

Point of Care technology to combat diabetes

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It's been widely recognized that biomedical research has an impact that could affect millions both locally and globally, so much so that it was identified as the fourth pillar of economy in Singapore in 2000, and SGD16.1 billion was allocated for the development and support of biomedical research from 2010 to 2015.

In fact, the biomedical research industry is now worth USD250million globally, with almost 50 percent of that current market demand being met by work done in Singapore. Research and development in the biomedical field is essentially the first step towards advancement in the medical field, which includes making new technology more cost efficient towards the fight against diseases.

But just how does this translate into benefits for the everyday consumer, or in this case, patients?

Let's first look at an overview of healthcare in Singapore, which is a multi-billion dollar endeavor - healthcare spending in 2016 is estimated to be around SGD11 billion, up from SGD4.7 billion just three years ago. These costs would be exponentially higher if all illnesses were treated at hospitals as the cost to build, operate and maintain is significant, and are not ideal for diseases which need continuing care, especially those that are chronic or age-related, like diabetes.

The fight against diabetes is a battle on many fronts for Singapore. Aside from the high proportion of Singaporeans who have been diagnosed with the disease - that's 11.3 percent of adults aged 18 to 69 in 2010. This makes Singapore the second-highest proportion of diabetics amongst developed nations, ranked only after the United States, and in 2010 cost approximately more than SGD1 billion in resources, and this cost will only keep rising to beyond SGD2.5 billion by 2050.

Point of Care technology and lowering costs

This is where commercialization in research and development remains one of the areas in medical advancements that can bring about the most change for healthcare systems. Technology has made it faster, easier and more efficient to diagnose diseases such as diabetes through Point of Care (POC) technology. Where before you might have needed days or weeks to get a simple diagnosis or test done reliably, now that time has been reduced to a fraction of the time, and cost.

Diagnostics testing forms the backbone of a large proportion of primary healthcare. POC technology would have one of the biggest impacts in helping to fight the disease. The introduction of said technology in the recent years have reduced the diagnostic time from two hours to a mere five minutes. This coupled with accurate results help healthcare providers to make informed decisions about treatments, especially for those who need specialty referrals or hospital admissions.

POC technology has been at the core of ensuring this change, and tests have become more cost effective and even more accurate while the machines themselves have become more compact and space efficient. This has enabled smaller clinics to take on more diagnostics, lessening the costs and strains on hospitals.

Benefits to patients

Quicker and more efficient testing also means that the treatment needed in each case can quickly be determined, while other technology has also enabled easier and more efficient self-management. A POC device could allow patients to quickly monitor their blood sugar levels at home, while needing only a couple of minutes to get a result with just in a pin-prick of blood. This would have previously needed more than 5 ml of blood and 120 minutes to determine a result.

A win-win for all

It is not just the fight against diabetes that POC technology has an impact on, in the case of the H1N1 outbreak that happened in 2009, efficient testing reduced the time needed to ensure that quarantine actions can occur faster to contain the disease from spreading. If healthcare professions have access to devices that are able to conduct multiple tests in a short span of time with one sample of blood or serum - being able to conduct 15 tests within 15 minutes with just one sample of blood - it would help in time and cost savings for polyclinics and outpatient clinics. Essentially these tools would enable healthcare professionals to be able to diagnose and quickly filter the patient to the right treatment.

For a healthcare system that's already taxed and stretched to its limit, having reliable tests to ensure that patients are attended to faster translated into a multitude of impacts - most of all, more cost efficiency. Commercialisation of biomedical technologies means that it becomes cheaper for everyone to use; and benefits society as a whole as healthcare moves forward towards easier, faster testing which are also more accurate. All this boils down to being able to treat patients with more ease, less cost and time. Less cost on treatments and diagnosis also means that healthcare spending and costs can be kept lowered, allowing more Singapore to affordably access the necessary healthcare, no matter the disease that they're fighting.