Short Introduction
As a result of China's economic growth and government's health reform investments, the healthcare industry in China has been continuously growing in the past years and this trend will continue in the coming years. Total healthcare expenditure is expected to reach 6.7% of GDP in 2015, compared to 5.1% in 2011. The sales volume for medical devices reached total revenues of 135.4 billion CNY (21 billion USD) in 2011. With double-digit annual growth rates of the medical device industry, China is expected to become the second largest market before 2020. This factsheet looks more closely at this rapidly developing industry from the perspective of patent applications.

Where are the hotspots?
Beijing and Shanghai are the two most interesting cities for the medical technology industries in terms of R&D. Although there is a small difference between the two cities (less than 5%), the differences between the regions are much more pronounced. For instance, the cities of Suzhou and Hangzhou together account for more than twice the number of patent applications of Tianjin. This is mainly due to the clustering effect of Shanghai and its high concentration of life science-related industries. Nevertheless, Tianjin has been developing rapidly in recent years in many fields, and medical technology has clearly become one of its pillar industries. Interestingly, in the southern China region, including Guangzhou and Shenzhen, the development of the medical technology industry is catching up very fast. Newly established companies and knowledge institutions such as Mindray, Edan Instruments, and the Shenzhen Institutes of Advanced Technologies (SIAT) are contributing heavily to the total number of patent applications. Furthermore cities in western China, such as Xi’an and Chengdu, are getting more and more attention as a result of the central government’s ‘Go-West’ campaign.
Who is filing?
The medical technology industry is a relatively new area of development in China. Not only does this offer the Chinese industry many opportunities to catch up with its innovation capability, it also generates substantial market demand for novel foreign technologies and products. This is reflected in the patent applications data. Firstly, the relatively small difference between Chinese companies and academic institutions indicates that both public and private sector are putting in great effort to meet the demand from the market. Secondly, a large percentage (35%) of patents are filed by foreign entities, indicating the importance foreign entities attach to this market. Chinese individuals account for the rest of the pie (24%). In many cases these individuals have signed agreements with their employers, which could be either companies or institutes.

Top-10 Chinese companies
The Chinese domestic medical technology industry is highly fragmented. Interestingly, there is no state-owned enterprise (SOE) in the top-10 of medical technology patent applications. Number one is Bao Dan Medical Device Technology from Guangzhou, accounting for more than 50 patent applications. This company is mainly active in the field of endoscopic surgery and capsule endoscopy, and its main competitor is the Japanese company Olympus. Second on the list is Zhongbang Implant Technology from Xi’an, primarily active in titanium biocompatible implant materials for dental and orthopedic surgery. MicroPort, in the third place, is a Shanghai-based company mainly focusing on products for orthopedic surgery (e.g. replacements for hips and knees) and endovascular intervention (such as stents and catheters).

Numbers four and five are both companies from Shenzhen with largely similar products such as patient monitoring systems, ultrasound imaging machines, and in-vitro diagnostics. It is noteworthy that both companies were founded in the nineties, have grown rapidly after 2000, and are very internationally oriented. Tianchen and Maquet, in sixth and seventh position respectively, are both based in Suzhou and contribute to the city’s strong performance. Tianchen is specialized in equipment for colorectal surgery. Maquet is a subsidiary of the publicly listed Swedish group Getinge AB and is specialized in
products for surgical workplaces, critical care, and interventional cardiology. Further down the list are two companies from Beijing. Aeonmed is specialized in OR and ICU equipment, while Panther is a Sino-French joint venture for surgical equipment such as staplers, sutures and meshes. Last but not least on the list is the German company Siemens with a focus on laboratory diagnostics, hearing instruments and medical imaging machines. Due to its patenting strategy, it is one of the few wholly foreign-owned entities that feature in the Chinese company patent statistics.

Top-10 Chinese academic institutions
The picture of the top patent filing academic institutions is in fact quite consistent with the top-10 patent filing hotspots. Guangzhou is an exception because one company (Bao Dan Medical Device Technology) has contributed largely to the total number of patent applications in that city.

As already mentioned, Shanghai region including Zhejiang and Jiangsu provinces is undoubtedly the hotspot for the medical technology industry. Top filing institutions from this region like Shanghai Jiaotong University, Zhejiang University, Southeast University, and Shanghai University of Technology are taking care of more than 50% of the total number of patent applications by the top-10 institutions. Furthermore, institutions from Beijing, Tianjin, and Shenzhen are also on this top-10 list. The third and fourth military medical universities from Chongqing and Xi’an respectively, are also consistently on the list.

Conclusion
Medical technology industry is a relatively new field for development in China, and is at this moment still highly fragmented. This does not only mean opportunities for foreign entities to introduce new products and technologies, but it also means that Chinese companies will put in a lot of effort to catch up with its western competitors on both the domestic and international market.
The Netherlands Office for Science & Technology in China has published an overview article and twelve patent factsheets in the following categories:

1. Basic materials chemistry
2. Biotechnology
3. Electrical machinery, apparatus, energy
4. Macromolecular chemistry, polymers
5. Medical technology
6. Micro-structural and nanotechnology
7. Optics
8. Organic fine chemistry
9. Renewable energy generation
10. Semiconductors
11. Surface technology, coating
12. Transport and automotive

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