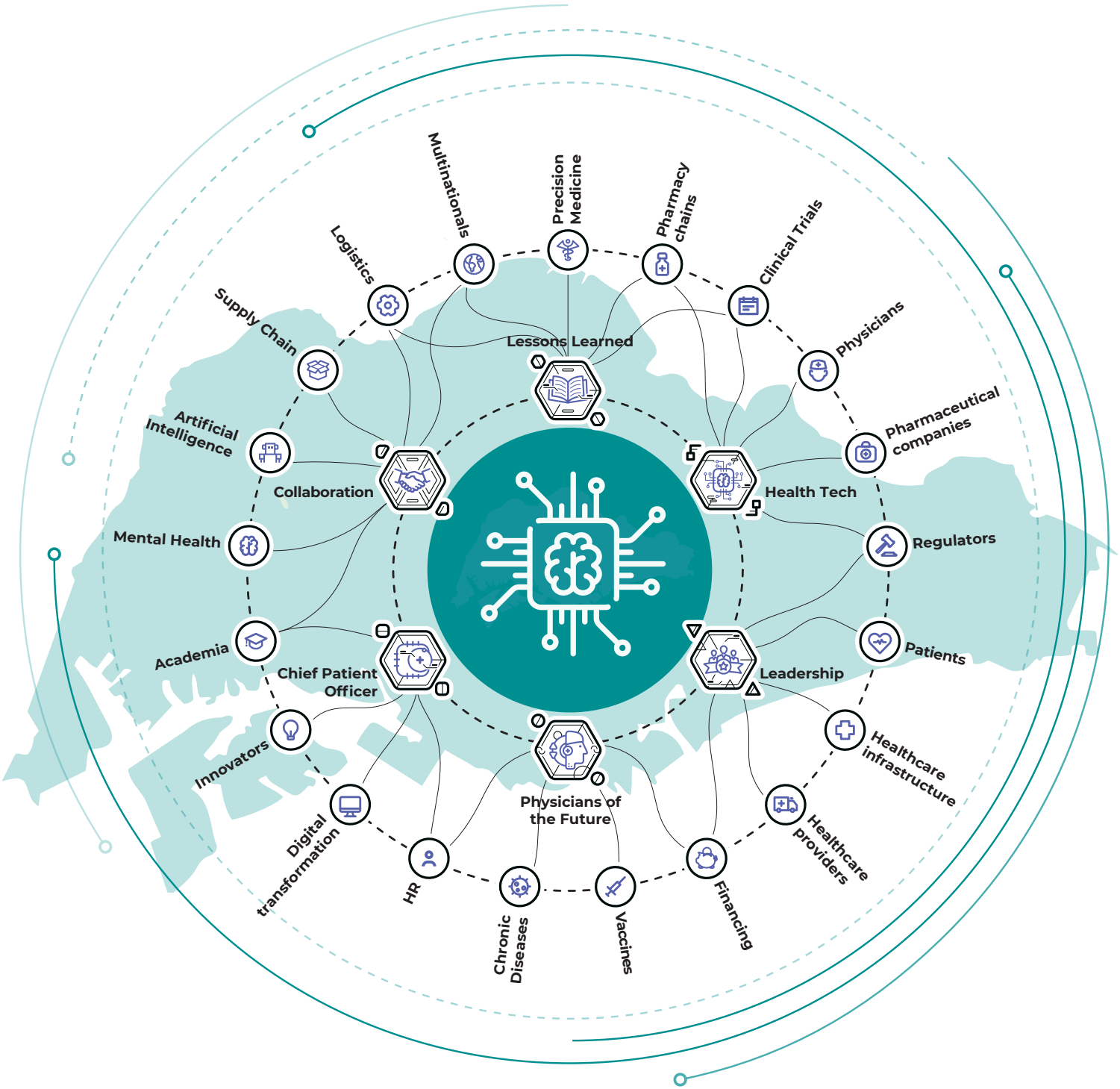

Stewards of Healthier Singapore 2023

EXECUTIVE FORECAST

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FORECAST

Executive Forecast Singapore: Stewards of Healthier Singapore 2023

Produced by White Ink House LLC.

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Contributors

This industry effort results from the time invested by executives for executives.

Stewards of Healthier Singapore

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This industry effort is the result of the time invested by executives, for executives.

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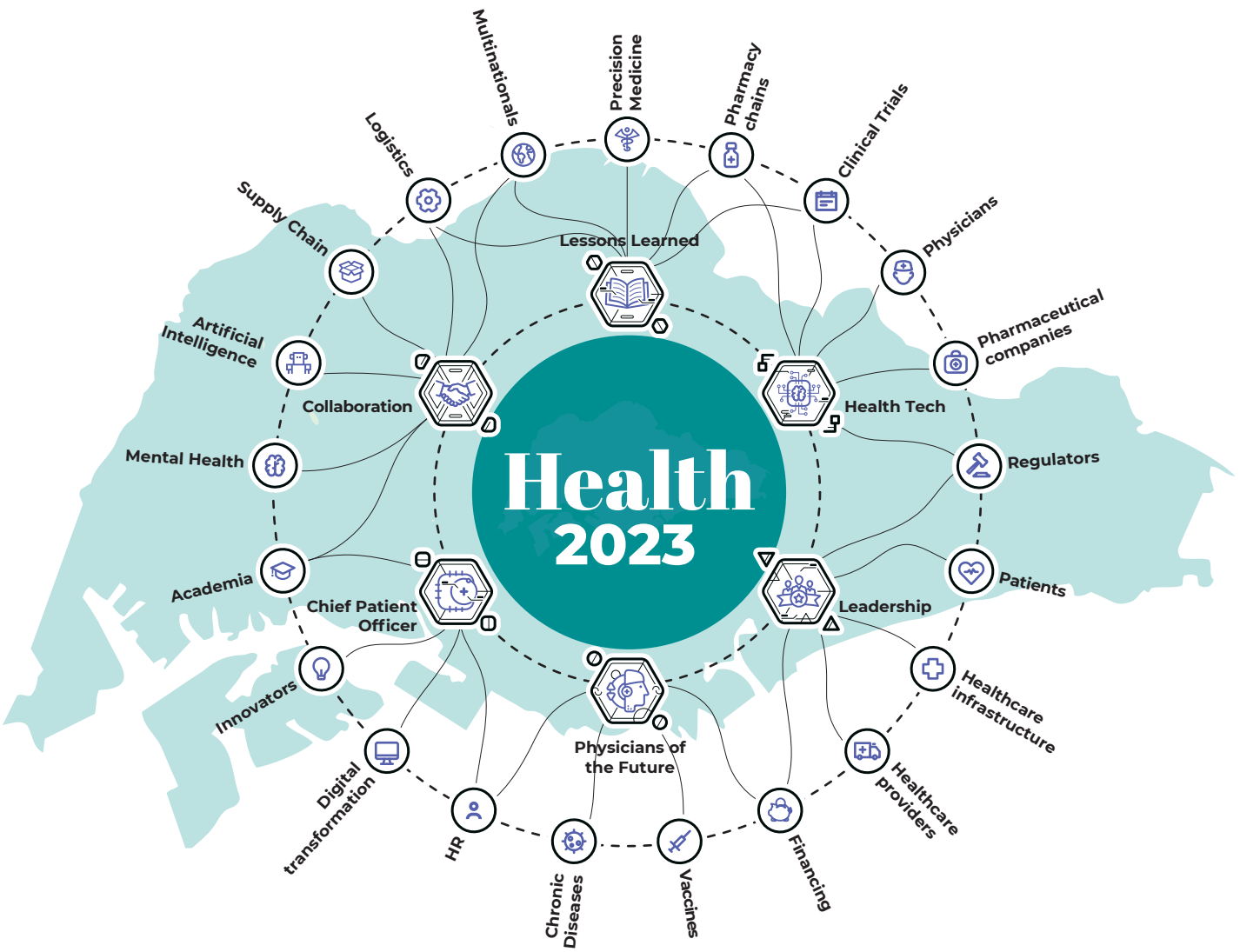

Health
2023
Multinationals
Precision Medicine
Pharmacy chains
Clinical Trials
Logistics
Supply Chain
Lessons Learned
Physicians
Artificial Intelligence
Collaboration
Health Tech
Pharmaceutical companies
Mental Health
Regulators
Academia
Chief Patient Officer
Leadership
Patients
Innovators
Physicians of the Future
Healthcare infrastructure
Digital transformation
HR
Chronic Diseases
Vaccines
Financing
Healthcare providers

Table of Contents

Executive Summary

Executive Forecast is proud to present this report highlighting Singapore's strategic role in an ever-evolving healthcare landscape. This report comprises conversations with high-level executives from Singapore's diverse healthcare ecosystem to showcase the work they are doing to establish the island nation as a hub for the APAC region, an innovation and R&D powerhouse, and an global healthcare management reference.

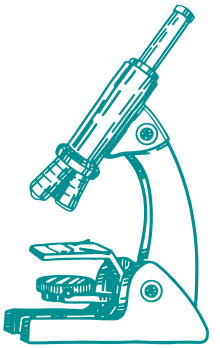
This forecast showcases the most compelling aspects of our dialogues throughout 2023 and aspires to draw light on challenges and prospects within the life sciences sector. Ultimately, we seek to establish an 'industry forward' perspective that prioritizes patients' well-being, highlights the system's endurance, bolsters business development, and shapes future policy.

As geopolitical challenges continue to shape the healthcare landscape, this report serves as a foundation for informed decision-making and actions. By addressing these issues head-on, the industry can work towards building more resilient healthcare systems. We hope this report inspires stakeholders to unite, driving positive change and progress in the healthcare sector.

Chapter 1

Singapore's Healthcare Agenda

Future-Proofing Healthcare



Singapore has 5.6 million people, a population similar to Barcelona, Guadalajara, or Nairobi, yet the country occupies a strategic role in the innovation world map far beyond its size. Its value comes from shaping policies and frameworks that enable R&D, and from being a market open and sizable for access strategies. "*One of Singapore's biggest assets is its stability. The policies prioritize businesses which in turn contribute to the country's stability. The government values private initiatives within the country and this is conducive for us to expand our robust footprint in the country.***" Illustrates Erika Pagani Country Manager of Pfizer Singapore.**

Singapore has achieved world-class standards in healthcare. According to the World Health Organization (WHO), its healthcare system ranks sixth globally and offers the fourth-best healthcare infrastructure in the world. The country also serves as the healthcare and medical hub of the region and Asia's best healthcare system. This makes Singapore a perfect ecosystem to advance and implement initiatives.

As an example, at the heart of Singapore's Smart Nation Journey we find the Ai's "Chronic disease prediction and management" project which combined with " Healthier Singapore" initiative focuses on Singaporeans being proactive in managing their health, prevent chronic diseases and lead healthier lifestyles. This is a prime example of an 'innovation first' embedded mindset, supported by technology and translated to society through forward thinking policy.

Coupled to a rapidly evolving economy, social progress, and an innovation-forward framework, COVID 19 has accelerated healthcare policy implementations, and bolstered Singapore's strategic contribution to the global healthcare scene.

"Although Singapore is a small country, it has a highly developed economy and healthcare infrastructure. It is digitally advanced with high internet penetration, mobile internet, and high adoption of social media and digital services, such as e-commerce. The government is collaborative and facilitates progress. Our Singapore-based team is engaged with the Ministry of Health to test some ideas before scaling across the region." Shares **James Chiang, VP & GM Asia for embecta**, the global diabetes giant.

Singapore's enduring political unity, ability to recognize and establish national priorities, and consistent search for collective well-being and social harmony have enabled Singapore to achieve outstanding success in many areas. *Its 'business-friendly'environment and 'reliable legal framework', are fundamental to attracting investors, R&D, and startups, which translates into shaping one of the world's most dynamic healthcare innovation ecosystems.*

Zainab Sadat, GM Southeast Asia, Abbott, knows that especially after the pandemic. "Localization is becoming a trend." On its path to creating a more sustainable healthsystem, Singapur is looking to produce locally and become a strategic distribution point to the rest of Asia. *As Mrs. Sadat elaborates,"This leads to technological transfers. In the process, nations become more self-sufficient and open-minded to collaborating with different key stakeholders and organizations in the future."*

This tendency can already be observed in Singapore's government agencies. These institutions colaborate closely with the private sector to promote health tech innovation. Some examples are the Economic Development Board (EBD), which actively works to strengthen the local health tech ecosystem, and the National Health Innovation Centre (NHIC) who aims to improve healthcare delivery and patient care by accelerating the development of innovative technologies and services. Along the same lines, **Yeoh Ying Ying, GM at Roche Singapore,** believes Singapore will play a role in navigating change in the Pacific region, "*Singapore's regulatory body will become a future reference for other countries in the region for making decisions on risk value assessment.*

This could be true for Health technology assessment (HTA) and access policies. Singapore can play an influential role in the region by pioneering healthcare for the future." Ms. Ying is particularly interested in this area due to the sheer potential of public-private partnerships in healthcare, especially because the government channels efforts into attracting investments and works closely with all industries. "*We are working to shape a broader and sustainable healthcare ecosystem that has a strong network of public-private partnerships. Collaboration is key and we must all be on the same page to shape the future of the pharmaceutical scene in Singapore.*"

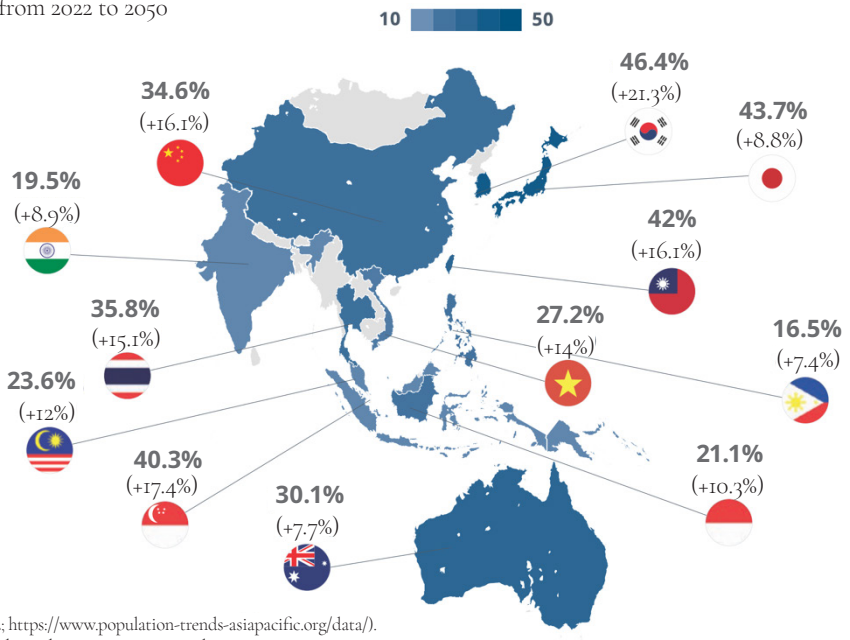
According to a 2020 Fitch Solutions report, *by 2029, Singapore healthcare's market is expected to more than double to $49.4 billion. Singapore's healthcare spending, comprising both public and private, is expected to account for 5.9% of GDP and could go up to 9% by 2029. This increase is largely attributed to rising government spending on healthcare and the local population's consumption of healthcare services, given the aging population and a trend towards earlier diagnosis of chronic conditions, close monitoring, and follow-up.* Government healthcare expenditure is expected to reach $36 billion by 2029. The Fitch report, however, estimated a modest rise in private healthcare to $13.5 billion in 2029.

The Young & The Elderly

In 2030, the Singapore population aged 65 and older is projected to triple. The elderly population may spend nearly twice as many days in the hospitals as those below 65, rising per capita spending for senior healthcare. According to IQVIA GoldenTrack from September 2023's "The geography of the world's oldest regions is shifting from the West to Asia Pacific, with 1 in 4 people reaching 60 years of age by mid-century. The elderly – growing faster than any other age group – is set to be the most important consumer growth segment in the foreseeable future."

2050 PROJECTION OF AGED 60+ (% OF TOTAL POPULATION

Absolute % change from 2022 to 2050



Source: United Nations (2022; https://www.population-trends-asiapacific.org/data/). Projection may vary slightly depending on sources quoted

How can the healthcare sector become appealing to the younger generations?

"One thing I look into is behavioral change with digital adoption; I wonder if we could consider aspects such as gamification. We have examples of this for rehabilitation by putting patients in front of a TV and getting them to do exercises through guided apps, making it interesting and fun, so it's not just a set of exercises to follow. *To draw younger generations would be to utilize some aspect of their creativity, and of course, there is always the more serious side of things, such as research which requires going into depth. The COVID-19 mRNA vaccine, for example, uses AI in its mRNA sequence design; there will most likely be more utilization of such aspects, which could prove attractive to the younger generations.*" **Karen Yu, Country Manager of Roche Diagnostics Singapore.**

Snapshot Facts April 2023

Healthcare Outcomes:

Singapore consistently ranks high in global health outcomes, including life expectancy, which stood at about 83.5 years in 2020, according to the World Bank.

The country also has one of the lowest infant mortality rates in the world.

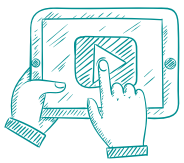
Healthcare Spending:

Total healthcare expenditure in Singapore has been on the rise as the population ages and demand for medical services increases. In the past, it accounted for around 4.9% of the GDP, according to the Ministry of Health (MOH).

Healthcare Infrastructure:

Singapore had over 10,000 hospital beds across its public and private hospitals as per recent data.

The country is known for its high density of healthcare professionals, with a high doctor-to-patient ratio compared to global averages.



Digital Health Initiatives:

The implementation of the National Electronic Health Record (NEHR) system is a testament to Singapore's commitment to digital health.

Singapore has also been at the forefront of telemedicine, which gained traction during the COVID-19 pandemic and continues to expand.

Research and Development:

The Research, Innovation, and Enterprise (RIE) 2025 plan has been put in place to continue driving R&D efforts in the health and biomedical sciences sector.

Investments in health and biomedical sciences R&D under the RIE2025 plan are expected to exceed those from the previous RIE2020 plan, which allocated more than S$3 billion over five years.

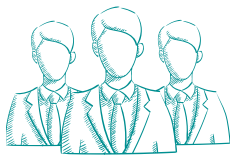
Pharmaceutical and Biotech Industry:

Singapore's biopharmaceutical sector has attracted multiple multinational corporations, which have set up manufacturing and R&D centers in the country. This includes companies like Pfizer, GlaxoSmithKline, and Novartis, among others.

The country's pharmaceutical exports have been increasing, reinforcing its role as a hub for the pharmaceutical industry in Asia.

Health Initiatives:

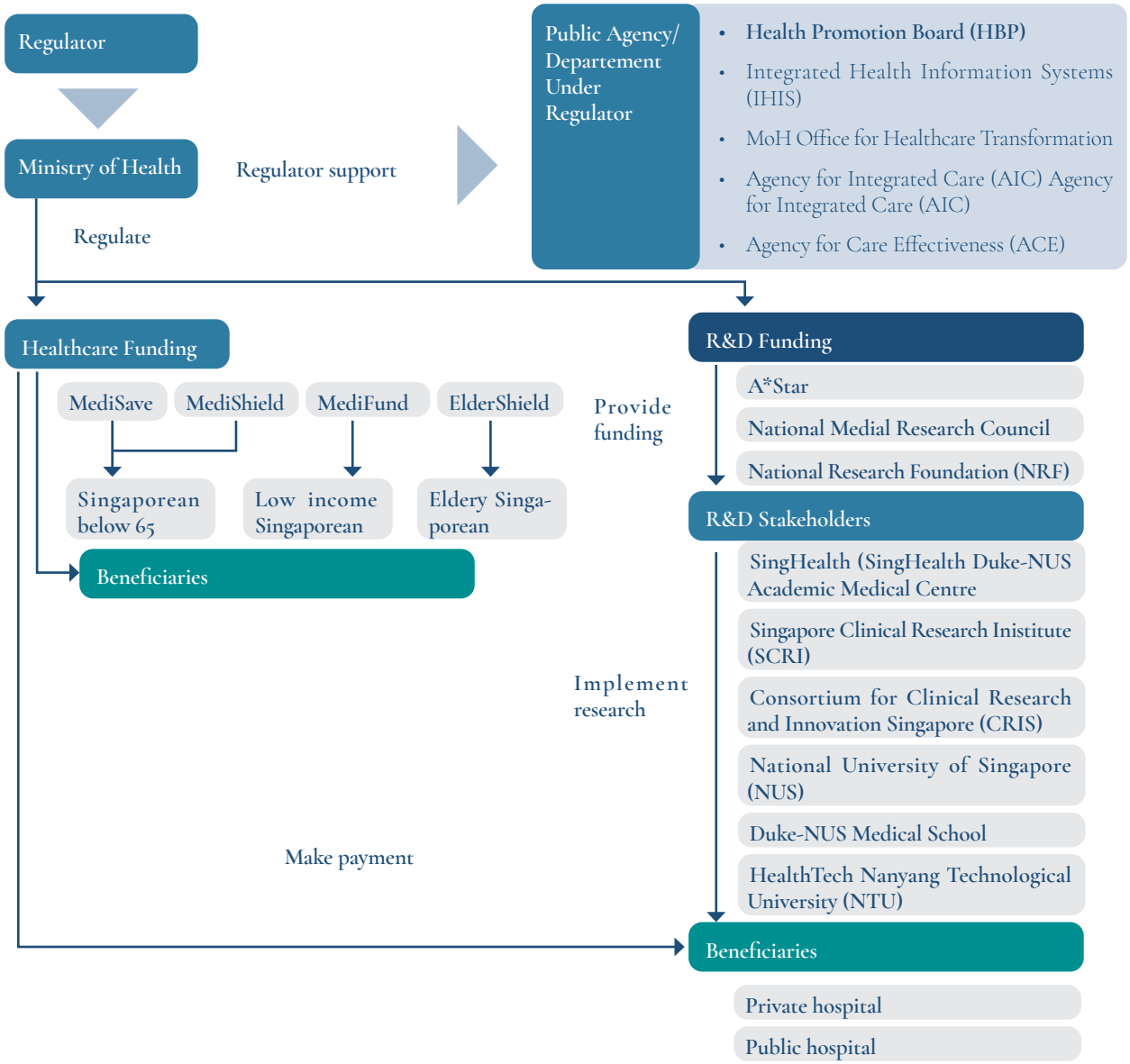
Healthier SG, an initiative launched by MOH, aims to promote preventive healthcare among Singaporeans, focusing on personalized health plans and greater community support for healthier lifestyles.



Aging Population:

With one of the fastest-aging populations in Asia, Singapore has been preparing to meet the increased healthcare needs through initiatives like the Action Plan for Successful Ageing and increased investment in eldercare services.

HEALTHCARE SYSTEMS ECOSYSTEM MAP



The public healthcare system of Singapore, is financed via the Central Provident Funds (CPF). A mandatory social security savings plan which consists of workers and employers making a monthly contributions to the fund in any of the accounts, "3M" (Medisave, MediShield, and Medifund) and ElderShield. The multipayer health care financing framework means that a single treatment episode might be covered by multiple schemes and payers, often overlapping.

MEDISAVE

- National health insurance plan.
- 7-9% of monthly salary up to SGD 41K
- Pay for in-patient and outpatient treatment

MEDIFUND

- Endowment fund by the government for excess healthcare expenses
- Approved amount depends on the financial, health, and social situation

MEDISHIELD

- Supplementary plan from Medisave
- For long-term hospitalisation and outpatient treatment of certain serious diseases
- Eligible for people under 85 years old

CareShield/ ELDERSHIELD

- Auto-enrolment for citizens and permanent residents at age 40
- Monthly payouts of SGD 300 or SGD 400 per month for up to 5 or 6 years for elderly with severe disability.

Private financing is also available and there are five for-profit insurance providers, which are regulated by the Singapore Actuarial Society (SAS). These are American International Insurance, Aviva, Great Eastern Life, NTUC, and Prudential Insurance. Their plans offer coverage for inpatient and outpatient medical expenses, surgical expenses, treatment of critical illness, disability, and long-term care.

Stats

5.64 Mil

3.4%
growth over previous year

TOTAL POPULATION in 2022
(as at end-June)

4.07 Mil

2.2%
growth over previous year

RESIDENT POPULATION in 2022
(as at end-June)

3.8
in 2022

4.0
in 2021

OLD-AGE SUPPORT RATIO
(residents aged 20-64 years per resident aged 65 years and over)

LIFE EXPECTANCY AT BIRTH
(Years)

28 DOCTORS
78 NURSES
5 DENTISTS
per 10,000 Population in 2022

7,688 PERSONS[1]
per Sq Km in 2022

Healthcare & R&D Ecosystem and Stakeholders

The Ministry of Health has centralized certain functions to prevent fragmentation and to encourage economies of scale. National organizations with important functions include the following:

Public Agencies

• *Ministry of Health (MOH)*

Manages the public healthcare system to ensure high quality and affordable basic medical services to Singapore residents. Licenses and regulates all healthcare establishments.

• *Health Promotion Board (HPB)*

Acts for health promotion, disease prevention and patient education. Establishes, engages and supports local and international partnerships.

• *Integrated Health Information Systems (IHIS)*

Technology agency for the public healthcare sector which digitizes, connects, and analyses Singapore's health ecosystem.

• *MOH Office for Healthcare Transformation*

A MOH unit which takes an experimental and evidence-based approach to reshaping healthcare in Singapore.

• *Agency for Integrated Care (AIC)*

Coordinates and supports efforts in integrating care to achieve the best care outcomes. Informs caregivers and seniors on staying active and aging well, supports and connects partners to strengthen their potential to provide quality care.

• *Agency for Care Effectiveness (ACE)*

Improves patient outcomes and healthcare value, drives evidence-based practice, gives healthcare guidance, and helps stakeholders make better choices.

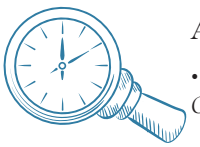
R&D Funding

• *National Medical Research Council*

The National Medical Research Council, established in 1994, oversees the development and advancement of medical research in Singapore. It provides research funds to healthcare institutions, awards competitive research funds for individual projects and is responsible for the development of clinician-scientists through awards and fellowships.

• *National Research Foundation (NRF)*

NRF was established as a department in the Prime Minister's Office. The NRF sets the national direction for R&D by developing policies, plans and strategies for research, innovation and enterprise. NRF provides funding to MoH through NMRCalong with direct funding through fellowship and grants.



Academic & R&D Institutions

• *SingHealth (SingHealth Duke-NUS Academic Medical Centre)*

A network of hospitals, national specialty centers, community hospitals, and polyclinics offering over 40 clinical specialties. Drives innovation to provide accessible and quality healthcare. Converges clinical care, education, and research.

• *National University of Singapore (NUS)*

The oldest higher education institution and the first autonomous research university in Singapore. Has a research-intensive medical school that provides innovative education and research to transform the way diseases are understood, diagnosed, and treated.

• *Agency for Science, Technology and Research (A*STAR)*

Leading public sector R&D agency. Bridges the gap between academia and industry through open innovation, collaborates both with public and private actors.

• *Singapore Clinical Research Institute (SCRI)*

National academic research organization dedicated to enhancing the standards of clinical research capabilities. Pilots scientific collaboration and research innovation to achieve better treatment outcomes for patients.

• *Consortium for Clinical Research and Innovation Singapore (CRIS)*

Provides synergies and develops strategies for nation-al-level clinical research under the stewardship of MOH. Brings together five entities:

• *Singapore Clinical Research Institute (SCRI)*

• *National Health Innovation Centre Singapore (NHIC)* • *Advanced Cell Therapy and Research Institute Singapore (ACTRIS)*

Healthcare Providers

• *Public hospitals*

Provide 80% of healthcare (inpatient, outpatient, and emergency services) and employ the majority of medical staff. Clustered into 3 groups: National University Health System (NUHS), National Healthcare Group (NHG), and SingHealth

• *Private hospitals*

Provide the remaining 20% of healthcare (clinics and hospitals). Generally offer better service level and minimum waiting times. Shared between two hospital groups: Parkway Pantai and Raffles Medical Group.

3 PUBLIC HEALTHCARE CLUSTERS

SingHealth	NUHS	National Healthcare Group
4 general hospitals	2 general hospitals	3 general hospitals
5 national specialty centres	3 national specialty centres	1 national specialty centre
8 polyclinics	7 polyclinics	7 polyclinics

Source: https://www.singstat.gov.sg/modules/infographics/population

POLICY FRAMEWORK

Healthcare Regulatory Policies

Singapore's healthcare system is underpinned by stringent government oversight, ensuring efficient service delivery and cost-effective pharmaceutical distribution. The Health Sciences Authority (HSA) upholds this regulatory framework, ensuring drug and medical device safety and compliance with strict standards.

Demonstrating flexibility, the HSA swiftly implemented the Pandemic Special Access Route (PSAR) during the COVID-19 crisis, speeding up the approval of essential medical products. This adaptability underlines the authority's effective emergency response without compromising on safety protocols.

Pharmaceutical and medical device firms must secure HSA approval before entering the Singapore market, a measure that guarantees only high-quality, safe healthcare products are available to consumers.

Organizational Healthcare Policies

Singapore's healthcare system is marked by significant government stewardship, with over 80% of hospital beds managed by public entities. While these hospitals operate competitively in the market, they are primarily driven by public service over profit.

The government's ownership over these quasi-private institutions provides a unique vantage point to shape healthcare services directly, bypassing the red tape often associated with private healthcare. This enables a nimble and aligned healthcare delivery that serves the national interest and public health efficiently

What is the unique position of private hospitals in Singapore?

"To better understand the healthcare setup in Singapore, it is important to consider the roles of private and public hospitals. *Private hospitals in Singapore are primarily designed to address acute issues, with patients typically staying for around three days. However, this means that the disease burden and conditions treated in private hospitals may not be representative of the population*, as those with chronic or geriatric conditions are more likely to seek treatment at public hospitals. This is due to government subsidies and incentives like the Pioneer Generation program, where some of the more elderly patients receive a high-level subsidy. Therefore, it is in their best interest, if they have a long-term ailment, to be treated in a public hospital. *Private hospitals like those under IHH Healthcare Singapore are uniquely positioned to provide quick diagnosis, intervention, and short stays for patients with acute issues."* Shares **Dr. Peter Chow, CEO, Mount Elizabeth Novena Hospital**

Fiscal Healthcare Policies

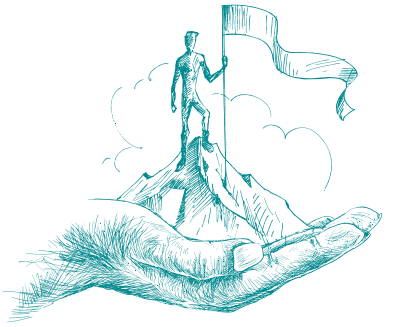
Singapore channels its tax revenues to make healthcare affordable, offering subsidies to public healthcare institutions and tax breaks for medical savings. Public hospitals receive funds through a mix of case-based payments and block grants. As of 2021, the MOH ensures a minimum of 30% subsidy on hospitalization costs in public facilities, scaling up to 80% for certain cases. Low-income citizens benefit from capped outpatient costs at 30% and receive additional subsidies for specialist outpatient treatments.

The MOH has also introduced an online calculator, aiding citizens to estimate medical costs and understand how much is covered by national healthcare schemes, Medisave and Medishield. This initiative helps in preventing unnecessary treatments by promoting financially informed healthcare decisions.

Digitalization Efforts:

The HSA has been making strides in digitalization to improve efficiency. The implementation of digital tools like the online treatment cost calculator provides efficient public access to healthcare information and aids in decision-making.

The Healthcare Opportunity
An Agenda for a Healthier Singapore



"One of Singapore's biggest attractions is how future-centric it is. Singapore's vision is to become a digitally transformed nation. It aligns with my vision and Roche's vision to build sustainable and resilient health systems that are future-proof. This vision will help us pilot the future and what it could look like. As a result, they are strongly committed to building competitive Singaporean talent and are open to skills from beyond the borders." **Yeoh Ying Ying, GM Roche Singapore**

Singapore has artfully integrated its healthcare sector into its broader economic strategy, positioning itself as a beacon for innovation amid the evolving landscape of multinational corporations, burgeoning startups, and tech-driven business models. The nation has consistently embraced a health-centric approach in its economic development plans.

The Singapore Economic Development Board (EDB), an arm of the Ministry of Trade and Industry, is pivotal in crafting policies that bolster Singapore's stature as an international nexus for business, innovation, and skilled professionals. It plays a critical role in attracting investment and partnering with businesses to innovate, increase productivity, and drive growth through new ventures based in Singapore.

Renowned for its sophisticated manufacturing sector, Singapore is deeply invested in high-tech production, ranking as the world's fifth-largest high-tech product exporter. Following the Research, Innovation, and Enterprise (RIE) 2025 plan, succeeding the RIE 2020, the government is channeling substantial investment—exceeding S$25 billion over five years—to elevate Singapore's manufacturing and engineering sectors, emphasizing digital and technological advancements.

In line with fostering a health-conscious society, the government launched Healthier SG, spearheaded by the Ministry of Health (MOH). This forward-thinking initiative is designed to revolutionize healthcare by encouraging preventive measures. It empowers Singaporeans to actively manage their well-being, fend off chronic illnesses, and enjoy robust support for healthier living choices. Through Healthier SG, the government aims to facilitate an ecosystem where individuals, healthcare providers, and the community collaborate to achieve better health outcomes, embodying the shift towards a preventive and personalized healthcare paradigm

Embecta is shifting towards a decentralized care model, claims **James Chiang, VP & GM, Asia,** "working to delay the onset of diabetes-related complications which aligns with the government's **Healthier SG** initiative." Chronic disease management and decentralization of care are common themes that all health systems have to deal with. Asia is highly connected and developed digitally, with one of the highest mobile internet acceptance and usage rates before COVID, which has been exponentially accelerated. *"The Ministry of Health in Singapore is launching a multi-year initiative that aims to shift the focus from "Sick Care" to "Health Care," achieved through a preventive care strategy that involves family physicians.* Due to our expertise in diabetes care, embecta has a significant role in this initiative. There is much work to be done in the diabetes care space, so we are naturally looking at partnerships within this ecosystem to develop a comprehensive solution."

"Although we are in the private sector, we are closely aligned with the government's objectives to utilize healthcare resources in a more effective and cost-efficient manner to achieve better outcomes in healthcare," affirms **Dr. Peter Chow, CEO at Mount Elizabeth Novena Hospital.** *The government's "Healthier SG" campaign will improve the population's health and control rising healthcare costs. The concept of value-based healthcare focuses on taking a longitudinal view of healthcare, rather than simply cutting costs at specific interventions."* Mount Elizabeth Novena Hospital prioritizes value-driven outcomes and is exploring the better use of big data and AI to enhance interventions, both at the individual institution level and the broader population level beyond hospital borders. For Dr. Chow, "this involves collaborating more effectively with primary care partners and sister units to improve integration. The challenge lies in understanding the cost of managing chronic conditions and their associated outcomes."

Karen Yu, Country Manager at Roche Diagnostics, Singapore, believes Singapore is among those who support the movement into preventative care through programs such as **Healthier SG**. *"With the Ministry of Health, we are transforming the direction for managing care. Post-COVID, there are many opportunities for digital adoption and telemedicine. We must work with policymakers in shaping the future of healthcare in the context of digital adoption to impact users." Ms. Yu states that taking behavior change into preventative care is the future,* and "in diagnostics, we play a role with the government and various stakeholders. Insurance companies are aligned with this trend as they are focused on preventive care, and the focus should be on collaborations across the ecosystem and bringing the future of healthcare."

Raakhi Khera Sippy, the VP and GM at GSK Singapore, acknowledges the changing age dynamics in the country as a catalyst for bringing together various parties with a focus on preventative healthcare. *"Singapore is facing a demographic shift with an increasing number of elderly citizens. In collaboration with the government, we're supporting the most significant health system overhaul in twenty years — Healthier Singapore,"* she states. She notes that GSK is realigning its product offerings to meet the needs of Singapore's elderly: "Our portfolio is evolving to include groundbreaking treatments and health interventions, from cancer care and therapies for multiple myeloma to a range of vaccines aimed at diseases commonly affecting older adults. These initiatives are part of our commitment to enhancing the health of Singapore's citizens, particularly those over fifty."

In addition to an expanding elderly demographic, Singapore also contends with obesity, a common challenge in developed countries. *"Overweight rates are high in Singapore, 10.8% right now, meaning one in nine or ten people are obese,"* proclaims **Dr. Kwang-Wei Tham, Executive Director of the Singapore Association for the Study of Obesity**, who is fostering collaboration with major players to tackle this pressing issue, "The big pharma companies are powerhouses with very strong scientific departments and are indeed developing health, so we partner with them when they need feasibility trials." Dr. Tham hopes this privately funded research, along with public sector recognition, can pave the way for change, "Our government acknowledges Singapore has a problem; *recognition allows for financing and access to care for people living with obesity, increased funding for medical education, and empowered primary care physicians in terms of treatment and prevention, which is where we want to arrive."*

Beyond Singapore

Singapore's pharma leaders are tasked with a formidable yet inspiring challenge: to be part of the construction of a visionary model of progress that stands as a reference for the global stage. It's about creating a blueprint for excellence that propels the nation forward but also sets a gold standard for others to follow. As architects of change, our leaders are not just steering Singapore's trajectory—they're charting a course for worldwide innovation and sustainable success. With its strategic location, cutting-edge infrastructure, and unwavering commitment to innovation, Lion City has positioned itself as a thriving pharmaceutical research, development, and manufacturing hub within the Asia Pacific región.

"*Singapore continues to be an important hub for us, and that's why there has been an increase in investments,*" states **Raakhi Khera Sippy, VP & General Manager of GSK**, who has recently bolstered its presence in the country by increasing its manufacturing footprint and solidifying its commitment to collaborating with public entities. "We most recently opened our manufacturing facility in Jurong. Another important aspect is our oncology assets for Singapore and globally. This continues to be a key focus for us, and we continue to be a partnership hub at the heart of what we do; all stakeholders are equally important, including the Health Promotion Board and the Ministry of Health. It is also about how we partner to deliver innovative medicines and vaccines to the rest of the world. That is why Singapore is a global hub based in Asia."

Singapore is a "country of pilots" because there are so many pilot programs launched out of Singapore. The government is collaborative and innovative, making it relatively easier to get things going. Our team based in Singapore has engaged the Ministry of Health in Singapore to think about how we can leverage our regional hub in Singapore to test some ideas before scaling across the region.

There are a lot of different opportunities; South East Asia is a huge market and thanks to the high-level infrastructure, human talent available, its logistics and manufacturings footprints, *Singapore is a* great hub. "*the government is collaborative and innovative, making it relatively easier to get things going. Our team based in Singapore has engaged the Ministry of Health in Singapore to think about how we can leverage our regional hub in Singapore* to test some ideas before scaling across the region." **Shares James Chiang, VP Asia, embecta**

Aside from manufacturing, the country acts as a strategic market for multinationals to test innovative projects before rolling them out to the rest of the world, often informally dubbed 'the nation of pilots'. One such company capitalizing on this is Swiss multinational **Roche**, "*Strategically, Singapore is the project pilot hub for Roche. We pilot many projects internally and externally. We have visionary partners, key-taught leaders, and government bodies always willing to work on multiple projects with us. This is why Singapore is strategically important to us.*", says GM **Yeoh Ying Ying**. The company's vision for its Singapore operations aligns perfectly with that of the Government and Ying Ying, "*The government aims to become a biomedical hub in the region. It is exciting because as they go through a healthcare transformation, it provides us with the perfect opportunity to work together to figure out what good sustainable healthcare looks like*. Piloting the future of healthcare is exciting for me; this is my vision."

Source: EDB

Chapter 2

An Innovation forward Agenda

Professor Lee Chien Earn, deputy group chief executive officer of SingHealth shared " SingHealth's vision is to define tomorrow's medicine, and part of this mission is to innovate and to advance". He shed light on the multifaceted nature of these innovations, recognizing that they must occur at all levels—from individual patient care to systemic healthcare reforms—to truly transform the landscape of medicine." 2023 Asia Health and Life Sciences Innovation and Cooperation Summit (AHLSICS)

A Glimpse into Singapore's Innovative Ecosystem

Singapore's healthcare landscape has become a global paragon for its forward-thinking approaches in patient care, precision medicine, and the integration of technology in health services. Key players in the pharmaceutical and healthcare sectors have recognized the city-state's innovative edge, leveraging its strategic advantages to advance their missions and serve the community more effectively.

Novo Nordisk Pharma, a beacon in the field of endocrinology, particularly diabetes care, is one of such companies making substantial inroads within Singapore. "Our company was founded for a simple yet crucial mission: to make insulin accessible to everyone who needs it," shares **Parful Chakkarwar, Country Manager at Novo Nordisk Singapore.** This vision propels the company forward, reflecting a century-long commitment to chronic disease management and the desire to close the gap for the hundreds of millions affected by diabetes globally. "While over 450 million people have diabetes, only half are being treated, indicating a significant gap in meeting the necessary needs. It's this underserved population that drives Novo Nordisk's global mandate," Chakkarwar adds.

In pursuit of this goal, Novo Nordisk has introduced an innovative diabetes treatment in Singapore, poised to revolutionize glucose level management. This novel approach promises a smarter, simpler way for patients to manage their condition, possibly enhancing their daily lives and redefining the standards of diabetes care.

Equally transformative are the efforts of Roche Singapore, under the leadership of **GM Yeoh Ying Ying.** The pharmaceutical giant is pushing the boundaries in oncology through strategic partnerships that marry technology with healthcare. "Our commitment to research and clinical trials is reflected in partnerships with Oncoshot and Icon Cancer Centre to enable digitally integrated data to become better decision-makers for patients," Yeoh states. This collaboration aims to merge Roche's comprehensive genomic profiling (CGP) with Oncoshot's AI capabilities and Icon's patient data, creating a digital ecosystem that can expedite clinical trials and patient matching. "This collaboration shows how digitalization can enable better outcomes or faster decision-making," Yeoh highlights.

At the heart of these developments is a commitment to digitization, which Roche Singapore believes is key to optimizing clinical trial mapping and personalized treatment strategies. By integrating CGP and genomic testing data into the existing healthcare infrastructure, the aim is to bring precision medicine to the forefront of patient care, setting new standards for the industry.

Complementing these endeavors is Pfizer's vision, articulated by **Eirka Pagani**, the **Country Manager**. She holds Singapore in high esteem, not just for its present capabilities but also for its futuristic vision. "Singapore is well-positioned and already thinking twenty years into the future of how to collect data, make precision medicine, and understand the impact of interventions at a granular level," Pagani praises. She underscores Singapore's readiness to back Pfizer's evolution, thanks to its high connectivity and data-rich environment. "Singapore has the infrastructure to aid us in our transformation. We feed real-time data from vaccine drives and healthcare systems to R&D to improve our vaccines and products," she adds.

This narrative of innovation is further bolstered by Singapore's Economic Development Board (EDB), which underpins these advancements. The EDB fosters an ecosystem where healthcare meets industrial opportunity, drawing in investments and supporting the life sciences sector's growth. Its efforts ensure that Singapore not only leads in high-value manufacturing but also sets benchmarks for health tech innovations and preventive healthcare.

Novo Nordisk's drive for accessibility, Roche's digital integration in clinical decision-making, and Pfizer's data-driven evolution exemplify Singapore's prowess in navigating the healthcare sector's future. Each organization's initiative complements the city-state's holistic vision, establishing Singapore as a crucible of healthcare innovation, where patient care, technology, and visionary leadership converge to create a blueprint for global healthcare excellence.

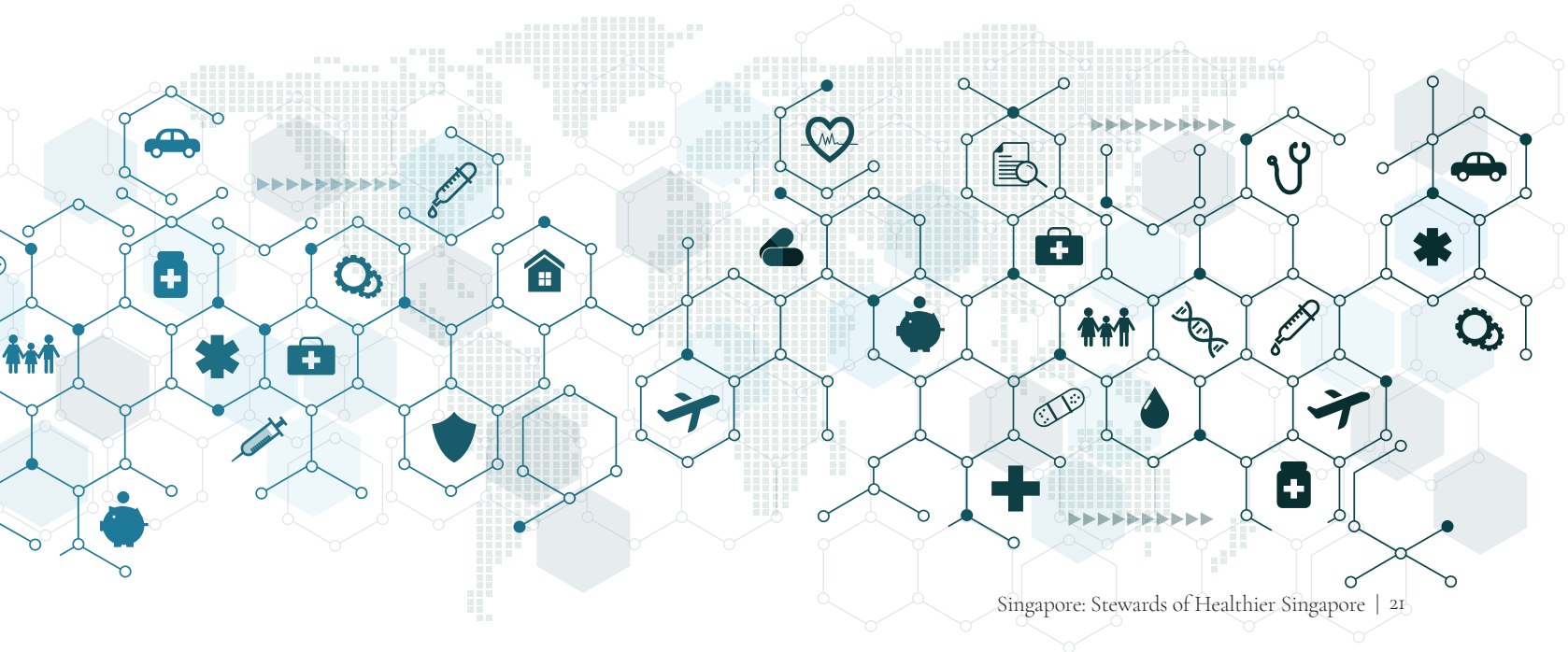
In conclusion, these leading pharmaceutical companies, with their distinct yet converging missions, underscore the transformative impact of Singapore's healthcare and pharma sectors. Their collective stride towards enhancing patient care through innovative treatments, digital integration, and precision medicine underpins the nation's forward-thinking blueprint for a healthier tomorrow. It is this shared commitment to advancement and excellence that positions Singapore as a shining example for the world in healthcare innovation and management.

Healthcare R&D Overview

Singapore has an established reputation as a center for scientific R&D in Asia, particularly in technology and biomedical sciences since the 1980s. The National Science and Technology Board, succeeded by the Agency for Science, Technology, and Research (A*STAR), has propelled the country's R&D forward. Biopolis, launched in 2000 as a biomedical sciences center, has catalyzed research breakthroughs, with substantial outcomes in patents and publications. Under the RIE 2025 program, with SGD 25 billion allocated, Singapore prioritizes Human Health to drive post-pandemic economic growth and tackle aging population challenges. A*STAR anchors the R&D framework, promoting collaboration between academia and industry across various sectors including MedTech and pharmaceuticals. This strategic endeavor is bolstered by the robust network of research entities within Singapore's universities.

The non-exhaustive list of the most outstanding R&D institutes and centers in Singaporean Universities is as follows:

- Singapore Eye Centre
- Cancer Science Institute of Singapore
- Mechanobiology Institute, Singapore
- Bioinformatics Institute
- Bioprocessing Technology Institute
- Genome Institute of Singapore
- Institute of Bioengineering and Nanotechnology • Institute of Medical Biology
- Institute of Molecular and Cell Biology
- Experimental Therapeutics Centre
- **Biopolis - biomedical research and development (R&D) hub**
- **S*BIO - a biotech company focused on the research and clinical development of novel targeted small molecule drugs for cancer treatment.**
- **Drug Discovery and Development Unit (D3) - a national platform for drug discovery and develop- ment set up in 2019.**



Innovation Flow

In Singapore, R&D endeavors are shaped by both national priorities and the specific interests of hospital clusters like NUHS, NHG, and SingHealth, each with its unique research focus. For example, while NHG emphasizes clinical applications, NUHS dedicates itself to diseases prevalent in Asia. These clusters operate autonomously in their R&D choices, addressing pressing healthcare concerns, with funding for large-scale projects often sought from the Ministry of Health (MOH).

The country's Health Sciences Authority (HSA) regulates medical devices, mandating pre-market approval and classification by risk. Singapore aligns with international standards, facilitating streamlined registration for foreign devices.

Competition for MOH and NRF funding encourages innovation, while Singapore's adherence to TRIPS and favorable IP laws, coupled with tax incentives, solidify its position as a conducive environment for R&D commercialization.

Certainly, Singapore has been successful in attracting a number of multinational pharmaceutical and medical device companies to set up manufacturing, clinical research, and R&D facilities in the country. Partnerships with agencies like the Economic Development Board (EDB) have been instrumental in this. Here are some examples:

Pfizer: In collaboration with EDB, Pfizer has established one of its first manufacturing technology development centers in Asia in Singapore. This site focuses on developing innovative manufacturing technologies and processes for its global network.

GlaxoSmithKline (GSK): GSK has a significant presence in Singapore, with investments in manufacturing and R&D. Their vaccine manufacturing facility in Tuas is an outcome of the partnership with Singapore's EDB, which is also a hub for pediatric and adolescent vaccines.

Abbott Laboratories: With a nutrition R&D center in Singapore, Abbott has leveraged the country's scientific talent pool and research capabilities, supported by EDB's strategic initiatives to advance research in medical nutrition and diagnostics.

Medtronic: Medtronic operates its Asia-Pacific regional headquarters in Singapore and has expanded its presence with the support of EDB, focusing on R&D as well as manufacturing activities for medical technology used in areas such as cardiac and vascular diseases, diabetes, and neurological conditions.

Roche: Roche has its Asia-Pacific pharmaceuticals and diagnostics headquarters in Singapore. With EDB's assistance, it has set up a production site and a regional center for applied science, which focuses on clinical research and diagnostics development.

Novartis: Singapore hosts one of Novartis's global service centers, which includes business services and digital operations. Their investment has been part of a broader strategy to optimize R&D capabilities, partially facilitated by the supportive policies of the EDB.

Sanofi: In partnership with the EDB, Sanofi has made significant investments in Singapore, including a regional hub that focuses on clinical trial coordination and management, among other activities.

These collaborations illustrate Singapore's attractiveness as a strategic location for the healthcare industry, bolstered by its commitment to creating a conducive environment for high-value manufacturing and innovative research, with government agencies like the EDB playing a central role in this growth.

The Geopolitical Impact on Healthcare Investment

In the complex landscape of global health, therapeutic areas have become arenas where geopolitics and investment intersect. As nations navigate the complexities of healthcare, the focus on specific therapeutic areas is not just a matter of public health but a strategic lever that commands attention—and consequently, investment. The aphorism "people don't invest in what they don't understand" rings particularly true in the realm of healthcare, where understanding precedes the willingness to allocate resources.

The geopolitics of health is inherently tied to the knowledge economies possess about diseases and treatments. Take, for instance, the surge in investment in virology and immunology triggered by the COVID-19 pandemic. This global health emergency transformed the once-niche fields into geopolitical priorities, capturing the attention of policy makers, investors, and the pharmaceutical industry at large. As understanding grew, so did the funds flowing into research, development, and distribution of vaccines and antiviral therapies.

Similarly, the increasing global burden of chronic diseases such as diabetes and heart disease has prompted a shift in focus. Countries with a higher prevalence of these conditions have recognized the need to advance their therapeutic strategies. It is no coincidence that these are also the areas seeing significant innovation and financial backing. The link between understanding the impact of these diseases and the commitment to invest in their management is clear and compelling.

Healthcare investment is more than a matter of public health; it is intertwined with economic resilience and international influence. Nations that champion medical breakthroughs not only bolster their public health but also enhance their geopolitical stature.

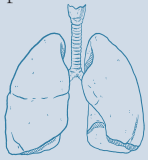
"Non-communicable diseases (NCDs) pose one of the most significant healthcare challenges of our time. In Asia alone, NCDs – including asthma, COPD, and chronic kidney disease - claim an estimated 8.5 million lives yearly. In addition, Asia bears the heaviest burden of lung cancer, contributing 62% of global lung cancer deaths. " Shared **Sylvia Varela Area Vice President Asia at AstraZeneca** at the 2023 Asia Health and Life Sciences Innovation and Cooperation Summit (AHLSICS) and called for collaboration across the region to drive sustainable healthcare systems.

The burden of disease is often measured by the prevalence of certain conditions and their impact on the healthcare system, as well as their economic and social implications. As of the last update, the following are considered some of the most significant health concerns in terms of burden of disease:

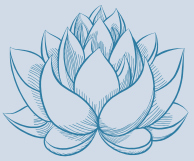
Cardiovascular Diseases: According to the Singapore Heart Foundation, cardiovascular diseases accounted for 29.3% of all deaths in Singapore in 2019. This makes it one of the leading causes of mortality.

Cancer: The National Registry of Diseases Office (NRDO) releases annual statistical reports on cancer. The Singapore Cancer Registry Annual Registry Report, for instance, noted that cancer accounted for almost a quarter of all deaths in Singapore.

Diabetes: The International Diabetes Federation (IDF) Diabetes Atlas provides information on the prevalence of diabetes by country. In their 9th edition, it was noted that Singapore has one of the highest prevalence rates of diabetes among developed countries, affecting about 10.5% of the adult population.



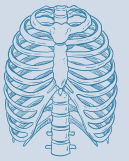
Respiratory Diseases: The Ministry of Health has highlighted chronic respiratory diseases as a significant concern, especially given Singapore's aging population.



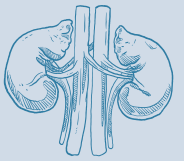
Mental Health Disorders: The Institute of Mental Health (IMH) in Singapore reported that about 13.9% of Singaporeans have experienced a mood, anxiety, or alcohol-use disorder in their lifetime.

Infectious Diseases: Data on infectious diseases such as COVID-19 are regularly updated by the Ministry of Health on their official website.

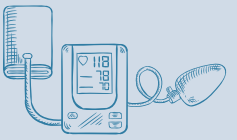
Neurological Disorders: The ageing population has led to an increase in neurological disorders such as dementia. The Well-being of the Singapore Elderly (WiSE) study reported that the prevalence of dementia among those aged 60 and above was about 10%.



Musculoskeletal Disorders: These are common causes of chronic pain and disability, as reported in studies like the Singapore Burden of Disease Study.



Chronic Kidney Disease: The National Kidney Foundation Singapore provides statistics on kidney disease, with reports indicating that about 10% of the population is affected by some form of kidney disease.



Hypertension: According to the National Health Survey 2020, 24.2% of the population aged 30 to 69 years have hypertension, with a higher prevalence among older adults.

The interview with Dr. Kiat Tan from SASO reveals a compassionate and determined approach to tackling obesity, emphasizing education, collaboration, and the dismantling of stigma. The insights provided highlight the ongoing challenges and dedicated efforts to manage and understand obesity in Singapore

Dr. Kiat Tan

Singapore Association for the Study of Obesity (SASO)

EF: What are the current priorities of the Singapore Association for the Study of Obesity (SASO)?

KT: SASO is pivotal in reframing obesity in Singapore. Our priority lies in advancing the understanding that obesity is not just a risk factor, but a complex disease. We're striving to shift the social perception and mitigate the stigma around obesity, ensuring that it's recognized and managed properly. Despite policy changes and interventions, obesity rates are rising, signaling a need to reassess our strategies. We emphasize ongoing lifestyle modification over temporary diets and aim to empower healthcare professionals to support individuals living with obesity, challenging the deep-seated misconception that obesity is a result of laziness or a lack of willpower.

EF: Could you elaborate on the overweight and obesity prevalence in Singapore?

KT: Singapore's overweight rates are significant, with roughly 10.8% of the population classified as obese. We've witnessed a concerning increase in obesity rates between 2004 and 2010, which has since plateaued. The goal isn't just to reverse the trend but to stabilize it to prevent a myriad of non-communicable diseases (NCDs). With an adjusted BMI cut-off for Asians, considering their higher body fat percentage at lower BMI thresholds, the health risk prevalence is alarmingly at 21%. It's clear that targeted and culturally relevant measures are crucial.

EF: What lessons and synergies can be transferred between the relevant associations?

KT: Knowledge exchange is vital. Each country or city with similar demographics can offer insights into effective obesity policies and initiatives. In Singapore, for example, the use of digital apps to encourage healthy behaviors showcases the potential for technology to support obesity management. Our role as a platform is to facilitate this sharing of best practices and learnings.

EF: In three years, SASO will celebrate its 25th anniversary; what achievements are you most proud of?

KT: The expanding interest and involvement in the field of obesity is heartening. We've seen a diversification in the range of healthcare professionals dedicated to obesity management. The collaboration fostered by SASO has enhanced our collective understanding and treatment of obesity. By pooling data and expertise, we've been able to make significant strides not just locally, but regionally.

EF: Singapore might be small, but it is a very value-driven market, just like your association. Is there a final message you would like to share?

KT: SASO is driven by the desire to create meaningful change for individuals living with obesity. We view our role as partners in their health journey, focusing on holistic improvements rather than solely on weight loss. Our commitment is to add value and quality to the lives of our patients, and in doing so, we continue to find inspiration and purpose in our work.

Centennial Celebration: A Journey of Innovation

This article integrates Novo Nordisk's past, present, and future, highlighting their impact on diabetes care and chronic disease management in Singapore and the world, in celebration of their 100 year celebration.

In the heart of Singapore's bustling metropolis, where modernity meets healthcare excellence, Novo Nordisk stands as a testament to a century of remarkable contributions to diabetes care. The company's unwavering dedication is perfectly encapsulated by **Praful Chakkarwar, Country Manager of Novo Nordisk Singapore**, as he reflects on the mission and values that have shaped their journey.

"Our company was founded for a simple yet crucial mission: to make insulin accessible to everyone who needs it," shares Chakkarwar. As the company celebrates its 100th anniversary, it continues to push the boundaries of what is possible in the treatment of chronic diseases. "For a century, we have been steadfastly dedicated to supporting people with chronic conditions, a testament to our unwavering philosophy and spirit," he adds, underscoring the company's long-standing history and its future trajectory.

Amidst a pandemic that challenged every sector, Chakkarwar took the helm in Singapore, with the global prevalence of diabetes looming large. "Globally, today there are over 450 million people with diabetes, but the number of patients being treated has come down dramatically," he explains, emphasizing the crucial gap Novo Nordisk aims to bridge.

The company's innovation extends its approach to obesity—a health concern that affects a significant portion of Singapore's population. Chakkarwar comments, "In Singapore, 1.7 million people are suffering from obesity-related issues; that's almost 1/3 of the population." Addressing obesity with sensitivity and expertise, Novo Nordisk is leading the way in transforming patient care and shaping public perception.

Reflecting on the lessons learned through the pandemic, Chakkarwar notes the vital importance of resilience and adaptability. "Understanding that you will be vulnerable despite the plans you may establish; and the need to master the agility to adapt and change is key," he states. This realization is driving Novo Nordisk's efforts in clinical research and collaborations, ensuring that its operations, both global and local, are agile and forward-thinking.

As Novo Nordisk delves into innovative treatments for conditions like Nonalcoholic Steatohepatitis (NASH) and cardiac-related complications, Chakkarwar's focus on community education and engagement remains strong. He describes the mission to educate on obesity as a two-fold challenge: raising awareness and equipping healthcare professionals with the knowledge to treat it effectively.

"Our pipeline in obesity aims to drive awareness, educate health professionals, connect those two factors through digital platforms, and work with stakeholders to connect patients with effective treatment," Chakkarwar outlines the comprehensive strategy to confront this multifaceted health challenge.

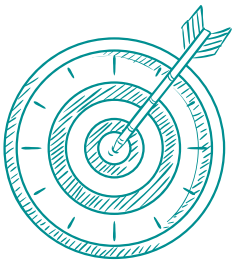
Looking ahead, Chakkarwar envisions a healthcare industry that prioritizes sustainable solutions and collaboration. "Not improving the patient's outcome is not in your good interest in the long term," he remarks, advocating for a patient-centric approach in the pharmaceutical realm.

As Novo Nordisk commemorates its centennial legacy, Chakkarwar's message to his team is poignant and forward-looking. "It's been 100 years, and we are still supporting people suffering from these diseases; this tells us the philosophy and the spirit have been right," he says. He encourages his team to remain driven by the clear, patient-driven objectives that have defined Novo Nordisk's past and will continue to guide its future endeavors.

The legacy of Novo Nordisk, mirrored in Chakkarwar's leadership, is one of passion, purpose, and unwavering commitment to enhancing the quality of life for those living with chronic diseases. As the company steps into its next century, it carries the torch of innovation and care, illuminating the path toward healthier futures for millions worldwide

Historically, Singapore has had one of the higher rates of diabetes prevalence among developed countries. A report released by the Ministry of Health in Singapore had indicated that one in nine Singaporeans has diabetes. Moreover, it was projected that Singapore could see more than 1 million people living with diabetes by 2050 if the trend continues.

Market Access strategies



Singapore's relatively small market size in terms of volume of patients, and its'access forward' policy makes it a unique canvas for companies to design market access strategies through partnerships, that consolidate commercial and distribution providing economies of bigger scale.

Such is the case of **DCH Auriga,** a leading Asian company in management solutions for healthcare companies. Its comprehensive end-to-end regulatory, commercial, and distribution solutions enable healthcare companies to access market opportunities in Asia."We are focused on strategic business pillars, pharmaceuticals, consumer/OTC, and well-medical devices. Our distribution platform enables our partners to reach customers in multiple channels. We provide demand-generation services in various therapeutic areas and channels. Our current portfolio of partners consists of various sizes from local, regional, and global players, with a healthy mix of products at every stage of the brand life-cycle," shares **Nicholas Yeoh, General Manager of DCH Auriga, Singapore**. "*We are committed to helping our partners navigate market complexities as they explore new opportunities in the dynamic landscape. We evaluate and work with our partners, assess their needs in the market, and roll out tailored solutions from an online or offline perspective, increasing value for our partners. For example, we rolled out robotic process automation in our ordering and tendering processes, improving order processing efficiency and costs in the long run.*"

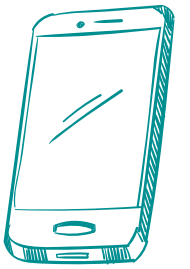
Similarly **DKSH, Singapore** manages multiple clients, and customers and covers orders for clinics and pharmacies. **Reuben Ong, DKSH's Vice President,** believes finding new creative and innovative problem-solving methods is vital when working in a healthcare company. He sees Singapore as the gateway to Asia and a market receptive to embracing innovation and the latest cutting-edge technology. "*The industry is innovating and creating tech products that allow patients to be in greater control of their health, some allowing connections via cloud to their health care providers. One of the biggest future trends is likely to be the uptake of health-tech wearables.*" DKSH is a strategic partner for companies overseas, who want to avoid the expense and complexity of coming to Singapore, as DKSH covers facilities and product registration, making the go-to-market simpler, *"We also manage different portfolios, aspects of volume and value, and my experience in these areas has been an advantage in building a network. DKSH also works on engaging with patients on a neutral platform to improve their treatment choices, empowering and educating them while crossing no ethical lines to help them differentiate between the truth, false truths, or half-truths, which abound on the internet.*

Healthcare in Singapore and the region more broadly is facing a number of concerns, whether it is addressing the rise in lifestyle and age-related chronic conditions; building future-proofed health systems that are prepared for future pandemics; or ensuring that healthcare providers can keep delivering and improving the healthcare standards that patients expect.

Healthcare costs are also growing much faster than wages. Personalized healthcare offers a way of meeting these challenges by making healthcare both more cost-efficient for providers through increased system efficiencies and more effective for the patients that rely on it, delivering better outcomes through more targeted treatments.

Moving forward, the focus will be on improving transitions of care between healthcare providers, strengthening its primary healthcare network, and increasing collaborations with partners within the community to better provide for the patient's needs and the population's health.

Big Pharma Embracing the Digital Shift



In the fast-paced world of pharmaceuticals, adaptation to technological advancements is not just an option; it's a necessity. Pfizer Singapore's recent stride into the digital domain is an exemplary tale of such an evolution. Erika Pagani, Country Manager of Pfizer, proudly states, "From the beginning of the year, we have incorporated digitalization into our corporate DNA." This move signals a shift from traditional methods to a digitally-centric business model that aims to improve customer engagement and operational efficiency.

Pagani elaborates on the monumental shift, emphasizing the importance of transitioning from an analog to a digital company. She acknowledges that integrating digitalization as a core component and strategy for market engagement is an ongoing process, with the establishment of KPIs and the implementation of new digital tools still underway. The urgency of this transformation was accelerated by the pandemic, requiring a swift adaptation to digital tools that were readily available.

The transformation at Pfizer Singapore is not just about adopting new technology but also about a cultural shift within the organization. "It took our mindset to change for people to understand the power of integrating," Pagani explains. The focus has transitioned from being marketing-driven to being scientifically driven, aiming for high-end, timely, and accessible conversations with customers.

The infrastructure in Singapore has been instrumental in Pfizer's transformation. With high connectivity and data availability, the nation provides a supportive environment for real-time data integration from vaccine drives and healthcare systems into R&D, thereby enhancing vaccines and products. Singapore's strong data infrastructure has been recognized and contributed to by Pfizer, as highlighted in a recent publication from the Saw Swee Hock School of Public Health.

Privacy concerns are paramount in this data-driven approach. Pagani is keenly aware of the ethical dilemma posed by data management and processing. "Privacy is very important, and more people should be aware of it," she notes, emphasizing the need to balance the use of private data to improve healthcare systems and outcomes. She lauds Singapore for its foresight in data handling and its potential to revolutionize precision medicine and granular impact assessment of interventions.

Meanwhile, **Raakhi Khera Sippy, VP & GM Singapore at GSK**, observes the market's changing landscape, affected by the digital revolution. "The pandemic has made a lasting impact, and digitalization in healthcare is here to stay," she asserts. Sippy points out that digitalization requires different strategies for different medical portfolios. Understanding the customer is crucial, and Sippy brings her experience from working in the field for five years before her tenure in Singapore, highlighting her passion for digital healthcare.

Roche Diagnostics, Karen Yu

What is the oncology strategy and the strategic importance of Singapore to the company?

"Roche is looking into working with the government to shape the ecosystem toward genomic profiling the Roche STCC (Singapore Translational Cancer Consortium). The data insights with various cancers provide information about what it will mean for us and potentially diagnostics. Looking further down the road, a certain genetic signature that is specific to certain cancers could be taken for research and diagnostics. *Personalized healthcare in oncology means matching the specific genetic mutation with a specific class of drugs, which can evolve into better and more specific care for individuals with specific mutations. We are also having this type of partnership together with pharma and moving into that healthcare ecosystem. This means leveraging our strength in pharma and diagnostics to drive efforts with the government and policymakers on how we can change and improve the outcomes of patients in the long run.*"

According to Sippy, aligning KPIs from the top of the organization to the bottom ensures seamless execution. She emphasizes the importance of keeping measures simple and outcome-focused rather than getting entangled in leading metrics, which can lead to disjointed execution.

Yeoh Ying Ying, GM at Roche Singapore, considers Singapore to be the potential project pilot hub for Roche due to its strategic position. "We pilot many projects internally and externally," Yeoh says, highlighting the progressive partners and government bodies in Singapore eager to collaborate on various initiatives. Roche's vision for personalized healthcare has materialized through key projects in Singapore that integrate data for digital execution and improve diagnosis, treatment selection, decision-making, and patient accessibility.

Singapore may be geographically small, but its leadership in the healthcare environment is notable. The commitment from pharmaceutical giants like Pfizer, GSK, and Roche to adopt digital tools and data analytics speaks volumes about the future of healthcare. These companies recognize that digitalization is not only about the technology but also about the value it brings to patients and the healthcare system at large. As these organizations lead by example, the healthcare industry watches and learns, poised on the cusp of a digital revolution that promises to redefine patient care and medical innovation.

SWOT ANALYSIS ON R&D LANDSCAPE IN SINGAPOREGAPORE

The following SWOT analysis is done and summarised for assessing Singapore's Research & Development sector.

STRENGTH

- Global Science and Technology R&D center
- Connectedness within the city
- Supportive regulatory environment
- Tax incentives for skills development
- Strong S&T infrastructure

WEAKNESS

- Shortage of managerial staff and S&T talent
- • Risk-taking entrepreneurial culture yet immature
- High cost of R&D (technology and manpower)
- Funding gaps at later stages of companies' growth

OPPORTUNITY

- Favorable business climate
- • Early stage funding easily available
- • Strong protection of IP rights

THREAT

- Talent retention in the face of interna- tional competition
- • Talent shortage

Praful Chakkarwar

Country Manager Singapore
Novo Nordisk

EF: You took over this position in the middle of the Pandemic. What was the mission you were given or the one you set out for yourself?

I was appointed a couple of months before the first COVID 19 cases started to appear in Singapore. Despite that, the mission was clear. *Novo Nordisk has always worked in chronic therapies, especially diabetes; that is where we make a difference*. Therefore, the task was to find ways to expand and reach a higher number of patients.

Globally, today there are over 450 million people with diabetes, but the number of patients that are being treated has come down dramatically. When we talk particularly about insulin therapy which is needed by most of them, Novo Nordisk provides treatment for more than 50% of the global demand, but that only accounts for about 24 million people. This is just a depiction of how difficult it is to enter this market, and that was basically the task that was set as a global mandate and the one I proposed for myself. Regarding obesity, most of the medical community recognizes it as a disease at an aggregate level, but at an individual one, when it comes to policymakers, doctors, and even patients, it's seen as a condition where someone has compulsive eating. This is probably the biggest challenge. *Because managing this disease means a huge burden on a country's economy, we are focusing too much on prevention and neglecting those patients who are already sick. In Singapore, 1.7 million people are suffering from obesity-related issues; that's almost 1/3 of the population.*

EF: If you had to identify two big lessons learned by managing through this time, what would they be?

I think the biggest learning has been realizing the vulnerability of the system. Even though every stakeholder in the system is aligned and puts in efforts to perfect its functioning, we can't change the fact there are many unknowns in the area. Because of that, helping people identify the purpose of why we do what we do is one of the key areas in which we need to emphasize that if you stick to the path of purpose, then your vulnerability stops being the biggest hurdle, for example, with the use of digital tools. They have entered our industry slowly but also showed that the ability of stakeholders to adapt to unforeseen situations is enormous. *We have catapulted decades of digital technology adaptation in the last two years, something that would probably not have happened in the next decade. In short, there are two main lessons; understanding that you will be vulnerable despite the plans you may establish; and the need to master the agility to adapt and change. The key is to prepare your organization with that mindset.*

EF: Can you describe your footprint in Singapore regarding clinical research, collaboration, and pipeline/portfolio? What are you excited about?

Collaborations happen at different levels, with clinical trials developing in line with our global and local goals. For example, we currently have treatment trials for Nonalcoholic Steatohepatitis (NASH), cardiac-related complications, genomics, and liver diseases, among others. These are the areas that follow our spectrum from basic research to clinical research, both in global and local operations.

EF: What is the NN role in educating the community?

The health system, in general, is not prepared to attend to obese patients; chairs in waiting rooms are small size; so are examination tables; there is a lack of bigger cup sizes for blood pressure monitoring; a vast majority of clinics don't have calibrated scales for more than 120 kilos; the most common answer a patient like this receives is that they need to lose weight. This is just a depiction, but it helps to understand why there are so many people reluctant to get treatment.

Obesity is a chronic disease with loads of factors involved; causes could range from genetic to psychological to hormonal, which is why a general practitioner should be able to provide support mechanisms. The first item on our pipeline is to create awareness by working with other stakeholders and using different platforms to encourage people to take action. Once we achieve that, the challenge is where those people go to get treated, given there is no specialty that focuses on obesity. Therefore, training the medical staff is our second biggest crucial task, which is why we impulse initiatives such as OPEN (Obesity Policy Engagement Network), an annual platform in collaboration with foundations and the Singapore Association for the Study of Obesity (SASO), where we offer 8 hours certificated course on how to manage obesity patients. We then connect patients who seek to be treated with doctors who have been trained.

This is how I see the future of obesity going: drive awareness, educate health professionals so that they can tackle the patient's needs, connect those two factors through digital platforms, and work with stakeholders to connect patients with effective treatment. We are providing education that goes in line with reducing that gap so more people can benefit from it because selling drugs isn't what saves patients.

EF: That is a great description of what it is to manage a therapeutic area, both understanding the ecosystem and mental health advocacy absence. What do you expect the industry will need to advance from prevention to treatment?

The key is to plan sustainable solutions, not short-term profits that hinder the ability to establish as a partner and relegate you to being a service provider. There are two big guides for the pharma industry. First, not improving the patient's outcome is not in your good interest in the long term, which is why it's imperative to make sure the company is delivering the best possible solution. That means always seeking better prospects for the patient, living longer and healthier, and not limiting the treatment to decreasing blood sugar levels. Second is the importance of collaboration. *The expertise is out there to help enhance the whole process, from awareness to treatment adherence. Therefore, it is crucial to get the people within your organization to understand this.*

EF: Novo Nordisk is celebrating its 100th anniversary next year. What will your speech be like to your employees?

It's been 100 years, and we are still supporting people suffering from these diseases; this tells us the philosophy and the spirit have been right. The company was established with a simple fact: insulin is a phenomenal treatment option, and people need it to be accessible.

> "The objective has always been to take advantage of the area where we have the expertise and provide the best solution for a vast majority of the people."

Looking into the future, I would tell my team to keep doing our jobs not because we must but because we have a clear patient-driven objective in mind. When we celebrate our 200-year anniversary, I won't be there, but I'm sure this is the mindset and legacy we are leaving the next generation, and it's what makes it fulfilling.

Erika Pagani

Country Manager Singapore
Pfizer

EF: What was your mission when appointed to Singapore?

EP: Upon arriving in Singapore, my first mission was to fulfill our vaccine commitment with the government once the first Pfizer vaccine was on the market. It was crucial to us to keep delivering our products in spite of supply chain disruptions. It was a challenging task, but it is something I quickly adapted to. *As a newly appointed manager, I learned how to manage the company remotely while building the company culture. Pfizer is a multifaceted business with a complex and robust portfolio that we promote alongside vaccines.*

EF: How do Pfizer labs and manufacturing plants in Singapore support the global supply chain, and what is Singapore's strategic importance?

EP: Pfizer Singapore has two small high-end operations. The first is a manufacturing technology development center, and the second is a scientific laboratory. *We are a trailblazer in developing and launching new products within Asia and other emerging markets. We produce an active ingredient API for many of the products that are exported globally. This is possible because Pfizer was established in Singapore in 1964 and has become the supply hub for the Asian region.*

EF: What are your top priorities in API manufacturing or supply chain management, and what have been your biggest lessons in the diversification of these centers worldwide?

EP*: One of Singapore's biggest assets is its stability. The policies prioritize businesses which lends to the government's stability. The government values private initiatives within the country. This allowed us to expand our robust footprint in the country. It helped us collaborate closely with the government and to have a dialog throughout the pandemic. We worked closely with several government agencies to ensure our products' free flow to minimize the pandemic's restrictions or constraints on our operations. It is a unique moment to be leading the organization.*

EF: What is your advice on managing a 'vaccines' portfolio while also giving continuity to health on the chronic disease side?

EP: Balancing our vaccine and other portfolios was a common issue globally. Therefore, some of our base portfolios underperformed because of the nature of COVID 19. Despite the challenges, we worked tirelessly to increase the importance of getting vaccinated and keeping up-to-date records.

Many people with basic chronic conditions could not access healthcare which challenged us to open other communication channels. This led us to deploy some digital tools to better communicate with patients and customers. This led us to initiate more programs like the delivery program we implemented for the direct delivery of medicines to the patient's home.

The second initiative we took on was the mental health initiative. There was a very relevant rise in mental health cases. We wanted to step in and help as a company. As a result, we entered digital partnerships with companies that provide mental counseling through physicians. We used social media platforms to raise awareness of mental health and vaccinations. We are now just beginning to see the results of our investments during the pandemic.

Pfizer Singapore delivered on its commitment, which earned us a reputation and the respect of our stakeholders. We can reach out to these stakeholders when we develop new projects or initiatives as they seek partnerships with us. It is about being patient-centric and making the patient's journey as easy and simple as possible.

EF: What is your take on Pfizer Singapore's adaptation to the digital business model?

EP: *From the beginning of the year, we have incorporated digitalization into our corporate DNA. We are preparing to transition from an analog to a digital company. Digitalization is our go-to core component and strategy when going to market though we are still building key competencies like KPIs and implementing new digital tools. During the pandemic, we had to quickly adapt to digitalization with the tools we had at hand.*

It took our mindset to change for people to understand the power of integrating. *We are changing from being marketing-driven to being scientifically driven. It is about the when, where, and how. We want to have high-end conversations with our customers. The customer must be able to reach us when they need us, so we offered a highly reachable communication channel.*

Singapore has the infrastructure to aid us in our transformation. There is high connectivity and data availability. We feed real-time data from vaccine drives and healthcare systems to R&D to improve our vaccines and products. Singapore has robust data. Recently there was a publication from the Saw Swee Hock School of Public Health, which Pfizer contributed to; on the responsibility of data sharing. Data management and processing are becoming the backbone of the ethical dilemma. Privacy is very important, and more people should be aware of it. We must balance using private data to improve healthcare systems and outcomes.

Singapore is well positioned and already thinking twenty years into the future of how to collect data, make precision medicine, and understand the impact of interventions at a granular level.

EF: What is your involvement in SAPI and how does it contribute to and fuel Pfizer's overall commitment to Singapore?

EP: Right after I joined the Singapore branch, there was an opening in the board of directors at SAPI, so I took the opportunity to join them in early 2021 as one of the board of directors. By August, I was the vice president, and now I am the Head of the public policy committee. The public policy committee comprises patient advocacy, health technology, and government affairs groups. The government affairs group is involved in shaping healthcare policies in the country. SAPI was founded in Singapore 56 years ago, and it hosts a lot of presidents from other multinational companies.

Singapore is going through major changes in its healthcare policies. The government has established the oncology drug list and is now moving to the healthier SG, which will be implemented next year. SAPI has been advocating to be the partner in the discussion to illustrate the industry's point of view. In the serial implementation, various stakeholders contributed to the outcome. After that, the MOA realized that several things needed to be adjusted over time. We hope to improve the dialog and give more insights with a healthier SG. We bring collective knowledge from all the big pharmaceutical companies in the association. The industry association has a bigger role as a collective for the industry.

EF: When you look back ten years from now, in your professional career, what would you like to be remembered for?

EP: I would like to be remembered for changing the avenues for collaboration and mutual respect for the government and the biopharma industry. After the pandemic, we built fundamental relationships with the government. *We can truly collaborate with the government through Pfizer or industry association channels. This is shaping the paradigm beyond covid about making better sustainable systems. Moving forward, I yearn for a connection beyond covid and vaccines.*

EF: Do you have any advice for women in pharma?

EP: I have been working for Pfizer for almost nineteen years now. When I joined in Brazil, there were no women. Now there is a balance in diversity between men and women. Six of nine country managers within the Singapore region are women. There is a 43% representation of women at the highest levels of the organization with no pay gaps. *Pfizer is very close to closing the great disparity between men and women. If you are not happy with your job, go to Pfizer.*

Raakhi Khera Sippy

VP & GM Singapore
GSK

EF: What was your mission given when appointed?

RKS: Our mission is clear.

> It is about how we reshape GSK Singapore as an innovative biopharma company and as a trusted partner...

and bringing solutions to advance healthcare and Singapore within the baseline business, which is predominantly general medicines and vaccines. Over the next year, we will be starting to bring in innovative value medication.

EF: Considering the aging population in Singapore, what does GSK's product portfolio look like, and how does that translate to Singapore?

RKS: The aging population is an important concern in Singapore. *Additionally, the largest healthcare reform is taking place for the first time in two decades, called Healthier Singapore, and it is focused on preventative care. We are partnering with the ministry to make sure that we are bringing our innovative medicine and vaccine portfolio. As an example, we have solutions for health matters that range from oncology to multiple myeloma; over the last year, we have had three approvals just in our portfolio.* We also have different types of vaccines that tackle therapeutic areas that predominantly appear in the elderly population. Regarding the quality of life, we have a biological indicator for nasal polyps, allowing people to breathe and smell better. These are just some examples of innovative healthcare that we are bringing to Singaporeans, especially the 50-plus aging population.

EF: In the context of GSK's investment in sustainability and being awarded the Access Initiative Index, how do such aspects translate to Singapore?

RKS: *Access to medicines continues to be a very important global level. However, regarding how we continue to foster our trusted partnership in Singapore and how we are continuing to play a pivotal role, we have been here for 60 years, and we were the first global healthcare company to establish a presence in Singapore in 1959. We are one of the biggest contributors to Singapore's biomedical science industry, to the tune of $2.5 billion in investments.* In terms of sustainability, that continues to be a focus. We have a pipeline of assets that are focused on reducing our carbon footprint, and we are a big leader in respiratory medications. *When it comes to innovation in our devices, sustainability and reduction in carbon footprint continue to be at the top of our minds.*

EF: How do you balance manufacturing in Singapore with prioritizing resources and partnering with various stakeholders?

RKS: *Singapore continues to be an important hub for us, and that's why there has been an increase in investments. We most recently opened our manufacturing facility in Jurong. Another important aspect is our oncology assets, not just for Singapore but globally. This continues to be a key focus for us, and we continue to be a partnership hub at the heart of what we do*; all stakeholders are equally important, including the Health Promotion Board and the Ministry of Health. It is also about how we partner to deliver innovative medicines and vaccines to the rest of the world. That is the importance of Singapore being a global hub based in Asia.

EF: What message do you have for investors regarding the direction of the pharmaceutical sector?

RKS: *GSK's vision is around uniting science, technology, and talent to get ahead of disease together; technology is the keyword. As part of the transformation that we have been through, there has also been a true digital transformation in GSK, with examples such as leveraging digital data and technology to bring medicines to patients at pace.* I believe that the pandemic drove an exponential transformation that we were not anticipating, but we have been at the forefront of leading the way in terms of how to connect with our customers by using innovative measures such as hybrid methods. This then gives them the right content through the right channel when they want it and how they want it. Our customers are like anyone else; they like to consume information at their fingertips as opposed to the traditional model. *In terms of what the message to investors would be, we continue to focus on growth and delivering operational efficiency, but growth is at the forefront. We are the second fastest-growing company in Singapore, and we have the ambition to be number one this year.*

EF: How do you see digitalization changing access to the market and the way public areas work?

RKS: I believe that it already has, and *we should focus on futureproofing ourselves; that's one impact of the pandemic, and it's here to stay now. There are different commercial strategies, and the way I apply digital data and technology to my classic medicine portfolio is different from how I apply this to my specialty or oncology medicine portfolio. This is where we need to be comfortable with the nuances because the specialist customers want a different digital interaction than the general practitioners or someone who has consistently used a household brand.* How you are consuming digital care and to land this with the impact, it's important to understand the customer inside and then break it down into content, the right channel, and the right place. I lived and breathed in this area for five years before I came to Singapore six months ago, so it is something I am passionate about.

What you measure is what you get; one of the key lessons was to keep things simple and make sure they are aligned at the top of the house to see what the representatives see at the bottom of the house. The minute that KPIs are disjointed, you start to see differential execution. The key was aligning at the top in terms of what are the key KPIs to measure and focusing on outcome-based KPIs versus lead metrics.

EF: How do you attract resources from headquarters?

RKS: *Singapore continues to be a global, regional, and local operating company, and the local operating is what I manage. We have global teams also based out of Singapore, and this helps to create synergies between global, regional, and local roles.* For example, over the last six months, I have sent talent to global roles and absorbed talent from the region and into the market. We have a nice pathway, and that makes Singapore attractive for people because they don't always have to move to London to gain global experience.

EF: What attracted you to this position, and what would you like to accomplish in the next three years in this position?

RKS: What excited me the most was bringing innovative medicines at pace in a market that values innovation. *We are shifting from a classic medicine and vaccines portfolio to an innovative medicine and vaccines portfolio at the forefront, partnering with the ministry to land this. Fast forward three years, two things in terms of the legacy I would like to leave; the first is a purpose-driven culture. If this is done right, then I know that performance will follow; that's the second point.* This means making sure that we have launched our innovative healthcare portfolio and brought it to as many Singaporeans as possible and accessing patients. A healthier Singapore will make it easier for us, and if we partner well, we will be at the forefront in terms of driving incremental access.

Yeoh Ying Ying

GM Singapore
Roche

EF: What mission did you set for yourself when you were appointed general manager in Singapore?

YY: *One of Singapore's biggest attractions is how future-centric it is for me. Singapore's vision is to become a digitally transformed nation. It aligns with my vision and Roche's vision to build sustainable and resilient health systems that are future-proof. This vision will help us pilot the future and what it could look like. As a result, they are strongly committed to building competitive Singaporean talent and are open to skills from beyond the borders.*

The government aims to become a biomedical hub in the region. It is exciting because as they go through a healthcare transformation, it provides us with the perfect opportunity to work together to figure out what good sustainable healthcare looks like. Piloting the future of healthcare is exciting for me; this is my personal vision.

EF: What is your footprint in Singapore, and what is Singapore's significance to the Roche Group?

YY: Before the pandemic, the entire Roche Group set an ambitious vision to change our customer engagement and to double down on our delivery to patients and healthcare systems. We want to deliver more at a lower cost for society. The team brought the vision to life by partnering with physicians and healthcare systems to add value to the vision.

> "Strategically, Singapore could be the project pilot hub for Roche."

We pilot many projects internally and externally. We have visionary partners, key-taught leaders, and government bodies always willing to work on multiple projects with us. *This is why Singapore is strategically important to us. We have completed several key projects that envision and embody personalized healthcare. The projects aimed to bring innovations to life and to show diagnosis, treatment selection, decision-making, and accessibility for patients.* We are also looking at how we can use data for digital integration. Many clinician-scientists are passionate about their research. Singapore may be small, but it is ahead in the healthcare environment in several key aspects.

EF: How does Roche define access, and to what extent do you use Singapore as a gateway and hub to drive access throughout surrounding markets?

YY: Access to us does not mean key markets; rather, it means providing access to all patients. We adopt different strategies because realizing this goal takes work. Some plans include differential pricing because of variable pricing in other markets. We are exploring innovative solutions. Roche is still trying to figure out how to do more.

We have programs that place leaders to run emerging market project solutions to try and solve healthcare system imbalances. The biggest issue around access and equality of access is the infrastructure and basic foundation of the healthcare system. Many efforts have been embarked on to enable access across the board. Singapore's role is from a sound scientific decision on accessibility and how we select treatment. Generally, patient accessibility is well-covered, which gives physicians room to make the right decisions for the patient.

Singapore's influence on its regulatory body will become a future reference for other countries in the region. It can be a reference for making decisions on risk value assessment. Singapore will play an influencing role in navigating change. That is to say that Singapore's strength in its various policies, such as regulations, will become a future reference for other countries in the region. This could be true for HTA and access policy. With this, Singapore could play an influential role in the region by pioneering healthcare for the future.

EF: How is Roche working with policymakers and government agencies to shape the future of the pharmaceutical scene in Singapore?

YY: It is currently an area of curiosity. This is an area that I am particularly interested in as I find the role and sheer potential of public-private partnerships in healthcare intriguing. Singapore is a small country that channels its efforts into attracting investments which is why the government works closely with all industries. We are still taking baby steps in public-private collaborations in the health system and private healthcare. We still have a way to go in the form of collaborative partnerships in the healthcare sector. This is the one key area we can all improve and work together on especially considering all the benefits all the stakeholders could reap. *We can only grow a broader, more sustainable healthcare ecosystem collaboratively. Collaboration is the one key area Singapore needs to improve and capitalize on to make private-public partnerships work. It is fundamental for future sustainability that everyone is on the same page.*

EF: As per your recent partnership with Oncoshot, how is the increased prevalence of sharing data and using AI improving research and clinical trials?

YY: I credit Oncoshot and Icon Cancer Centre for coming on board in this project. Together we look for ways to enable more digitally integrated data to become better decision-makers for patients. It is a broad vision that encompasses many things. This collaboration is an example of our commitment and a case of how partnerships can be done. Oncoshot has AI data science capabilities, and Icon is a group of hospitals with patient data. Our role is to provide access to the data of our panel. We do genome sequencing and CGP for Icon through our FMI panel. As a group, we want to integrate our CGP and FMI data into our normal laboratory reports and database.

EF: How are you contributing to increasing Singapore's innovation footprint?

YY: At Roche, we are extremely proud of our heritage in bringing innovative solutions for patients, and the Singapore government has been a strong partner in encouraging greater innovation. They are eager to bring innovation into Singapore, from manufacturing to clinical trials and research to bringing in new thoughts and ideas. For us locally, it is about piloting new innovative concepts. When we talk about personalized healthcare as an example, we rolled out the Shining Tower initiative that aims to pilot and build collaborations with the ecosystem and make personalized healthcare sustainable. Singapore was selected and is a center of excellence site to pilot the project as an example to others.

The people in our organization play a critical role in enhancing the awareness of the capabilities of what we can have here and connecting with the right stakeholders in the ecosystem. There are many future innovative topics, treatments, and digital initiatives. *The environment here is robust and conducive to these types of initiatives. Overall, this helps with the ambition of the country to become an innovative hub. This aligns with Roche's mission to always be the leader in charted and uncharted areas.*

EF: What key achievement will you add to your speech for your fiftieth anniversary in Singapore next year?

YY: In the past fifty years, we have had the opportunity to positively impact the lives of so many Singaporeans. We have brought many innovations to the market and collaborated with key healthcare players to help play our part in shaping and changing the healthcare ecosystem. Roche is proud of the discovery of and introduction of targeted treatment. The discovery brought about many changes within the healthcare system.

How do we support building this capability and making sure we are making the right decision? Targeted therapy was the first step, and we continued with personalized healthcare. With that, several people are trying to shape the ecosystem. *At the core, Roche is a business with a purpose and has delivered on that purpose and the impact we want. Everyone who has joined the organization has a personal story of why we are here. Everyone has an underlying purpose and passion for why they are in the healthcare industry. It is a moment to be proud of what we have achieved these past fifty years.*

Reuben Ong

VP of Healthcare
DKSH

EF: What mission were you given when appointed VP to DKSH in the middle of the pandemic?

RO: I have a fairly diverse background, with experience with multinationals in Singapore. After nearly six years in one of the Japanese leading multinationals, I felt it was time for the next challenge, and that was DKSH.

It felt like a perfect fit for the logistics and distributor landscape because it is about understanding the needs of the principals, how they want business done, and, through my expertise, fulfilling those needs. I jumped straight in, meeting with potential clients, providing assistance where it was lacking, and giving insights when needed. Being an active member of the Singapore Pharma Association also helped; I have been on the Board of Directors for the last four years. I am part of the Ethics, Business, Committee, which oversees the code of conduct for the pharma industry in Singapore.

I was heavily involved in the roll-out of sponsorships of third-party congresses and guidance for virtual meetings, which was very useful when the pandemic hit, particularly in the initial upheaval of change. In DKSH, my role is to give clients and potential clients based outside of Singapore but interested in using us as a stepping stone into Asia Pacific and to gain an understanding of how the market works. During 2020 and into 2021, I was involved in negotiating the oncology drug list, which went live in September 2022. The next key highlight is HealthierSG, how our new Minister of Health will drive it forward, and how it will impact the Pharma Association, a key stakeholder in the healthcare landscape.

EF: What will 2022-2024 look like, and what have been the biggest lessons learned for the coming years?

RO: *DKSH is about managing multiple clients, handling thousands of customers, and covering orders for clinics and pharmacies.* The biggest lesson with this is that constant problem-solving is a vital skill set when working in a healthcare company, and it is an asset that has served me well in DKSH. In the coming years, I also think that it will be a season of finding new creative and innovative ways of problem-solving.

EF: What are DKSH's main growth drivers? Where are your priorities and allocation of resources?

RO: *Our priority and baseline is our supply chain network, but the key growth drivers are commercial alliances and commercial outsourcing.* We serve as a representative for clients who are reducing their presence in Singapore or have decided to leave. In fact, some of our clients are no longer present in Singapore. In order to ensure business continuity, they engage us to manage their business operations on their behalf. Other clients have given us their legacy products to drive sales and marketing for them – this is mainly because we have one of the largest and strongest marketing and sales teams in Asia Pacific. And, of course, there are some clients with a few notable market-leading products who do not want to set up shop here, thus engaging us to do the commercial management and representing them. *Make us a strategic partner in Singapore. Starting a company can be costly and complex, but we cover facilities and principles as well as product registration which makes the go-to-market much simpler.* We also manage different portfolios and aspects of volume and value, and my experience in these areas has been an advantage in building a network.

EF: What has been DKSH's position, reaction, and solutions to the challenges in logistics and distribution in the supply chain; if you have had problems, that is?

RO: We have had issues. Very early in the pandemic, the Government Procurement Office (ELPS) changed tenders from three to five-month holding of goods. It represented a 66% increase in capacity, which meant that those who participated in these tenders needed a larger stock holding, but due to Covid outbreaks, plants were not manufacturing enough to pump up the supply, and this happened worldwide, making it extremely hard to fill such a gap. *Across the industry, we also see that the costs of running any distribution center have increased due to labor costs, with the cost of transporting goods going up 30 to 50% - not only freight costs but land transportation as well because of the price increase of petrol. In Singapore, taxes have also gone up 7 to 8%, and. It costs more to run our delivery trucks than last year.* All the above impacts the consumers, including inflation.

On the other hand, Singapore has invested a lot in healthcare. Free vaccines were made available. In the initial pandemic stages, when treating patients in ICUs, they were all fully covered, and there was no cost to the individual. The government took active steps in stockpiling drugs and ICU units in case of a future outbreak. The great concern is whether the big pharma and medical device companies will consider Singapore a key place for innovation despite being a heavily regulated and restricted country. Life is like a pendulum; we swing to the extremes and react back each time we go too far; only by hitting the extreme can we find common ground. If our healthcare environment is overly affected or impacted by a restrictive innovative system, *I am sure we will find the middle ground of where we should be. That said, Singapore remains an attractive stepping stone into Asia Pacific and a melting pot of business activities.* Singapore is not only a gateway to Asia but a market receptive to embracing innovation and the latest cutting-edge technology. *Post-pandemic, we can also expect many Chinese companies or Chinese-backed companies are making their presence felt.*

EF: Fast forward five or ten years from now; when you look back at this moment of your career, how would you like to be remembered?

RO: I have worked hard but feel fortunate to have doors opened for me. Working with my team allows me to be a mentor. *I very much remember how I started and where building connections was central to having a successful and happy operation. I am considering being part of an executive mentoring program for people interested in pursuing a career in healthcare for the next generation. This is in tandem with some of my past experiences, where I have mentored diploma students to help map their futures.* We do internships with pharmacies to get them on board, and we actively work on teaching them. Interns are here to learn not to do excess and fill in work but to create a platform for them to absorb the business environment and be able to contribute.

Nicholas Yeoh

GM Singapore
DCH Auriga

EF What attracted you to DCH Auriga?

NY: For over 50 years, DCH Auriga has been one of the leading market management solution partners for healthcare companies to bring essential pharmaceutical and life science offerings to Asia. Its comprehensive end-to-end regulatory, commercial, and distribution solutions enable healthcare companies to access market opportunities in Asia and help deliver the best possible care to those in need. *Its multinational strength and start-up agility, coupled with long-standing partnerships with healthcare companies, provide a stable platform for me to drive growth and transform the organization to better serve the healthcare ecosystem stakeholders in a dynamic, changing market environment.*

EF: What was the mission you were given when appointed?

NY: The pace of digital adoption over the past few years has accelerated the evolution of the healthcare landscape in Singapore. The mission of DCH Auriga, to which we are committed, remains stronger than ever.

> **"We are here to enrich lives by making the right healthcare solutions more easily and readily available in the market."**

This means that our market management solution offerings need to evolve with the market to ensure we are creating value for our partners, healthcare providers, patients, and our own people. We aim to grow exponentially to become the leading partner of choice for healthcare companies to leverage our world-class distribution, commercial, and patient solutions infrastructure.

EF: What do you attribute this growth and any potential growth to?

NY: The 1st wave of growth in the next few years will come from healthcare companies refocusing and rebalancing product portfolios, which creates opportunities for market management service providers like DCH Auriga to optimize the brand's life cycle. We have omnichannel expertise and experience managing healthcare brands at every stage of the product life-cycle, and our market channel relationships give partners ready access to customers. For example, we were recently chosen as the commercial partner by a Swiss multinational company to distribute and market their innovative primary care products to general practitioners on the back of our strong track record and wide coverage in that channel.

In line with our mission to enrich lives, we are also committed to bringing to market innovative healthcare products, especially for underserved populations and areas where increased competition will benefit our customers, leading to greater affordability and access for patients in Singapore.

EF: How do you think digitalization has changed the service or product offerings and the solutions you bring to the client?

NY: For DCH Auriga in Singapore, we are committed to helping our partners navigate market complexities as they explore new opportunities in this dynamic landscape. We evaluate and work together with our partners to assess their needs in the market and roll out solutions tailored to address those needs from an online or offline perspective. We are continually upgrading our systems and introducing new capabilities to meet performance demands. For example, to enhance order processing, we implemented robotic process automation (RPA) in our ordering systems to improve the speed of order fulfillment. Our commercial teams are trained to engage with customers on virtual platforms to supplement day-to-day sales visits to our customers. *We are also building our capabilities further downstream to offer patient solution programs in order to address their access, adherence, and convenience challenges in addition to our current direct-to-patient delivery capabilities for consumers and over-the-counter products.*

EF: How do you choose the businesses you are involved in, how does it match the expertise you are developing, and what are your biggest growth drivers?

NY: We look at the market needs and synergies in the partnership, which we can deliver as well as add value to the healthcare stakeholders. DCH Auriga is an end-to-end market management solutions provider, and we are focused on strategic business pillars, namely pharmaceuticals, consumer/OTC, and medical devices. Our distribution platform enables our partners to reach customers in multiple channels, and we provide demand-generation services via our dedicated and syndicated commercial teams in various therapeutic areas and channels. Our current portfolio of partners consists of various sizes from local, regional, and global players, with a healthy mix of products at every stage of the brand life-cycle. *Growth drivers for us will come from scaling the current portfolio expansion of services with current partners as new partnerships are formed moving forward in line with our strategic business pillars. For example, we recently onboarded a leading rapid diagnostic test company where we provide omnichannel marketing and distribution solutions. The sheer scale of their business will contribute more than 10% growth for our organization.*

EF: How are your resources distributed to the different areas you cover, and what is the prospect of growth in those areas?

NY: *We are focused on growing three key pillars of our business, namely pharmaceuticals, OTC/Consumer, and medical devices, in line with our existing comprehensive distribution and commercial multichannel reach to hospitals, clinics, pharmacies, retail stores, and e-commerce.*

Singapore, being a market with an appetite for innovative solutions and products, will present opportunities for new market entrants, and we intend to capitalize on this. Healthcare companies will look for a partner who can provide insights, go-to-market infrastructure, and a proven track record in growing healthcare brands. DCH Auriga, being agile and flexible to the needs of our partners, is well placed to offer customized solutions to our partners to ensure the value we provide to them is maximized.

Being a multinational company with a regional footprint in more than ten markets in Asia, we also offer unified solutions to partners for regional partnership to ensure coherence in overall strategy execution and compliance across markets, while our country experts ensure broad strategies are localized to cater to local market nuances.

EF: Five years from now, when you look back at your career, what would you like to be remembered for?

NY: From a business perspective, I would like to be remembered for laying a strong foundation for DCH Auriga to operate in the new market environment, scaling the business to new heights, and, more importantly, making a positive difference in the lives of patients in Singapore. As a healthcare leader, I would like to be remembered as that guy who made a difference, inspiring my colleagues to grow and bringing the best out of them.

EF: In the transformation, what are the next steps and priorities in your agenda to execute?

NY: We will focus on enhancements to our operations to achieve greater productivity and cost efficiencies. This will form the base on which we work together with our partners to develop new services to navigate in the changing healthcare landscape. We also intend to focus on our people in terms of their development as we view them as our greatest asset in achieving our vision as an organization.

It is important for healthcare executives to embrace change and be bold in experimenting with new initiatives. As leaders of the future, we need to first understand the challenges faced by patients and healthcare stakeholders and then customize solutions to plug those gaps to drive greater convenience and accessibility for patients. Always focus on the challenges at hand, then design the solution leveraging technology wherever possible.

Chapter 3
The MedTech Frontier

Singapore's medtech sector is rapidly becoming a structural part of Asia's healthcare innovation scene, leveraging robust government backing and strategic partnerships to unlock significant economic potential. In a nation known for its business-friendly environment, the sector's growth is noteworthy, contributing substantially to Singapore's S$94 billion healthcare industry. With a compound annual growth rate (CAGR) projected at 10.2% from 2020 to 2024, the medtech industry stands as a beacon of opportunity for investors and innovators alike.

This is driven by a convergence of factors from advanced manufacturing capabilities to a skilled workforce, ensuring its position at the forefront of healthcare modernization. .

Singapore is strategically placed to enable MedTech companies to tap into these regional opportunities. Today, Singapore is home to more than 60 multinational MedTech companies undertaking various activities, from regional headquarters and manufacturing to research and development.

Cardinal Health in Singapore offers a significant contribution from an R&D standpoint. **Aniruddha Patankar, Cardinal Health's Managing Director,** shares, "We have a global research center –the only one outside the US- driven by a team of engineers and scientists who strive to develop innovation to deliver greater clinical value to customers and patients. We tap into the local talent pool to resource R&D, Sourcing, and other functions beyond Commercial activities. We benefit from a vibrant ecosystem and deploy talent and locally developed products.

The new-old kid in the block is embecta, one of the oldest business units, known as the Diabetes Care business unit in Becton Dickinson, and a spin-off from BD. **James Chiang, VP & GM** for embecta, shares, "As a global company, *Embecta serves 30 million People with Diabetes. We are one of the largest diabetes pure-play companies in the world. Even as an American company, we have a significant presence outside the US, including in the Asia Pacific region. Our focus today is on insulin delivery.* Over the next few years, we will continue to focus on the MedTech space within diabetes care and leverage our core competence, making high-quality insulin delivery devices and distributing them on a large scale worldwide.

Road map for embecta's Singapore growth

"As we continue to grow our business, we will have the opportunity to serve more people with diabetes. And the more people we serve, we will create a bigger, positive impact in the diabetes care space." Shares **James Chiang, VP & GM** for embecta Singapore.

'People with Diabetes' is the investment we have made to grow our presence in the e-commerce space. Through e-commerce, we can reach more patients and provide convenience.

The innovation pipeline. Our R&D team is currently working on an insulin patch pump, one that is designed with Type 2 patients in mind. Type 2 represents 90% of all people with diabetes, and this represents a significant market for embecta to serve.

Finding market-relevant products across the globe, products that allow us to leverage the capability of our teams on the ground. As an example, we recently partnered with 'Intuity' in the US, a company that has created an automatic blood glucose monitoring device.

Probir Das, Group Executive Officer, Terumo Corporation, maintains, "*The world's economic center of gravity moves a few degrees yearly to the east, even as our regional health systems still need to be defined. With the world becoming smaller and more people exposed, the need and expectation for quality healthcare increases.*" Mr. Das believes the evolution of me-

A conversation with Timothy Low CEO of Farrer Park Hospital

EF: Singapore is known for its startup culture in the health tech area; if you had to create a new health sector startup in Singapore in 2023, what would it be and why?

"I would look for unmet needs and areas where a large population would benefit. Two areas come to mind:

Home monitoring for chronic diseases, where the user can easily buy into and embrace the service. Hypertension and diabetes affect many people, and especially elders who struggle with chronic illnesses. That is why home monitoring devices should have a simple design and remind them to take their medication, take their blood pressure, or test their urine or blood for sugar in the case of diabetics. Again, we need these systems to be simple in order to work for chronic disease management. It is like having a hospital at home, which is a trend now.

Borderless healthcare: getting a second and third opinion or consult from wherever you are. A well-connected platform to access a second opinion from afar -making it borderless- to seek and decide where to be treated. It is more than telemedicine, offering healthcare beyond borders.

dical devices depends on interoperability, communication with centralized health data, robotics, and the emergence of big data analytics. "Thirty or forty years ago, we were driving cutting-edge breakthrough innovation, but as we grew, we moved from being singularly innovative -as happens when companies get bigger- to manufacturing and process-focused. Now we are working to reorient Terumo back to cutting-edge innovation again." Terumo, a hundred-and-one-year-old Japanese company, is in the middle of a massive transformation based on their three-D strategy built on trust and credibility, "Medical devices will better deliver when supported by i) interoperability - with devices talking to each other and with electronic medical records in a seamless common language conversation, ii) robotics – which still has a long way to go, and iii) AI-based algorithms determining how treatment outcomes can be improved by comparing massive data points."

On preventive care, **Karen Yu, Country Manager for Roche Diagnostics Singapore,** notes, "The responsibility of individuals to manage their care before disease hits them is integral. Technology has evolved, allowing us to act on earlier stages of the disease. For example, the HPV human papillomavirus test provides the opportunity almost to prevent cervical cancer if done with the vaccine." Ms. Yu is looking into working with the government to shape the ecosystem toward genomic profiling and diagnostics. Further averring, *"Personalized healthcare in oncology means matching the specific genetic mutation with a specific class of drugs, which can evolve into better and more specific care for individuals with specific mutations. We have partnerships with pharma, leveraging the strength of pharma and diagnostics to drive efforts with the government and policymakers to change and improve the outcome of patients in the long run."* On regulatory matters, Ms. Yu observes it took years for a product to get regulatory approval, "but post-pandemic we have learned to work closely with policymakers and regulators to bring tests to the market in record time. *Roche was the first company in the world to get a PCR on a fully automated system. Working with regulators is key to reducing approval times.*

In the pursuit of advancing healthcare towards a more sustainable focus on prevention and early diagnostics, the American multinational Abbott is actively contributing to this transformative journey. "Within Abbott Diagnostics, we have products for over 30 diseases, some more popular than others. Our vision for Southeast Asia is to spread awareness of the different diagnostic solutions available, the ease of use, and the quickness of the diagnosis process" explains Zainab Sadat, GM Southeast Asia, Abbott. "We want people to be aware of the various options available to them." He further underscores the impact of digital awareness on patient behavior. " *More and more patients are researching their diagnoses. People are becoming more curious, and patients are going to physicians with more questions because of digitalization." At this point Mr. Sadat observes that digital transformation in healthcare transcends the mere performance of medical devices; it serves as a valuable resource for patient education. "We need to invest in educating people and creating awareness among patients for thoughtful decision-making, taking control of health, and taking personal accountability for their well-being.* It is a trend we need to persistently dwell on. Everything is practical, pragmatic, fast-paced, and controlled by decision-makers."

Leading the Precision Oncology Agenda

Karen Yu, Roche Diagnostics

What is the oncology strategy and the strategic importance of Singapore to the company?

"Roche is looking into working with the government to shape the ecosystem toward genomic profiling the Roche STCC (Singapore Translational Cancer Consortium). The data insights with various cancers provide information about what it will mean for us and potentially diagnostics. Looking further down the road, a certain genetic signature that is specific to certain cancers could be taken for research and diagnostics. *Personalized healthcare in oncology means matching the specific genetic mutation with a specific class of drugs, which can evolve into better and more specific care for individuals with specific mutations. We are also having this type of partnership together with pharma and moving into that healthcare ecosystem. This means leveraging our strength in pharma and diagnostics to drive efforts with the government and policymakers on how we can change and improve the outcomes of patients in the long run.*"

Timothy Low, CEO and Board Member of the Farrer Park Hospital, has been part of its planning and building since it all began ten years ago. The building has a five-star hotel, a multi-specialty hospital, and a specialist medical center -all seamlessly integrated into a unique model worldwide. *"We built the complex with a multi-purpose mindset to function normally in "peace times," yet in a pandemic, we could quickly switch the hotel into a quarantine or isolation area." A patient can reach our emergency clinic in two minutes, 24/7.* "We have trained the hotel staff to monitor and swab people in isolation, permitting us to keep the hotel staff when there is no tourism. The hotel air and water are infrastructurally separated from the hospital for infection control; we can adapt to the different circumstances with a design that ensures quality and control. The model adjusts based on current needs; for instance, we repurposed two hotel floors during the pandemic for private dining purposes.

James Chiang

VP/GM Asia
embecta

EF: What impact did the spin-off from BD have on embecta in the Asian region?

JC: Before we spun off from Becton Dickinson, we were one of the oldest business units, the Diabetes Care business unit in BD. In 1924, BD produced the very first insulin syringe in the world, which was a significant milestone for both People with Diabetes and the organization. This was very soon after the discovery of insulin by doctors Frederick Banting and Charles Best in 1921. It has been 98 years since we made the first insulin syringe and about a year since we became an independent company. We call ourselves the "new/old kid" on the block.

As a global company, embecta serves 30 million 'People with Diabetes'. We are one of the largest diabetes pure-play companies in the world. While we are an American company, we have a significant presence outside of the US, including in the Asia Pacific region. Our focus today is on insulin delivery. Over the next few years, we will continue to focus on the MedTech space within diabetes care and leverage our core competence, which is making high-quality insulin delivery devices and distributing them on a large scale across the world.

Our strategy for the future can be defined in three broad pillars. The first pillar is focusing on our core strengths. It is about increasing our footprint to serve more 'People with Diabetes'. Not only do we deliver high-quality insulin delivery devices, but we also pair that with clinical education that supports clinical outcomes. An example of how we reach more 'People with Diabetes' is the investment we have made to grow our presence in the e-commerce space. Through e-commerce, we can reach more patients and provide convenience in terms of how our customers get access to our products. In the case of e-commerce, our products can be delivered right to their doorstep.

The second pillar is our internal innovation pipeline. Our R&D team is currently working on an insulin patch pump, one that is designed with Type 2 patients in mind. Type 2 represents 90% of all people with diabetes, and this represents a significant market for embecta to serve.

The third pillar is finding market-relevant products across the globe, products that allow us to leverage the capability of our teams on the ground. *As an example, we recently partnered with Intuity in the US, a company that has created an automatic blood glucose monitoring device. This is an innovative all-in-one device that allows users to take their blood glucose readings in one simple step, compared to traditional BGMs.These three pillars form our strategic intent over the next few years. As we continue to grow our business, we will have the opportunity to serve more people with diabetes. And the more people we serve, we will create a bigger, positive impact in the diabetes care space.*

EF: When you were assigned your new role as general manager in Asia, what mission did you set for yourself?

JC: The first thing that was on my mind was to ensure business continuity and our ability to drive business growth from the day of the spin-off announcement to the day of the actual spin-off and beyond. I had to keep associates across the region engaged and informed and understand what the changes meant for them.

EF: To what extent is embecta using Singapore as a gateway and hub to service surrounding nations?

JC: Although Singapore is a small country, it has a highly developed economy and healthcare infrastructure. It is digitally advanced with high internet penetration, mobile internet usage, and high adoption of social media and digital services like e-commerce. It is often seen as a good location to test new ideas before scaling them to other Southeast Asian countries and beyond. *Some even say that Singapore is a "country of pilots" because there are so many pilot programs launched out of Singapore. The government is collaborative and innovative, making it relatively easier to get things going. Our team based in Singapore has engaged the Ministry of Health in Singapore to think about how we can leverage our regional hub in Singapore* to test some ideas before scaling across the region.

EF: What is embecta doing to leverage technology for the patient's benefit, and how do you see the adoption of technology in diabetes care in your region?

JC: One of the ways we want to deliver our clinical experience, knowledge, expertise, and leadership is through our diabetes care app. Technology is based on people's beliefs that have sped up technology ado. People are now more open to technology and all the benefits it has to offer. E-commerce has also changed how people access and consume goods, leading to technological adoption. *Asia is highly connected and developed digitally. It had one of the highest mobile internet acceptance and usage rates before COVID. Covid accelerated those rates exponentially. People now use digital media to connect and consume.*

One of our biggest challenges at embecta is our reach. The people we help are in different places, which means stretching out our reach and resources. We can leverage people's technological adoption and acceptance to expand our reach. We actively work on consumer engagement through social media channels, e-commerce, and apps. The adoption rate within the MedTech industry is not too bad, but it has room for improvement. *We are expanding, learning, growing, and using various digital tools to assist patients better every day.*

EF: Ten years from now, when you reflect on your career and the inception of embecta as a stand-alone company, how would you like to be remembered as a leader?

JC: *I have been given an incredible opportunity. The spin-off is a gift because I am today one of the pioneers who are entrusted to build the future of an organization that has such a rich legacy. All the decisions and choices we make in embecta today will become the foundations for the next ten, thirty, or hundred years.*

Looking back ten years from now, there are two things that I want to accomplish. One is to know that I have made a positive impact on the millions of people who rely on our products to live a life that is unlimited by diabetes. The other is to know that through the work we do at embecta, our employees have the opportunity to grow, become successful in their careers, and continue to create

Probir Das

Group Executive Officer
Terumo Corporation

EF: What are the lessons learned over this period managing the APAC region, and how are you dealing with and applying the lessons learned?

> "Terumo is in the middle of a massive positive transformation."

PD: *We have been a traditional medical device company focused on engineering capabilities.* Thirty or forty years ago, we were driving cutting-edge breakthrough innovation. As we grew we moved from being singularly innovative -as happens when companies get bigger- to being manufacturing and process-focused. Now we are working to reorient Terumo back to cutting-edge innovation again.

My biggest learning these past few years is the amazing realization that we could be this resilient. The answer perhaps lies in having a purpose, in my case, making difficult decisions on resource allocations, funding, talent, and projects. Going back to our purpose of 'contributing to society through healthcare'; was the only way to get the right answers. And there lies my second learning: the strength of a simple higher purpose. As I was a new leader at the start of the pandemic driving a large transformation within the region, our associates needed a leader. People refer to MedTech as high tech, but more than a technology business, it is a trust and credibility business. *A 100-year-old device, such as a thermometer, still saves the world in a pandemic.* Bringing our people together kept us together. We have done things differently over the last three or four years, but our 450 associates have adapted and worked better through the challenging times.

EF: Where is the Medtech the industry is headed towards to?

PD: *Medical devices will deliver much better when supported by i) interoperability – with devices talking to each other and with electronic medical records in a seamless common language conversation, ii) robotics – we are not yet at the stage where a cardiologist in Europe can do a procedure on a patient in Vietnam, but we shall get there, and iii) AI-based algorithms determining how treatment outcomes can be improved by comparing massive data points.*

Advanced algorithms that support physician decisions and patient lifestyles will digitally transform healthcare, and we want to be ready and prepared for it.

EF: Could you elaborate on the strategic importance of Singapore and the A-Pac region to Terumo? How are you using Singapore as a gateway and a hub to drive access in the region?

PD: We are an Asian-origin company and the world's largest Japanese medical technology company. Most of the top global MedTech companies are US and Europe-based.

The world's economic center of gravity moves a few degrees yearly to the east, yet our regional health systems still need to be defined. Asia has a huge population that needs access to reliable healthcare, and with the world becoming smaller and people more exposed, the expectation and the need for quality healthcare increases. As a result, we see growth funding aggressively coming into India, Indonesia, Vietnam Philippines, and gradually these emerging markets will scale up. New hospitals are still being built in Asia, which is not happening as much in developed markets, making business growth an opportunity in the mid to long-term as Asia invests in the future.

As a Japanese company, we are also obliged to be successful in Asia; we do not have a choice. In this context, Singapore is the right location for our regional headquarters. It provides a stable and conducive policy environment, an excellent logistic location and ecosystem, and good access to experienced talent.

EF: How are you leveraging your role as a member of the APACMed board to increase collaborations to help shape the future of healthcare in the region?

PD: An industrial association must not be a place for any anti-competitive activity. The APACMed leadership and my board colleagues are constantly focused on compliance strengthening. We are trying to facilitate things such as crafting policy frameworks for software as a medical device and creating sufficient stakeholder awareness of the value of medical technology. APACMed is the only regional medical technology association in Asia. Ten minds work much better than one, and addressing different stakeholders as a group gives us strength. Across Asian countries, we can sit across the table with providers' systems and have enriching and learning dialogues.

Lastly, there are pockets where policymakers are increasingly pushing for the localization of medical device manufacturing. While long term there is merit, there must be a better policy of targeting this to low-risk devices first, 'driving local for global' rather than 'local for local,' ensuring a strict global quality standard, and building attractive financial risk mitigation incentives. Together, the regulators and industry must find a balance between innovation, quality, cost, and timely access. This is impossible without active collaboration.

EF: When you look back at this period in your professional career, how would you like to be remembered as a leader?

PD: Why should I even be remembered? I am just another among so many!

But if I must answer, I can only say I tried hard to leave what I inherited better after me.

My 81-year-old mother, who is not a professional, recently asked me what I did, and I found it unusually hard to explain my work to her in simple lay terms. Then it came flashing to me after a sleepless night; I collect people! *Like a curator who collects and cares for beautiful works of art, I collect, bond, and take care of people, and if I must be remembered, I would like to be remembered for that.*

Aniruddha Patankar

MD Asia
Cardinal Health

EF: Could you elaborate on the business units across the region?

AP: Globally, Cardinal Health has multiple healthcare offerings; it covers the end-to-end health spectrum, from delivery to outcomes; we also do our own R&D and manufacture our own products. In the Asian market, Cardinal Health's presence is primarily in manufacturing and selling a broad range of general medical and specialty medical products. Key among them: the prevention of Venous Thromboembolism (VTE) through mechanical prophylaxis, patient monitoring through electrodes, thermometry, and driving patient recovery with the help of nutritional delivery products. Additionally, our surgical gloves portfolio keeps us close to our clinical customers and surgeons. *In Asia, our next goal is to offer clinically differentiated products throughout critical patient pathways from OR to ICU to ward.*

EF: What would Cardinal Health's definition of access be?

AP: Cardinal Health looks at demand and manufacturing from a global standpoint; we are able to leverage our global scale to deliver market-leading products to customers based on local needs. There are a couple of ways to look at access: identifying the right product and adding value to the customer is one way of providing access. We strive to drive customer awareness and create enough incentives for an option to be a viable solution. *We are mindful of creating access in terms of regulatory pathways, skill sets, and required competencies. We start with customer needs in mind, considering what value we can offer. When we find the right fit, our teams will drive access through meaningful engagement.*

EF: Could you elaborate on the role technology has had in the past years, and what are the trends for the future?

AP: Prior to the pandemic, most leaders already believed that there were different avenues where digital could be used to support commercial growth, but Covid accelerated the trend and opened the door to opportunities we had not thought practical before. Face-to-face relationships in the MedTech industry were considered very important, but Covid made us realize what could be done during lockdowns. *In Cardinal Health, internally and externally, we have become extremely open and learned to collaborate online. It takes a certain amount of expertise to brainstorm online, achieve an open dialogue, have creative conversations, and be successful – something impossible to imagine pre-Covid.* We have also moved to the next level regarding the external environment - our customers. We conduct conferences online, showcase products online, have different We-Chat channels in China, and talk to thousands of customers through various platforms in one go, accessing people in a way only made possible by technology. *All these trends are here to stay, especially for uncomplicated products and when people already possess a certain understanding and information. Best competencies and practices can be shared through technology at a fraction of the cost. Those are the aspects that are here to stay.*

EF: How do you attract the best and the brightest to Cardinal Health, Singapore, and the Asian market?

AP: Attracting and retaining the right talent has always been a challenge, currently probably a bigger one. It has to be a win-win situation and a good fit for the talent and the organization. *We must have the right culture within the company to attract good talent. In particular, internal recommendations and references are valuable because they attest to our culture. It is also about producing high-quality medical products and creating a reputable brand in the market.* I don't mean advertising campaigns but rather a reputation built on the good work we do when working with stakeholders like distributors, regulatory authorities, government agencies, and hospitals so that when people see our brand, it creates a conducive ground for talent to realize they can grow, achieve their potential, and be appreciated for their contributions. *The culture, the value we offer, the work we do, and our mission in terms of our impact on delivering medical products and services that improve patient outcomes in different markets all add up.*

EF: Singapore is known as a global innovation hub, and science and innovation are fundamental to your company; to what extent are you contributing to include Singapore's local innovation footprint?

AP: *Cardinal Health's presence in Singapore goes beyond selling products; we offer a significant contribution from the R&D standpoint. We have a global research center housed here, the only one outside of the US, driven by a team of engineers and scientists who strive to develop innovations that will deliver greater clinical value to customers and patients.* We also have a large procurement team and other global teams operating from Singapore - a lot of talent. We tap into the local talent pool to resource R&D, Sourcing, and other functions beyond Commercial activities. *Singapore gives us access to its talent pool, a valuable and unique element in line with our long-term objective of supporting local healthcare needs, which in turn contributes to the success of Singapore and Cardinal Health. We benefit from a vibrant ecosystem and deploy talent globally for the greater good. The products developed locally are also marketed around the world.*

EF: Cardinal Health has operated in Singapore for almost twenty years; what would be your advice to other executives on managing, motivating, and leading virtually while creating impact and value for the sector?

AP: *It will be Cardinal Health's 20th anniversary in Singapore next year. In the early years, our business activities revolved around sourcing; we have a huge sourcing team in Singapore that plays a critical role in our global supply chain operations.* In terms of commercial operations in Asia, we are still fairly new, supporting regional customers and stakeholders over the last eight to nine years. We know from our global experience that it always comes down to our customers, adding value and making a difference that will get one through the highs and lows. The trust built with our customers over the years has enabled us to partner with them to navigate global challenges like pandemics, logistic issues, inflation, supply shortages, etc. All the while collaborating with customers to ensure patient needs were met. Keeping the customer at the center of the conversation is key to staying outcomes-driven. Every organization has internal plans that are integral to the market they operate. However, we cannot look only inward and in isolation at our internal plans and products and ignore where the market is going or what the market needs.

> "We must work in sync with the market, contribute towards its sustainable development, and strengthen our organizational footprint for mutual benefit."

EF: Is there any final message you would like to share with our healthcare sector readers, who are very targeted? As you are when you refer to the Cardinal Health Way of working.

AP: It can be easy to get lost in internal jargon that has little meaning for external audiences. For example, when I speak of driving "Focused Growth," people in Cardinal Health know what I mean. To decode this for an external audience means to "simplify and prioritize." *Healthcare is evolving excitingly; our mission is to improve people's lives through prevention, ensuring they do not get to a critical stage health-wise.* For us at Cardinal Health, it is about making the right decisions, helping the caregivers who are our extended partners, listening to them, offering them solutions, and delivering to them the value they need.

Karen Yu

Country Manager Singapore
Roche Diagnostics

EF: What was the mission you set yourself when you were appointed?

KY: In terms of looking at the team, we were coming out of the pandemic, though not completely, and things were settling down. My primary focus was getting the team refocused on the routine business. I have a strong team to work with a solid foundation for us to build on. *We set ourselves the task of reigniting passion and finding what drives our employees when it comes to working. This is an important environment for them, and we must embrace it.*

EF: What is the oncology strategy and the strategic importance of Singapore to the company?

KY: Roche is looking into working with the government to shape the ecosystem toward genomic profiling the Roche STCC (Singapore Translational Cancer Consortium). The data insights with various cancers provide information about what it will mean for us and potentially diagnostics. Looking further down the road, a certain genetic signature that is specific to certain cancers could be taken for research and diagnostics.

Personalized healthcare in oncology means matching the specific genetic mutation with a specific class of drugs, which can evolve into better and more specific care for individuals with specific mutations. We are also having this type of partnership together with pharma and moving into that healthcare ecosystem. This means leveraging our strength in pharma and diagnostics to drive efforts with the government and policymakers on how we can change and improve the outcomes of patients in the long run.

EF: What are your expectations from this collaboration, and what do you hope to achieve?

KY: *At this juncture, we are still driving cancer care in parts, meaning that there is step-by-step management. I envision finding out whether it makes sense to investigate genetic profiling from the start and, from that opportunity, derive types of targeted therapies.* Comprehensive genetic profiling throws hundreds of different mutations out during the process, whereas now, the step-by-step process means going through hotspots and diversifying the various cancers.

EF: How do you diversify your portfolio, and what are the lessons learned from managing two different market portfolios?

KY: The pandemic meant that we had to reprioritize, so we had products in the pipeline held back, and some of those in areas of non-communicable diseases. *We learned from the pandemic how to work closely with policymakers and regulators to bring tests into the market in record time. It usually takes years before we can get a product through regulatory approval, but COVID took us less than a month to get things through. Roche was the first company in the world to get a PCR on a fully automated system.* I remember when we were informed that we had the EUA test on the market, we were very surprised; never in my 22 years of experience had we seen something like the 2020 experience.

Bringing it closer to home, once we got approval from the FDA and EUA, we quickly brought tests to Singapore and the local Health Sciences Authority, our regulatory body. They approved the test in record time using the provisional authorization route. That learning for me stands out. We all must come together to get this type of test released as quickly as possible because there is an immediate need. When Monkey Pox first appeared, we were again quick to launch into the market three different products. *We won't stop focusing on communicable diseases but will continue to drive tests because infectious diseases are one of our areas of focus, picking up on what we left off.*

EF: How can we increase awareness of the importance of oncology diagnostics?

KY: *Working with regulators is key. I'm aware that our interactions with our local regulators were always evidence-based. Whichever product comes to the market that has been thoroughly reviewed with evidence, the time for approval can be shorter. The intention would be to engage regulators earlier, providing them with the requirements or providing us with the requirements of what they would be looking into, allowing us to bring products into the market faster.* I would imagine that for oncology-related tests, the outcome is more toward the personalized healthcare side; the evidence with the therapy must go together.

The special thing about the collaboration with STCC is that there isn't a particular gene that we are going after; it's a full genomic profile that we are looking at. We don't know where it will go, but that's why we are embarking on the exercise.

EF: How can the healthcare sector become appealing to the younger generations?

KY: One thing I look into is behavioral change with digital adoption; I wonder if we could consider aspects such as gamification. We have examples of this for rehabilitation by putting patients in front of a TV and getting them to do exercises through guided apps, making it interesting and fun, so it's not just a set of exercises to follow. *To draw younger generations would be to utilize some aspect of their creativity, and of course, there is always the more serious side of things, such as research which requires going into depth. The COVID-19 mRNA vaccine, for example, uses AI in its mRNA sequence design; there will most likely be more utilization of such aspects, which could prove attractive to the younger generations.*

Zainab Sadat

GM Southeast Asia
Abbott

EF: What attracted you to join Abbott after working in GSK for almost 19 years, especially after the big shift toward diagnostics?

ZS: Within GSK, I gained a wealth of experience. I worked in three different business roles, the consumer, pharma, and vaccine divisions. Healthcare is at the heart of everything I do. Everything we do has a purpose. Our purpose is to help people live healthier and better lives; it is about being patient-centric. *We work to eradicate different diseases, introduce new products, increase preventative healthcare, and improve patients' lives through our products and services.*

At GSK, I gained a wealth of experience covering different markets. I received much exposure through traveling to foreign countries and understanding the cultural nuances of other countries and people. *It taught me how to work in a team, make decisions, become successful, and continuously evolve and change based on market dynamics. Change is inevitable; you can never change if you keep doing the same thing.* At the beginning of every new year, we must consider the key points to change and challenge the status quo to move to the next level and raise the bar. Raising the bar is based on individual performance, how we market and position our products, cater to a larger population, and access a larger cohort of stakeholders to create awareness through education.

We are currently working on moving from presumptive diagnostics to differential diagnostics. Presumptive diagnostics assume a patient's condition based on their symptoms. Traditionally, the physician prescribes a whole range of products based on the patient's symptoms in Asia. If the specified products do not work, the patient must return and get another prescription. We must change the mindset around presumptive diagnostics. *With the differential diagnosis, a patient uses an affordable, easy-to-use test for diagnosis, and once diagnosed, they receive the most appropriate treatment. Differential diagnosis is targeted medication that results in speedy recovery. It makes the diagnosis process easier and faster.* The advantage of differential diagnosis is the early diagnosis, which directly impacts the overall health economics of patients. The earlier treatment is administered, the more reduced the overall costs are. Many advanced therapies available can cure or treat diseases before they advance.

Within Abbott Diagnostics, we have products for over 30 diseases, some more popular than others. *Our vision for Southeast Asia is to spread awareness of the different diagnostic solutions available, the ease of use, and the quickness of the diagnosis process. We want people to be aware of the various options available to them.* When our products are available in the labs, we work on making them available in hospitals and primary physicians. We are working on providing a faster, cheaper, and more accessible diagnosis. Much work is needed from a market-shaping perspective, and we are already progressing. It is a whole new world for me, which makes it exhilarating because, in the past, my focus was on the treatment end of the spectrum. Vaccines are very relevant within the healthcare setting. The area we emphasize is the test-and-treat approach.

EF: How do you rate the progress of democratization, decentralization, and digitalization within your region?

ZS: A lot of progress has been made in all three areas; however, much progress and effort are still needed. A mindset shift is essential. Many people seek the familiarity of normality. As a result, they backslide into the old way of doing things. We want to change that. During the pandemic, there was a boom in digitalization, but instead of continued growth, there has been a decrease in digital utilization. *We learned a lot of lessons during this transition period. We can further explore and leverage these key trends without returning to the old ways from before the pandemic.*

Democratization and decentralization differ from country to country. One of the biggest bottlenecks in many countries is regulatory clearances. Many regulatory authorities are used to evaluating products the old pre-pandemic way. During the pandemic, governments allowed accelerated reviews of products. However, these permissions are slowly being revoked. Our challenge is ensuring they continue leveraging everything they learned during the pandemic rather than returning to the old working methods. We talk to government officials and healthcare professionals to ensure they continue using and progressing. We are moving in the right direction and leveraging everything we learned.

With inflation and economic pressure, people's priorities are changing, and we need to change with them. People are now a lot more digitally aware. *More and more patients are researching their diagnoses. People are becoming more curious, and patients are going to physicians with more questions because of digitalization. We need to invest in educating people and creating awareness among patients for thoughtful decision-making, taking control of health, and taking personal accountability for their well-being.* It is a trend we need to persistently dwell on. Everything is practical, pragmatic, fast-paced, and controlled by decision-makers.

Through digitalization, we can connect with anyone globally. My team works virtually without constrictions on where they work, as long as they deliver on their work. From my team's perspective, we are accessible to each other through multiple channels. Our communication has drastically improved through digitalization. Everyone is reachable, and responses are faster.

EF: How do you see collaboration evolving in Singapore?

ZS: *One of the biggest things produced by the pandemic was self-sufficiency. Governments are becoming more self-sufficient and less dependent on others.* Singapore is a developed market with resources, so affordability is fine. However, they are looking for ways to become more sustainable. Their vision is to attract investors to invest in vaccination plants within Singapore and distribute products to the rest of Asia.

Localization is becoming a trend. More and more countries are looking to attract investors to invest and produce locally. This leads to technological transfers. In the process, nations become more self-sufficient and open-minded to collaborating and collaborating with different key stakeholders and organizations in the future. The world benefited from collaborations during the pandemic. With higher demand and a supply shortage, partnerships rapidly increased. To meet the demand, many manufacturers and organizations worked in sync to make products available to end users. Localization will continue; however, it is dependent on the business model. In some areas, we need to be self-sufficient; in others, we need to collaborate. *Whenever there is an opportunity to grow and shape the market, we will take it* to create more opportunities for everyone.

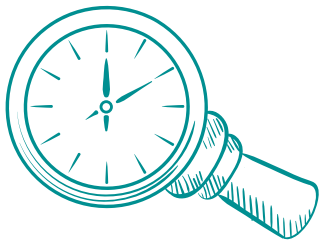
EF: Fast forward a year from now; what do you want to celebrate at the end of the year?

ZS: I want to celebrate being able to establish and introduce new products. We have many products in our pipeline. It is exciting to make new products accessible to everyone. *Accessibility is the key. We want to gain access to more people in the region for better access across the globe. We want all patients to be able to access our products. We look forward to shaping the market, increasing awareness of a care business's overall rapid diagnostics point, and building the test and treatment concept. It is a meaningful job for me.*

Chapter 4

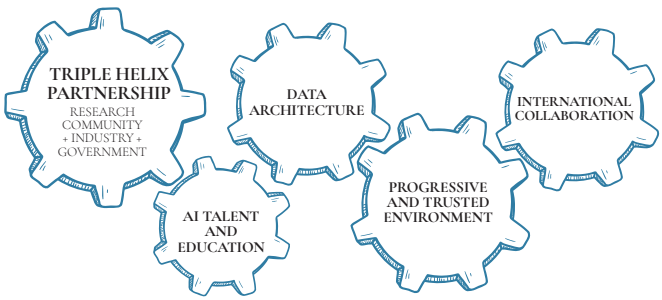
The Future

Future Proofing Healthcare



Deciding Tomorrow's Health is a Today's task, in the policies we draft, the research we prioritize, and the technologies we embrace. It is a landscape that will be inhabited and inherited by the generations to come, and thus, it demands our utmost prudence and visionary thinking. A domain where foresight is as crucial as the treatments and technologies it employs. As we stand at the crossroads of the present and the future, it is imperative to recognize that the future of healthcare is being shaped by the choices we make today. .

In this same way, Singapore's healthcare future was decided on the past. The Smart & Healthy Nation Journey, was launched together with the Nation -wide AI strategy back in 2019. With the aim to further strengthen its global competitiveness through rethinking business models, increase productivity and remaining a global reference.



A brief look into the ecosystem enablers shows the importance of international collaboration and partnerships together with Education and Data Arquitechture.

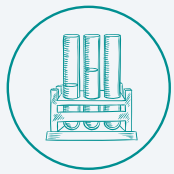
In Singapore's vibrant economy, artificial intelligence (AI) is reshaping healthcare, opening up new business avenues and enhancing efficiency in ways that promise to transform patient care. AI is integrating into healthcare systems, heralding advancements in personalized treatment, predictive health analytics, and streamlined operations, marking Singapore as a pioneer in medical technology.

The nation's healthcare AI sector is thriving, with the government-backed Smart Nation initiative propelling growth and drawing international investments to its tech-savvy environment. Singapore is nurturing a dynamic ecosystem that encourages collaboration between AI innovators and health industry giants, poised to make a significant impact on the sector's growth.

There are 5 National AI Projects, that aim at delivering strong social and economic impact.

INTELLIGENT FREIGHT PLANNING

SEAMLESS & EFFICIENT MUNICIPAL SERVICES



CHRONIC DISEASE PREDICTION & MANAGEMENT

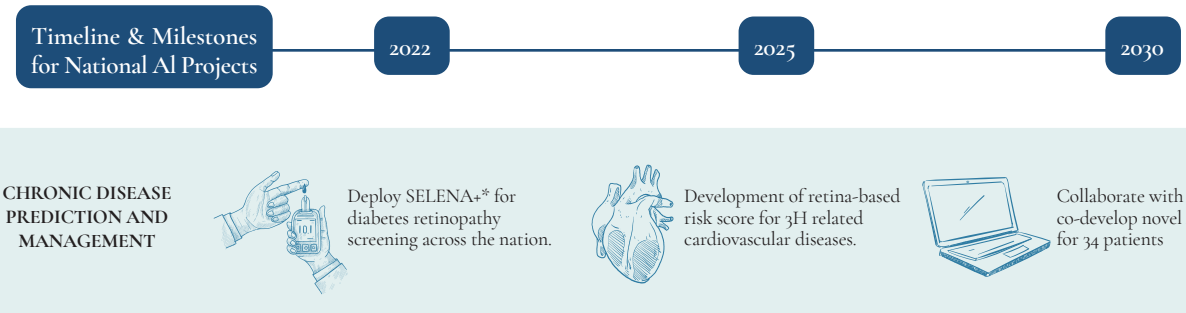
PERSONALISED EDUCATION THROUGH ADAPTIVE LEARNING & ASSESSMENT

BORDER CLEARANCE OPERATIONS

The Chronic Disease Prediction and Management, Will look into:

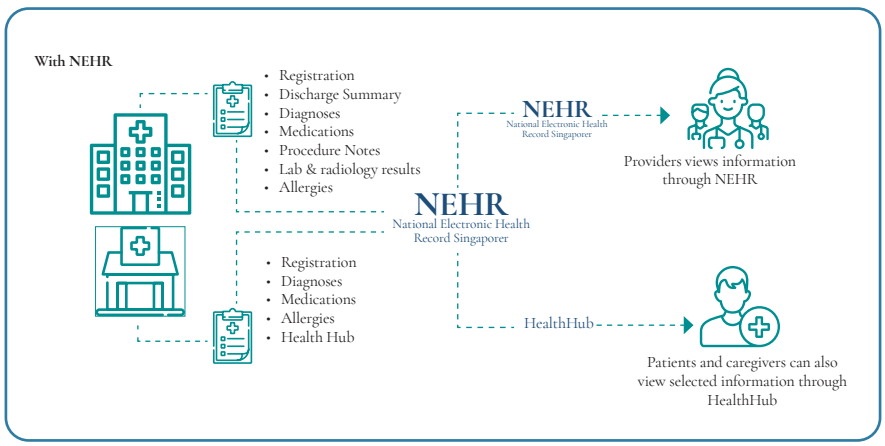
- Personalised risk score for chronic diseases
- Clinical decision support for primary care doctors
- Personalised management of chronic diseases.

Other objectives under the national AI strategy involve clinical decision support for primary care doctors and empowering patients to manage their diseases better. A look into the objectives and timelines:



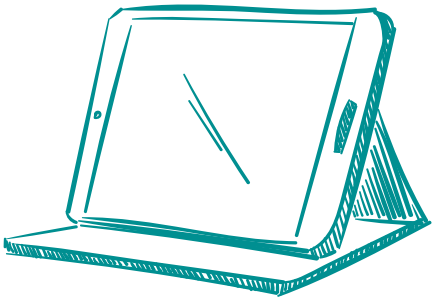
At the backbone of this initiative is the Electronic health records (EHR)

"One Patient, One Health Record" has been the motto behind the 2011's national EHR initiative. Launched in 2011, Singapore's initiative centralizes health records under the Ministry of Health, maintained by Integrated Health Information Services. With over 1,300 healthcare providers linked, authorized professionals can access a patient's comprehensive health history. Singaporeans and permanent residents can manage their health data, appointments, prescription refills, and payments through the HealthHub portal.



"AI-based algorithms determining how treatment outcomes can be improved by comparing massive data points. Advanced algorithms that support physician decisions and patient lifestyles will digitally transform healthcare, and we want to be ready and prepared for it." Shares **Probir Das, Group Executive Officer, Terumo Corporation** the world's largest Japanese medical technology company.

The Technology Muscle



As generative Artificial intelligence (AI) creates a frenzy in its breakout year, the importance of distilling useful applications from the noise becomes more important than ever, especially regarding health. With the global AI healthcare market predicted to be worth $187 billion in 2030, the technology can bridge healthcare gaps, broaden access, improve the accuracy of diagnostics and treatments, and drive economic growth.

"Healthcare is going through the maximum disruption now, compared to what it has seen in the last hundred or two hundred years; health is moving away from hospitals to the patient's homes, devices speak to each other, and there is a lot of AI," exclaims **Probir Das, Group Executive Officer of the Terumo Corporation**. He believes that technology can bridge healthcare gaps, such as physician workload and fatigue, "Today in the US, one of every four doctors wants to retire prematurely because they are overwhelmed by work. In the next 20 years, I believe the number of doctors will drastically drop, the use of AI will increase hugely, and there will be a significant change in how doctors treat patients."

Similarly, **Dr Timothy Low, CEO of Farrer Park Hospital,** claims technology is already being applied in this way to compensate for a lack of human capital within the healthcare ecosystem, "*In hospitals in Singapore, RPA (robotic process automation) is adopted because we don't have enough human resources to do the repetitive stuff; therefore, we use software for that work. Adoption is easier in these areas because it doesn't involve patient decision-making.*" He suggests that the health industry needs to be receptive to new innovative technology, "*We need early adopters who like to ride on new health tech to make faster and more accurate decisions and are prepared to use AI.*"

A key consideration when adopting AI is the origin of the information used, "we need to aggregate data from multiple sources to improve the health outcomes of long-term patients," claims **Dr. Peter Chow, CEO of Mount Elizabeth Novena Hospital Singapore**. "This means ensuring that long-term patients are healthy and implementing services that help them throughout life. To achieve this, we need to leverage both AI and big data. We can provide better healthcare outcomes by bringing together information from diverse sources." The hospital is fostering a collaborative approach to ensure the spillover of its work in AI supports the population beyond its walls, "*We are exploring how to make better use of big data and AI to enhance our interventions, both at the individual institution level and at the broader population level beyond hospital borders.* This involves collaborating more effectively with primary care partners and sister units to improve integration."

AI applied.

Case 1 Farrer Park Hospital

Considering Singapore is one of the most innovative countries and very open to technology, how do you see the adoption of artificial intelligence by doctors in Singapore?

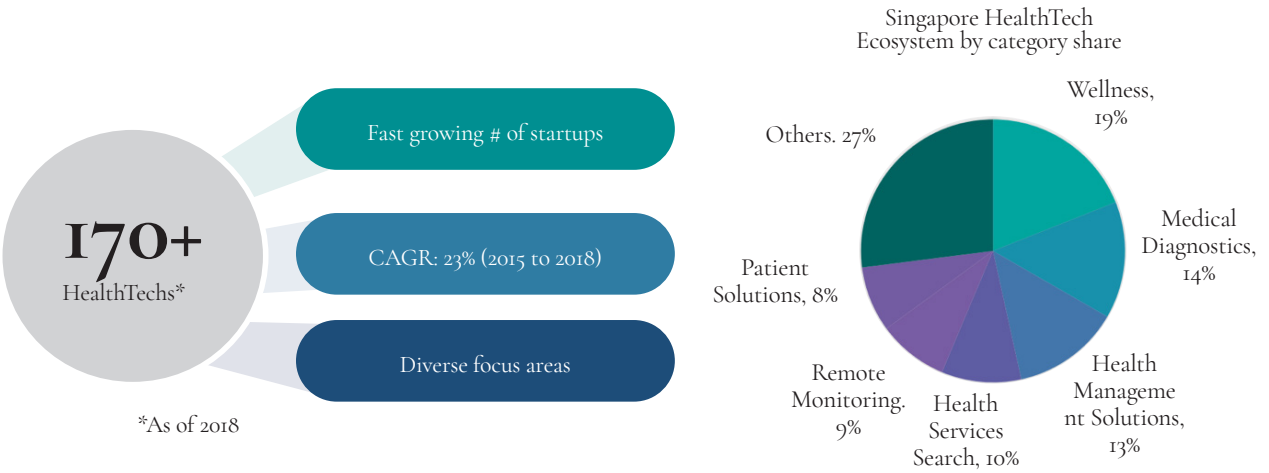
"*Doctors are generally conservative and cautious, so adopting new technologies in healthcare is slower than in the tech world.* They have an inborn fear of wrong decisions or data they personally haven't construed that could affect their reputation. It could even raise medical and legal issues. They wait until somebody else adopts the technology, and if it works, they will also adopt it. Even in Singapore, this happens, and the region has similar behavior. *We need early adopters who like to ride on new health tech to make faster and more accurate decisions and are prepared to use AI. In hospitals in Singapore, RPA (robotic process automation) is adopted because we don't have enough human resources to do the repetitive stuff; therefore, we use software for that work. Adoption is easier in these areas because it doesn't involve decision-making for patients.* We have an education infrastructure in place; we have the faculty –doctors and specialists- and those interested in continuing their training." Timothy Low, CEO.

Case 2

à**What is your opinion on the short to medium-term advancement and accessibility of digitalization and technology in Singapore, specifically in healthcare?** Dr. Peter Chow, CEO, Mount Elizabeth Novena Hospital

"There are two levels of consideration for using AI to improve healthcare. Firstly, *AI can be used to improve the effectiveness of specific procedures,* such as endoscopy, by assisting clinicians in detecting issues like polyps. Many hospitals are already testing this, and it could reduce population-level misdiagnosis. Secondly, we need to aggregate data

from multiple sources to improve the health outcomes of long-term patients. This means ensuring that long-term patients are healthy and implementing services that help them throughout different life stages. To achieve this, we need to leverage both AI and big data. *By bringing together information from diverse sources, we can provide better healthcare outcomes."*



Source: https://www.edb.gov.sg/en/business-insights/market-and-industry-reports/the-singapore-healthtech-ecosystem.html

The market trends for AI in healthcare are dynamic and reflect the ongoing technological advancements, regulatory changes, and evolving healthcare needs. Here are some key trends shaping the AI healthcare landscape:

Increased Demand for Telemedicine and Remote Monitoring: The COVID-19 pandemic has significantly accelerated the adoption of telehealth services. AI is a critical component in this domain, enhancing virtual consultations with capabilities like AI-driven diagnostics and patient triage.

Predictive Analytics in Patient Care: There is a growing trend towards using AI for predictive analytics to forecast patient outcomes, manage chronic diseases, and anticipate future pandemics. This is leading to proactive rather than reactive healthcare strategies.

Personalized and Precision Medicine: AI facilitates the analysis of vast datasets to tailor treatments to individual patients. This approach is becoming more prevalent as it can significantly improve outcomes, particularly in fields like oncology and genomics.

Drug Discovery and Development: AI is streamlining the drug development process, from identifying potential drug candidates to speeding up clinical trials through better patient selection and monitoring.

Operational Efficiency: Healthcare providers are increasingly deploying AI to optimize operations, manage patient flow, predict staffing needs, and automate administrative tasks, resulting in cost savings and improved patient experiences.

Data Security and Privacy: With the increased use of digital health records and AI, there is a heightened focus on securing sensitive health data against breaches and ensuring compliance with regulations like GDPR and HIPAA.

Ethical and Transparent AI: As AI becomes more integrated into healthcare, ensuring that AI systems are ethical and decisions can be explained is critical. This includes addressing biases in AI algorithms that may affect patient care and outcomes.

Integration with Wearables and IoT Devices: AI is being integrated with wearable technologies and IoT devices to provide real-time monitoring and health alerts, which can be particularly beneficial for elderly care and managing chronic conditions.

Cross-sector Partnerships: There is a notable increase in collaborations between tech companies, pharmaceutical firms, and healthcare providers, combining expertise to drive innovation in AI healthcare solutions.

Regulatory Support and Challenges: Governments are beginning to establish more robust frameworks for AI in healthcare to encourage innovation while ensuring safety and efficacy. The regulatory landscape is complex and evolving, posing both opportunities and challenges for market players.

In Singapore, these trends are often at an advanced stage due to the nation's commitment to becoming a Smart Nation, with significant investments in health technology and AI as a strategic priority for national development.

In Singapore's AI healthcare landscape, several key players are instrumental in the surge of innovation and implementation. These include a mix of homegrown startups, global tech giants, academic institutions, and government bodies that are all contributing to the vibrant ecosystem. Here's a brief overview of some of the key players:

Government Agencies:

Smart Nation Initiative: Spearheads national efforts to leverage technology for societal and economic advancement.

Integrated Health Information Systems (IHiS): The technology agency for the public healthcare sector, driving digitalization in healthcare services.

Agency for Science, Technology, and Research (A*STAR): A leading agency that fosters scientific research and talent for a knowledge-based Singapore.

Healthcare Groups:

National University Health System (NUHS): Focuses on integrating research with clinical services and education.

Singapore Health Services (SingHealth): Engages in extensive research and development to incorporate AI in clinical practices and patient care.

National Healthcare Group (NHG): Conducts research on population health to develop AI tools for predictive analytics and disease management.

Educational Institutions:

National University of Singapore (NUS) and **Nanyang Technological University (NTU)**: Both universities are heavily involved in AI research, often in collaboration with healthcare sectors and industry partners.

AI Startups and Companies:

Biofourmis: Personalizes care using digital therapeutics powered by AI.

Lucence: Provides AI-driven cancer diagnostics for personalized treatment plans.

Healint: Leverages AI for the management of chronic conditions through real-time data analytics.

International Tech Giants:

IBM Watson Health: Partners with local institutions to develop AI applications in oncology and genomics.

Google Health: Works on AI research projects tailored to regional health concerns, leveraging data analytics and machine learning.

Siemens Healthineers: Invests in digital innovations, including AI for diagnostic imaging in Singapore's healthcare sector.

Venture Capitalists and Investors:

Sequoia Capital and **EDBI**: Invest in promising AI healthcare startups in the region, providing the necessary capital for innovation and scaling up.

Regulatory Bodies:

Health Sciences Authority (HSA): Regulates medical devices and health products, including AI applications, ensuring they meet safety and efficacy standards.

These entities are not just developing AI technologies but are also fostering partnerships and collaborations that facilitate the translation of AI research into clinical practice and healthcare management. Through their collective efforts, these players are cementing Singapore's position as a global hub for AI in healthcare.

Timothy Low

CEO
Farrer Park Hospital

EF: What are your insights on digitalization, and how are you using it in your interconnected building?

TL: *We use a technology called VDI, Virtual Desktop Infrastructure, which contains all the patient's information, and the doctors can access it from their mobile phones or tablets in real-time. The data can be transmitted anywhere in the world. As the hospital patients' results come in, these go straight to the doctor's phones or tablets, whether at a conference, restaurant or wherever.* If they attend a forum in the US, they also have access to their patient's results. The same happens for monitoring results. The information is password protected and has security and real-time connectivity for patient care for the principal doctor and whoever else is taking care of that patient. There is a Smart tablet on each patient's nightstand, and patients can use it to order meals, choose from a menu of 200 choices, read digital newspapers, see the results the doctors show them, and play games.

EF: How do you see the healthcare hospital facilities evolving in the future? Where is the trend going?

TL: *Next for healthcare are AI and automation. AI is decision support for doctors and physicians. I have recently introduced an AI colonoscopy in Farrer Park.* In Asia, colorectal cancer is one of the top killers, and nowadays, it is happening in younger patients; I have seen 35-year-old patients getting colorectal cancer. Colonoscopies are a screening tool to help healthcare reduce cases in terms of early detection of colorectal cancer. The difference in an AI colonoscopy is when the doctor introduces the scope; the AI will identify areas the surgeon may have missed, for example, flat polyps, which the AI can find in less than a second and warn the surgeon. It shows around 20 to 30% of missed polyps. Clinical diagnostics for clinical decision-making is an area where AI can help.

It is very difficult to diagnose dementia, and there are more patients with dementia worldwide. It is important to pick up on dementia early to delay the process with medication or therapies. *We have AI-assisted MRI, which helps identify early dementia. When the brain tissues shrink in the early stages, the patient is perhaps a little forgetful, but there is nothing to raise the alarm, but the test can be done for early detection of dementia. We also use AI for cognitive monitoring skills, with the patient taking 20 minutes to do a quiz; the answers go to the algorithm system, which will churn out a report for the doctor to see if the patient has any cognitive decline. The exercise can be followed up every year to monitor the general progress.*

EF: When you look back at this period in your professional career, how would you like to be remembered considering you navigated difficult times?

TL: *Leadership is about building new leaders within the organization*. There are leaders at every level, and individuals should be leaders of their own lives and areas of influence. I want to be of significance; by this, I mean touching and improving the lives of others. That would be my contribution and my satisfaction.

Also susteinability is important nowadays. Our entire building is green, and we have been certified "Green Mark Platinum," the highest accolade given to a facility that saves energy. ESG is our top priority; we save 30% on energy annually to maintain this certification while helping the environment and being sustainable, and we work on the staff having the same mindset. There are fifteen gardens within our complex. We aim to be green and to heal; bringing the patients closer to nature has a healing component. Biophilic architecture brings nature closer to people and is part of healing. Finally, art can also help to relax people; hospitals can make people anxious, and we have more than seven hundred pieces of art within the complex. The art is uniquely curated and, in a few cases, drawn for the building. We support regional artists; each piece has the artist's name and the reason the work was created. The art helps patients and caregivers release anxiety and stress. Art and nature are part of the healing process in Farrer Park.

Dr. Peter Chow

CEO
Mount Elizabeth Novena Hospital

EF: Can you elaborate on your background and how this contributes to your current role?

PC: I was trained as a dental surgeon and spent around 16 years in the public healthcare sector; I thought it would be of great value to have experience in the private sector too. I was fortunate to be given an opportunity with Mount Elizabeth Novena Hospital, which was, at that time, IHH Healthcare's newest hospital in Singapore. *The current success of the hospital is the result of the meticulous planning and strategic foresight of past and current CEOs and other leaders who laid the foundation.* After a few years with the hospital, the COVID-19 pandemic hit, and I was grateful to be a part of the hospital during that challenging period for the healthcare industry. I feel incredibly privileged to have been a part of the hospital during this unique time, and now, as we move past the pandemic, we are planning for a new stage of growth for the hospital.

EF: In a post-COVID-19 scenario, after making so many tactical decisions, what are the priorities for growth today?

PC: In Singapore, similar to many other economies, there remains a shortage of workforce across several sectors. *To address this challenge, it is crucial to prioritize the recovery of our workforce capacity, particularly as it directly impacts healthcare.* With two full years of COVID-19 behind us, there will inevitably be a surge in healthcare demands that cannot be fully addressed within a year. We are seeing patients not only from Singapore but also from other regions who require follow-up care that was deferred during the pandemic. This has resulted in more complex cases that take longer to stabilize. Additionally, healthcare providers are facing a new challenge: global inflationary pressures. *Rising costs in healthcare were already on an upward trajectory, and this new pressure emphasizes the need for providers to find ways to deliver care more cost-effectively.*

EF: Can you describe the role you see for integrated healthcare and value-based care?

PC: The concept of value-based healthcare focuses on taking a longitudinal view of healthcare rather than simply cutting costs at specific interventions. *At IHH Healthcare Singapore, we are prioritizing value-driven outcomes that go beyond simply assessing the cost of care and instead evaluate overall outcomes. We are also exploring how to make better use of big data and AI to enhance our interventions, both at the individual institution level and at the broader population level beyond hospital borders. This involves collaborating more effectively with primary care partners and sister units to improve integration.* While it may be easy to determine the costs and outcomes of certain interventions, such as knee replacements, it is more challenging to understand the cost of managing chronic conditions and their associated outcomes.

EF: How is IHH SG working with the public sector to improve the healthcare landscape in Singapore?

PC: *The current focus of Singapore's public sector is to promote population health through empanelment with primary care physicians.* Currently, only 20% of primary healthcare is provided in the public sector, with 80% being provided by individual general practitioners. The government is working to create networks that bring these individual primary care providers together to organize and care for the population. This is an important step toward providing longitudinal care and preventive services. In line with this, IHH SG has a primary care group of clinics and is working to build up its primary care sector to support the government's initiatives. Another goal is to understand healthcare costs in the hospital sector and find ways to reduce them, especially for patients requiring hospitalization. These initiatives are aligned with IHH SG's focus on value-driven outcomes.

Dr. Kwang-Wei Tham

President
Singapore Association for the Study of Obesity

KT: SASO, Singapore Association for the Study of Obesity, was founded in 2001. Obesity became an evident problem in Singapore as late as 2010; following the world trend, we are a developing country on this topic, and when I took over, it had already gone awry.

Our mission has, since the beginning, been to promote the research and study of obesity and be a platform to bring stakeholders together. We are a professional medical organization, not just doctors but people from different walks of obesity. *As the country matures, we are working to change the social perception of obesity and let it be seen as a disease in its own right. Many organizations worldwide recognize obesity as a major problem; the WHO and Singapore do. In the process of prioritizing obesity, the narrative is important.* People tend to see it as a risk factor, like smoking; however, the understanding of science has developed, especially over the last two decades. Obesity, like diabetes, starts from things that have gone wrong in the body, from an imbalance. The mindset of concept change has been very slow to take on, especially in Asia. While we are doing the right things, changing food and environmental policies, with the government putting in resources, obesity rates are still rising. What are we doing wrong? The scientific-based body has put a lot of effort into promoting information on obesity correctly, treating obesity as a disease. *It is not about going on a weight loss diet for three months; there must be a follow-up, keep making the changes, and disease management. It is not because people are lazy or lack willpower, as some doctors might conclude, but unfortunately, this leads to general stigma and bias and not addressing or treating the problems of obesity correctly. We serve as a platform with information, expertise, and resources.* One of our aims is to link people up; we are a community of healthcare professionals who believe in advancing knowledge and education about obesity and advocate for people living with obesity. One of the biggest misunderstandings is that obese and overweight people are lazy; they internalize this bias and believe they are not good enough. They don't go to a doctor and think they are fat because they don't try hard enough. They don't come in for health screening, don't take up healthy behaviors, suffer the inequality of healthcare delivery, and are psychologically and physically affected. *Our role is to fill in the gaps through scientifically based knowledge and education.*

EF: Could you elaborate on the overweight and obesity prevalence in Singapore? Numbers are rising worldwide, but how does this translate into Singapore?

KT: Overweight rates are high in Singapore, 10.8% right now, meaning one in nine or ten people are obese, but at least the rate has held steady, and the WHO aims to halt obesity rates. *Between 2004 and 2010, Singapore nearly doubled its obesity rates, rising 60%, when the government woke up and became more involved. We are not trying to reverse the trend because it is predicted that if we can stop it, we can avert the downstream effect of many NCDs. There is a WHO report about reducing NCD deaths by 30% by 2030, and they recognize that if we don't deal with obesity, it won't be possible.* We have a National Population Health Study every six years or so; the last was in 2017, and the previous was in 2010. Since 2017 our rates have risen a little, from 8.7 to 10.8%. We have held it steady in the big scheme of things. When referring to obesity rates, we use a universal weight measure for comparison with the rest of the world, the BMI, with a body mass index of 30. Whether a person is Caucasian, Asian, Afro-American, or whatever, everybody uses a body mass index of 30. But Asians cannot tolerate a lot of fat, and the same BMI means a lot more fat for an Asian, which tends to be in the wrong areas, mainly in the visceral or central location -the belly area- causing heart diseases and diabetes. The relevant BMI cut-off nearly doubles for an Asian. We now use lower BMI cut-offs appropriate to Singaporeans and Asians.

This is reflected in our obesity- reaching 21% of what we call health risk. *Regardless we need to look at what is meaningful for our population, and one in five Singaporeans is at weight risk. And there are many problems related to obesity and weight risk. Nearly 60% of Singaporeans are in the so-called overweight and obesity range, which is very high, and measures must be taken.*

EF: What lessons and synergies can be transferred between the relevant associations?

KT: Each country is in different phases of developing relevant obesity policies: infrastructure, food environment, physical activity, transport, etc. *As a platform, we inform what works; it can be something as simple as a digital app. Singapore is used to digital apps, they have been used for quite some time already, using incentives to match behavior, and this is an area that continues to be refined. Singapore is very small but has a dense population of working adults, so we can share best practices, if not with countries but with cities of similar demographics, and learn from each other. Learnings can be taken and adapted. As a platform, we get people to share.*

EF: In three years, SASO will celebrate its 25th anniversary; what achievements are you most proud of?

KT: First and foremost, I am delighted that over the past twenty years, interest has been increasing, including from the clinical aspect, more professionals willing to be trained and develop skills in this area, and we are seeing new specialties coming in. Before, it was mainly endocrinologists; now, we see cardiologists, family physicians, dietitians, and researchers getting involved. *I am gratified to see our field has grown to include more people from different worlds to complement each other so we can move further. Everybody is keen to learn from each other and to share, and the platform opens a lot of collaborations. As a small country, our strength lies in unity and building upon what we have done. Our human resources are small, and the patient pool isn't very big, so if we pool our data (experience, outcomes, and economics) together, we can go much further. Our data and guidelines and local expertise can contribute to the region.*

EF: Singapore might be small, but it is a very value-driven market, just like your association. Is there a final message you would like to share?

KT: At the end of the day, it is about creating value. My hospital team is small, but we dream big, and our dream inspires us to keep moving forward; without it, we would quit and give up, especially in a field such as obesity. The difference we can make to the people who live with obesity is a critical aspect that propels us forward. We want to make a difference. We don't feel superior to the patients or condescend to change their lives; we understand how challenging it is for them to change in an environment and with families that work against them; a bigger push than drugs is needed. *We see ourselves as partners who journey with our patients living with obesity. If we can make them a little healthier and more positive, there is value in what we do.*

Thank you.

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