FSSA Investment Managers



Global Emerging Markets

The pulse of innovation

How China's technology hub is transforming healthcare in emerging markets

May 2026

We explore how Shenzhen medical device companies such as Mindray are taking advantage of the city's knowledge and manufacturing networks to compete on the global stage.

One bright morning in Shenzhen's Longhua industrial district, robotic arms glide across a smart assembly line, piecing together advanced ventilator machines. In an office building nearby, engineers refine artificial intelligence (AI) algorithms that can rapidly detect lesions on lung scans. And at a hospital across town, doctors activate a high-resolution colour ultrasound screen, on which expectant parents see their baby for the first time.

Welcome to Shenzhen's fast-growing medical technology cluster. The southern Chinese city is famous as a hub for consumer gadgetry, from smartphones to delivery drones. But it is also quietly becoming a world leader in less-flashy technological niches, such as medical devices – the tools used to diagnose, monitor and treat health conditions.

Med-tech firms are taking advantage of Shenzhen's extensive local supply chains and deep pools of engineering and scientific talent to create cutting-edge products. In doing so, they are tapping into broader secular trends, such as the rise in demand for healthcare solutions among ageing populations, in China and beyond.

In this article, we explore the innovation and production ecosystem that is nurturing the growth of these companies, and take a closer look at what we believe is one of the most impressive examples, Shenzhen Mindray Bio-medical Electronics, which has risen from its Chinese base to win market share from Western multinationals.

The story of Shenzhen: from oysters to advanced tech

To understand the development of Shenzhen's medical technology industry, it helps to examine the city's remarkable history. Until 40 years ago, Shenzhen was a loose collection of fishing and farming communities located along the Pearl River estuary near Hong Kong. Oyster harvesting was the main economic driver of the region.

This changed in 1980, when Shenzhen was designated the first of China's Special Economic Zones (SEZ), as part of Deng Xiaoping's market reforms. Private investment flowed into the area, and the population exploded as migrants arrived in search of new opportunities.

The role of migrants in Shenzhen's development created a distinctive culture of openness and inclusivity. The city's welcoming spirit is captured by a local saying, which literally translates as: "When you arrive in Shenzhen, you are already a Shenzhener." As Shenzhen grew, it increasingly became a beacon for talented entrepreneurs from across China, who brought ideas, expertise and ambition.

In its first phase of industrialisation, Shenzhen was a hub for original equipment assembly manufacturers, mostly in low-value, labour-intensive industries. But the city started moving up the value chain in the 1990s. The government promoted joint ventures with foreign firms, while the launch of the Shenzhen Stock Exchange in 1991 improved access to capital for local companies, which started experimenting with new business models, many of them in the technology sector.

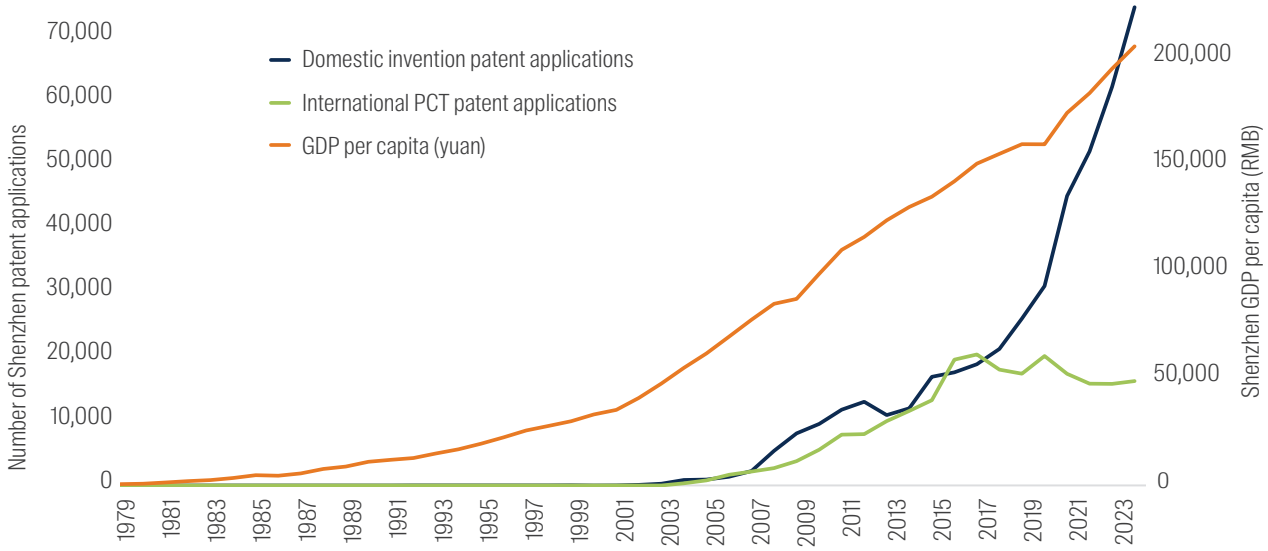
Western firms such as Apple established sprawling manufacturing facilities in the area, attracted not just by the prospect of low-wage labour, but also by Shenzhen's intricate and efficient electronics supply chains, and by the increasingly skilled local workforce. As Apple CEO Tim Cook later put it when asked to explain the rationale behind the company's operations in China: "The products we do require advanced tooling, and the precision you have to have is state of the art. The tooling skill is very deep [in China]. In America, you could have a meeting of tooling engineers and I'm not sure you could fill the room. In China you could fill multiple football fields."[1]

[1] Tim Cook interview at the Fortune Global Forum in Guangzhou, 2017.

With its technical knowhow and culture of openness and idea-sharing, it is little wonder Shenzhen's own companies quickly progressed from making "copycat" (or *shanzhai*) products, which imitated Western equivalents, to minting their own designs. Investment in research and development (R&D) in Shenzhen rose consistently from the mid-2000s, reaching RMB223.6bn (US$31.6bn) as of 2023, with corporate spending representing 93% of the total in that year.

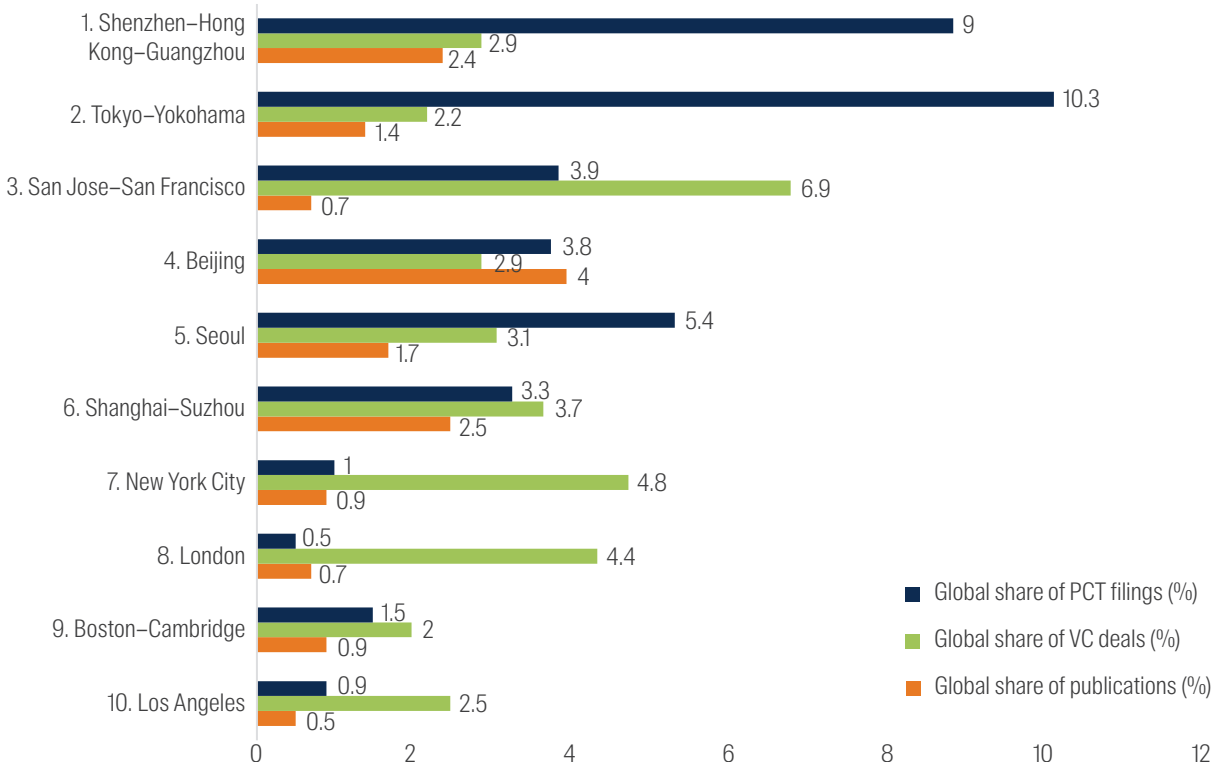
The result has been a boom in innovation, as measured by scientific publications, venture capital activity and patent applications (see Figures 1 and 2).[2] Shenzhen-based technology firms such as Huawei, Tencent and BYD now consistently rank among the top firms globally based on patents awarded. These giants draw strength from specialised industry clusters, which provide the components, expertise and infrastructure required to translate their ideas into marketable products.

Fig 1. Shenzhen Gross Domestic Product (GDP) per capita (RMB) and patent applications, 1979-2024



Source: World Intellectual Property Organization, Shenzhen Statistical Yearbook, FSSA Investment Managers, 2025.[3] PCT: Patent Cooperation Treaty.

Fig. 2: World Intellectual Property Organization ranking of global innovation clusters, 2025



Source: WIPO, FSSA Investment Managers, 2025.

[2] 'Innovation Cluster Ranking 2025', WIPO, 2025.
[3] Deyun Yin, Julio Raffo, Jie Tang, "Global Innovation Hotspots Innovation ecosystems and catching-up in developing countries: Evidence from Shenzhen", WIPO, 2022.

Shenzhen and medical technology

In his recent book *Breakneck*, author Dan Wang argues the secret of Shenzhen's rise from imitator to innovator is its harnessing of what he calls *process knowledge*, which is based on patterns of relationships among technical workers. "Shenzhen is a community of engineering practice where factory owners, skilled engineers, entrepreneurs, investors and researchers mix with the world's most experienced workforce at producing high-end electronics," Wang writes.

These communities work most effectively when they resolve into sectoral hubs – and Shenzhen's medical devices cluster is perhaps the best example. According to official data, the city is now host to 1,800 medical equipment manufacturers, many of them based in the Guangming and Longhua districts. These firms benefit from close ties to Shenzhen's expanding network of hospitals and scientific research institutes.

National and local government policies have played a role in fostering the growth of the cluster. China's leaders are grappling with the pressures of a rapidly ageing population – at the end of 2024, 22% of citizens were aged 60 or over, double the proportion in 2004 (see Figure 3) – and this is driving an increase in overall healthcare spending. Since 2012, total Chinese healthcare expenditure has risen at a compound annual growth rate of 11% to reach RMB9tn (around US$1tn).[4] (This equates to around 5.5% of China's GDP, compared with average healthcare spending of around 9% of GDP in developed economies, and more than 17% in the US, which suggests there is scope for further growth.)[5]

Amid burgeoning demand, China is keen to modernise its healthcare system and curb its reliance on imports. Shenzhen's local authority is prioritising the development of high-end equipment in areas such as medical imaging, patient monitoring and life support. To further these efforts, it joined forces with private companies and academic institutions to establish the National Innovation Centre for High Performance Medical Devices in 2023.

But while top-down policy initiatives have helped accelerate investment in the cluster, the more interesting developments have occurred organically. This is where Mindray comes in. As one of the city's oldest and most ambitious medical device firms, it has played a catalytic role in building the networks, standards and capabilities that define the sector. It now stands at the centre of a world-class innovation and production ecosystem.

Fig. 3. Age cohorts in China 2004-2024 (% of total population)



Source: World Bank, Population Pyramids, 2024.

Case study: Mindray

In many ways, Mindray's rise mirrors Shenzhen's own. The company's chairman and co-founder, Li Xiting, was born in a rural village in 1951, and his studies were cut short by the Cultural Revolution. He nevertheless went on to become a researcher at the prestigious Chinese Academy of Sciences, training as a cryogenics physicist before working at Shenzhen Anke, a partly state-owned enterprise that created the country's first magnetic resonance imaging (MRI) scanner in the 1980s.

In 1991, Li learned from doctor friends that they were unable to afford basic medical equipment, because foreign firms in the industry were taking advantage of their monopoly status to charge high prices. Teaming up with two ex-colleagues from Shenzhen Anke, Li launched Mindray, with a mission to develop affordable, high-quality medical devices within China.

Mindray drew on the electronics supply chains available on its doorstep to create its first products: basic-but-effective patient-monitoring devices that won favour with medical professionals. By 2001, the company had a 15% share in the monitoring device segment across the country, and soon expanded into other categories, such as life support, medical imaging and in vitro diagnostics (IVD).

[4] JP Morgan China healthcare service review, 2025.
[5] World Bank data, 2024.

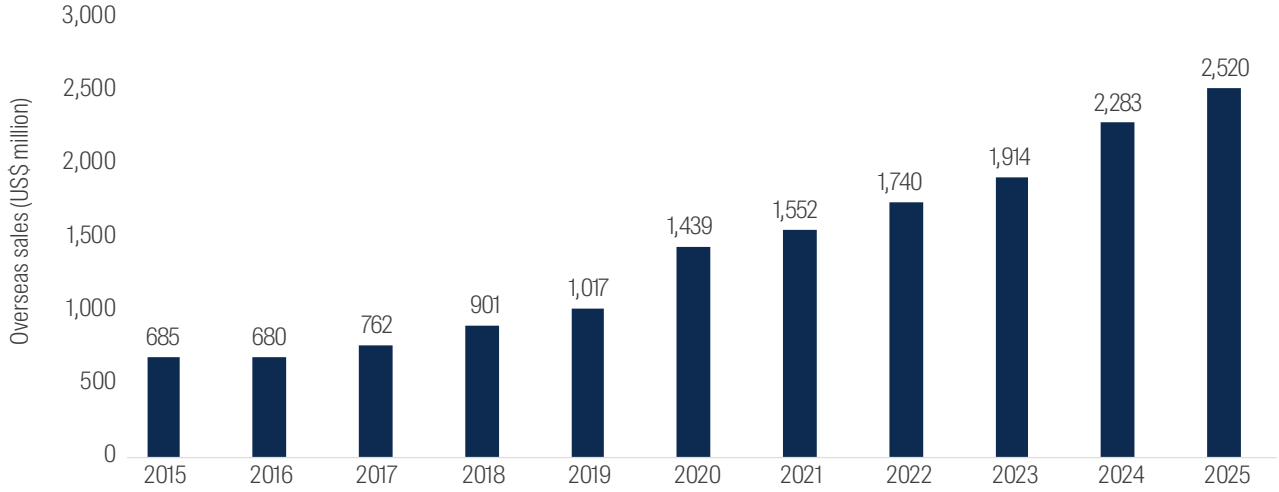
With suppliers, tooling and skilled labour close by, Mindray was gradually able to bring aspects of the manufacturing process in-house, and its vertically integrated production model helped keep costs down. Expanding profit margins enabled the company to ramp up its spending in R&D, which has remained at 9-10% of revenue annually since the early 2000s.

Mindray also developed a wide-ranging sales network, in China and around the world. In 2006, it listed on the New York Stock Exchange (like other Chinese firms listed in the US at this time, it later privatised and restructured, before floating on the Shenzhen Exchange in 2018).

By the time the Covid-19 pandemic hit, Mindray was China's biggest medical device company, and its patient-monitoring machines and ventilators proved vital tools in the country's battle against the virus.

Internationally, too, the pandemic triggered a surge in demand for Mindray's products: its overseas sales spiked over 40% in 2020 and have continued to rise steadily in subsequent years (see Figure 4). Outside China, Mindray's lower costs provide it with a key advantage over Western multinationals, especially in value-conscious emerging markets. But its products are increasingly competitive in terms of quality and reliability – a tribute to the company's commitment to growth through innovation.

Fig. 4. Mindray overseas sales growth (US$ million)



Source: Company data, 2026.

From follower to leader in imaging and AI

Mindray's innovation strategy is a classic example of the Shenzhen process knowledge model in action. Working closely with customers, suppliers and other nodes in the supply chain, its R&D teams are strongly focused on solving real-world problems. They use rapid feedback loops between design and production to iterate and improve the performance of their current devices and test next-generation technologies.

Mindray's international expansion creates additional R&D synergies, as the company learns more about the sophisticated needs of overseas hospitals and develops better products to sell. This systematic approach may be one reason why it has been able to close the gap on global med-tech majors despite spending considerably less on research in absolute terms. Mindray's total R&D investment totalled US$561m in 2025, far below the outlay of GE Healthcare (US$1.3bn), Philips Healthcare (US$2bn), Siemens Healthineers (US$2.3bn) and Medtronic (US$2.7 bn).[6]

Consider Mindray's recent breakthrough in ultrasound imaging. In 2023, the company launched the Resona A20, a high-end ultrasound device that uses acoustic boosting technology to improve the sensitivity of the signals that create the final image. It features different underlying systems to the equivalents produced by Philips and Siemens, while delivering comparable results.

The broader Shenzhen ecosystem was integral to the development of the Resona A20. To build the device, Mindray collaborated with upstream suppliers to source higher-performance materials that met the resolution requirements of the ultrasound probes; midstream suppliers to procure more-advanced circuit modules to support the equipment's data-processing and image generation capabilities; and downstream medical service providers to ensure their training methods could be adapted for more-sophisticated kit. In this way, Mindray's innovations have both benefited from the local supply chain and helped lift standards across the network.[7]

In the same collaborative spirit, Mindray has also teamed up with other leading organisations on research initiatives – it was among the founding members of the National Innovation Centre for Advanced Medical Devices – and is forging partnerships to develop digital services to complement its device portfolio.

In 2024, Mindray worked with Tencent to release Qiyuan, a large language model (LLM) designed for use in critical care. Qiyuan integrates real-time patient information and

[6] Company figures for the fiscal year 2025.
[7] Shenzhen medical device cluster case study, Securities Times, 2025.

historical case notes to answer personalised patient-condition enquiries and suggest treatment options. Mindray says this AI-powered system can produce medical records 30 times faster than traditional methods. It is already being used on clinical wards across China.[8]

The investment view

At FSSA Investment Managers, we have been closely following Mindray's progress since 2007. Through meetings with the company, its customers and suppliers, we have steadily built conviction on the firm and it is now a key holding in our portfolios.

At the core of Mindray's success are its people and culture. Although he is no longer involved in day-to-day operations, Chairman Li Xiting remains the largest shareholder and his ethos still permeates the business. As he once said of the company's mission: "We need to constantly innovate to make products that are of the best quality while at an economical price."[9] Both elements here – the tireless commitment to innovation and the effort to keep costs low for customers – continue to drive the company's approach.

However, Mindray has experienced significant challenges over the last few years, most significantly China's volume-based procurement (VBP) policies, which have put pressure on its pricing. The company has also acknowledged internal missteps, including maintaining higher inventory than necessary in anticipation of stronger equipment-renewal demand from China's hospitals.

This indicates the uncertainties involved with any investment in the healthcare sector, where policy and regulation can influence companies' fortunes. In China – as in the UK, Europe and Japan – healthcare spending is still largely driven by public funding rather than private insurance, which means the industry has some cyclical elements that must be carefully monitored.

Nevertheless, we remain confident in Mindray's longer-term prospects. The company estimates its overall market share in China at around 19% (based on the categories where it is present) and only 2.4% globally.[10] Given that major multinational counterparts typically boast a dominant share of 60-70% in their home markets, this suggests it has plenty of scope for further penetration.

One area in which Mindray sees a particular growth opportunity is the IVD segment, where its current domestic share is a modest 10%. IVD machines require consumables – such as reagent, calibration kits and cartridges – which need to be replaced on an ongoing basis. Building its IVD business therefore gives Mindray the opportunity to increase the proportion of its overall revenues that derive from recurring income, which should improve its resilience.

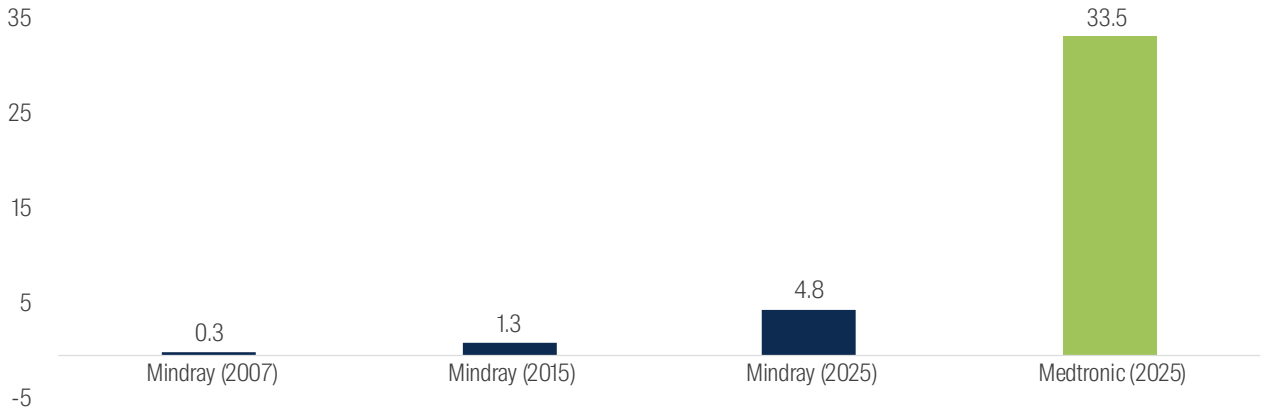
Global expansion

Mindray also sees scope for further growth in its international business. Overseas, its products usually sell at a 25-30% discount to major multinational equivalents, giving it the edge in segments where it is approaching parity in quality with the incumbent brands. The company has seen strong growth in sales in Brazil, Indonesia, Mexico and Turkey amid rising demand for better healthcare solutions in emerging markets.

Although it only derives a small proportion of its revenue from the US, the tariff-related uncertainty in 2025 further weighed on Mindray's share performance. But its longer-term track record gives us confidence it will continue to deliver solid earnings. It has been able to grow its sales and profits at a compound annual growth rate of 15% and 25% respectively over the last 10 years – with an average return on equity (ROE) of 33% over the same period – which suggests it will continue closing the gap on international leaders such as Medtronic (see Figure 5).

What is perhaps most exciting about Mindray is that it continues to embody Shenzhen's fast-moving, collaborative spirit. For investors, the company's blend of local embeddedness, global reach and long-term growth prospects is compelling. As board secretary May Li remarked to us at a recent meeting amongst the gleaming high-tech showrooms of Mindray's headquarters: "The good days are yet to come."

Fig. 5: Mindray is catching up with global leaders (revenue, US$bn)



Source: Company data, FSSA Investment Managers, 2026.

[8] "One day with Mindray's critical care LLM: A key driving force for long-term business success", JPMorgan, February 2025.
[9] "Mindray's medical devices flew off the shelves amid Covid-19. Now Li Xiting says company's growth is just starting", SCMP, 2021.
[10] "Health care within reach", Mindray conference presentation, 2025 (market share estimates based on 2023 figures).

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