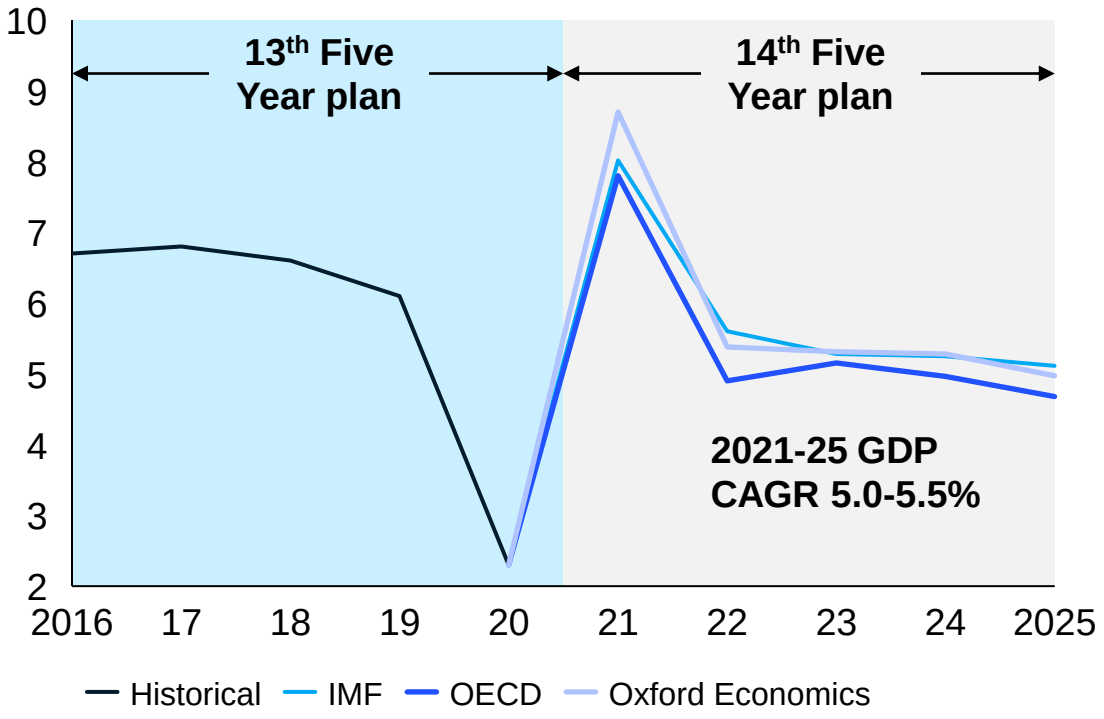
Digital health on the rise

1: Healthcare remains the government's top priority in 14th Five Year Plan (FYP)

Outlook for China GDP growth falling back post-COVID …

China Real GDP growth 2016-25
Percent



… yet healthcare remaining central with major goals set in 14th FYP

R&D expenditure increases at 7% p.a.
14th FYP targets 7% growth p.a. by 2025 for R&D expenditure, of which at least 8% devoted to basic research

3 healthcare-related frontiers of science and technology
Government policy and ~100 Bn RMB funding support brain sciences, genetics and biotechnology, as well as clinical medicine advancement

BMI[1] reform for funding sustainability
Key initiatives include municipal / provincial funding coordination, outpatient mutual aids, dynamic NRDL update, and DRG/DIP roll-out

Ambitions for biopharma hubs in regional FYPs
Biopharma as strategic focus for China's 3 megalopolises,[2] e.g., Shanghai targets making biopharma a 186 bn USD business by 2025

1. BMI: Basic Medical Insurance, 基本医疗保险
2. Beijing-Tianjin-Hebei, Yangtze River Delta and Guangdong–Hong Kong–Macau Greater Bay Area

Source: IMF; EIU; OECD; Oxford Economics; McKinsey analysis, Nov 2021

1: 14th FYP of medical equipment industry emphasizes full value chain upgrade and localization

4 development visions for building a comprehensive MedTech industry

Upgrade full value chain
Breakthrough in core components and materials for broader localization of MedTech value chain

Enrich product portfolio
Applications of high-end devices at scale; mid-to-large companies grow at 15% CAGR

Improve brand recognition
Strengthened global impact and innovation leadership; 6-8 Chinese MedTech companies entering global top 50 by 2025

Develop new ecosystem
Integration with 5G, AI and IoT and other technologies as new pillars for innovation

7 key development areas of high-end and digital-enabled devices and equipment

Key areas	Examples
Diagnostics	• High-end imaging diagnostic equipment, e.g., dual energy X-ray CT • IVD analyzer, e.g., microfluidic analysis, immunochemistry, MS
Treatment	• Radiotherapy equipment, e.g., proton therapy system • Surgical robotics in MIS[1], orthopedics, neurology
Monitoring and life support	• Next generation of dialysis and ventilation machine • AI-enabled wearables and artificial organ
Implants	• Miniaturized pacemaker and neurostimulator • Advanced materials and 3D printing
Women's and children's health	• Pregnancy wearables • Diagnostic and analytical software for prenatal screening
Rehabilitation	• AI-enabled rehabilitation device • Nursing equipment enabling human-machine interactions
Traditional Chinese medicine	• AI diagnosis support system for traditional Chinese medicine • Smart treatment device, e.g., acupuncture, moxibustion

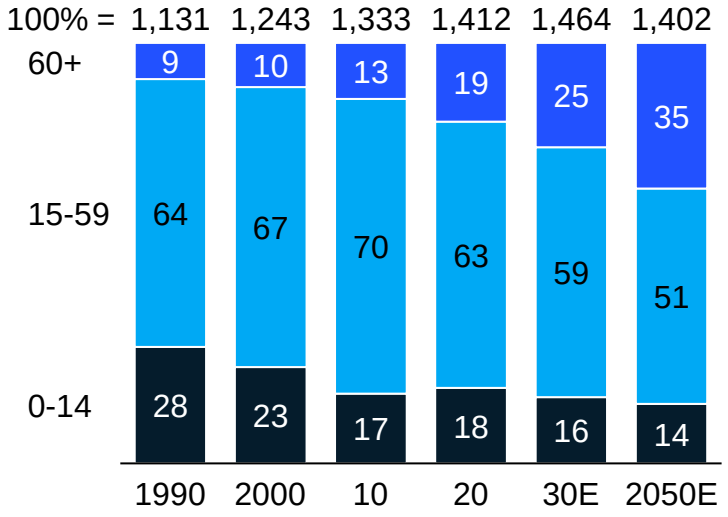
1. Minimally invasive surgery

Source: Ministry of Industry and Information Technology; McKinsey analysis (Oct. 21)

2: Accelerated ageing population and three-child policy spark new healthcare opportunities

Accelerated ageing China population

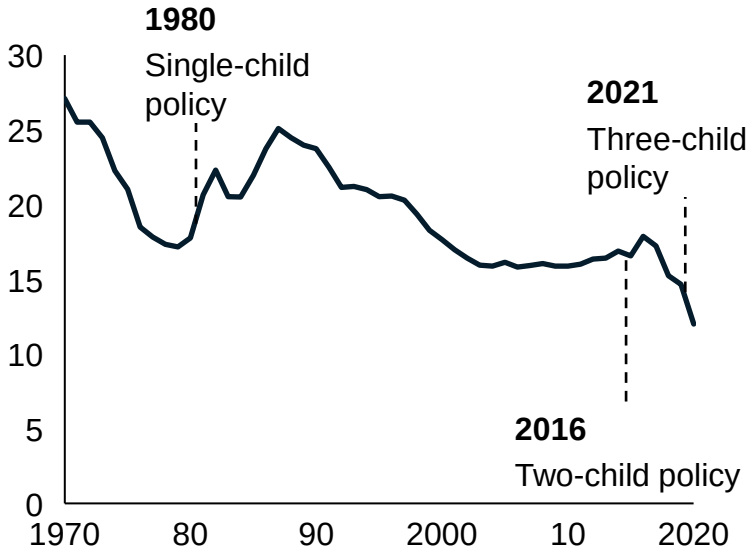
China population by age group
Million persons, percent



Ageing and delayed retirement lead to expanding wealthier senior population with enhanced affordability for healthcare services

Three-child policy aims to boost birth rate

1978-2020 China births per year
Million births



While uncertainty remains on the scale and duration of its impact, three-child policy will likely unlock high-end fertility demand

Healthcare demand grows across 3 domains

Healthy ageing
- Disease management
- Nutritional supplements
- Assistive devices
- Senior care communities

Fertility services
- In vitro fertilization
- Artificial insemination
- Preimplantation diagnosis
- Prenatal testing

Pediatric care
- Vaccinations
- New born screening
- Neonatal nursing
- Allergy treatment

Source: MGI; National Bureau of Statistics; press release; McKinsey analysis (Oct. 21)

3: Tiered healthcare infrastructure and payer systems aim to achieve higher efficiency while addressing diverse patient needs

Strengthening of tiered healthcare system

Establishing national and regional centers

10
national medical centers YTD

120
provincial medical centers by 2025

Enhancing county-level specialty care

500
county hospitals to upgrade to Class III in the 14th FYP from 450 in 2018

Leapfrogging primary care network

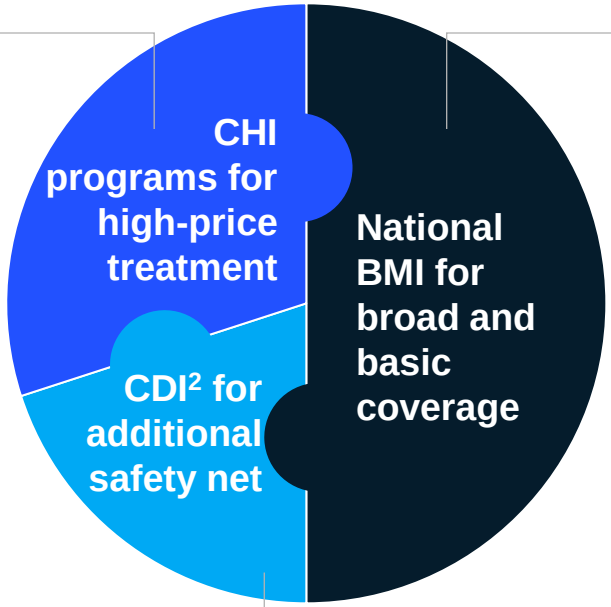
500
community hospitals to be built out of existing CHC/THC[1] by end of 2021

Emergence of multi-payer system

2 Tn RMB
total CHI premium by 2025 with

CBMI[3] expanded

to **150+** cities in 2021



2.48 Tn RMB for total BMI fund, with

10-15%
increase in fund raised for residents in 2021

Raising reimbursement benefit, e.g.,

>**60%** in reimbursement ratio

1.CHC: community healthcare center; THC: township healthcare center
2.CDI: critical disease insurance
3.CBMI: city benefit medical insurance

Source: 14th FYP; NHC; MOH database; press release; McKinsey analysis (Oct. 21)

4: MedTech VBP is rapidly expanding in scale and pace, with visible impact

Majority of top medical product categories by hospital spending impacted by VBP to date

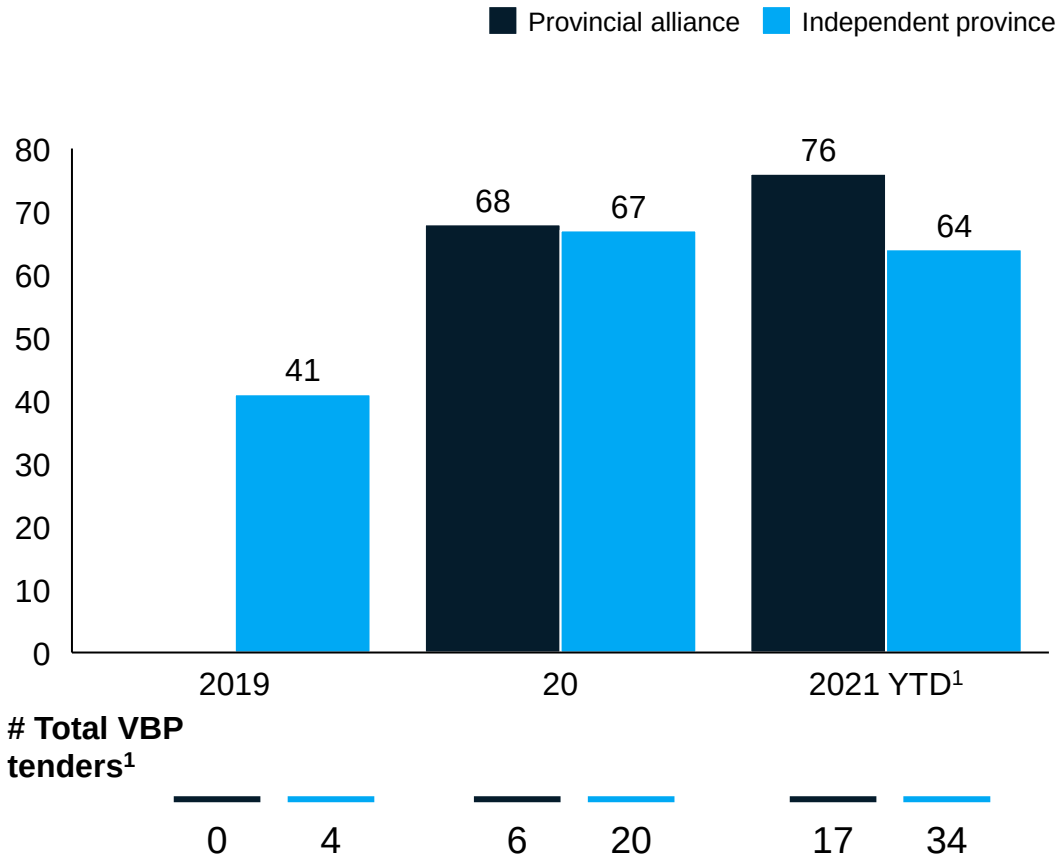
VBP exposure of top 15 hospital spending medical products[1]

VBP exposure[2] National VBP >=70% 30-70% 15-30% <15% 0%

Rank[1] by hospital spending	Product category	VBP exposure (% population in VBP impacted regions) 2019	2020	2021 Oct.
# 1-5	Coronary stent			
	PTCA balloon catheter			
	Intraocular lens			
	Stapler			
	Titanium clip			
# 6-10	Infusion set			
	Bone plate			
	Wound patch			
	Artificial hip joint			
	Intravascular catheter			
#11-15	Artificial knee joint			
	Bone screw			
	Suture			
	Pacemaker			
	Interbody fusion cage			

VBP is accelerating on regional level, with provincial alliance deepening price drop beyond 75%

Percent of average price drop[2]



1.As end of Oct 2021, counted when tender initiated; assessed using the total population in all VBP-impacted regions, as percent of total China Mainland population as a proxy;100% = national VBP; 0% = no VBP yet
2.Calculated by each product in each tender with public available price drop information

Source: Press release; McKinsey analysis (Oct. 21)

4: Market volume sees clear uptake post national VBP with relatively stable share for successful bids esp. in 2nd national VBP

YOY growth of national DES procurement volume

Pre-DES VBP (2018-19)	+11%
Post-DES VBP: 1-month implementation (Jan 21 vs. Jan 20)	+9%
Post-DES VBP: 8-month implementation (Jan to Aug 21 vs. Jan to Aug 20)	+54%

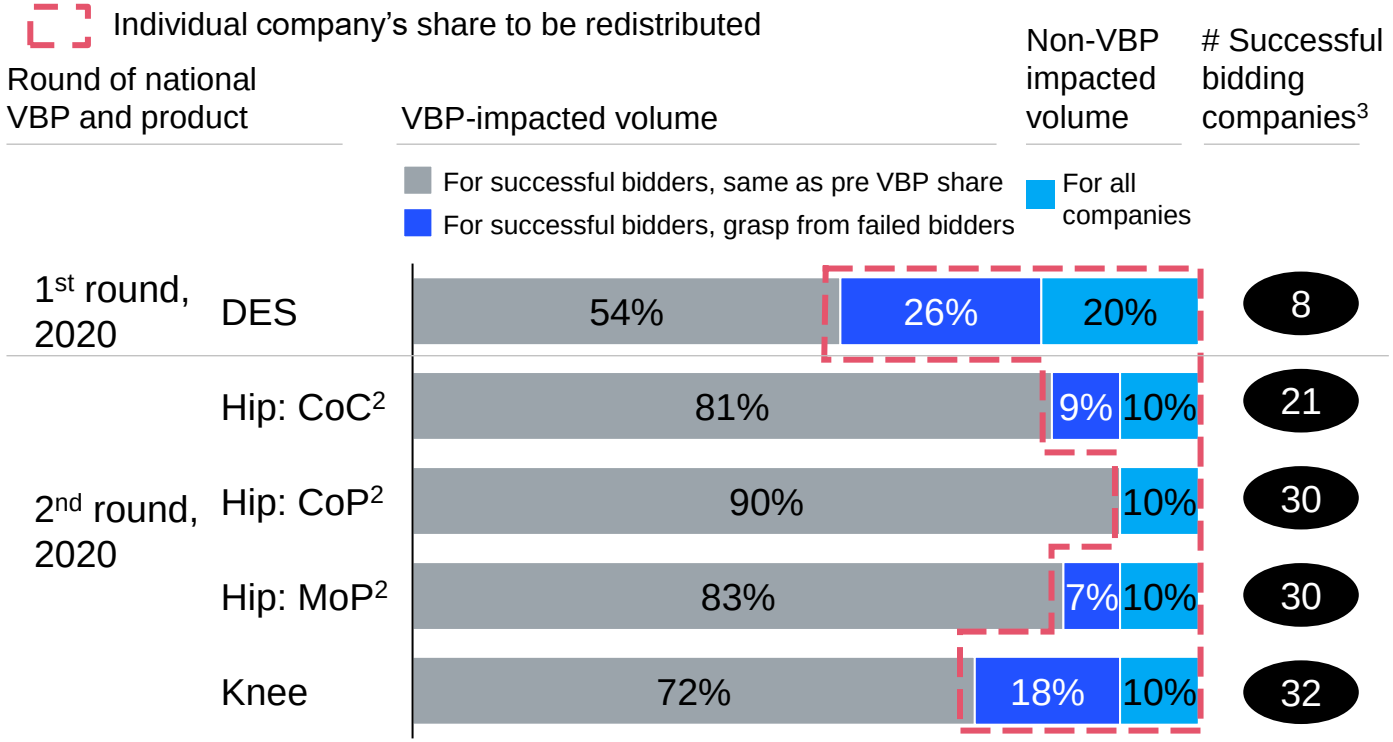
1,100 K > **1,070 K**

Volume procured in reality in the 8 first months (Jan to Aug 21)

Volume procured as target for the first year (Jan to Dec 21)

Volume share estimation for national VBP[1], total =100%

Illustrative



"Public hospitals are likely to stay with the same products if successful in bidding, even for non VBP impacted volume as a "safer" choice. So far, the share split between MNC and local in DES does not change much…

-- Industry Expert

1. For joint VBP, assuming winners gain the same volume as intentional volume (意向采购量) given precise volume share post VBP is under uncertainties given the tendering rule; 2. CoC: ceramic on ceramic; CoP: ceramic on polyethylene; MoP: metal on polyethylene; 3. Count based on # of applicants (申报企业)

Source: Press release; Expert interview; McKinsey analysis (Oct. 21)

4: Rationalized tendering mechanisms accommodate the complexity of MedTech products and business models

Non-exhaustive Outside-in perspectives

Principles for improving VBP tendering mechanism

Balance of clinical efficiency and quality

- Competitive pricing to lower BMI expenditure
- Stable supply of qualified products/instruments
- Adequate service support to accompany product sales

Tendering mechanisms are more rationalized

Improvement	Mechanism example	
	National VBP (joint)	**Provincial VBP**
More sophisticated **grouping** mechanism	Two layers for hip • First by materials (CoC, CoP, MoP[1]) • Second by company's scale (**>85%** market share and rest)	7-province-alliance on drug-coated coronary balloon, etc. • Grouping based on company's scale (**>80%** market share and rest)
More comprehensive **criteria** and **longer list** for successful bids	• Comprehensive review based on pricing, quality, expertise in clinical support, etc. • Linkage of # of successful bids to # of participants	Fujian province on coronary balloon, etc. • No restrictions on # of successful bids, shortlisted as long as % price drop requirement met
Better business support and clearer responsibilities along value chain	• Tendering price covers cost of critical services and products • Additional charges to hospitals for sterilization requested	12-province-alliance on trauma • Surcharge for sterilization allowed

1. CoC: ceramic on ceramic; CoP: ceramic on polyethylene; MoP: metal on polyethylene

Source: Press release; McKinsey analysis (Oct. 21)

4: VBP induces MedTech players to pursue full value chain transformation

Near term: Lean commercial model implemented

Initiative	Example
SKU/supply management	• Ortho players stock up implants/ instruments supply through global supply chain prior to national VBP • Optimize SKUs post regional VBP
Distributor consolidation	• Review small or lower tier distributors and increase use of large-scale distributors and KA teams for economics of scale • More partnership cases with logistic platforms or 3rd party service providers
Marketing and sales optimization	• Prioritize professional education, e.g., DES players only retain academic conference sponsorship • Allocate commercial resources to premium products and channels (e.g., private hospitals)

Long term: Holistic transformation needed

- **R&D:** accelerate **product / service innovation**, e.g., the leading orthopedic player regards “robot assistance” as the next growth driver
- **Manufacturing:** enhance **COGS efficiency**
- **Commercial:** double down on **omnichannel engagement** with physicians and patients to increase sales efficiency and broaden reach

Source: Press release; McKinsey analysis (Oct. 21)

5: “In China for China” is the focus for current wave of localization initiatives by MedTech MNCs

Details on next page

	Past era	Current era
Rationale	Market entry for labor cost advantage and untapped growth opportunities	Expanded presence for improved market access and emerging local innovations
Scope	Manufacturing of low value-add products and rudimentary processes (e.g., assembly)	Focusing on locally-centric innovations, and doubling-down local manufacturing
Approach	Direct ownership with capital investment or M&A	Increasingly diversified approach, especially via partnership
Companies	Leading MedTech MNCs focusing on capital equipment, orthopedics and selected low value consumables	All MedTech MNCs across sectors and scales

Source: McKinsey analysis (Oct. 21)

5: Current localization wave focuses on step-up changes in both R&D and manufacturing with more diversified approach

Recent localization moves in China

Non-exhaustive **Outside-in perspectives**

Focusing on local-centric innovations	Ortho Clinical Diagnostics 奥森多医疗	Opened up **China R&D center** to fulfill local clinical demands and strengthen **"In China for China" strategy**	SIEMENS Healthineers	Established an innovation center for **MedTech/digital** start-ups, in collaboration with Zhangjiang Group
	cytiva	**Unveiled an R&D center** in Shanghai **as the first in Asia** to boost single use bioprocessing technologies	BECKMAN COULTER	Launched CytoFLEX SRT, the next-generation Benchtop Cell Sorter, as the **1st China-for-global** model after **3+ years of R&D** in Suzhou
Doubling-down on local manufacturing	Johnson & Johnson	Manufactured the 1st **UHD[1] 4K endoscopic imaging system** for arthroscopy in its Suzhou factory	GE	Started to manufacture its **most premium equipment** in China for global, e.g., CARESCAPE R860 ventilators in June 2020
	ThermoFisher SCIENTIFIC	Announced investment of **USD 50 mn** on construction of **another new factory**, will become company's largest life science industry base in APAC	Smith+Nephew	Leveraged MAH policy and global leading CDMO Flex for **local manufacturing of arthroscopy**

Emerging trends

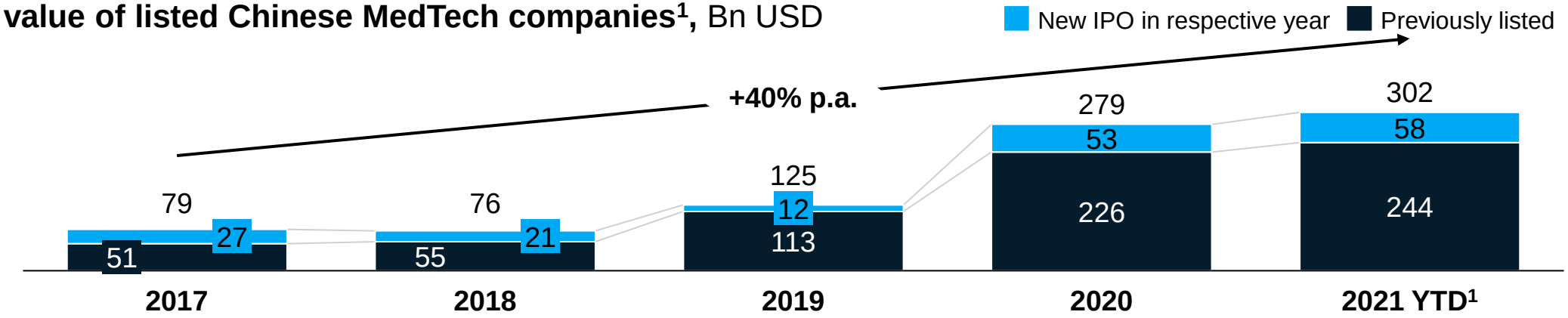
- Increase significance of China market in R&D, tailoring offerings to meet local demands and sourcing innovations from China for China and even global with diversified models, e.g., incubators
- Upgrade to more premium products and more upstream processes, leveraging advanced manufacturing capabilities in China
- Support from regulatory, e.g., MAH opening up alternative routes, NMPA Announcement 104[2] accelerating local manufacturing transfer

1. Ultra High Definition
2. 国家药监局关于进口医疗器械产品在中国境内企业生产有关事项的公告(2020年 第104号), for Class II and III medical devices with imported registration record

Source: Press release; McKinsey analysis (Oct. 21)

6: China MedTech debuts on public market at a record-breaking pace in 2021

Total market value of listed Chinese MedTech companies[1], Bn USD



	2017	2018	2019	2020	2021 YTD[1]
IPO companies by listing year[2]	13	5	11	17	34
IVD	6	2	3	8	10
High-value consumables	4	0	6	5	10
Others	3	3	2	4	14

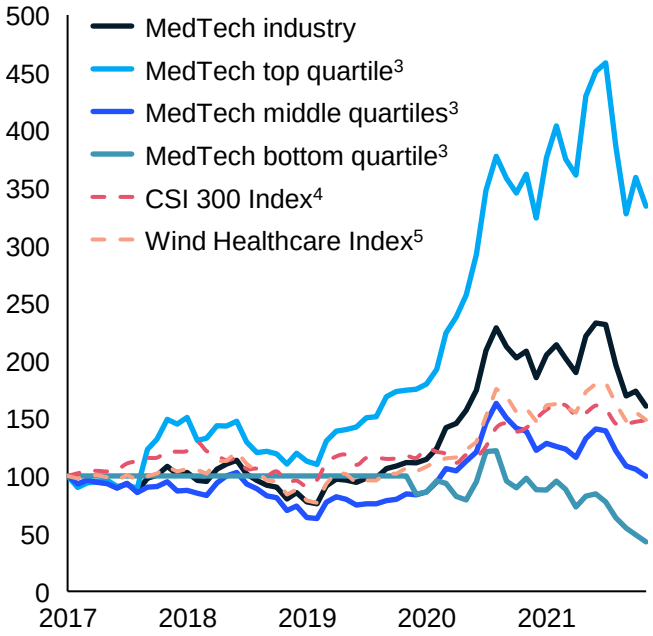
1. Including MedTech listings on Shanghai Stock Exchange (STAR included), Shenzhen Stock Exchange, Hongkong Stock Exchange and Nasdaq; Market value at end of each year; as end of Oct. 21
2. Including split listing

Source: Wind; McKinsey analysis (Oct. 21)

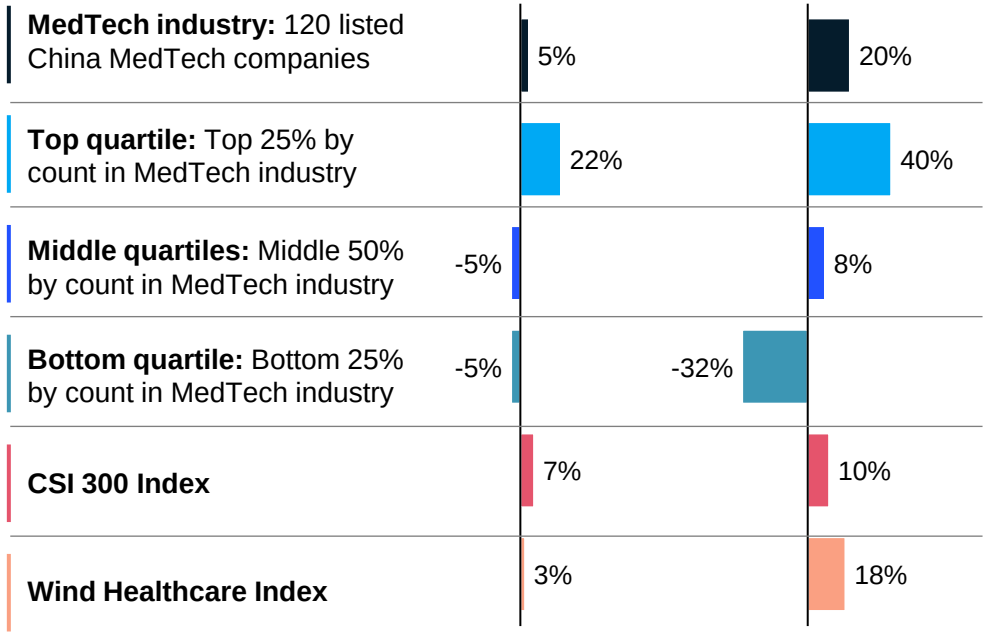
References to specific products or organizations are solely for illustration and do not constitute any endorsement or recommendation

6: COVID-19 considered to have sparked strong growth of China MedTech, yet stock market performance diverges

Cumulative total shareholder return (TSR)[1] for China MedTech
Indexed[2]; Dec 31, 2016 = 100



Total shareholder return (TSR) CAGR, percent



China MedTech catch up with market post-COVID-19
COVID-19 stimulated a wave of growth for MedTech industry, which slightly underperformed to the overall market pre-COVID-19

Market value concentrated in the top performers
Top 25% companies are representing ~54% of industry market cap[6]

Lagging players under pressure
Significant underperformance of bottom quartile even post-COVID-19

1. As of Oct 31, 2021
2. 120 public Chinese MedTech companies included; a capitalization-weighted, time-relative index was created, with Dec 31, 2016 set to 100 and dividend adjusted
3. Top quartile: top 25% of all MedTech companies (N = 30) ranked by cumulative TSR; middle quartiles: middle 50% of all MedTech companies (N = 60) ranked by cumulative TSR; bottom quartile: bottom 25% of MedTech companies (N = 30) ranked by cumulative TSR
4. Capitalization-weighted stock market index for 300 stocks traded on Shanghai Stock Exchange and Shenzhen Stock Exchange
5. Capitalization-weighted stock market index for 405 Healthcare sector stocks in Wind database
6. As of Oct 31, 2021

Source: S&P Capital IQ; Wind; McKinsey analysis (Oct. 21)

7: New era of global partnerships for China MedTech to accelerate product upgrade and commercial expansion

Non-exhaustive

China MedTech | Global partner

Deals between China and global MedTech

2020 – 2021YTD[1]

6+ joint ventures

10+ licensing deals

7+ outbound M&As

10+ strategic partnerships

Theme	Select examples	
Technology co-development	启明医疗 VENUSMEDTECH / HealiumMedical	Introduction of intervention therapies to treat hypertension based on renal artery denervation (RDN) technology
	PEIJIA / inQB8	Joint development of transcatheter tricuspid replacement technology (TTVR)
Portfolio expansion	Genesis MedTech / SHOCKWAVE MEDICAL INC	Local development and manufacturing of Intravascular Lithotripsy (IVL) products
	燃石医学 Burning Rock Dx / ONCOCYTE™	Launching DetermaRx in China, an NGS-based cancer therapy selection product for early-stage NSCLC patients
Marketing partnership	mindray / Probo MEDICAL	Authorizing Probo Medical, a leading medical imaging equipment service provider, as the distributor of ultrasound solutions in North America
	SHUWEN 数问生物 / PerkinElmer	Distribution Shuwen's breakthrough preeclampsia POCT test in 100+ countries around the globe by PerkinElmer

1. As end of Oct., 2021

Source: GBI; BioCentury BCIQ; press release; McKinsey analysis (Oct. 21)

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8: MedTech companies are strengthening digital health offerings along the patient journey

NON-EXHAUSTIVE

Examples of digital health solutions launched in China since 2020

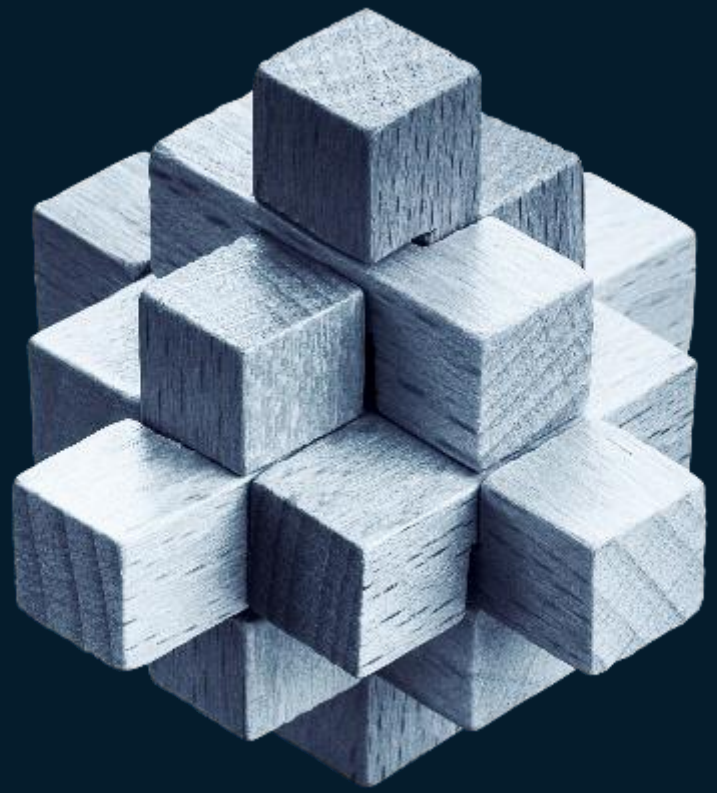
	Primary prevention and screening	Diagnosis and staging	Treatment	Surveillance/self-management
Chinese MedTech	mindray 迈瑞 **AI-assisted products for blood cell analysis,** jointly developed with Tencent AI Lab	乐普医疗 LEPU MEDICAL **ECG monitor integrating AI deep learning** algorithm to support CVD diagnostics, co-developed with Intel	UNITED 联影 IMAGING **AI-enabled all-in-one solution** to integrate CT-Sim, smart target volume delineation and planning, and radiation therapy	yuwell **Continuous glucose monitor** that allows real-time monitoring, alarming, and data **sharing with HCPs through mobile app**
MNC MedTech	ZEISS Collaboration with **WeChat platform** for myopia prevention, e.g., providing vision test, risk prediction, customer education	GE Healthcare **Edison AI platform** partnering with 7 AI companies to build an ecosystem of AI medical software for providers	Medtronic **Robotic guidance platform** for surgical planning, precise instrument guidance, and real-time visualization during spinal surgery	Abbott **Glucose monitoring mobile app** launched for diabetic patients to track indicators and manage lifestyle

Source: Company website; press release; McKinsey analysis (Oct. 21)

References to specific products or organizations are solely for illustration and do not constitute any endorsement or recommendation

Both Chinese and MNC MedTech are doubling down on **AI-enabled products/solutions**, and **direct patient engagement**

MNCs take a further step to **build open platforms** and engage local digital natives to co-build a digital ecosystem



Contents

Recap from last year – Path to a global leading MedTech industry role: Three scenarios

China-centric decoupled MedTech market

With continued geopolitical tensions and access limits across markets, China remains focused on domestic needs, innovation and investment

Engine of global business growth

China continues to be the most critical contributor to growth in the global MedTech market and a net importer of innovation

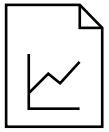
Epicenter of global MedTech industry

China achieves a step-change in its global market position by leading in technology and business model innovation, including larger investments in global markets and assets

Sources: McKinsey analysis (Oct. 21)

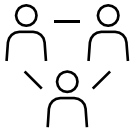
Three areas are critical to understand where China is heading

A Growth momentum of China MedTech



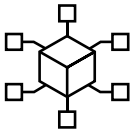
- China is outpacing global MedTech market growth, although dynamics vary by segments
- A prosperous domestic market enables Chinese companies to rapidly scale up

B Rise of Chinese MedTech companies



- Investors, regulatory system, and ecosystem partners collectively foster local innovations
- Leading Chinese MedTech companies are realizing globalization ambition, although individual company performance varies

C Digital disruptions in China MedTech

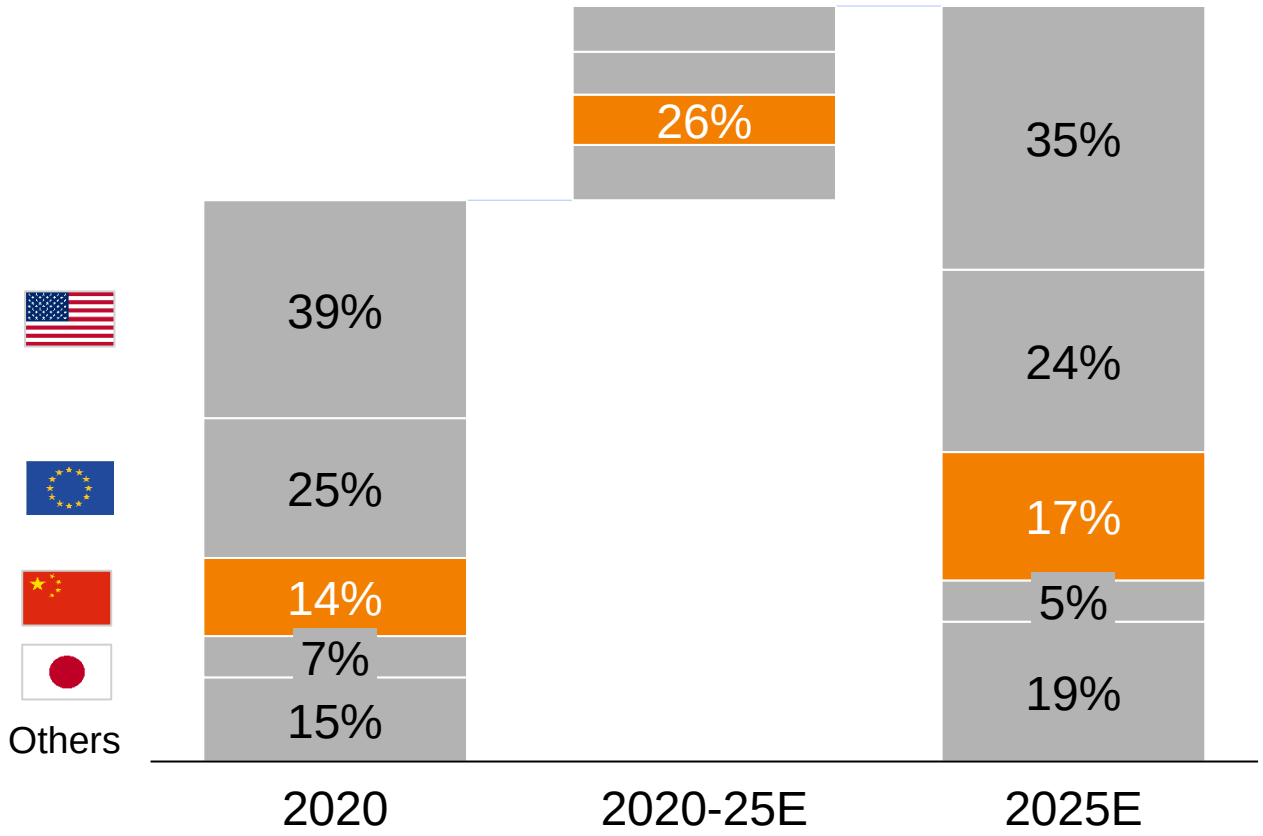


- Digital health solution/offerings rapidly developing in China supported by policy and broader digital ecosystem
- Omni-channel HCP engagement still lags behind compared to pharmaceutical companies and overseas markets

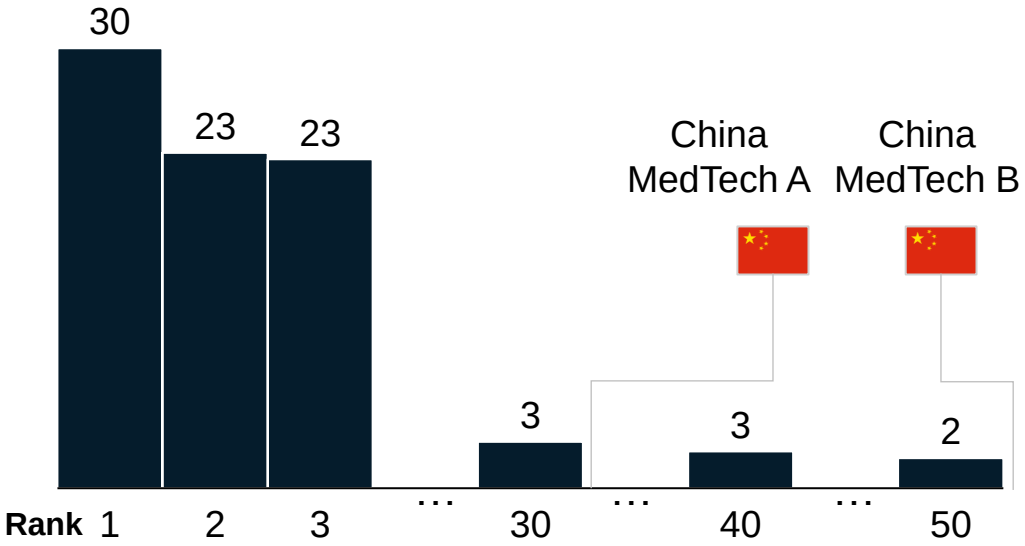
Source: McKinsey analysis (Oct. 21)

A: China is outpacing global in market growth, with several global top MedTech companies to emerge from China

China and global MedTech market size by sector, 2020 vs. 2025



Global MedTech companies ranking by 2020 revenue (public listed), Bn USD[1]



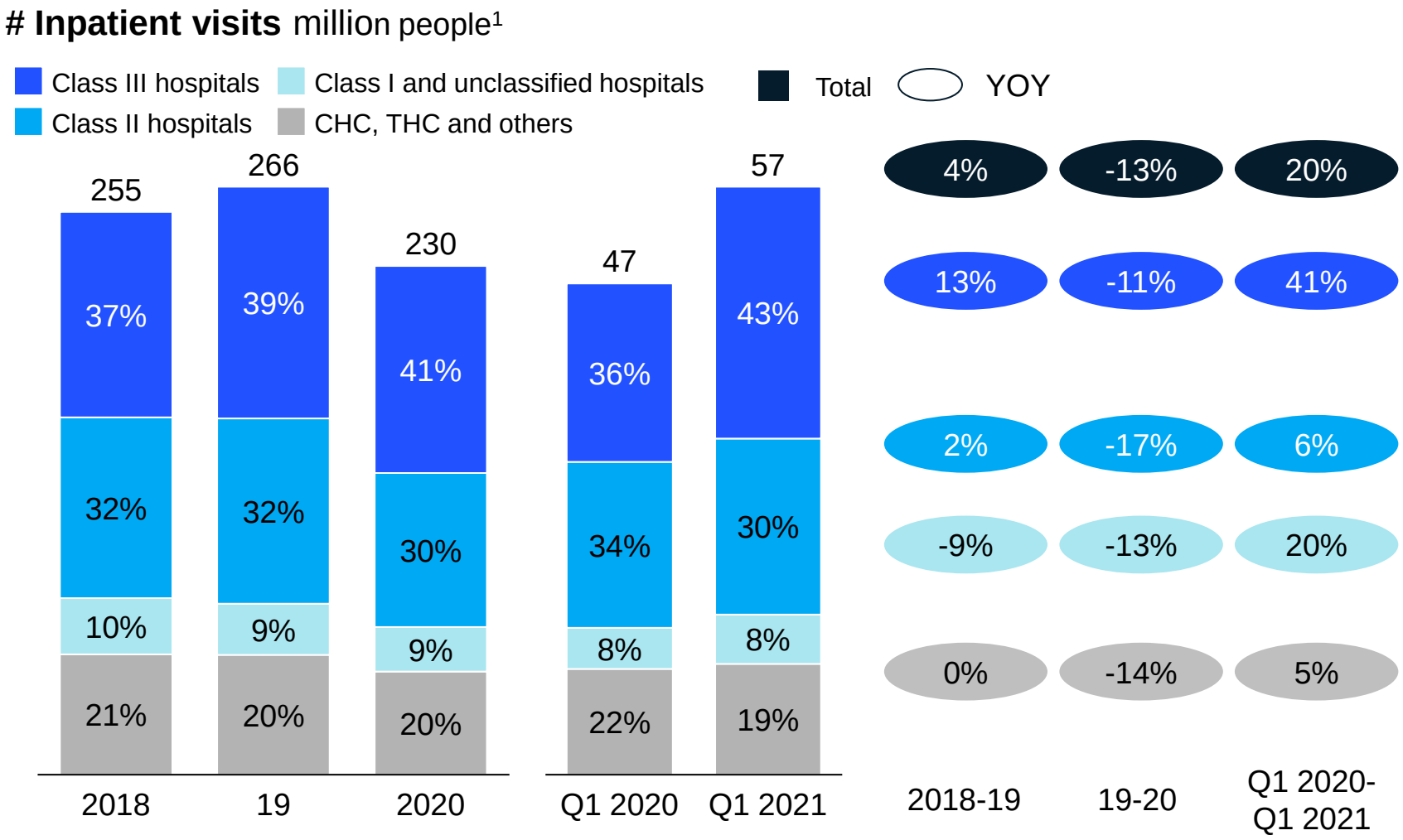
Goal in 14th FYP of medical industry:

6-8 China MedTech companies to join **global top 50** by 2025

1. Comparison with listed local companies with public revenue announcement

Source: Press release; GlobalData; HRI; Ministry of Industry and Information Technology; McKinsey analysis (Oct. 21)

A: Market growth to continue as volume of patients continues to grow



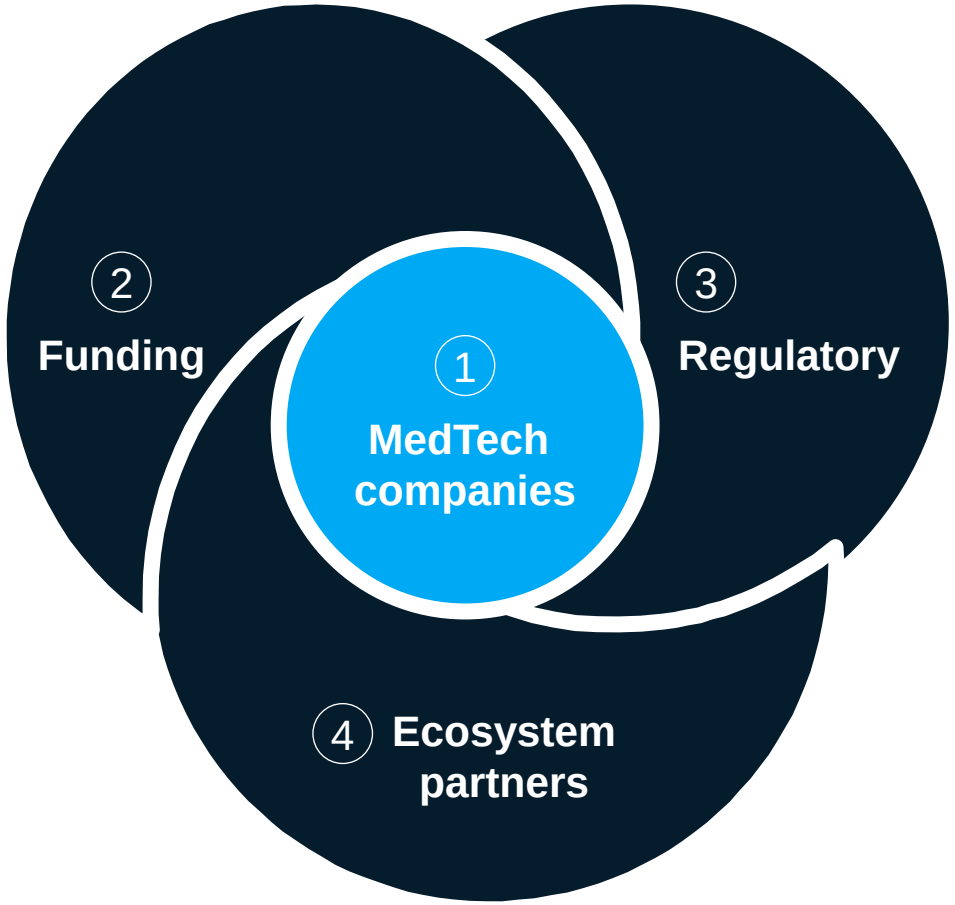
Though temporally affected by COVID-19 pandemic, **patient visits recover strongly in 2021 across hospital class**

Such **momentum will continue** in coming years, driven by the robust medical demands, improved affordability, and enhanced healthcare infrastructure and capability, etc.

1. Using 出院人数 as proxy for 2020 and Q1 2021

Source: NHC, press release, McKinsey analysis (Oct. 21)

B: Investors, regulatory system, and ecosystem partners collectively foster local innovations



1. Local players make progress on innovations, increasingly competing head-to-head with MNCs

2. Sufficient funding and maturing investors foster innovative local MedTech companies, although deal # and size decrease in 2021 vs 2020

3. Regulatory reforms accelerate innovative product launch, e.g., Priority Track, Emergency Approval Process[1], acceptance of self testing report

4. Chinese MedTech companies form diverse partnerships with CMOs/CDMOs, diagnostic AI start-ups, tech giants, health insurance/service providers, pharma companies/biotechs, etc.

1. 应急审评

Source: McKinsey analysis (Oct. 21)

B1: China MedTech companies continue the innovation momentum with more global leading products

Outside-in perspective **Non-exhaustive**

Breakthrough Device Designation De Novo

Examples of breakthrough product/ pipeline by China MedTech companies in China market

ReAces, the **world's first puncturable occluder**, released promising clinical trial data in 2021

The first local domestic proton therapy device, launched **clinical trial** in China in July 21

NOVA, approved by NMPA as **the world's first** intracranial drug-eluting stent system in July 21

ALLVAS, endovascular intervention robot, **completed** the **world's first** clinical trial of robot-assisted thoracic and abdominal aortic stent graft intervention in China in August 21

Examples of recent US FDA designation for innovative products by China MedTech companies

2019

Litos and Tulip, DEB catheter for treating below the knee lesions

2020

NaviCamTM MCCE[1] System, which enables real time visualization and offers a **non-invasive, patient friendly** option to traditional endoscopy

HCCscreen, a blood-based NGS test, as **more effective way** for hepatocellular carcinoma early detection

2021

PADN[2] device, a radiofrequency ablation product, which can significantly improve clinical outcomes without related complications

UriFind, which utilizes DNA methylation detection for the diagnosis of bladder cancer

RDN[3], the world's first basket-shaped 6-electrode ablation catheter, with excellent performance in vessel adhesion and energy release

1. Magnetically controlled capsule endoscopy; 2. Pulmonary artery denervation; 3. Renal denervation

Source: Company website; press release; McKinsey analysis (Oct. 21)

References to specific products or organizations are solely for illustration and do not constitute any endorsement or recommendation

B1: China is competing head-to-head with global on NGS-based cancer early screening

Examples of NGS-based liquid biopsies for cancer early screening

NON-EXHAUSTIVE

Study type ● Prospective ○ Retrospective

Company	Test (indication)	LDT[1] launch time	Clinical study initiation time	Study type	Population enrolled, '000
鹊远基因 SINGLERA	ColonES (CRC[3])	2018	Before 2018	○	1
和瑞基因 Berry Oncology	Liver screening (HCC[4])	2020	2018	●	10
GENETRON 泛生子	HCCscreen (HCC[4])	2020	2019	●	5
燃石医学 Burning Rock Dx	ELSA-seq test (Pan cancer)	No intended date disclosed	2020	●	14
GRAIL	Galleri (pan cancer)	2021	2016/2019/ 2021[2]	●	140[2]
EXACT SCIENCES Thrive. Earlier Detection	CancerSEEK (pan cancer)	No intended date disclosed	2016	●	10
	Oncoguard liver (HCC[4])	2021	2018	●	2
GUARDANT	LUNAR-2 (CRC[3])	2022E	2019	●	10

1. LDT, Laboratory developed test; 2. CCGA study initiated in 2016, PATHFINDER study initiated in 2020, NHS collaboration initiated in 2021, will include 140,000 people over the age of 50 without any suspicion of cancer; 3. CRC, Colorectal cancer; 4. HCC, Hepatocellular Carcinoma

Source: Company websites; clinicaltrials.gov; press release; McKinsey analysis (Oct. 21)

China quickly catches up with global peers in cancer early detection, extending across **similar span of indications** and covering **large population** in clinical studies

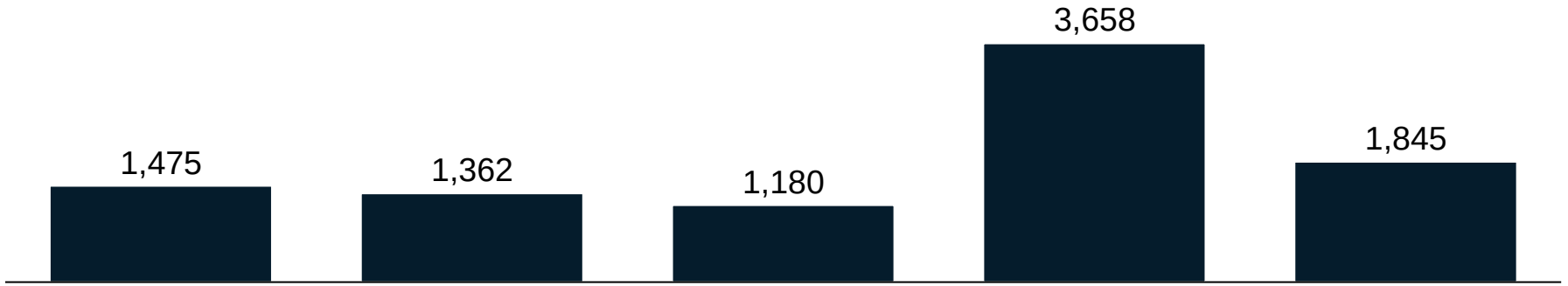
China can unlock great potential due to 3 aspects:

- **Large population,** e.g. through partnership with local government on early cancer screening program
- **Vibrant capital market,** e.g., 3 companies that have NGS for early cancer screening business IPOed since 2020
- **Active ecosystem partnership**, e.g. with big tech companies on cancer screening

B2: PE/VC are actively funding local MedTech

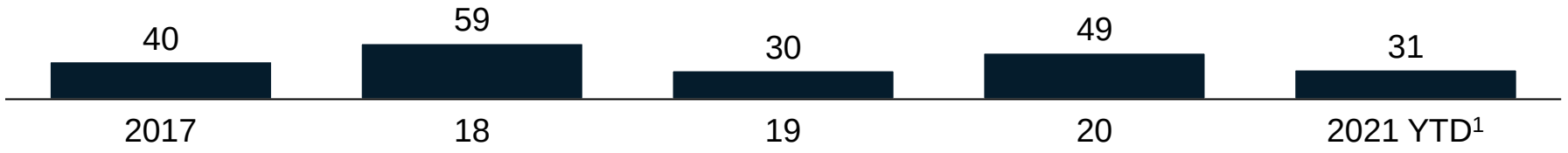
PE/VC deals in Chinese MedTech companies, 2017-2021 YTD[1]

Total deal size
Millions USD, deals with disclosed deal size only



 # Deals

Average deal size
Millions USD, deals with disclosed deal size only



1. As end of Oct, 2021; with AVCJ captured deals only

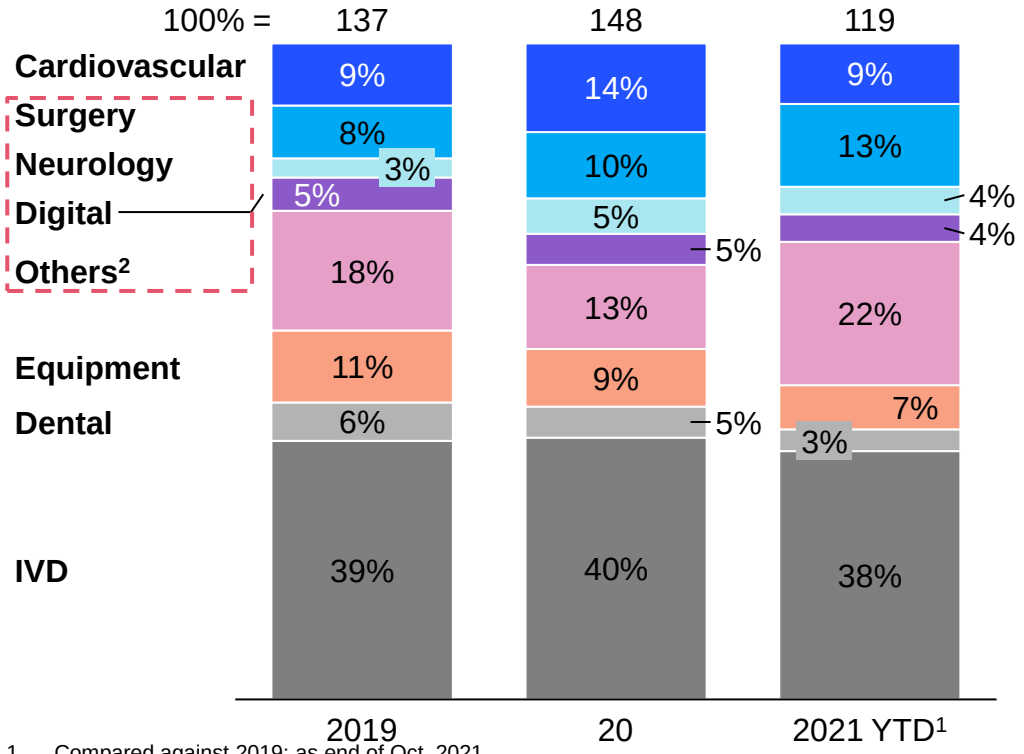
Source: AVCJ; press release; McKinsey analysis (Oct. 21)

B2: Venture funds are focusing on three investment themes

Growing sector

Cardiovascular, neurology, and surgery are increasing in PE/VC deals[1]…

PE/VC deals by sector
(2019-21 YTD[1], share of total)



1. Compared against 2019; as end of Oct, 2021
2. Including ortho, home use, ophthalmology, beauty, etc., individual share <5%

… and there are 3 key investment themes observed

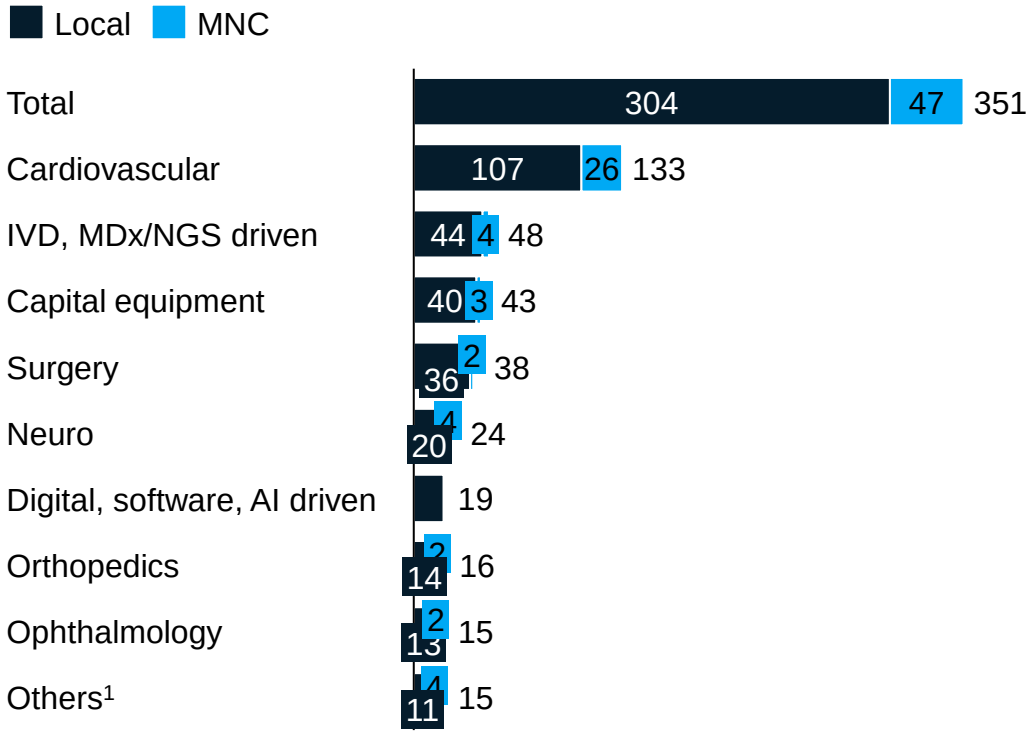
Theme	Description
Cutting-edge technology	**Innovative products with emerging local presences**, e.g., heart valve in CVS, interventional neurology in neuro, robotics in surgery
Innovative business model	**Platform play, vertically integrated** business model or **E2E patient journey solution**
Proven market and hotspot for exits	**Segments with increasing IPOs** (e.g. IVD especially genetic testing)

Sources: AVCJ; McKinsey analysis (Oct. 21)

B3: NMPA has enacted a series of new policies to further accelerate approval timelines

"Fast track" accelerating innovative product launch from 2014 to Oct 2021

of cases entering "fast track" and by category[1]



Additional regulatory improvements to foster local innovations

Examples of recent policies

Policy	Issue year	Description
Update of emergency approval process[2]	2021	Establishment of an emergency approval pathway for products used in pandemic, e.g., COVID-19
Acceptance of self testing report	2021	Shortening clinical trial preparation time and advancing in-house inspection capability
Technical guideline on RWD[3] for medical device clinical evaluation[4]	2020	Offering alternatives to the traditional clinical trials with 11 situations listed where RWD[3] can be considered for clinical evaluation

1.创新医疗器械特别审查程序; Others including diabetes care, respiratory, aesthetics, gastroenterology, as end of Oct. 2021; 2. 医疗器械应急审批程序（修订稿征求意见稿）; 3. Real World Data; 4. 真实世界数据用于医疗器械临床评价技术指导原则（试行）

Source: GBI; press release; McKinsey analysis (Oct. 21)

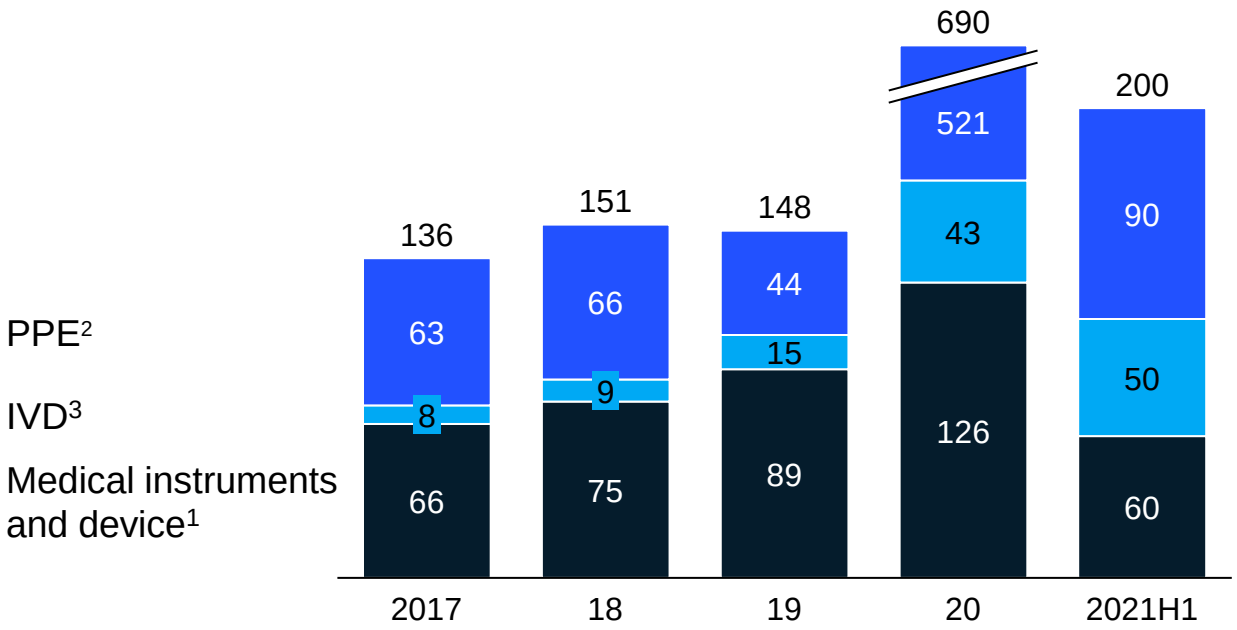
B: Local MedTechs are increasing their visibility on the global stage

NON-EXHAUSTIVE

Global demand for MedTech products rose during COVID-19…

Export value of 3 key MedTech segments from China, 2017-2021H1

Bn RMB



1. Medical instruments and device 医疗仪器及器械
2. PPE includes masks, gloves, and protective clothes
3. IVD includes reagent and device

… accelerating globalization of local MedTech

Market penetration advancement

Penetration into **700+** global high-end accounts, covering **2/3** of US hospitals

Entered supplier list of several global key accounts for its wound management segment

Manufacturing capacity expansion

Capacity for disposable gloves jumped by **2.5X**, fulfilling global demand gap due to supply shock of Malaysia during the pandemic

Upward supply chain integration

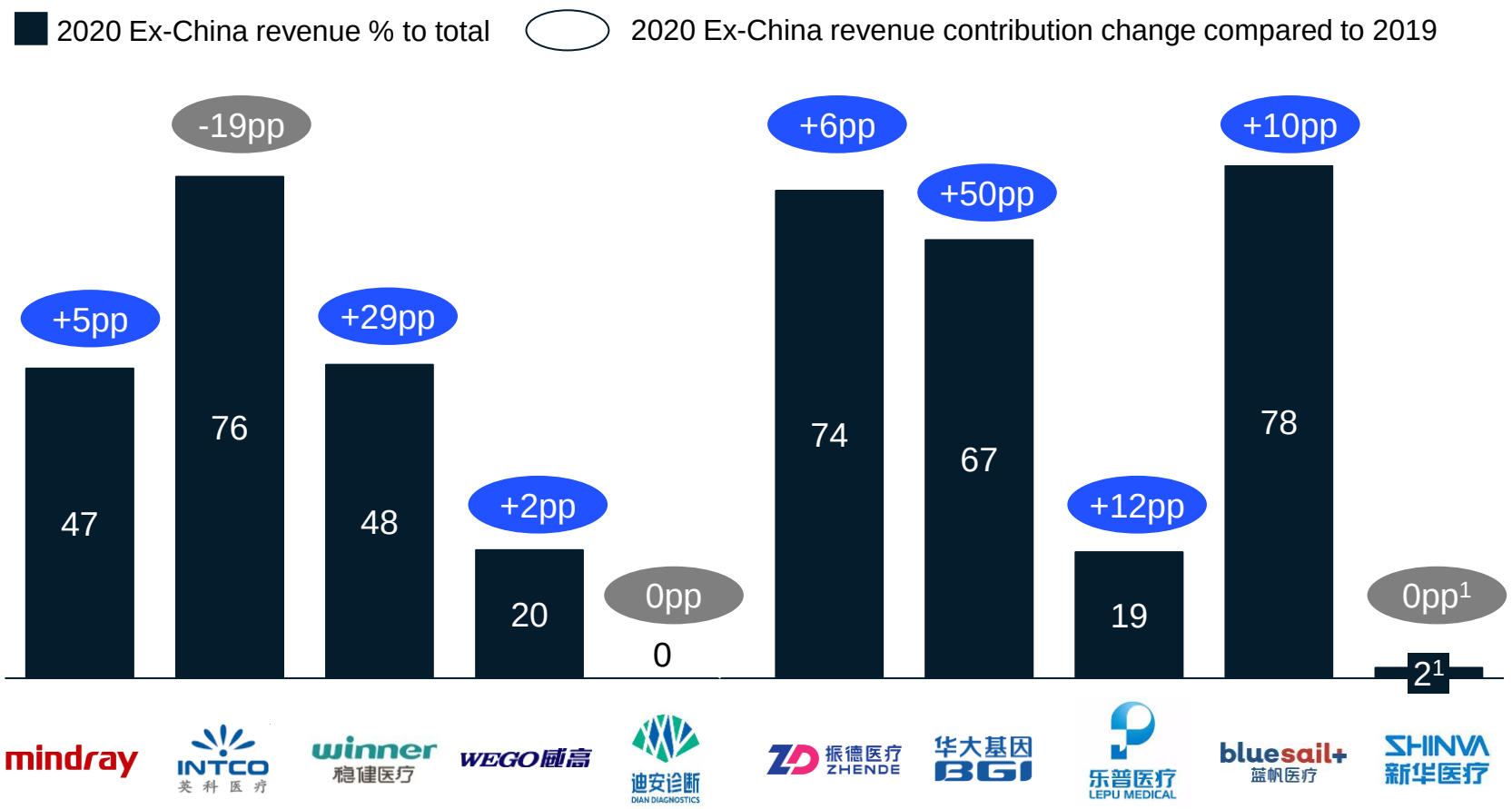
661 mn USD acquisition of Finnish company HyTest, a world-leading supplier of IVD raw materials

Source: China Customs; press release; company reports; McKinsey analysis (Oct. 21)

B: Globalization progress varies across local MedTech companies and segments

NON-EXHAUSTIVE

Ex-China revenue contribution of top 10 local listed MedTech companies, 2020, %



1. For all business including pharma, compared to 2019, 2020 Ex-China revenue contribution sightly increase by <0.1%

Source: Wind; company annual report; press release; McKinsey analysis (Oct. 21)

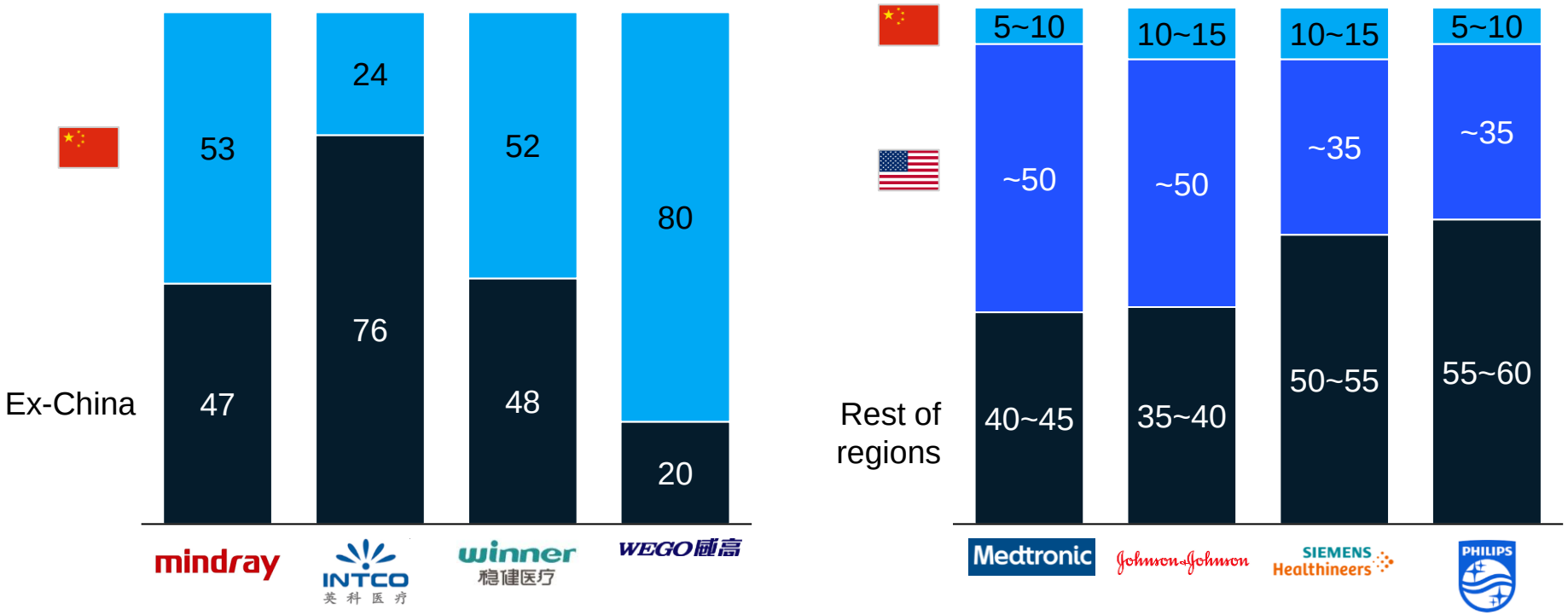
Leading local MedTech players **are generating stronger presence on the global stage**, especially riding on the tailwind from **COVID-19**

Individual company performance **varies**. In general, **IVD** and **low value consumables** companies had better global revenue contribution during 2020

B: There is still room for Chinese MedTech companies to further unlock their business potential overseas

Examples of global revenue and footprint of several top MedTech companies

By country revenue contribution for select leading local and global MedTech companies, 2020, %



There is still huge room for China MedTech companies to **further expand footprint to global market** – for top global MedTech players, China's contribution has not exceeded 15% yet, compared to 50%+ for China MedTech players normally

Source: Wind; company annual reports; press release; McKinsey analysis (Oct. 21)

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B: There are five key strategic questions to consider regarding globalization

1 GTM model

How to test all viable options with a holistic assessment and long range view, e.g., going indirect or direct with large hospital groups, building up business from M&A or OEM

2 Country prioritization

How to have a detailed understanding of various countries, including market size, local customer needs, regulatory, and make the right prioritization across countries by waves

3 Financial assessment

How to define the right pricing strategies across countries and how to quantify the return of globalization including total investment, revenue, and margin

4 Operational excellence

How to keep the supply chain stability and service efficiency and how to build up broad network and relationships with the right local partners that are a good fit for business

5 Global organization and talent

How to establish an organizational structure and functions, with the right talent strategy to grow the business abroad

Source: McKinsey analysis (Oct. 21)

C: MedTech companies participate in digital along three key dimensions

1 **Digital offerings to various stakeholders**

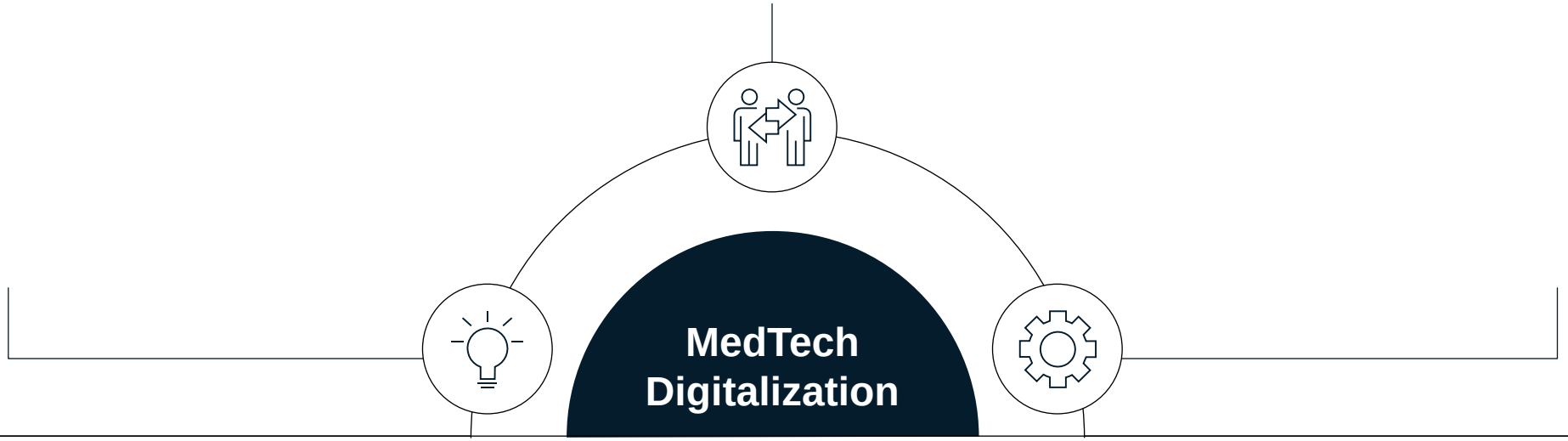
Innovative digital products or solutions that deliver value to hospitals, physicians, and patients

2 **Omnichannel engagement with health professionals**

MedTech companies embark on omnichannel HCP engagement for better customer experience

3 **Optimized internal operations**

Reimagine operating processes to dramatically reduce costs and accelerate decision making



Source: McKinsey analysis (Oct. 21)

C1: Healthcare reforms offer opportunities for MedTech companies to support upskilling hospitals in operations

NON-EXHAUSTIVE

Healthcare reform in China has fundamental impact on the way hospitals operate

Enabling medical alliance by internet+

Government encourages the deployment of internet technology for shared information and coordinated services among medical alliance members

Strengthening public hospital operations

NHC directs public hospital operations towards more scientific, standardized, refined, and informatized, to achieve optimized operating efficiency at reasonable costs

Adapting to DRG/DIP payment model

As BMI funding is under pressure, DRG/DIP[1] payment model reform are piloting at large scale to control cost

MedTech companies empower hospitals to embrace change through digital offerings – select examples

5G-enabled interconnection for remote medical care

Siemens helps West China Hospital build a SPECT/CT 5G RSA[2] virtual cockpit to realize **real-time communication** and **interactive operation guidance** between experts and scanners

SIEMENS Healthineers + 華西醫院

Intelligent asset management for operational efficiency

GE Asset Performance Management (APM) **optimizes equipment health and maintenance** to improve operations and reduce costs of ownership

10~40%	**5~10%**	**>300K**
reduction in reactive maintenance	inventory cost reduction	equipment under management in China

Digitized solutions for streamlined process

Philips IntelliSpace Portal, an advanced visualization and analysis software solution, streamlines diagnostic process, follow-up and communication across clinical domains and modalities for higher efficiency and lower cost

PHILIPS

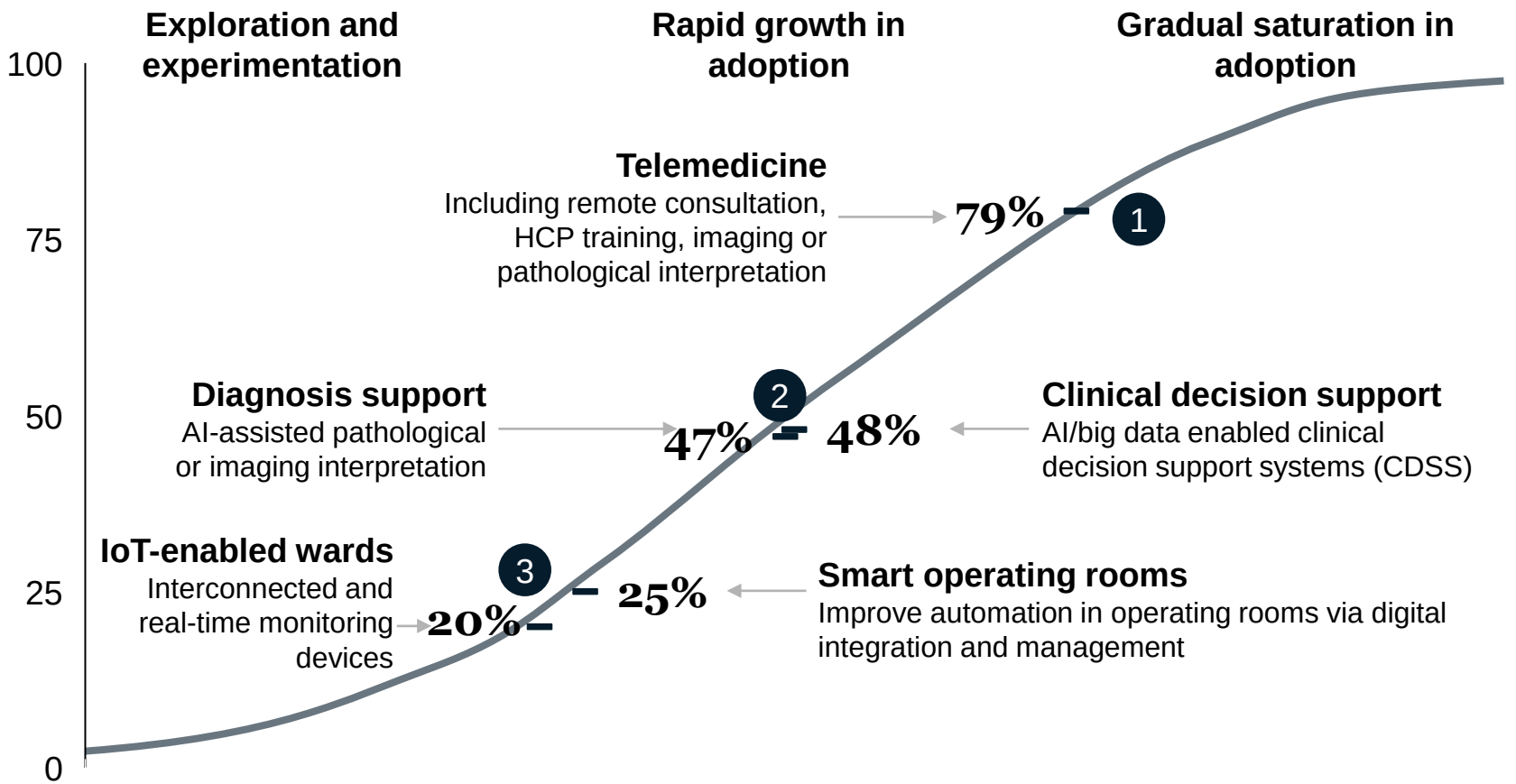
1. DRG, diagnosis related group; DIP, diagnosis intervention packet
2. RSA, remote scanning assistant

Source: NHSA; Ministry of Industry and Information Technology; GE website; Siemens website; Philips website; press release; McKinsey analysis (Oct. 21)

References to specific products or organizations are solely for illustration and do not constitute any endorsement or recommendation

C1: Adoption of digital clinical solutions for physicians in waves in China

Coverage ratio of clinical solutions by category for physicians in China,
%, N = 800 hospitals IT head or hospital heads in China across hospital class and city tier



1. Average coverage ration across all surveyed hospitals; equals to the number of hospitals adopting respective solutions divided by total number of hospitals

Source: Digital hospital survey 2020, supported by Siemens Healthineers; McKinsey analysis (Oct. 21)

Key observations

1. Telemedicine are maturing as the flagship clinical solution use case
2. One immediate opportunity for MedTech companies lies in the seamless integration of clinical decision making and diagnosis support tools into physician's current workflow
3. In the mid-to-long run, integrated solutions have potential to further unlock value

C1: Digital health solutions emerge in China to empower patients for remote care/self-care, with digital therapeutics as one example

#DTx approved: 1 - 2 | 3 - 5 | 6 - 8 | >8 | 0

Policy tailwinds shed green light on three major aspects of B2C digital healthcare…

Internet+ healthcare services

Dec 2020

NHC announced to enhance the level of convenient, intelligent and humanized online medical services[1]

Online Rx fulfillment

Apr 2021

General Office of the State Council announced the permission of online Rx drug sales

BMI reimbursement

Nov 2020

NHSA issued guidance on BMI coverage for Internet+ services, treated the same as offline

… leading to more diversified B2C digital health solutions, e.g., digital therapeutics[2]

Number of digital therapeutics approved by authorities with public announced clinical trial[2], by specialty

NON-EXHAUSTIVE

	China	USA
Psychiatry	3	10
Rehabilitation	1	4
Oncology	1	2
Internal medicine	1	8
Respiratory	0	6
Cardiology	0	4
Neurology	0	2
Gastroenterology	0	2
Ob-Gyn	0	1
Total	**~6**	**~37**

Wide range of indications, e.g., ADHD, substance abuse, insomnia, depression

Focusing on key indications, i.e., diabetes and asthma

1. 关于深入推进“互联网+医疗健康”“五个一”服务行动的通知; 2. Digital therapeutics are defined as evidence-based, clinically evaluated patient interventions that are primarily driven by software; China: NMPA; USA: FDA; excluding digital health softwares without clinical trial disclosure.

Source: NHSA; State Council; NMPA; FDA.gov; press release; McKinsey analysis (Oct. 21)

C1: Local ecosystem in digital therapeutics still at early stage with no clear reimbursement pathway

		
Regulatory approval	• **2017:** Technical Review Guideline published to include software into medical device regulatory framework • **2021:** AI Medical Software Classification Guideline finalized	• **2005:** First guidance for premarket submission for software devices • **2017:** Digital Health Software Pre-certification program • **2020:** Temporary exemption to DTx for psychiatric disorders
Payment model	• **Patient out-of-pocket** as the primary model • **Industry partners invest** in some cases	• **Self-insured employer** as most common payer, with private health insurance, provider, and industry partner in addition • **National Medicare coverage** for FDA-designated breakthrough medical devices[1]
Capital market	• Sporadic private investments since 2015. Mainly still Series A or B funding round	• Growing investments on leading DTx players in the past decade • **Proven exits,** e.g., Propeller Health acquired in 2018 for 225 mn USD

1. Through a new pathway, Medicare Coverage of Innovative Technology (MCIT), published by Centers for Medicare & Medicaid Services (CMS) in January 2021; the effective date is delayed to December 2021

Source: FDA.gov; NMPA; expert interview; press release; McKinsey analysis (Oct. 21)

C2: MedTech industry is still scaling up new channels with few leaders moving into the adoption of omnichannel

Multichannel
Engaging HCPs through offline, remote and digital channels

Online conference and live product demo by national KOLs

Reps interact and share info with HCPs via Enterprise WeChat account

Online physician communities, e.g., DXY, for broad physician education

Omnichannel 1.0
Coordinated engagements across different channels

Product info and scientific research sharing on digital channels

Reps coordinate interactions offline and online, enabled by CRM

Digital marketing broadens coverage and generates leads

Omnichannel 2.0
Optimized engagement model enabled by data analytics

360° view of HCP with insights supported by granular HCP data and real-time adjustment

Data & Analytics Engine provides reps with next best action/products

Capability building and change management within the organization

Majority adopting

Select companies piloting

Emerging leaders

Source: Press release; McKinsey analysis (Oct. 21)

C3: Capturing full potential of omnichannel engagement requires coordinated business strategy that goes beyond “multi-channel”

MedTech companies have leveraged new channels and tools to reach customers…

Example of new channels

WeChat public accounts

Mobile sharing of live and recorded educational content

Self-developed website

Central depository of training material for easy access

3rd party online platform

Expand customer reach and e-commerce

… next-level coordination is required to unlock full value potential of omnichannel

Strategy

- Define use cases that are aligned with strategic objectives to generate tangible and sustainable business impact

Tech stack and advanced analytics

- Upgrade tech stack to collect and integrate the data across touchpoints
- Deploy advanced analytics to coordinate among channels with tailored engagement and message

Operating model

- Transform to agile operating model to enable rapid iteration and customer centricity
- Implement rigorous change management to help the organization transition to new way of working

Source: McKinsey analysis (Oct. 21)

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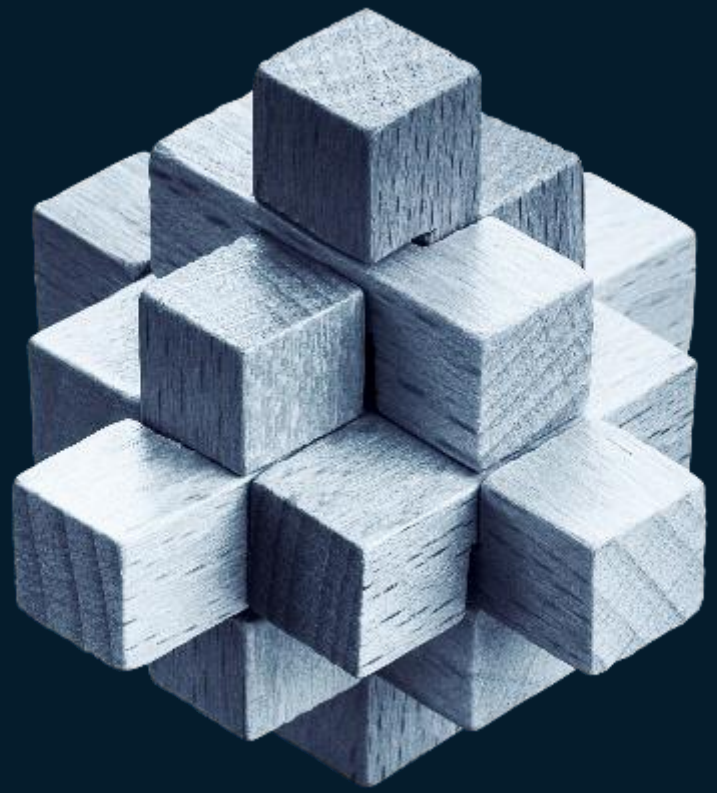

Contents

Closing thoughts: What will matter most for MedTech leaders in China

1. China continues to be the most critical market in global MedTech, yet it is more complex with specific competitive dynamics and policy evolution (e.g. volume based procurement)
2. Doing business as usual will not be sufficient, and the window to change could be tight. MNCs MedTech need to rethink their localization strategy, innovation paths, and commercial differentiation while locals need to continue investing in R&D and explore global market opportunities
3. Digital & analytics starts to emerge as one of the winning formula. Building up the foundation right is critical to get a heads start in the mid-long term race, incl. data infrastructure, ecosystem partnership, and talent development
4. Overall, China MedTech is becoming one of the most attractive sectors for investors – local replacement, MedTech platform and introducing innovation incl. first to market in China, best in class to sell internationally and even first in class are key investment thesis

Sources: McKinsey analysis (Oct. 21)

For more on China life sciences and healthcare…

www.mckinseychina.com

McKinsey China Life Sciences Practice leadership team (27 Partners and Associate Partners)

APACMed Annual MedTech Forum

DeviceChina Conference 2020

McKinsey China Pharma and Biotech Executive Roundtable

McKinsey China Biotech Roundtable

Source: McKinsey

McKinsey
& Company