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Healthcare Consumerisation Driving the Demand for Home Diagnostic Innovations in Asia

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The healthcare industry is witnessing a major shift in patient behaviour-- patients are more independent and aware of their health and well-being. With this healthcare consumerisation transformation, the diagnostics industry is also changing to address the new demands of this consumer-driven ecosystem. There is a growing interest in accessible and convenient over-the-counter (OTC) and direct-to-home (DTC) testing. With the prevalence of chronic diseases, and the ongoing fear of infectious diseases post the COVID-19 pandemic, home diagnostics products and services are growing at a rapid pace.

One of the primary drivers of home diagnostics, apart from the growing chronic disease population, is the overload on the healthcare staff. Traditional diagnostics take a long waiting time usually associated with a doctor's visit or a lab report analysis, which might sometimes take 2-3 days on an average. With the increasing awareness of personal health and treatment compliance, the use of self-monitoring technologies especially for chronic diseases such as diabetes, hypertension, and neurodegenerative disease, which provide real-time fast diagnosis, is gaining popularity amongst patients. Self-monitoring or home diagnostics gives patients the opportunity to monitor their diseases and avail timely intervention, especially for stigmatised diseases such as mental illnesses.

Though the Asia Pacific region has typically been slow in the adoption of personalised and remote care technologies, primarily due to systemic inertia; the changing demographics, changing consumer behaviour, and demand for low-cost accessible care have fueled the concept of home care and diagnostics. The pandemic was a wake-up call for the healthcare

systems to re-energise and focus on technology innovation and convergence. Advancements in wearables and digital health technologies with the integration of artificial intelligence (AI) and the Internet of Things (IoT) in home diagnostics are driving industry growth, enhancing the quality and accuracy of diagnosis.

Wearable and Portable Devices

Most of the commercially available home diagnostics and monitoring technologies in Asia are for diabetes and hypertension. Government agencies and healthcare systems have acknowledged the benefit of home diagnostics and monitoring solutions as a cost-effective way to diagnose these conditions early. This reduces the burden on healthcare workers and unnecessary hospitalisations due to exacerbation of the condition.

Beyond diabetes and hypertension home monitoring and diagnostic devices, the industry is also reinventing specific home diagnosis and monitoring solutions for other applications. Several new startups are coming up to meet this demand. For example, Japan-based Aevice Health has created a non-invasive wearable device that enables early detection of cardiopulmonary illnesses, remotely and in real-time. At-home ECG devices are very popular home monitoring and diagnostic solutions for cardiovascular conditions. Companies such as Sunfox Technologies (India) and Agatsa (India) are developing small, portable 12-lead ECG monitors.

Wearables are also commonly used devices for remote health monitoring, such as continuous monitoring of heart rate, pulse rate, respiration rate, and temperature. It’s interesting to note that apart from major players such as Fitbit or Apple, in-house Asian companies such as Zepp Health and Huami are also witnessing wide consumer acceptance.

Future Outlook: The future of remote health monitoring includes smart home technologies to empower elderly and chronically ill patients. Advanced home health monitoring technologies such as contactless wall-mount sensors and tabletop sensors offer non-obtrusive home monitoring of movement/activity. For instance, Dozee (India) offers contactless patient monitoring with warning systems. These devices inform caregivers, family members, and healthcare providers, in case of incidents such as falls or alarming changes in health parameters, allowing the elderly to lead their life safely and peacefully.

Enabling Home Diagnostic

The healthcare industry has witnessed a drastic digital transformation across all sectors. Integration of AI and IoT in at-home health monitoring and diagnostic devices has helped in improving the accuracy of these devices. The use of machine learning and deep learning algorithms in personal health monitoring products enables the derivation of large amounts of (and useful) health parameters from complex and simultaneous measurements of data. AI can also provide beneficial personalised health tips for patients.

Digital technologies have made home diagnostic services prompt, seamless, and cost-effective. Companies such as Orange Health or Healthians based in India provide affordable on-demand diagnostic services. Consumer awareness has also led to the rapid adoption of at-home genetic testing such as China's Genebox and India’s MapMyGenome. Home diagnostics is further enabled by online doctor consultation mobile applications such as Practo in India, Qmed Asia in Malaysia, and Doctor Anywhere in Singapore.

As the Asia Pacific boasts more than a billion smartphone users, this widespread adoption of smartphones has created a tremendous opportunity for mhealth, especially for home monitoring and diagnostics. Smartphones offer a gamut of opportunities for the diagnosis of sleep apnea, to mental health illnesses. For instance, a smartphone app can assess the breathing and snoring sound of patients during sleep and assess the risk of obstructive sleep apnea in patients, making diagnosis extremely comfortable and convenient for patients, instead of diagnosing in a clinical setting. Australia-based ResApp Health provides clinical quality diagnostic tests and management tools for respiratory diseases only using smartphones and mobile apps.

Future Outlook: Over the past few years, digital biomarkers have seen extensive research and industry initiatives. Digital biomarkers such as vocal biomarkers can be analysed using AI speech algorithms for the detection of several diseases, from chronic obstructive pulmonary disease (COPD) to mental health illnesses. Canary Speech is working with SMK Corporation and Japan's National Cerebral and Cardiovascular Center to develop early-stage dementia using vocal biomarkers in the Japanese language. Similarly, Koye Pharma is collaborating with Sonde Health to develop its vocal biomarker technology, which can diagnose diseases such as COPD from voice patterns. These technological developments will be critical in enabling home diagnosis, especially for the elderly population.

Challenges and Recommendations

Certainly, technology advancements have democratised healthcare testing at home, however, the timely and skillful sample collection and report backlog may remain some of the challenges for the at-home diagnostic services. Rapid tests and laboratory automation will be the solution for streamlining and accelerating home diagnostic services. Home-based blood testing or easy-to-use, non-invasive test kits will be instrumental in creating a decentralised and democratic healthcare system. In the future, we can expect innovations in autonomous and self-powered microfluidic devices, which can read the analyte levels in the sample, to have tremendous growth opportunities in at-home and self-testing.

These consumer-oriented home diagnostics help in bridging the gap in care and deliver a more seamless, convenient, and patient-centric experience. Understanding consumer needs, large diagnostic players such as Abbott, and Roche, or service providers such as Quest Diagnostics are embracing home diagnostics. Smaller players are innovating around the products, reagents, and assays to make home-based testing available.

In the near future, the home diagnostic industry in Asia will thrive on wearable IoT devices and the mHealth companies. The high scalability and accessibility are the major factors behind the success. Several home diagnostics technology companies are emerging in this region and challenging the legacy health infrastructure. Strategic partnerships building on business synergies will be critical for a healthy digital ecosystem.

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