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Singapore's AI potential and prospects to emerge as a premier clinical trials hub

May 17, 2024 | Opinion

"Singapore plan to invest more than $1 billion over the next five years to further boost country's artificial intelligence (AI) capabilities" explains Edwin Ng is Senior Vice President and General Manager, Asia Pacific, at Medidata



As Asia establishes itself as the global hub for clinical trials, Singapore is bolstering its position as the preferred location for these trials to take place. The country's strong R&D capabilities, talent pool, world class healthcare infrastructure, and robust regulatory and ethical standards are some of the reasons it is quickly becoming the ideal destination for clinical trials, particularly in the Southeast Asia region. The government's plan to invest more than $1 billion over the next five years to further boost Singapore's artificial intelligence (AI) capabilities will further strengthen the country's position.

AI and analytics are revolutionizing healthcare and drug development by enabling the design of more precise, efficient trials, potentially boosting their success, and speeding up drug discovery. AI is accelerating insights by processing colossal amounts of data within seconds, a number that would take humans years to process. AI is also enabling clinical trials to incorporate a more diverse pool of trial participants that better represent the patient population, ensuring as many patients as possible benefit from scientific advances.

AI can accelerate drug development, sharpening Singapore's competitive edge as a clinical trial hub

Data underpins clinical trials. To demonstrate a drug's safety and efficacy to stakeholders, including regulators, providers, and patients, researchers depend on evidence. The immense volume of data that comes from evidence generation is staggering – trials today collect seven times more data than trials of 20 years ago, and that data comes from a wide variety of sources which can take months to reconcile. At the same time, trials have also become more complex, as therapies that are undergoing development become more targeted. This additional complexity makes it extremely challenging to successfully run and complete trials on time.

In an increasingly complex landscape, AI can transform the decision-making process and significantly shorten the time it takes to bring a drug to market. While it would take humans years to sift through thousands of variables, it takes an algorithm just

seconds. However, the real power comes from the combination of the algorithm uncovering valuable insights, and the human expertise needed to make a decision. Data from previous trials can be mined by AI technologies to improve understanding of diseases to ultimately enhance the design of clinical trials, allowing pharma companies to build more effective treatments, faster.

The COVID-19 pandemic has shown how critical it is to quickly develop and provide new vaccines and treatments to patients. With a new drug typically taking 10 to 15 years to develop, AI has the potential to accelerate drug development timelines, benefiting patients and sharpening Singapore's competitive advantage as a hub for clinical trials.

Improving patient diversity is critical in ensuring that new drugs benefit all patients

Participants in clinical trials should ideally be representative of the groups of people who will use the therapy, as drugs can react differently to genetics and biological factors. However, the lack of participant diversity has long been a challenge in clinical trials. In fact, out of the 292,537 participants in global clinical trials, only 11% were Asian (United States Food and Drug Administration, 2020). This is despite Asia being the world's fastest-growing healthcare market, primarily due to an aging population and a rise in chronic diseases in Southeast Asia. Figures from the World Health Organisation show that 55% of all deaths in the region are due to non-communicable diseases – that is nearly 8 million people every year (Nusser, 2017).

AI can help address diversity challenges by allowing researchers to identify and select sites that are more likely to enroll diverse patients, including those from underserved communities.

Generative AI as the next frontier

With AI continuing to evolve, we are seeing advancements in the technology such as generative AI. While traditional AI focuses on automating and analyzing historical data and making predictions based on those, generative AI produces new content based on the data it is trained on.

Used in pharma and medical-device industries, the potential impact of generative AI can be significant. McKinsey Global Institute (MGI) estimates the technology could help these sectors generate SGD$80 billion to SGD$150 billion a year by accelerating drug development and therefore productivity. One of the single most impactful applications of generative AI that they can leverage is the use of synthetic data. This is high-fidelity data created by algorithms that protects patient privacy, while keeping their data safe, and preserving the integrity of the clinical trial dataset.

The integration of AI into clinical trials is not without challenges, as the life sciences industry has traditionally been risk averse. While there is valid reason to be cautious, the potential benefits of integrating AI into the drug development life cycle are extremely promising.

Whether in preclinical stages, or in the commercialization phase, AI-enabled drug development is now used by an estimated 400+ companies, and has reached a SGD$66 billion market, placing AI more firmly in the mainstream life sciences. In Asia, Singapore is well placed to take the lead in AI-enabled drug development, and its continued investment in technology and infrastructure will sharpen its attractiveness and competitive advantage as a hub for clinical trials.