

FUTURE OF HEALTHCARE & WELLBEING WHITEBOOK 2021-2022



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MESSAGE

from Minister for Health of Singapore,
Mr Ong Ye Kung

COVID-19 has been a crisis for a generation. All health ministers today are seized with managing the ever-evolving COVID-19 situation, while still grappling with the long term challenges concerning the health of our populations.

The two are not unrelated. Throughout history, capabilities built up to respond to emergencies and crises proved to be enduring over time. The capabilities we acquired in fighting the COVID-19 crisis has long-term relevance to our healthcare systems. There are at least five areas of relevance.

Building capabilities with long-term relevance

First, wider adoption of vaccines. More people are now aware about vaccines and how they help to prevent infectious diseases. This will encourage vaccination take-up for other infectious diseases and prevent more diseases and deaths.

Second, a stronger primary and community care system. During the COVID-19 pandemic, whether it is vaccination, testing or home recovery, they are carried out at the primary care level, in the community. The pandemic brought out the importance of these aspects of medical care, as the first line of defence against serious illnesses. As our population ages, upstream primary care, where we screen our population for chronic diseases and dispense advice to help people lead

healthier lifestyles, will prevent the onset of severe chronic illnesses later on in their lives.

Third, COVID-19 presented an opportunity to make telemedicine an indispensable feature of our future healthcare system. We had to quickly scale up deployment of telemedicine operations to support the COVID-19 operations such as our Home Recovery Programme. Individuals are now more comfortable with the concept of remote care and I hope that this trend will continue.

Fourth, personal hygiene. Throughout the pandemic, we have also seen the incidence of influenza, other bacterial and viral infections plunged. This is likely due to our population observing safe distancing, wearing masks and practising good hygiene habits such as washing our hands more frequently. Hopefully, these can become permanent habits of Singaporeans, which will make us healthier and more resilient to diseases.

Finally, COVID-19 has helped us become more prepared for future pandemics. With COVID-19, we have built up a whole new arsenal of surveillance and response tools, to deal with future pandemics. Most importantly, we have people hardened by the pandemic crisis, such that we know how to co-operate with each other and work in unison to overcome a major challenge like COVID-19. These are important improvements to our pandemic preparedness for any future crisis.

A Common Baptism of Fire

Today, Singapore finds itself in a rather unique position. We know that it is not possible for a global city state like us to eradicate the virus within our borders. Lockdowns inflict pain and suffering to many workers, families, students and businesses.

We will need to open up social and economic activities progressively and safely. We have therefore decided to embark on a journey to transit to a resilient nation that can live with COVID-19. But the path we take will not be straightforward, but full of twists and turns.

COVID-19 is a common threat to human kind. Every country and people have been put through a stringent baptism of fire, and we are learning from each other. I also hope that as soon as we are ready, Europe and Asia can start to rebuild the bridges across our continents again.

I thank EuroCham for your continued efforts in fostering engagements between European companies and Singapore stakeholders. I hope this spirit of co-operation stay strong, to help see all of us through this pandemic.



MESSAGE

from the President of EuroCham Singapore,
Mr Federico Donato

I am delighted to present the Future of Healthcare & Wellbeing Whitebook 2021-2022 by EuroCham Singapore.

The beginning of 2020 saw a healthcare crisis of unprecedented magnitude hit the world. It required every individual, company, nation, and region to come together to present solutions to not only curb the rapid spread of COVID-19 but also realize that healthcare systems could no longer be merely reactive but had to be proactive instead. The European Commission, individual European nations and the Singapore government – all confirmed their intention to prioritize urgent population needs and followed up on such statements in the subsequent months by supporting the healthcare system in mandating quarantine processes, rigorous testing, and encouraging nationwide vaccination programmes. These governments also rose to the challenge of supporting businesses in finding alternative modes of working arrangements that prioritized health safety while ensuring minimal damage to the economy.

In selecting the future of healthcare and wellbeing as the Chamber's main topic in 2020 and 2021, we address a top priority for many global companies. Even before the pandemic, healthcare has been high on the European Commission agenda, as well as a priority in the United Nations through their Sustainable Development Goals. However, it has now come to the forefront of many dialogues. In Singapore especially, building a sustainable healthcare system and fostering a healthy population have become of paramount importance.

For these reasons, we take the lead in launching our showcase of Best Practice Sharing Sessions where European and local companies share their initiatives and plans. The publication of this 'Future of Healthcare & Wellbeing Whitebook' is also a reflection of this mission and contains position papers and surveys on innovation, wellbeing and nutrition.

We engage Singaporean and European companies in all our activities, because our chamber is a place where partnerships are fostered and deeper collaboration between Europe and Singapore begins.

As a European Chamber of Commerce, we represent the voice of European Businesses in Singapore, advocating for a more open and free market in Singapore, even as we acknowledge and promote safety of the population in line with the guidelines of the government.

The Healthcare Whitebook mirrors these principles and promotes an exchange of views and practices between Europe and Singapore. The purpose of this publication is to encourage the private sector to engage in innovative thinking, while prioritizing the rising wellbeing and healthcare needs and recognizing some of the unique challenges that face Singapore.

Through the Future of Healthcare & Wellbeing Programme, our Chamber focuses its efforts around three topics that are high on the agenda for both Singapore and Europe. They are Healthcare & Innovation, Healthy Lifestyle & Wellbeing, and Healthy & Sustainable Food.

Given the pandemic, Europe and Singapore both share a disrupted healthcare system that must accelerate the pace of digitalisation to meet new and urgent needs. It is time for the two regions to join in an open dialogue and exchange views on how to move forward while ensuring that the economy remains open and robust in tandem with a high level of health safety for the population.

This Healthcare Programme could not have been accomplished without the crucial support of the Healthcare Committee and the committee's Chairman, Anbu Srinivasan. I would like to extend our appreciation to Accenture, BNP Paribas, XCL World Academy and HERE Technologies as our Diamond members, and to all our Gold and Regular members for their support of our programmes and activities. Also, a special thanks to our main stakeholders: the EU Delegation to Singapore and the Ambassador for their guidance, various Singaporean government bodies including but not limited to Ministry of Health and Health Promotion Board for engaging with us, the National Business Groups for sharing their vision of Europe's future with Singapore, and all other contributors and editors who made this Whitebook possible. Only through such collaboration and partnerships can we tackle such immediate and future challenges of our world.

Happy as always to try to contribute humbly to a stronger Singapore – Europe business agenda.



MESSAGE

from the Ambassador of the European Union to Singapore, H.E. Iwona Piórko

Since the outbreak of the COVID-19 pandemic, the EU has stepped up efforts to build a strong European Health Union. Through this, all EU countries prepare and respond collectively to health crises. The European Health Union improves protection, prevention, preparedness and response against health hazards. In addition, it anticipates future pandemics enhancing the resilience of European health systems.

Among the many lessons, the pandemic has taught us international cooperation with like-minded countries such as Singapore, is crucial. We need to strengthen our crisis preparedness and management of cross-border health threats, and monitor the global supply of medicines and medical devices to mitigate possible shortages in the future.

The EU is a strong supporter of the World Health Organization as the lead multilateral body to direct global health coordination and responses. Together with Singapore, and as part of our Strategic Partnership with ASEAN, we are committed to vaccine multilateralism. We will continue to work together to ensure fair, equitable, and affordable access to safe and effective vaccines through the COVAX facility.

The EU and Singapore are strong partners working jointly to reinforce and modernize the rules-based multilateral trading system. The concept of open and fair trade is strongly embedded in our comprehensive Free Trade Agreement, in force since November 2019. Among the many benefits, the FTA includes

specific provisions on pharmaceutical products and medical devices. It increases regulatory cooperation, promotes innovation and establishes competitive market conditions based on principles of openness, non-discrimination and transparency, while protecting intellectual property rights.

This is particularly important as we witness an increase in trade in counterfeit medicines, pharmaceutical products and medical supplies. Against the backdrop of the global health crisis, illicit goods pose an even greater risk to human health.

Our bilateral trade with Singapore in pharmaceutical products and medical devices is valued at around €6.5 billion in 2020. This represents 16% of our total merchandise trade flows. In fact, this year (2021), Singapore is among the main destinations for exports of EU vaccines in Asia. This shows the EU's strong commitment to global equitable access to COVID-19 vaccines.

Mental health is another key issue that has emerged in these trying times. Stringent lockdowns, work-related issues and above all, the emotional toll of dealing with the suffering of loved ones has resulted in new challenges.

Mental health and well-being are interlinked. Even before the pandemic, the EU actively contributed to international policy frameworks, notably the UN Sustainable Development Goals and the nine global voluntary targets set by the WHO on non-communicable diseases.

To improve mental health, the EU has set several actions to promote an active and healthy lifestyle, while ensuring high-quality food in the market. Nutritional needs and physical activity are both essential for health promotion and disease prevention.

Ageing and the increase in chronic diseases such as cancer, diabetes and heart diseases are increasing costs to potentially unsustainable levels adding to the risk of unequal access to care for people across the globe.

External environmental factors, including climate change, as well as the risk to lose our ability to protect ourselves against infectious diseases, due to anti-microbial resistance, are also exposing us to new risks.

Given this context, innovative technologies and further research are key to face future challenges in the healthcare sector. As part of the EU's research and innovation programme 'Horizon Europe', we have set an ambitious budget of €95.5 billion until 2027. This will fund research in priority areas, including the healthcare sector.

I applaud the sustained efforts of EuroCham Singapore to steer industry discussions on healthcare in Singapore. This whitebook marks another milestone to highlight European excellence in the fields of healthcare, innovation, healthy lifestyle and sustainable food. Thank you for providing a solid basis for ongoing discussions on the future of healthcare and well-being.



MESSAGE

Chair of EuroCham Healthcare Committee, Mr Anbu Srinivasan

It is my pleasure to present to you The Future of Healthcare & Wellbeing Whitebook 2021-2022 by EuroCham Singapore.

2020 and 2021 have been extraordinary years. The pandemic created abrupt changes in the healthcare system and health of the general population. Healthcare became a top priority on the agenda for governments around the world. Major market forces are dramatically changing the landscape, disrupting healthcare's status quo with pharmacy chains, payers, technology companies and others making their presence felt.

To adapt and thrive in these challenging times, effective collaboration and communication are crucial for organisations. At the Healthcare Committee of EuroCham we work

to foster alliances between European companies and the Singapore healthcare ecosystem to accomplish positive outcomes for the people of Singapore.

As part of this commitment, the chamber launched "The Future of Healthcare and Wellbeing Programme". Three pillars were identified within this program: Healthcare & Innovation, Healthy Lifestyle & Wellbeing, and Healthy & Sustainable Food.

The programme covered a wide range of ideas from healthcare regulation to health technology assessments to Covid 19 vaccinations. Through the dialogues, we were able to engage a wide variety of stakeholders from regulators, healthcare practitioners, EuroCham member companies and students.

The Healthcare and Wellbeing Whitebook is a summary of all these interactions and provides a reference for the future. It is a culmination of a year long journey that was only made possible by the contributions of our many stakeholders. I would like to extend my appreciation to all the Healthcare Committee members, our guest speakers and moderators and to the EuroCham Singapore team, whose hard work made this programme a reality.

As we look ahead with cautious optimism, we will continue to drive the exchange of ideas between European companies and the Singaporean healthcare ecosystem.



MESSAGE

from the Executive Director of EuroCham Singapore, Mrs Nele Cornelis

It has been a productive year for the European Chamber of Commerce: a year during which we have embraced the topic of Future of Healthcare and Wellbeing in acknowledgement of the challenges the pandemic continues to present to both businesses and our society. We have been running the Future of Healthcare and Wellbeing Programme from September 2020 till the end of 2021 and it encompassed a significant portion of our activities during that time.

Given the disruption in healthcare systems facing Singapore and the countries in Europe, there is much the two can collaborate on and learn from each other, thereby leading to healthcare being the focus of our activities. Our choice to make Future of Healthcare and Wellbeing the main programme of the year became even more compelling by our observation that many of EuroCham's members were stepping up to assist the government with not just immediate COVID relief efforts but in building a healthier nation through technology and advocacy.

With the support of our Healthcare Committee helmed by Mr Anbu Srinivisan as Chair of the Committee, EuroCham planned a series of sharing sessions and webinars on three relevant areas: Healthcare & Innovation, Healthy Lifestyle & Wellbeing, and Healthy & Sustainable Food. These three topics were identified to be highly relevant to both Sin-

gapore and Europe not only on a broader societal level, but also on a commercial level. Simultaneously, EuroCham planned to execute surveys, position papers and articles – all to be included in this Whitebook that would coincide with the above three focus areas as well. We were keen to collaborate with not only our members but also external stakeholders to make this programme a successful one.

Immediately, the programme triggered a lot of interest from our members. The initiatives were warmly welcomed by both the European Commission, the Singapore government and other key stakeholders.

On 17th of August 2020, the programme kicked off with the sharing session on "Healthy Lifestyle & Wellbeing". It was the first of a series of 10 monthly events where we not only successfully collaborated with National Business Groups, but also with local universities: LKY School of Public Policy – NUS, Duke-NUS Medical School, and NUS Saw Swee Hock School of Public Health.

The programme also marked the compilation of content-driven position papers and reports covering the three healthcare focus areas of the programme. I am most appreciative of the strong support extended by our members in the preparation of these position papers. Conducting the papers and reports would not have been possible without their efforts.

The programme would not be complete without showcasing our members' excellence in Healthcare & Wellbeing, both in Europe and in Singapore. Their views, strategies and objectives appear in this Whitebook under the chapter "European Excellence in Healthcare & Wellbeing".

This first-ever Future of Healthcare & Wellbeing Whitebook of EuroCham offers real insight into the strategies pursued by companies and leaders in Europe and in Singapore, the capabilities and innovative solutions being developed for a challenging future and the calibrated opportunities European companies bring to Singapore. We hope the Whitebook can serve as an inspiration to private and public sector players to join forces to overcome challenges that span across national borders.

A programme of this magnitude commands tireless efforts by many parties: in addition to the contributors, editors, partners and advertisers who made this Whitebook possible, I thank also our Diamond, Gold and Regular members for their generous support in helping us achieve our goals, as well as our partners and sponsors with whom we have worked very closely. My team and I look forward to another year of fruitful collaborations and partnership in which EuroCham continues to represent the business interests of your organisations in Singapore.

ABOUT EUROCHAM



WHO WE ARE

EuroCham is an independent non-profit organisation governed by members, representing the common interest of the European business community in promoting bilateral trade, services and investments between Europe and Singapore and the region.

WHAT WE DO

EuroCham represents the voice of the European business community in Singapore. We provide our members with a forum for advocacy, networking and information sharing within the European and Singaporean business communities and governmental circles.

OUR COMMITTEES

Our committees provide a common European platform to exchange information, discuss common issues businesses face and undertake coordinated initiatives. Through 12 committees we carry out advocacy work and publish position papers to put forward our recommendations.



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OUR NETWORK

EuroCham gives you access to a large networking pool consisting of the bilateral National Business Groups, European companies operating in Singapore, the Singaporean government, the Singaporean business community, the diplomatic circle and key partners across ASEAN.

Our network helps you connect with business leaders from a variety of business industries. We offer a wide range of events such as prestigious gala dinners or luncheons attended by high-level executives like the "European Luncheon", "Schuman Lecture" and the "Awards Gala Dinner". Take part in discussions rounds with experts and business representatives and social networking events such as the "European Networking Nights" that provide your company with increased corporate visibility.

INTRODUCTION

In Singapore, as in the EU, proactive measures have been taken in responding to the global imperative for businesses to become more future-forward in the healthcare and wellbeing sector. The COVID-19 pandemic has reminded us that we cannot merely remain reactive anymore.

The European Chamber of Commerce (Singapore) has enfolded in 2020-2021 a programme under the title 'the Future of Healthcare and Wellbeing' while contemplating that the world is facing an unprecedented challenge, and that the healthcare industry must accelerate key processes in order not simply to overcome crises but to stay ahead of them.

While Singapore is noted for its robust healthcare system it continues to strive for greater improvements in this field. The government's commitment to encourage the nation in living healthy and ensuring better wellbeing for all is equally embraced by EuroCham's members, European companies. Through this Whitebook, EuroCham seeks to further address the three topic areas which have been the focus of the programme.

The areas of focus of the "Future of Healthcare and Wellbeing" are:

1. Healthcare & Innovation
2. Healthy Lifestyle & Wellbeing
3. Healthy & Sustainable Food

A series of activities have supported the programme, including the 'Best Practices' sharing sessions, the launch of the 'Future of Healthcare and Wellbeing Whitebook', and closed-door meetings with key government stakeholders. The European Commission, Singapore government, and other key stakeholders have all warmly welcomed these activities as a way forward to open dialogue on potential pathways for future collaboration, which revolve around highlighting healthcare best practices, challenges, and opportunities in Singapore.

The Whitebook seeks to promote communication between Singapore and Europe while supporting the private sector and Singaporean stakeholders to pursue innovation and collaboration for the betterment of the Healthcare sector. It illustrates the common interests of the EU and Singapore with respect to healthcare, our efforts at EuroCham to advocate for a healthier future, and how European companies can drive change towards a society that is well-equipped to lead healthier and better lives. In addition, it demonstrates how European and Singaporean companies have collaborated in our joint pursuit of excellence in healthcare and in our belief that if we are to tackle the vast challenge we face, we need to engage all existing actors.

The Whitebook entails 3 chapters:

- Chapter 1: the compilation of three position papers covering the state of development of healthcare and wellbeing in Singapore and, going forward what the future outlook is,
- Chapter 2: a survey of 15 sector-relevant organisations based in Singapore, whose initiatives and strategies are presented in the Healthcare Report 2021.

- Chapter 3: Company profiles of well-established European organisations based in Singapore, to exhibit the excellence and expertise of innovation within healthcare and wellbeing industry

The three position papers in the first chapter of this Whitebook cover opportunities of collaboration between European companies and Singaporean stakeholders.

The first paper showcases Singapore's efforts in relation to innovation and value-based healthcare. It offers a holistic view of what a move towards actualizing Value-based Healthcare (VBHC) in Singapore would entail. The paper seeks to move beyond conceptualisation to real examples of how key players within the healthcare ecosystem (such as the financiers, the regulators, the tech-providers, the care-providers) can contribute to a possible VBHC system, and thereby also provide some insights into potential challenges that Singapore may face.

The second position paper is covering the future of physical health and mental wellbeing. It begins by exploring public and personal contributions towards improving physical health and mental wellness, through better health awareness programmes and self-care education. The paper then moves to mapping out how company-level contribution to physical health and mental wellness varies not only across the sector but pre- and post-pandemic as well.

The position paper of healthy and sustainable food looks at how European organisations in Singapore are facing up to the challenges of food security and sustainable means of food production. It also highlights the need for production of healthy food given the rising trends in food-related health concerns in Singapore.

The second chapter of the Whitebook is a report that discloses the results of a survey EuroCham ran from early February to late March in 2021 among Singapore-based companies related to the healthcare, wellbeing and food and nutrition industry.

Healthcare and Wellbeing Report 2021 stressed the importance of heightened awareness and understanding of available opportunities and challenges within the sector. Furthermore, the report emphasized the importance of cultivating partnerships with governmental players and the establishment of a sound ecosystem of private and public stakeholders.

The final chapter of the Whitebook profiles companies with demonstrated expertise within healthcare and wellbeing: showcasing European excellence in one of the three areas of focus.

It is evident in these companies' healthcare initiatives and ambitions that they wish to integrate research and innovation into their businesses, in an effort to re-think how the public can derive the most positive outcomes from the healthcare services delivered to them. It also illustrates how incremental changes in lifestyle can not only improve health outcomes but also overall wellbeing throughout one's lifespan. Eventually these efforts will culminate in growth and returns on capital for those companies.



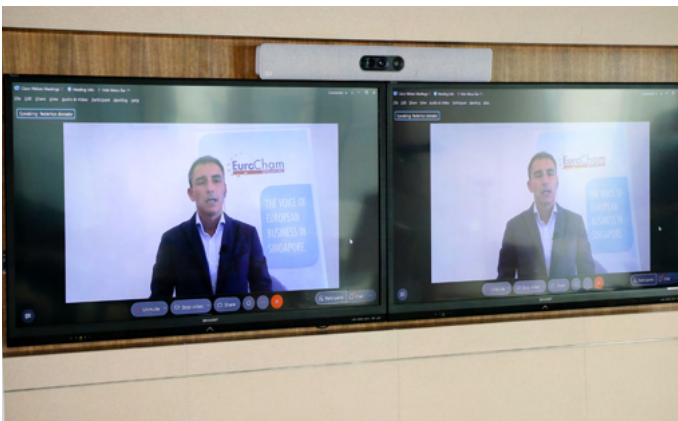
MINISTRY OF HEALTH CLOSED-DOOR SESSION

20 AUGUST 2021, FRIDAY (SINGAPORE)

The European Chamber of Commerce, Singapore hosted the Minister for Health, Mr Ong Ye Kung, and EuroCham members at the premises of its Diamond member, BNP Paribas.

Joris Dierckx, Chief Executive Officer at BNP Paribas Singapore Branch, Nele Cornelis, Executive Director of EuroCham Singapore, and Marjolein Oyen-Driesens, Vice President of EuroCham Singapore warmly welcomed the minister at the foyer before heading into a closed door discussion with the rest of the EuroCham members where Minister Ong Ye Kung started with a speech, reiterating the Singapore Government's commitment to staying open.





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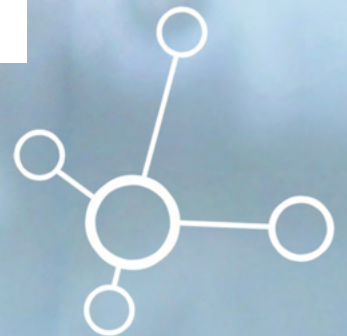
HEALTHCARE & INNOVATION

EUROCHAM POSITION PAPER 2021–2022

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CHARTING THE PATH - Singapore's Value-Based Healthcare (VBHC) journey

The increase in life expectancy, coupled with the rise in the incidence and prevalence of chronic diseases is putting greater pressure on healthcare systems around the world. Singapore is no exception. According to the World Health Organization, Singapore witnessed a 4% y-o-y growth in health expenditure between 2013 and 2018¹. This increase in health expenditure is expected to continue to accelerate given the nation's ageing population. Forward thinking policymakers and industry players have raised concerns that the traditional fee-for-service (FFS) model is not sustainable in the long run. Fuelled by regulatory actions, consumer expectation, cost pressures and an overall shift in the healthcare landscape, Singapore is expected to see an acceleration in the transition from FFS to VBHC².

Below, we examine Singapore's progress in implementing Value-based Healthcare (VBHC), and cases that can be leveraged from our European peers. We outline the driving forces and implications of VBHC across healthcare stakeholders, the building blocks for VBHC using case studies from Europe and the milestones achieved in Singapore, with a perspective on Singapore's readiness for VBHC.

SECTION 1. FIRST STEPS TOWARDS A VALUE-BASED HEALTHCARE MODEL IN SINGAPORE

1.1. DEFINITION OF VALUE: FOR THE PEOPLE

Financial and regulatory headwinds in Singapore have been pushing the healthcare industry towards VBHC. The country solidified the roll-out of VBHC with the 'Three-Beyonds' Strategy in 2017³. The pillars supporting the strategy are 'Beyond Healthcare to Health'; 'Beyond Hospital to Community'; and 'Beyond Quality to Value'³. The intent is to pave ways to provide quality care for the population across Singapore's social fabric, while keeping the healthcare system sustainable for the current and future generation. Under the 'Three-Beyonds' Strategy, value is weighed by the patient, the people, and the community.

Patient centricity is key to realising the core purpose of the 'Three-Beyonds' Strategy. To scale up the impact of VBHC, it is essential to facilitate collaboration across all industry players involved in patient care - from providers, payors, to enablers (players in life sciences, technology, and support services). The backbone of VBHC is a collective effort across healthcare stakeholders to better serve the people and the community, while balancing affordability, quality of care, and sustainability of the healthcare system.

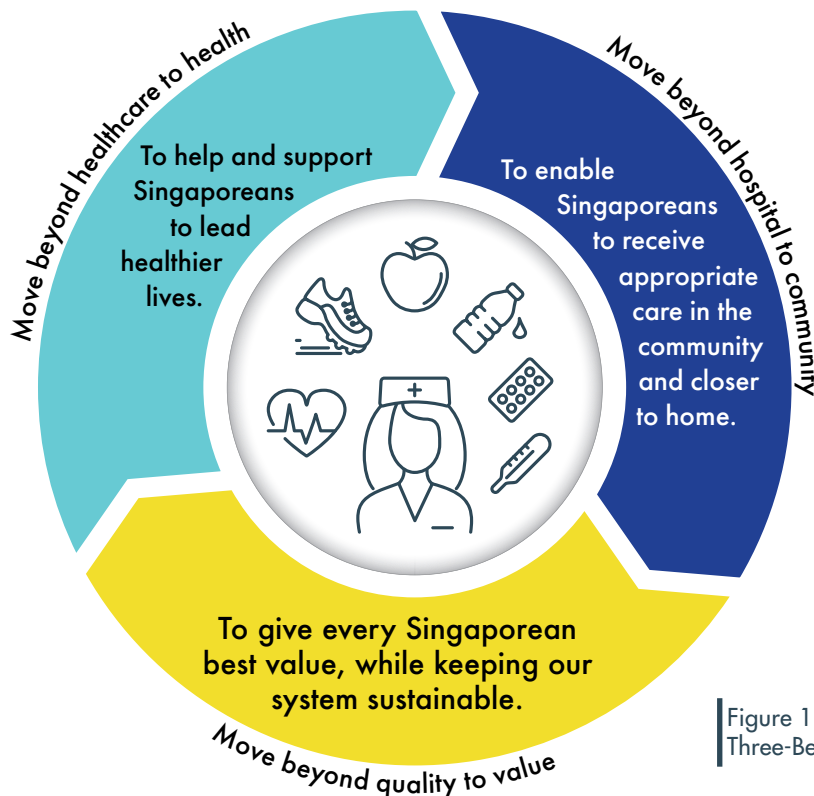


Figure 1
Three-Beyonds Strategy⁴

¹ World Health Organisation Global Health Expenditure database (n.d.) Current health expenditure (% of GDP)

² Deloitte (2020) Value-based healthcare is a shifting economy

³ Ministry of Health Singapore (2018) Opening Address, Singapore Healthcare Management Congress 2018

⁴ SingHealth (2021) Value-driven Health, Singapore Allied Health Conference, SingHealth DukeNUS Academic Medical Center

1.2. IMPLICATIONS OF VBHC FOR HEALTHCARE STAKEHOLDERS

PROVIDERS

Providers in Singapore have achieved incredible milestones in delivering value to patients and improving patient experience. With VBHC, there is now scope to further improve and expand the impact providers have on patients and the wider community. Leveraging the core intent of VBHC, providers utilise a myriad of strategies and hold diverse schools of thought on the best ways to improve holistic patient outcomes. Some providers have used VBHC as a strategic opportunity to demonstrate their commitment to patient experiences and outcomes⁵.

Moreover, VBHC can enable providers to stay competitive with physicians, by reorienting physician's compensation from volume to value. Borrowing from success cases, physician compensation redesign begins with the agreement of a set of guiding principles that align to the mission, strategy, and payer mix, supported by a set of tools to help decision making. When done correctly, the principles of VBHC will be aligned with the physicians' intrinsic motivation to provide the best care to their patients; refocusing incentives from quantity to quality. The added value of care for the patient can also aid in providing more purpose to physicians' work and reduce burnout⁶. When physicians' needs are addressed, this naturally can lead to a differentiated patient experience and reduce discrepancies between patient needs and outcomes.

PAYORS

Payors who successfully embed the principles of VBHC can better understand patient needs. Payors that enter value-based contracts (VBCs) drive better outcomes for their members, enhance the member experience, reduce unnecessary costs, grow relationships with their networks, and grow market share by offering a differentiated product. These factors can lead to more satisfied members, reduced premiums, and a stronger provider network⁷. With VBHC, payment innovation typically spans shared savings, bundled payments, capitation, and, in some instances, insurance products⁸.



However, despite the apparent benefits, the switch from traditional FFS to VBHC is challenging. It can be difficult to articulate the benefits of VBCs given the switching costs involved. Additionally, variances in payment models, quality measures, and other parameters can make VBCs difficult to administer⁹. Although this can be initially challenging to payors, VBCs are an essential component to the VBHC roll-out¹⁰. The benefits of implementing the VBHC model not only reduces costs, but also leads to better health outcomes for the patient and the community it serves.

Perspective from Prudential Singapore:

Healthcare financiers can play a role through providing incentives for policyholders to take a more vested interest in their own health and treatments. An example would be claims-based pricing. Policyholders are given incentives - in the form of premiums savings - for staying healthy, or for their choice of healthcare treatment. On one level, this approach incentivizes people to actively take care of their health so that they either do not fall ill or they fall ill less often. This way, hospitalization claims decrease and overall healthcare expenditure follows suit too. At another level, people are incentivized to think more deeply about their own medical treatment decisions - whether public or private care would best serve their needs. This way, claims costs are managed and will ultimately translate to premiums being kept more affordable in the long term.

ENABLERS

VBHC is a promising way to deliver services with an understanding of patient needs that can enhance the healthcare ecosystem. The arrangements between healthcare enablers – such as life science, technology, and support businesses - along with payors and providers, will play a critical role in enabling appropriate access to new innovation and tools to realise the core intent of VBHC. For instance, patient experience for the elderly care segment involves not only caregivers but also transportation providers to get them to and from the locations for treatment. Transportation enablers could participate in designing special travelling routes that connect the nearest hospitals with the communities, enhancing patient experience beyond the hospital.

⁵ Abduljawad (2011) Incentives for better performance in health care. Sultan Qaboos University medical journal

⁶ Deloitte (2020) Equipping physicians for value-based care

⁷ Deloitte (2020) Value-based Healthcare in a shifting economy

⁸ Deloitte (2015) Journey to value-based care: Insights and implications from Deloitte's 2015 health plans executive interviews

⁹ Deloitte (2020) Value-based Healthcare in a shifting economy

¹⁰ Deloitte (2020) Value based healthcare in a shifting economy

In addition, pharmaceutical and medtech companies are starting to venture into healthcare databases, aggregating patients' and providers' data from multiple sources into a single view, to develop innovative solutions to enhance patient interaction. This will benefit care coordination and extend care beyond the physical space across care pathways¹¹. There are other potential initiatives and movements to promote VBHC by integrating and sharing the same goal with the city state – applying VBHC measures to achieve greater outcomes for the people, and for the nation.

Accurate and comprehensive health data have a major role to play. However, data sharing brings with it new regulatory and cyber implications as it involves various enablers collecting vast amounts of data from individuals. This has created an extremely complex landscape involving an ecosystem of trusted partnerships, innovative products, and service providers with its own risk management and controls. In Singapore, and other mature economies in Europe, data sharing is stringently monitored to protect patient information. For VBHC to be realised on a large scale, there is a need to create a high level of assurance and trust for patients and business partners¹². Consistent gathering of data, as well as efficient integration of information from registries and electronic health records, could help to underpin efforts to scale up VBHC.

Perspective from Fresenius Medical Care Singapore and Philips Singapore:

Developing and building innovative technologies into the way VBHC is deployed would help to improve patient outcomes. Long-term care providers often work with chronically ill patients and the goal should be to identify problems early and take preventative measures so as to minimise hospitalisation. To this end, having a robust clinical information system to assess patients' risk of chronic illness or need for hospitalisation would serve to provide targeted care and improve the patient outcome.

Innovations such as Artificial Intelligence (AI) enable vital data aggregation and analytics that are changing both the patient and staff experience, making healthcare more personal, preventive, predictive, precise, and productive. The ability for devices and systems to connect with each other and share data has the potential to allow a 360-degree view of a patient's health, allowing clinicians to make faster and more responsive decisions. At the same time, AI technology also enables breaking the silos between the different parts of the healthcare system, thereby empowering patients to take ownership of their own health, and improving the overall patient experience.



SECTION 2. BUILDING BLOCKS TOWARDS VBHC

2.1. VBHC IN EUROPE

Maturity and adoption of VBHC differs across Europe, with large variations in the extent to how value is defined, and the metrics used to assess the outcome¹³. Through trial and error, mature economies in Europe have made good strides in implementing VBHC. Europe's success stories act as a model for Singapore, highlighting the opportunities and challenges to anticipate as it scales up VBHC. Studying the overarching progressions found across the mature economies in Europe brings to light fundamental building blocks required to achieve the intended benefits from VBHC.

2.2. BUILDING BLOCKS AND MILESTONES

VBHC GOVERNANCE AND VISIONING

A clear policy agenda to integrate healthcare stakeholders will be key to realising VBHC. Making the shift towards VBHC is a transformational journey paved with complexity, risks, and a culture change for all stakeholders involved. Agile governance that encourages experimentation and change is crucial to making this shift a successful one. Sweden provides a good example. To spearhead nationwide adoption of VBHC, in 2013, Sweden launched the Swedish national collaboration for value-based reimbursement and monitoring of healthcare (SVEUS) platform¹⁴. Backed by supportive governance, the decentralised healthcare system in Sweden helped to encourage experimentation at the local level. Spanning across 21 regions, Sweden created a range of opportunities for local authorities to pilot reforms within a smaller population before scaling up nationwide.

Similar to Sweden, the Singapore government took a strong stand in favour of VBHC. In 2017, Singapore's Ministry of Health (MOH) introduced the 'Three Beyonds' Strategy¹⁵. The main goal of this initiative is to give the people access to the best possible care, while balancing affordability with quality of care. Each healthcare initiative, across the enablers and providers, has followed this agenda in alignment with the VBHC reformation. A key milestone is the optimisation of healthcare outcomes through the introduction of the Value-Driven Care (VDC) programme. Many clinicians were involved in the VDC programme as members of the National

¹¹ Deloitte (n.d.) *Value-Based Contracting Services*

¹² Deloitte (2010) *How Medtech companies will drive the future of health*

¹³ Economist Intelligence Unit (2015) *An introduction to value-based healthcare in Europe*

¹⁴ Economist Intelligence (2019) *Value-based healthcare in Sweden: Reaching the next level 02/05/2019*

¹⁵ Khalik, S., (2017) *The '3 Beyonds': Singapore's strategy to sustain quality healthcare as demand rises. The Straits Times 30/11/2017*

VBHC Workgroup or condition-specific VDC clinical workgroups. Encouraged by MOH, these collective efforts led to standardised quality indicators for the 17 high-cost high-volume conditions by analysing data and identifying opportunities to improve clinical outcomes in a cost-effective way¹⁶.

POPULATION HEALTH MANAGEMENT

Measuring and improving the health of an accountable population is a tenet of VBHC. Rather than replicating the same breadth of services across providers, care is tailored based on a deep understanding of the clinical needs of risk profiles such as geriatric, paediatric, and chronic patients, with technology and big data as the key enablers. In Germany, the government partnered with technology companies to design a tailored disease management programme to better manage chronic patients. General practitioners were incentivised when patients are enrolled onto these programmes. Between 2007-2015, Germany saved approximately €35M against risk-adjusted normal costs of care¹⁷.

Similar trends have been witnessed in Singapore. MOH reorganised the public healthcare system into three integrated clusters for more patient-centric care focused in the community. Each integrated cluster is able to draw from the combined strengths and talents of the other two clusters to deliver more comprehensive and person-centred health promotion, disease prevention, curative and rehabilitative care for the population in their respective regions¹⁸. This initiative is backed by cross-cluster information flow and coordinated services so that together, MOH serves as one public healthcare system for the people of Singapore.

INTEGRATED HEALTHCARE DELIVERY

Understanding value requires an overhaul across the continuum of care. VBHC can be realised when supported by policies that lead to greater integration of care pathways and closer coordination of care between stakeholders. A good example of this can be found in the United Kingdom. The National Health Service (NHS) initiated collaboration with local councils and enablers across England. This initiative brought together professionals from a wide range of organisations to find and deliver the best solutions to support the community, through joint budget and investment. In Camden Town, local services have joined forces to form a Rapid Response Team to prevent unnecessary hospital admissions while enabling patients to receive care in the community. This resulted in £2.5 million in cost savings¹⁹.



In Singapore, the Agency for Integrated Care has been working with the integrated clusters to implement the Hospital to Home programme. This programme consolidates the care transition arrangements of hospitals with the aim of facilitating the discharge of patients back home in a timely and seamless manner²⁰. With a VBHC integrated informatic system, patients' information is shared across facilities, including community care facilities. Community care providers assist in rehabilitation and nursing services for patients in their own homes, while being the first point of contact when caregivers require any assistance. This presents a seamless transition from hospitals to the community, without readmission or a repeat registering of a patient's health condition.

VALUE-BASED REIMBURSEMENT SCHEME

A concrete cost measurement and well-established contract is important for a successful value-based reimbursement scheme. With VBHC, reimbursement is designed to encourage accountability, thereby driving better outcome for the patient. Mature economies in Europe are using bundled payment systems, where health providers are paid for a complete episode of care lasting for a year or longer, giving the provider full responsibility for the entire care cycle, including complications. In Sweden, bundled payments are adjusted according to the preconditions of patients and expected cost of outcomes. Under this setting, Sweden reduced cases due to complications and revisions by 20% in 2011 compared to the traditional reimburse plan²¹.

In Singapore, the Agency for Care Effectiveness was set up to research treatments, medicines, and devices that provide the best value for every dollar spent, using health and treatment assessments. Healthcare professionals and stakeholders are invited to benchmark and structure the pricing scheme with a cost transparent model²². This has reduced the average length of stay and saved associated costs²³. Furthermore, Singapore recently announced the MediShield Life or MediSave reimbursement programme for cancer drugs through indication-based pricing or therapeutic value of drug and patient outcomes. This initiative could ease the pressure on the healthcare system while managing demand from rising cancer prevalence and emergence of higher cost cancer therapies²⁴.

¹⁶ Ministry of Health Singapore (2019) Opening address of Singapore General Hospital 23rd Annual Scientific Meeting 12/04/2019

¹⁷ Liberty, M. (2018). Is Germany Really Ready for PHM? Signify Research. 31/05/2018

¹⁸ Ministry of Health Singapore. Reorganization of Healthcare System into Three Integrated Clusters to Better Meet Future Healthcare Needs. 18/01/2017

¹⁹ NHS. (n.d.). Joined-up working rapidly reaping the rewards for patients. NHS. UK ²⁰ Ministry of Health Singapore (2018) Speech by Mr. Gan Kim Yong, Ministry of Health, at the Global Conference on Integrated Care. 02/02/2018

²¹ The Economist (2019) Value-based Healthcare in Sweden: Reaching the next level, The Economist Intelligence Unit

²² Ministry of Health Singapore (2016) Speech by Mr. Gan Kim Yong, Ministry of Health, at the MOH Committee of Supply Debate. 13/04/2016

²³ Cheah, J. (2019) Asia Pacific Forum "Integrated Meets Value-based Care: Aligning Stakeholders' incentives". HIMSS Conference. 13/02/2019

²⁴ Ministry of Health Singapore (2021) Higher MediShield Life or MediSave Claim Limits Based on Indication-based Pricing. 03/02/2021

One of the innovative payment models adopted by the MOH is bundled payments. Funding is based on a patient's entire care episode across multiple healthcare setting or attendances. This gives providers opportunities to optimise care, reduce costs, and pass on savings to patients²⁵. Leveraging this example, the National University Health System (NUHS) has developed an effective informatics solution to collect, aggregate and analyse patient data. This systematic practice is to enable continuous measurement of financial value and quality performance. For instance, in the case of total knee replacements, through VBHC, NUHS has been able to reduce patients requiring blood transfusions from 26% of cases to 3%, resulting in savings of S\$955 per case whilst maintaining quality care²⁶. MOH will continue to expand on these positive efforts and study financial solutions and innovations that encourage healthcare providers to optimise care and improve outcomes.

2.3. CHALLENGES AND BARRIERS

There will be unavoidable challenges along the journey of scaling up VBHC. Challenges experienced by the mature economies in Europe present scenarios for Singapore, to better prepare for the future. Some universal challenges seen across Europe include a misalignment in definition of patient population for tracking or measurement, complexity in quantifying outcomes-based benefits, failure to differentiate drugs generating value and uneven incentive structures and policies²⁷.

STRATEGIC		OPERATIONAL		
Determining the appropriate measures of value to link payment	Misaligned incentives among payers, providers and pharma	Administrative burden to operationalise VBHC	Uncontrollable factors that influence outcomes	Collecting, integrating, and analysing real-world data
<ul style="list-style-type: none"> • Misalignments in definition of patient population for tracking / measurement • Misalignments in defining outcomes / metrics to be measured • Complexity in quantifying outcomes-based benefits • Failure to recognise how different drugs generate value in different ways and need for a segmented approach 	<ul style="list-style-type: none"> • Misalignments in incentives, structures and policies that shape the behaviours and interactions of different stakeholders result in suboptimal outcomes and uptake of innovations • Some example issues include: <ul style="list-style-type: none"> - Organisations incurring cost vs. those achieving savings - Costs incurred in year, savings over multiple years - Managing performance based contracts alongside utilisation based contracts 	<ul style="list-style-type: none"> • Value-based contracts require different skills and more resources to administer, monitor and adjudicate than traditional contracts 	<ul style="list-style-type: none"> • Other variables that could impact the outcomes of drug or device use include: <ul style="list-style-type: none"> - Patient factors - Physician factors - Reimbursements hurdles - Legal and compliance considerations 	<ul style="list-style-type: none"> • Value-based contracts require capturing and analysing data and tracking individual patients, their treatments, and outcomes • Validation and analysis will require collaboration and trust between pharma, providers and payers, and both sides should agree on methodology early in the process

Figure 2
Challenges in VBHC Scale-up

2.4. SINGAPORE'S VBHC READINESS

Deloitte has defined a Four Steps of Action towards VBHC framework²⁸ (Figure 3). Singapore is perceived to be in the early stages of 'Step 4: Design Catalysts to Enable Scale-up'. In Singapore, VBHC was heavily rolled-out from a regulatory level, predominately across stakeholders in the public health sector. The initiatives found in SingHealth, National Healthcare Group and NUHS are successful examples. To replicate these success cases and scale up the VBHC impact, the private sector will need to come in as a catalyst.

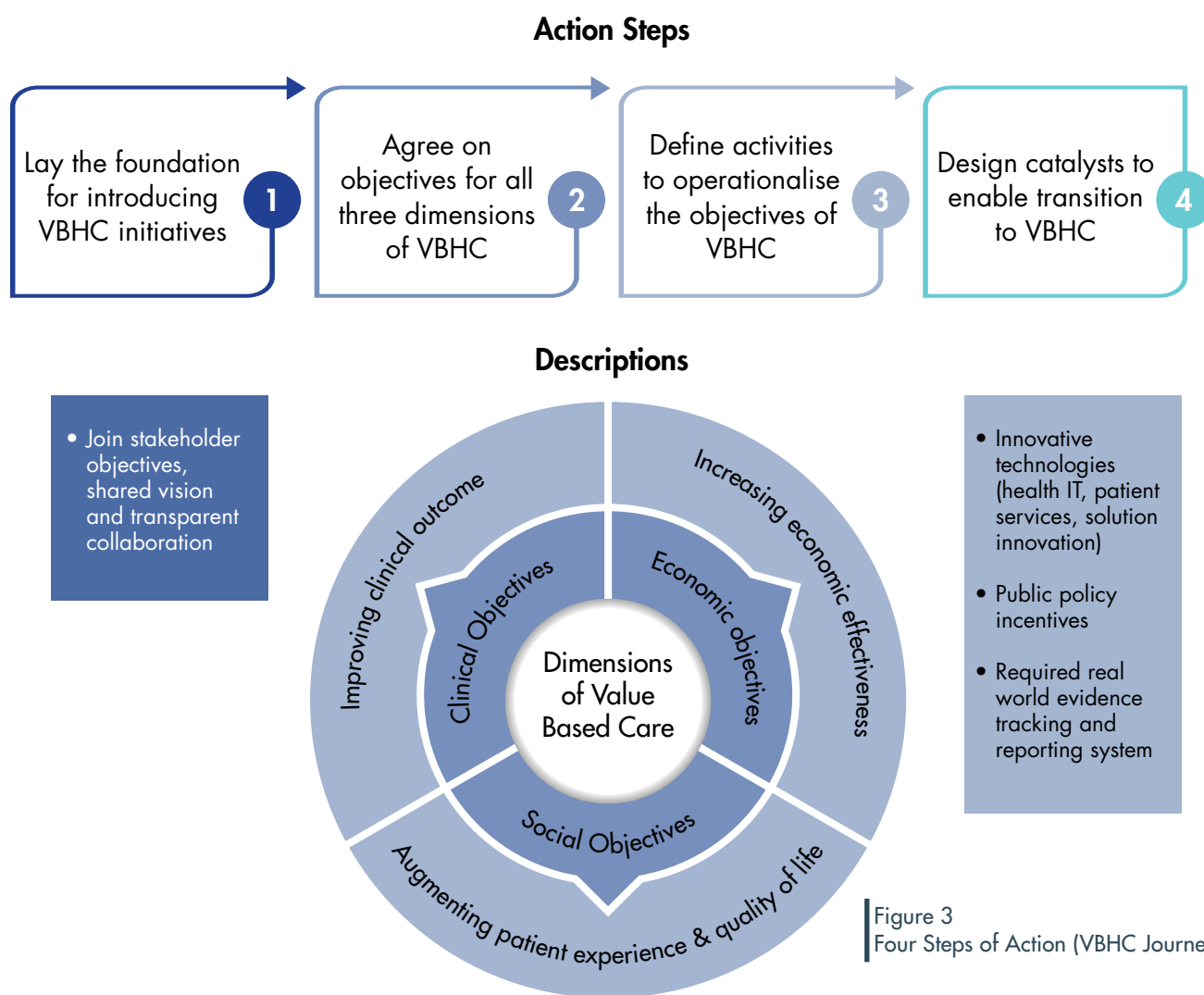
The Singapore government would need to further encourage the healthcare stakeholders in the private sector, especially the enablers, to operationalise the concept of VBHC into business practices. Preparations for wider scope of business integration is critical, before carrying out feasible and innovative solutions. Once healthcare stakeholders in the private sector are aligned, the partnership between the government and these stakeholders can accelerate transformation and generate more innovative solutions for the people of Singapore.

²⁵ Ministry of Health Singapore (2021) Ministry of Health Committee of Supply Debate 2021 05/03/2021

²⁶ National University Health System. (n.d.). Value Driven Quality Care. NUHS

²⁷ Deloitte (2020) VBHC today and tomorrow

²⁸ Deloitte (2017) Laying the Groundwork for Value-Based Healthcare in Europe



VALUE-BASED HEALTHCARE JOURNEY

Perspective from AlciMed:

One of the key VBHC challenge is the readiness of the different players in the ecosystem to be aligned at the same path for good coordination.

Though, Singapore has a vibrant ecosystem in life sciences of pharmaceutical MNCs, SMEs, startups beyond public institutions & payers to accelerate the transition to VBHC. In addition, with VBHC, the switch from consumer to patient should last longer so key players at the interface like nutrition companies could be also good partners to move towards this transition & help notably gather data. Most of infant nutrition companies for example are expanding their portfolio into healthy ageing products to create awareness of consumers of potential health concerns that may arrive to prevent them. Some of them are focusing their R&D work on personalized nutrition gathering data to demonstrate benefits. Singapore has started few years ago to create this ecosystem in nutrition & food that could be also an asset for this VBHC switch.

SECTION 3. THE JOURNEY HAS BEGUN, BUT THERE IS WORK TO BE DONE

VBHC is the pinnacle – it provides direction towards a better healthcare system to serve current and future generations in a sustainable manner. The journey will have its challenges, requiring coordination and collaboration amongst providers, payors, enablers and patients.

To better prepare to get these stakeholders on-board, there must be clear communication on the benefits of VBHC, and what this means for the future of Singapore healthcare. There is work to be done still, such as optimising a pilot rollout and taking the experience to a wider scale by leveraging technology to enhance the end-to-end patient experience. Cases from our peers in Europe demonstrate that there is much room for collaboration between Singapore and Europe so as to spearhead Singapore's VBHC journey.

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WHERE HEALTHCARE CAN ADOPT LESSONS IN DIGITAL TRANSFORMATION FROM BANKING

BY DR EUGENE HONG, EXECUTIVE DIRECTOR OF INSTITUTIONAL BANKING GROUP, HEALTHCARE AND PHARMACEUTICALS, DBS BANK

What does it take for people to really start paying attention to their health and well-being? A pandemic, it seems.

When Singapore's Health Promotion Board and tech giant Apple unveiled a first-of-its-kind national health initiative in September last year, it couldn't have been more timely. They launched LumiHealth¹, a personalised programme that taps technology and behavioural insights to encourage Singaporeans to live healthier lives through the Apple Watch and iPhone – with reminders, activity coaching, challenges and of course, incentives. The app has since been downloaded more than 100,000 times², as many here doubled down on exercise³ during the pandemic.

More than that, the collaboration between what used to be seen as two unlikely partners in healthcare signalled the churn in the industry and more importantly, the way forward.

Evolving consumer needs, advances in technology, ageing populations are changing the healthcare industry, and Covid-19 is accelerating this. Where healthcare delivery used to involve clearly defined roles between regulators, pharmaceutical companies, financiers (such as banks and insurance companies) and the enablers such as doctors and healthcare practitioners, these industry boundaries are blurring. In some cases, they have already been dismantled.

As a result, a new ecosystem is emerging – one that is driven by interconnected systems, partnerships, and better outcomes. With digital technology and Artificial Intelli-

gence (AI) transforming healthcare business models, all players are going to be playing more than one role.

AN UNPRECEDENTED ERA OF CHANGE

The global healthcare and pharmaceutical industry has had to move quickly to bring innovations to market at speed as it grappled to contain the pandemic, from test kits to vaccination rollouts and even Covid-19 mortality risk calculators.

Had players not adapted and changed, all of us would likely be a far worse off than we are today. This is a mentality that the industry needs to retain going forward.

The good news is, unlike in previous pandemics such as the Spanish Flu, H1N1, or even SARS, we have technology on our side like never before as a huge enabler of this change. Technology is doing for healthcare what it has done for banking and finance – democratising access and lowering costs.

Telemedicine, once on the fringes of medicine, has become increasingly important. In certain situations, such as during lockdowns or in rural areas where access to medicine is limited, it has become an absolute necessity. Viettel Telehealth, a telemedicine programme by Vietnam's biggest telco Viettel Telecom, is expected to benefit some 70 per cent of the population⁴ who live in rural Vietnam. That a telco has entered healthcare is, again, unheard of.

The availability of out-of-hospital alternate care systems that are powered by technology has, in fact, been in place for a while now. Singapore's upcoming Woodlands Health Campus (WHC), for instance, has been designed to rely heavily on smart technology to improve patient care in homes, rather than within the hospital.

Set to be the city-state's first acute and community care hospital when completed in 2022, it will tap technology – such as wristbands – to allow doctors to monitor the health of their patients remotely, including tracking vitals, medication times, and holding remote rehabilitation sessions. Within the hospital, robots are expected to manage logistics, housekeeping, and tasks such as delivering food.

Elsewhere, breakthroughs in gene editing are pushing the development of precision medicine, which allows drugs to be customised specifically to a patient's genetic make-up. Big pharma is buying into genetic testing through collaborations. In 2019, Novartis joined forces with Microsoft to apply AI across the Swiss pharmaceutical company's value chain, from manufacturing to finance, as Novartis Chief Executive Vas Narasimhan highlighted that AI holds promise⁵ in personalised medicine.

What is clear is that the healthcare industry is knee-deep into an era of change, and things can only move faster from here.

LESSONS FROM BANKING

Yet, the digitalisation of healthcare is taking place at such a rapid rate that it risks mis-

¹ "Singapore and Apple partner on national health initiative using Apple Watch", Apple, Sep 16, 2020. <https://www.apple.com/sg/newsroom/2020/09/singapore-and-apple-partner-on-national-health-initiative-using-apple-watch>

² "Speech by Mdm Rahayu Mahzam, Parliamentary Secretary for Health, at the Ministry of Health Committee of Supply Debate 2021, on Friday 5 March 2021", Ministry of Health, Mar 5, 2021. <https://www.moh.gov.sg/news-highlights/details/peech-by-ms-rahayu-mahzam-parliamentary-secretary-for-health-at-the-ministry-of-health-committee-of-supply-debate-2021-on-friday-5-march-2021>

³ "Singaporeans and weight gain during the pandemic", Ipsos, Jan 27, 2021. <https://www.ipsos.com/en-sg/singaporeans-and-weight-gain-during-pandemic>

⁴ "Key takeaways for the Indian pharma sector", DBS, accessed Oct 4, 2021. <https://www.dbs.com.sg/corporate/research-and-insights/business-insights/4-key-takeaways-for-the-indian-pharma-sector>

⁵ Neville, Sarah and Waters, Richard. "Novartis and Microsoft join forces to develop drugs using AI", Financial Times, Oct 1, 2019. <https://www.ft.com/content/93e532ee-e3a5-11e9-b112-9624ec9edc59>



steps, which could derail the much-needed transformation of the industry.

DBS Bank embarked on our drive to digitalise banking back in 2009 and the journey has not been without its bumps.

First, there is a strong need to ensure the right processes and protocols are in place, supported by an underlying culture shift, starting from the top and filtering down all throughout the organisation. Large organisations must be prepared to experiment, test, fail and try again.

Take blockchain as an example. With blockchain solutions, many fintech companies have broken through legacy barriers to revolutionise financial services and how they are delivered. We knew that we had to be in the space because we were no longer competing with other banks but new technologies that disrupt.

As a result, we decided to experiment with blockchain technology a few years ago, partly out of the potential it promised. It was not easy because we had to acquire expertise and adapt our existing services.

But the work has paid off, allowing DBS to ride on the wave of blockchain-enabled

payments. Our new initiatives include a newly minted joint venture⁶ with JP Morgan and Temasek Holdings to develop a wholesale blockchain-based payment network targeted at cross-border transactions.

Healthcare will face its own share of disruption. Where banking has been using blockchain for payments, healthcare can tap the technology to securely transfer medical records or manage the hospital/pharmaceutical supply chain – turning opaque and fragmented systems into interoperable, seamless ones.

The need for interoperability is another key lesson that we have learnt in meeting evolving customer demands. The developments in open banking – where customers' financial data held by banks can be accessed and used by regulated providers in a collaborative and secure ecosystem – epitomise this.

In healthcare, the sharing of electronic health records, as we do with financial data today, will allow doctors to access a patient's most updated medical history easily and efficiently, and better see to the patient's needs, especially with telemedicine and out-of-hospital arrangements where medical data needs to be made immediately available.

Perhaps there are legacy data processes or "sacred cows" that the industry will have to re-examine to bring this to fruition, but the end-goal – to benefit consumers – must be the focus. When DBS migrated our workloads, applications, and internal operations into the cloud, it opened up the 24/7 availability of banking services, reshaping the way customers banked for the better.

Technology is an enabler. But we must also be prepared for the problems that arrive with it, in particular, security, or cybersecurity. This must be a key priority and requisite for healthcare systems to share data or interoperate.

The WannaCry ransomware attack⁷ in 2017, which crippled the National Health Service in the United Kingdom, is a well-documented, costly example. No hospital can afford downtime today, should it be hit by a similar attack.

The readiness of healthcare systems to introduce and adopt new technologies quickly while having appropriate levels of data security in place, as banks do in the safe-keeping of customer data, remains critical to sustaining progress.

The parallels between the two industries extend beyond a low tolerance for error. Powered by data and digital transformation, both are embracing innovation and change in legacy approaches to work.

When DBS was named the world's best digital bank by UK-based financial publication Euromoney this year, its editor Louise Bowman said the bank "demonstrated a rare skill⁸: not just surviving a crisis, but using it as a chance to innovate and to be a better bank".

The pandemic has not just been a lesson in continual change and innovation for DBS, but also for many in the healthcare industry.

As organisations grapple with the ongoing Covid-19 pandemic and rapidly shifting operations without compromising the standard of care towards patients – working instead to uplift them – a culture shift is key. Industry players must evolve and find partnerships even in the most unlikely of places to position themselves for new opportunities and the future of healthcare.

⁶ "DBS, J.P. Morgan and Temasek to establish platform to transform interbank value movements in new digital era", Temasek, Apr 28, 2021. <https://www.temasek.com.sg/en/news-and-resources/news-room/news/2021/dbs-jp-morgan-temasek-establish-platform-to-transform-interbank-value-movement-new-digital-era>

⁷ Hern, Alex and Gibbs, Samuel. "What is WannaCry ransomware and why is it attacking global computers?" *The Guardian*, May 12, 2017. <https://www.theguardian.com/technology/2017/may/12/nhs-ransomware-cyber-attack-what-is-wanacrypt0r-20>

⁸ Tan, Nai Lun. "DBS named world's best bank, world's best digital bank by Euromoney". *The Business Times*, Sep 10, 2021. <https://www.businesstimes.com.sg/banking-finance/dbs-named-worlds-best-bank-worlds-best-digital-bank-by-euromoney>



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Vaccine distribution logistics, with HERE

Optimizing the supply of vital medicines

The production and distribution of COVID-19 vaccines is the most significant industrial challenge since the end of the Second World War. It presents dilemmas around fair play and maximizing a limited initial supply to safeguard lives, prevent long-term health conditions, and ensure a quick return to prosperity.



Real-time visibility, predictive supply chain planning and the ability to immediately address exemptions are paramount. Understanding your shipments, customers and factories can provide the context needed to reduce risk and streamline production and distribution.

Identification of vulnerable populations

Initial rollout of a vaccine to the most vulnerable groups can be optimized through location data alongside vital demographic information. As COVID-19 spreads, it creates new health concerns and exacerbates existing ones. Public health officials need to know where vulnerable people live and the location of existing service infrastructure.

HERE Technologies offers rich location datasets that improve understanding of vulnerable populations. This includes vital demographic information. By combining relevant location-based data with other data, public health officials can identify and analyze areas with more vulnerable populations.

How HERE supports vaccine supply

	Freight Optimization	Streamline Distribution	Shipment Tracking
 Boosting efficiency	<ul style="list-style-type: none">• Asset location• Optimize transport plan• Analyze ideal capacity• Avoid supply cages	<ul style="list-style-type: none">• Establish effective distribution centers• Optimize inventory staging	<ul style="list-style-type: none">• Capture temperature deviations in real-time• Real-time ETAs• Instant event alerts for better planning• Stock tracking to enrich venue and yard maps• Instant delay notifications
 Enhancing visibility	<ul style="list-style-type: none">• Understand asset journey• Real-time asset alerts	<ul style="list-style-type: none">• Improve resilience - shipment patterns and disruption analysis	<ul style="list-style-type: none">• Easy-to-use control tower• Shipment congestion heat maps

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HEALTHY LIFESTYLE & WELLBEING

EUROCHAM POSITION PAPER 2021–2022



European Chamber of Commerce (Singapore)

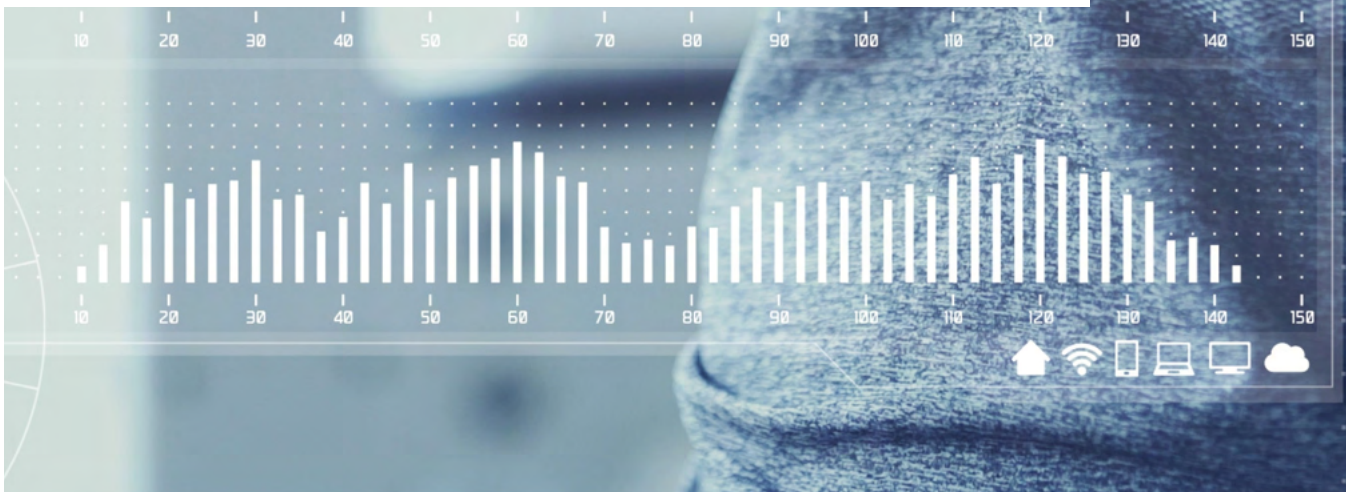


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Conclusion & Recommendations

INTRODUCTION

Health and wellbeing play a pivotal role in the experience of being human. Leading a healthy lifestyle and maintaining personal wellness are goals universally acknowledged, regardless of who one is or where they live. The understanding of what constitutes a healthy lifestyle may vary, however the desire to live healthy does not change.

It must also be acknowledged that people's perception of health and wellbeing is constantly evolving because given time, science continues to progress and more technological advancements, innovations, and knowledge are made available. Humanity is at times faced with dire circumstances and unforeseen factors, such as currently when it is undergoing a significant shift in paradigm due to the global pandemic.

Thus it has become necessary to re-examine the goals of the healthcare system going forward, how the system should be better financed and how to improve the population's health education.

Even before the pandemic, many in the industry were beginning to recognise that the focus in healthcare needed to shift towards a more human-centric model that prioritised prevention and protection over reactionary cure of diseases. The concept that health is a composite of physical, mental and social wellbeing has been well underscored in the past two years. More than ever before, there is a spotlight on mental and social wellbeing due to the increasing isolation people have been experiencing.

Thus, the pandemic has accelerated this shift and is driving towards a model that delivers better health outcomes while decreasing financial and resource burdens. To enable this change, individuals at all life stages must be acutely involved in understanding their healthcare needs and recognizing how to better take care of themselves beyond what hospitals are able to provide.

To establish a viable and sustainable ecosystem, the future roadmap for health and wellbeing necessitates the interplay of multiple and diverse agents.

CHAPTER 1 PUBLIC ENGAGEMENT TO IMPROVE POPULATION HEALTH IN SINGAPORE

1.1. PROMOTING INDIVIDUAL ENGAGEMENT TO IMPROVE HEALTH

Health Promotion Board (HPB) has been actively promoting individuals to take responsibility for their health and wellbeing and initiated two nationwide programmes to further this national goal.



National Steps Challenge™¹

The National Steps Challenge™ is the world's first population level fitness tracker-based physical activity initiative that encourages Singaporeans to move more. By leveraging behavioural insights and technology, the Challenge encourages Singaporeans to take more steps and clock Moderate to Vigorous Physical Activity daily as part of their everyday lives, and reward them for sustained behavioural change when they reach different physical activity milestones.



MOVE IT Programme

HPB runs various types of initiatives under the MOVE IT Programme to encourage Singaporeans to stay physically active, which includes but is not limited to Mall Workouts, Quick HIIT, Lose to Win, and Healthy Workplace Ecosystem. The MOVE IT Programme is inclusive and encompassing to cater to a wider range of individuals with diverse needs.

1.2. PROMOTING HEALTH & WELLNESS IN THE WORKPLACE

In recognising that most adult Singaporeans spend a majority of their daily lives at work, the government has developed workplace wellness programmes in order to make healthy living more accessible for this population of Singaporeans.

Workplace Outreach Wellness Package²

The Workplace Outreach Wellness (WOW) Package assists all businesses in their efforts to create a healthier and more engaged workforce. This package is designed specifically for organizations, and includes a variety of useful and beneficial health programs delivered right to their offices.

Chronic disease and follow-up is one such WOW health programme an organisation can look into investing for their employees. The follow-up is individualised and accessible to the employee so that their own health goals are attainable.



There are both general and targeted workplace health programmes that companies can look into based on the goal of the company. General workplace health programmes are aimed towards boosting physical and mental wellbeing based on basic health areas such as physical activity, nutrition, mental wellbeing, etc. Whereas, targeted workplace health programmes are customized to address specific health areas of concern the company has identified.

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Healthy Workplace Ecosystem

HPB has been partnering with landlords and developers to bring healthier food options, free exercise sessions, educational workshops and health screenings to their workers and tenants at their workplaces. The collaboration aims to establish Healthy Workplace Ecosystems of convenient and conducive environments for workers to achieve healthier lifestyles.

¹ <https://www.hpb.gov.sg/healthy-living/physical-activity/National-Steps-Challenge>

² <https://www.hpb.gov.sg/workplace/workplace-programmes/workplace-outreach-wellness-package>



1.3. UNDERSTANDING SELF-CARE

Self-care has become one of the most important aspects of healthy living in the modern day as it accords the individual significant positive health outcomes.³

- Self-care management
- Treatment of minor ailments
- Management of chronic conditions
- Reduction of serious illnesses

Future of Self-Care

Self-care is now more than a trend, it is a reality for SCOR both as reinsurer and as an employer. More and more, people realize that prevention is the best way to protect yourself from illness. Several factors come into play: access to information and new technology, able to monitor through devices and use of algorithms that enable easier and faster analysis of individual health status.

Self-care is supporting a smoother tariffication process for insureds as their habits will support their tariffication. For employers, it is a differentiator which will also bring very positive output for their employees.

Most of the government healthcare schemes are related to older generations linked to MediShield Life, CareShield Life, ElderShield, etc. with nothing much linked to self care as per our definition and thus we don't think it matches.

To have policy implemented (eg. MediShield Life discounts) which provides advantages or benefits to people who practise self-care, improving one's health, something like preferred life which focuses on giving discounts for insured with good health stats.

Providing more parks, more cycling and jogging routes, nature walks to allow more members to have some form of exercise, not forgetting to provide convenient toilet stops, water points, rain shelters, more parking slots near certain key locations, preferably free during off-peak to encourage better usage of space. Most are already available but certainly more can be done especially the supporting aspects (car-parks, toilets, water points, etc) other than parks, etc.

Companies can always have programmes for self-care or even a fitness and wellness room in an office environment on top of what the government has provided and the government can always provide some form of subsidies for companies which create fitness/wellness rooms in offices.

CHAPTER 2 SCOR - COMPANY LEVEL CONTRIBUTION TO PHYSICAL HEALTH AND MENTAL WELLNESS

During the past few years, European companies have started to implement wellness programmes both at the initiative of the company itself, and at the request of their employees. Given the pandemic, companies and employees alike recognize more than ever before the need to keep improving such wellness programmes and make accessible adequate support.

SCOR is one such company which has been proactive during the pandemic period in ensuring that their employees are receiving as much support as possible to maintain overall wellbeing, but especially focusing on mental wellbeing.

SCOR has set up an Employee Assistance Programme which allows their employees to receive mental health support if they feel the need but also access to resources to help them. The effects of this programme are boosted by the provision of several physical activity programmes such as physical activity bootcamp and yoga (most of which were virtual).

While SCOR's wellness programme has existed long before the pandemic, the assistance aspect of it has only been implemented since 2020. In general, SCOR noticed that the level of medical 'off days' has remained low during the period of the programme. One of the notable offshore benefits from the wellness initiatives, such as the yoga programme, was to assist people bond together even through social distancing.



³ https://assets.gskstatic.com/corporate/Health-Economic-Study/GSK_report_summary-FINAL.pdf

While there is definitely an economic side to the equation leading to an opportunity to diminish the office footprint of the company, SCOR is also looking at ways to bring their people together and make the most out of new office features, also by proposing a bigger pantry, fitness room, etc.

SCOR is hoping to combine economic value and better working accommodation for their employees. SCOR is currently in the midst of redesigning their offices and will be ready in the first quarter of 2022. In doing so, SCOR is hoping to combine economic value and better working accommodation for their employees.

Prior to COVID-19 pandemic, SCOR had already introduced a work-from-home format allowing people to work remotely 1 day per week. In the post-COVID context, SCOR is looking to foster this initiative and provide their employees with even more opportunity to balance work and life.

Due to our activity, our employees can fully set up their working hours as they see fit as long as it doesn't interfere with the organization of their team. Currently, our set-up is 1 day per week from home but it will likely evolve even further within the next few months.

As we are trusting our employees to do what is best for them and the company, there is no eligibility rule beside the fact to have proven the capability to work from home which is almost automatic in the context of the pandemic.

Since October 2021, SCOR has launched an app called GoodLife, which enables people to evaluate their health - based notably on their walking habits through a model called BAM (Biological Age Model).



It is clear that European companies understand and actively embrace supporting and improving the working conditions of their employees so as to ensure their physical and mental wellbeing is protected.

CHAPTER 3 MENTAL WELLBEING IN THE POST-PANDEMIC CONTEXT

3.1. MENTAL WELLBEING IN POST-PANDEMIC SINGAPORE

The COVID-19 pandemic has taken a toll on the mental wellbeing of Singaporeans. Much of the stress results from a plethora of concerns such as fear of the extremely

contagious virus having now become a continually mutating one to the possibility of sustained economic downturn and unemployment, extended restrictions on mobility and social contact both within and across national boundaries.⁴

The 24/7 National Care Hotline, set up shortly after Singapore went into its Circuit Breaker lockdown in April 2020, received close to 28,000 calls within five months of its establishment. The Samaritans of Singapore similarly noted a 30% increase in calls to its suicide prevention hotline during the Circuit Breaker⁵. April 2020, specifically, saw a 42% increase in helpline calls, with callers sharing concerns around financial hardship, stress around the home environment, and anxiety from being separated from loved ones.

While prolonged national lockdowns and social separation measures reduce the risk of viral transmission, they can also lead to increased anxiety, depression, and stress.^{6,7} In April 2021, a Straits Times survey, conducted one year after the Circuit Breaker, found that people are socialising less, their social circles have shrunk and their overall mental wellbeing has taken a hit.

Having staff work from home instead of in the office has become an accepted way to reduce contact exposure between co-workers and hence curb the spread of COVID-19. To promote flexible working arrangements during the Circuit Breaker period, the Government provided an enhanced Work-Life Grant to qualifying companies, with more than \$180 million given to 8,000 companies from April to August 2020, covering almost 90,000 employees.

⁴ <https://www.csc.gov.sg/articles/strengthening-mental-wellbeing-in-a-pandemic#notes>

⁵ N. Elangovan, "SOS Hotline Receives 30% More Calls during Circuit Breaker Period", *Today*, September 15, 2020, accessed January 7, 2021 <https://www.todayonline.com/singapore/sos-hotline-receives-30-more-calls-during-circuit-breaker-period>

⁶ S. K. Brooks, R. K. Webster, L. E. Smith, L. Woodland, S. Wessely, N. Greenberg, and G. J. Rubin, "The Psychological Impact of Quarantine and How to Reduce It: Rapid Review of the Evidence", *The Lancet* 395 (February 2020): 912–920.

⁷ E. A. Holmes, R. C. O'Connor, V. H. Perry, I. Tracey, S. Wessely, L. Arseneault, C. Ballard, H. Christensen, R. C. Silver, I. Everall, and T. Ford, "Multidisciplinary Research Priorities for the COVID-19 Pandemic: A Call for Action for Mental Health Science", *The Lancet Psychiatry* 7 (April 2020): 547–560.

However, for many Singaporeans, being obliged to work from home has meant a blurring of lines between their professional and private spaces, with some bosses expecting subordinates to be available to work at hours outside usual working hours. Singaporeans have also expressed worry about job loss, admitting to working long hours from home to avoid retrenchment or redundancy—raising further concerns for their mental health and wellbeing.

Nevertheless, having had a taste of flexi-work arrangements since the pandemic, many Singaporeans now want better work-life balance in future, with a preference for work-from-home as the norm.^{8,9} For these Singaporeans, flexi-work arrangements offer a chance to meet both their work and personal demands on their own terms and in their own space,¹⁰ while affording more time with their families and other pursuits—all of which have benefits for mental wellbeing.

3.2. SINGAPORE GOVERNMENT ON MENTAL WELLBEING AT WORKPLACES

A tripartite advisory on mental wellbeing at workplaces¹¹ was jointly issued by the Ministry of Manpower (MOM), Singapore National Employers Federation (SNEF) and National Trades Union Congress (NTUC) on 17 November 2020.

Inclusive of recommendations to support individual employees and recommendations for teams/departments, the tripartite listed the following recommendations for organisations:

- Review the state of employees' mental well-being regularly as part of risk assessment for workplace health.
- Review HR policies to ensure hiring practices, workplace practices and performance management systems are non-discriminatory and merit-based in nature.
- Implement and encourage take up of flexible work arrangements (FWAs) to help employees meet both their work and personal demands. Types of FWAs include (but are not exclusive to):
- Establish a work-life harmony policy to provide clarity on after-hours work communication.
 - > Understanding the need for proper rest outside of work hours
 - > Establish after-hours policy for work communication
- Establish return-to-work policies to support employees who are recovering from mental health conditions.



⁸ L. Lai, "8 in 10 in Singapore Want to Work from Home or Have More Flexibility", *The Straits Times*, October 15, 2020, accessed January 7, 2021

<https://www.straitstimes.com/singapore/8-in-10-in-singapore-want-to-work-from-home-or-have-more-flexibility>

⁹ R. Wee, "Three-quarters of Singapore Employees Expect Work-life Balance to Improve from Flexi-work: Poll", *The Business Times*, October 15, 2020, accessed January 7, 2021

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¹⁰ Ministry of Manpower, "Tripartite Advisory on Mental Well-being at Workplaces", accessed May 12, 2021

<https://www.mom.gov.sg/covid-19/tripartite-advisory-on-mental-well-being-at-workplaces>

¹¹ Ministry of Manpower, "Tripartite Advisory on Mental Well-being at Workplaces", accessed May 12, 2021

<https://www.mom.gov.sg/covid-19/tripartite-advisory-on-mental-well-being-at-workplaces>

3.3. PRIVATE SECTOR ON IMPROVING MENTAL WELLBEING IN THE WORKPLACE

Companies have indicated their employees highlight that isolation with the feeling of lack of support is their most important concern currently. Companies have to take this into account while also ensuring that due to COVID-19 safety regulation, their employees are able to work adequately from the safety of their homes.

With this in mind, SCOR has proposed a new office set-up wherein the corporate environment is a more friendly one, and that allows for more opportunities to be together and support each other as needed while in the office (while still upholding health safety regulations).

This new working culture, as outlined by SCOR, would include flexible working hours as well as activities-based working will be introduced to reduce the overall carbon footprint by reducing the office space and maintaining social-distancing while continuing to foster togetherness. The aim is to protect the health and wellbeing of the company's employees at all fronts.

Due to the importance of what is being attempted, it is important to note that the challenge is to find the right balance between enough regulation to ensure a minimal level of wellbeing and enough freedom for companies to define their programme and structure so that it is unique to their company's situation, size, culture, etc. To that end, further collaboration between the private sector and public sector would be beneficial to understand the ways in which companies look to the government for financial and policy-level support. Such collaboration would also help to verify if the efforts by private businesses are welcomed and supported by the government.



Conclusion & Recommendations

The importance of maintaining physical and mental wellbeing so as to lead a healthy and balanced life has become even more pronounced since the pandemic hit. However, these two factors have been at the forefront of every population health policy and every company's HR strategy even earlier than that.

The pandemic has merely accelerated and highlighted the acute need to support the society from every aspect – from children to adults, and especially working adults who often face the brunt of socio-economic pressures that lead to poor health.

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HEALTHY & SUSTAINABLE FOOD

EUROCHAM POSITION PAPER 2021–2022



European Chamber of Commerce (Singapore)



HEALTHY & SUSTAINABLE FOOD

Singapore is a country with a population close to 5.7 million people (around half of whom live in urban centres) with, pre-COVID-19, one of the fastest economic growth rates in the world, averaging just above 6% in GDP growth terms annually over the last few years. Exceptionally high rates of urbanisation and a lack of traditional agricultural output has put pressure on food supplies and food security in Singapore. COVID-19, and the continued intermittent lockdown of economies over the past two years as well as disrupted shipping lines, has served to highlight how fragile supply chains and food security in the ASEAN region were, and how much of a problem such unprecedented events could pose for Singapore.

The Singapore Green Plan 2030 features the target '30 by 30', which refers to Singapore's goal of building up its agri-food industry's capability and capacity by 30% of its nutritional needs locally and sustainably by 2030. With the majority of Singapore's food being imported, local production is imperative in reducing the nation's reliance on food imports and helping to build a more resilient food future. Such a plan will also provide some temporary relief should supply chains break down due to unforeseen circumstances. The government is also looking into "novel foods" including alternative proteins that do not have a history of being consumed as food. Examples include "plant-based" and "cultured" (lab-grown) meat².

Several European businesses in Singapore are at the forefront of work in this area, be it in helping to innovate the technology surrounding agri-food production and animal farming, through working to improve efficiency in the processing of foods, and then working to ensure adequate measures are in place to promote improved information for consumers on the food products before them.

At the same time, Singapore is well aware that the journey does not end at sustainable food production, but that it is a cyclical feedback loop between sustainable diet and consumption as well. The government has become increasingly focused on improving the nation's overall health and encouraging better dietary habits amongst consumers through education campaigns.

In short, Singapore is already on the path to promoting the concept of "sustainable food systems" and should continue to encourage both the private sector of the industry and consumers to actively engage with the local policies. Sustainable food systems is a farm to fork concept as it encompasses sustainable food production on the one hand, and sustainable diets and



consumption (such as through the reduction of food waste) on the other. Measures for reducing food loss and waste have to be environmentally sustainable and should foster food and nutrition security, allowing people to live healthier and longer lives.

THE CASE FOR BOOSTING AGRICULTURAL PRODUCTION USING TECHNOLOGY

Given its small size, Singapore has always had to contend with the issue of how to produce and provide more food with fewer natural resources and competing uses for available land. Singapore has estimated 720 square kilometers of land, of which only two square kilometers is currently used for land-based food farms. At sea, about one square kilometre of effective sea space is used for food fish farming in the Straits of Johor and deeper Southern Waters³.

At its most basic, food production begins with the seed. One way to increase production in a country like Singapore is to invest in alternative farming methods that utilize less space, such as indoor farming or vertical farming. Singapore Food Agency (SFA) has been active in encouraging local and overseas partnerships to boost such alternative farming.

Urban Farming Partners Singapore (UFPSG), a unique partnership between Singapore and the Netherlands which seeks to bring the urban farming initiative to the next level towards strengthening Singapore's food supply chain and paving the way to food security. In 2020, UFPSG initiated construction of a \$3m state-of-the-art indoor farm in Singapore, which has been partially funded by SFA.⁴ The indoor farm will be producing all types of lettuce, baby leaves, herbs as well as other

¹ <https://www.ourfoodfuture.gov.sg/30by30>

² Requirements for the Safety Assessment of Novel Foods, dated 23 November 2020

³ <https://www.sfa.gov.sg/food-farming/food-farms/farming-in-singapore>

⁴ <https://kenlog.nl/urban-farming-partners-singapore-awarded-funding-to-build-state-of-the-art-dutch-technology-indoor-farm-in-singapore/>

crops like spring onion and fennel in a fully-controlled indoor growing environment. This indoor urban farm is a first in Singapore that utilises Dutch technology.

Ensuring farmers and local communities have access to education and training is also an integral aspect of the equation. Teaching farmers how to utilise technology safely, effectively and efficiently is a key task for the agri-science industry. For example, in Indonesia BASF are running Farmer Field Schools to teach effective rice growing practices.⁵ BASF is also developing and rolling out technology services to assist farmers in identifying problems with their crops, using scouting technology to identify pests, diseases and requirements for boosting the use of fertilisers where nitrogen levels might be low.⁶ Other leading agri-science firms are also developing similar tools.

At the forefront of today's agricultural innovation is digitalisation. Farmers are increasingly relying on digital technologies that can analyse and transform millions of bytes of data into meaningful insights that help them make real-time decisions.

In February 2020, the first Aquaculture 4.0 close containment system for tropical fish - a commercial Smart Floating Fish Farm - was launched in Singapore by Singapore Aquaculture Technologies (SAT), in partnership with Siemens. Siemens implemented an end-to-end digital solution which included the IoT operating system MindSphere that provides a central repository and monitoring of critical sensor and process data across a secure network. As a result, the quality of the fish and potential savings for resources such as energy, oxygen and feed has already been improved with the knowledge derived from collected and visualized data.

Science and technology, alongside the significant research and development resources that leading agri-science firms have, will become the foundation for farming worldwide, but especially so in Singapore. This shift towards innovation-driven industry should ensure an increase in productivity, reduction in food loss and waste, and minimise the impact on the general environment.

THE CASE FOR BETTER NUTRITION

The quality of the food that one consumes, and its nutritional value is one of the most outstanding and important factors in maintaining and improving overall health. A poor diet can cause non-communicable health conditions such as hypertension, heart and blood vessels diseases, obesity, and diabetes - all of which are on a rising trend in Singapore.

Not having the right levels of nutrition in the food consumed, getting the right mix of proteins, fats, vitamins, minerals etc. can adversely affect a person's health, and especially so in the early years of physical and mental development.

Evonik has long been invested in improving the nutrition-intake of people and has recognized the need for supplements to aid the body's natural processes. In order to achieve the right electrolyte balance, most people need more potassium in their diet. However, many only get half their recommended intake a day. Potassium is a vital mineral that controls important cell functions. The right dose of potassium helps maintain normal blood pressure and so reduces the risk of heart disease. Evonik's potassium derivatives help consumers achieve this.

Another challenge currently is that most people consume 2-3 times their recommended daily sodium intake. Evonik's potassium derivatives help in sodium intake reduction. As a leavening agent, Potassium Bicarbonate is a healthy alternative to sodium content, to help customers to achieve an improved diet and lifestyle.⁷

On a similar note to provide healthier shrimps in Vietnam, Evonik's Active Oxygens and Animal Nutrition business lines worked in a collaborative project with the German Society for International Cooperation (GIZ) to improve the sustainability and efficiency of Vietnamese aquaculture.

The project used an innovative dosing technology for hydrogen peroxide on a commercial scale to address the common issue of the shrimp dying from lack of oxygen.⁸ The technology created more stable living conditions for the shrimp, while reducing the number of bacteria and other pathogens in the water, which



⁵ <http://www.croplifeasia.org/2017/07/biotechnology/#/>

⁶ <https://agriculture.basf.com/global/en/business-areas/crop-protection-and-seeds/use-areas/crops/rice.html>

⁷ <https://corporate.evonik.com/en/products/industry-teams/potassium-hydrogen-carbonate-123766.html>

⁸ <https://vietnamtimes.org.vn/improving-the-sustainability-and-efficiency-of-aquaculture-production-in-vietnam-17324.html>

helped farms decrease the use of antibiotics. The shrimp were also fed special amino acid feeds from Evonik, which reduced the need for protein ingredients such as fish meal and soybean meal.⁹

Coming at the same problem from a different angle, Unilever Food Solutions has partnered with The Social Kitchen and Angliss Singapore to roll out The Vegetarian Butcher in Singapore. Singapore currently leads the Asian market in terms of plant-based food consumption, with two in five Singaporeans actively choosing a flexitarian diet and are consuming less meat¹⁰. The Vegetarian Butcher has high-quality, accessible and versatile plant-based meat alternatives that are not only suited for a healthier plant-based diet but also for socially responsible consumers looking to make more sustainable lifestyle choices.

Improving the diet of the population through increasing the number of healthier options available for consumers is a joint effort between the public and the private sector. There is still much room for collaboration to ensure consumers embrace healthy eating as a viable lifestyle choice rather than a one-off occasion. Healthy dietary habits and sustainable production of food go hand-in-hand in the agri-food industry in the long run.



NUTRITIONAL LABELLING IN SINGAPORE

Both the government and consumers have started to recognize the importance of understanding what exactly one is eating and thereby ensuring that the right levels of nutrition are consumed. Nutritional labelling is something Singapore has been discussing for the past few years, and as a concept it is not something new. Many European countries have adopted nutritional labelling and has provided the insight that it is an area



that has been fraught with difficulty for regulators and producers. Different countries have different requirements for what is shown on labels, both in format and information required, and also on which products such labels are mandatory and which are voluntary.

While Singapore is a leader and a hub in the ASEAN region in terms of agri-innovations and technology, many companies have their production and/or supply factories based out of Singapore. The different systems in each country within the region can result in adding cost and complexity to manufacturers, and confusion for consumers. This lends the situation a unique problem that requires deeper conversation and collaboration between the public and private sector.

Singapore's nutritional label for food, the 'Healthier Choice Symbol', has been beneficial to many consumers. The labelling standard for pre-packaged drinks, 'Nutri-grade', in Singapore is set to come into full force sometime at the end of 2021.¹¹

CONCLUSION

Singapore being a multicultural society has a rich diversity of traditions and foods. Singapore's love for food is often anecdotally touted as a strong unifying factor for its citizens who come from many different walks of lives. Hence it is all that much more important that as a nation - the public sector, the private sector and the consumers - all understand the challenges Singapore faces in producing more food locally, and how Singapore is attempting to improve the general nutrition value of the food available in the market. Ensuring longevity not only for the environment, but also improving the quality of life for the population is the holistic approach to sustainability that is important to take in regard to the agri-food industry.

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⁹ <https://corporate.evonik.cn/en/media/news/evonik-presents-system-solutions-for-sustainable-aquaculture-in-china-163998.html>

¹⁰ <https://www.unilever.com.sg/news/2020/the-vegetarian-butcher-comes-to-singapore/>

¹¹ <https://www.straitstimes.com/politics/parliament-pre-packaged-sugary-drinks-to-carry-a-d-grading-by-end-2021-bubble-tea-to-follow>



COVID-19 VACCINATION FACTS AND FICTION

EUROCHAM WEBINAR E-BOOK - JUNE 2021



European Chamber of Commerce (Singapore)

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Panelist

Mr Simon Gordon

Chief Commercial Officer
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Panelist

SUMMARY

On 15 June 2021, the European Chamber of Commerce (Singapore) invited distinguished speakers from Fresenius Medical Care, Pfizer, GSK, Accredify, NUS SSH School of Public Health, and Duke-NUS Medical School to share their knowledge with the public in a webinar titled "COVID-19 Vaccination – Facts and Fiction". The aim was to discuss the issues related to COVID-19 vaccinations and provide clarity of facts to combat inaccurate information in the public domain.

One of the key takeaways from the event was that the speed of development of the vaccines was not due to any compromise in clinical development standards or regulatory oversight.

INTRODUCTION

There are multiple aspects to consider when looking at the COVID-19 pandemic and the vaccines. Initially, no one knew much about the virus which would later be known as SARS-CoV-2. The speed at which the virus spread, combined with the lack of effective treatment options, put an enormous strain on healthcare systems around the world.

As the epidemic turned into a pandemic – it became clear that vaccination would be one of the best solutions to address COVID-19 going forward. Everyone was enthusiastic about the prospect of vaccines and much of the conversation started revolving around when these would become available.

The mutation of the virus has been a cause of concern for the public.

As conversations turn towards reopening borders both here in Singapore and elsewhere, there is a need for governments and health authorities to efficiently verify an individual's vaccine information to manage the safe re-opening of the country. Digital vaccine passports were highlighted as a viable solution.

Last but not least, as COVID-19 shifts from a pandemic toward an endemic state, mass vaccinations continues to be a key intervention to protect the population against severe diseases.

Several manufacturers promptly announced the development of COVID-19 vaccines. While this process was underway, non-pharmaceutical interventions such as hand-washing, disinfection, safe distancing, and the use of protective equipment such as masks, were key in trying to contain the spread of COVID-19. Protective equipment was of even more importance in the healthcare sector where frontline workers were at high risk. A rigorous implementation of these measures from the beginning, when nothing else was available, have helped control the number of infections until vaccinations became available.

THE PURPOSE OF THIS WEBINAR IS TO GET THE KEY ACTORS TOGETHER, TO ADDRESS SOME GAPS, TO PROVIDE NUANCED INFORMATION.



Mr Anbu Srinivasan
Chair of EuroCham
Healthcare Committee

VACCINES ARE NOT A SILVER BULLET AGAINST COVID-19

While global vaccination programmes are being carried out, it is still important to maintain other non-pharmaceutical interventions to protect the population.

Infection prevention and control with non-pharmaceutical interventions includes:



Hand-washing



Disinfecting hands and surfaces



Personal Protection Equipment (PPE) including masks, face shields, gloves etc



Social distancing, isolation and cohorting of staff

EDUCATE AND INFORM

It is essential to keep different parts of the population informed and updated - medical workers, caregivers as well as patients.

Communication for each of these target audiences differs and sensitivity to their context can potentially affect how they absorb information.

PRIORITISATION OF VACCINES

As vaccines have become available globally, governments had to make decisions on who should receive the first doses as most countries received a limited supply of vaccines. For many countries, frontline workers were prioritised for vaccines.

However, it was not initially evident that securing vaccinations for patients with chronic diseases was just as vital. It required clear communication and collaboration between the various stakeholders to ensure that the doses of the COVID-19 vaccines reached the right people in the right order according to risk.

MISINFORMATION

Information is key in the battle against the spread of diseases and in this case, COVID-19.

Unfortunately, a lot of misinformation about vaccines spread quickly through social media. Reductionist or sensationalistic news headlines, impeded the acceptance of vaccines, with rejection rates being as high as 50% and above among patients and medical staff in countries where vaccines had become available.

While conspiracy theories abound, it was and is imperative for the healthcare industry to address the different concerns of different stakeholder groups such as patients, caregivers, and health professionals. Targeted approaches are needed for each group to give accurate information about vaccines, allowing them to make informed decisions.

CONTINUED VIGILANCE AND DISCIPLINE

Until vaccines are able to offer protection to a greater proportion of the population, it is important that everyone continues diligently the habits that ensure infection prevention, such as the wearing of masks and hand-washing.

THE MEASURES WE HAVE IN PLACE SHOULD CONTINUE UNTIL THE POPULATION HAS ACHIEVED IMMUNITY.



Dr Michael Etter
Chief Medical Officer, Asia Pacific
Fresenius Medical Care

Dr Etter shared his views on the importance of continuing non-pharmaceutical interventions while the population is receiving vaccination.

STAGES OF COVID-19 CLINICAL TRIALS



PHASE I
Small study with 50 participants after the pre-clinical stage; the aim is to look for proof of principle and the safety of the vaccine.

PHASE II
Involves between 50 to 100 individuals; proof of concept is established at this stage, and again, the safety of the vaccine as well as the immunogenicity of the vaccine. This is also the stage of the trials to determine the optimum dose and to examine the different schedules used.

PHASE III
Also known as the Pivotal License Studies, this is a bigger study that can reach up to 10,000 participants where the main focus is on vaccine efficacy and vaccine immunogenicity, and once again, the safety of the vaccine.

PHASE IV
Referred to as the Post Marketing Studies, this is where the vaccine is introduced to the population. Safety of the vaccine remains a top priority as well as its effectiveness.

The difference between the vaccine efficacy in Phase III and effectiveness in Phase IV is that efficacy is measured in a trial setting with a small inclusion/exclusion criterion and a well-defined design of the study, whereas effectiveness refers to the vaccine's performance in real-world setting.

AN ACCELERATED COVID-19 VACCINE DEVELOPMENT PATHWAY

During the pandemic, many clinical trials were carried out simultaneously. Results from these trials were collected, published and analysed, and necessary amendments were reviewed and made with regulatory authorities without the usual wait.

Most companies were also studying multiple platforms at the same time.

For example, Pfizer-BioNTech was studying four different mRNA platforms until they arrived at the one that was finally selected.

Recruitment of patients and individuals for the clinical trials was also much easier and faster due to the on-going pandemic. Pfizer-BioNTech was able to test its mRNA-based COVID-19 vaccine candidate on 44,000 individuals in five different countries and the same is true for the other pharmaceutical companies producing COVID-19 vaccines.

Regulators such as USFDA and EMA also showed great agility during the pandemic by expediting their reviews and using emergency use and conditional authorisation.

By prioritising and channelling resources, and using expedited pathways, National Regulatory Authorities were able to accelerate access to vaccines without compromising on safety or efficacy.

**700 MILLION DOSES HAVE BEEN DISTRIBUTED
ACROSS 100 COUNTRIES.**



Dr Amgad Gamil
Senior Director
Regional Medical Lead Emerging Markets, Vaccines, Pfizer

Dr Gamil shared his views on the scale of Pfizer-BioNTech mRNA vaccines distributed and how real-world evidence of efficacy and safety continues to be observed from different countries.



EVALUATING COVID-19 VACCINE CANDIDATES

VACCINE EFFICACY

The US FDA required the vaccine to have a minimum of 50% vaccine efficacy for authorisation. The majority of the authorised vaccines have at least 50% vaccine efficacy or above. The Pfizer-BioNTech and Moderna mRNA vaccines had a high efficacy of 90% and above in their Phase III trials.

NEUTRALISING ANTIBODIES

Another important criterion is the level of neutralising antibodies produced by those vaccinated.

Because there was no correlate of protection, the levels of neutralising antibodies (of those who were vaccinated) were compared with the antibody levels of convalescent serum (ie, from those who had recovered from COVID-19).

IMPACT ON CELLULAR RESPONSE

The impact of the cellular response was likewise important for the regulatory authorities as it was evident from the beginning of the pandemic that CD4 and CD8 played a key part in the transmission of COVID-19. Some vaccines showed an effect on these cells in a way that they helped to decrease the transmission and by providing a longer duration of protection.

DURABILITY

Regulatory authorities also look at the durability and the duration of protection of the vaccine. Although the majority of the pharmaceutical companies producing vaccines published their studies after three or six months, they are still tracking the population health trends and gathering additional data.

SAFETY

Safety is such a priority for regulatory authorities and pharmacovigilance departments in industry. Pharmaceutical companies often have independent data monitoring committees who also evaluate safety alongside the pharmacovigilance departments of manufacturers.

STORAGE AND DISTRIBUTION

The last evaluation criteria revolve around storage and distribution of these vaccines.

FOR VACCINE PLATFORMS LIKE THE MRNA, WE DID NOT SEE ANY CONCERN THAT PROTECTION HAS BEEN REDUCED (AGAINST THE DIFFERENT VARIANTS).

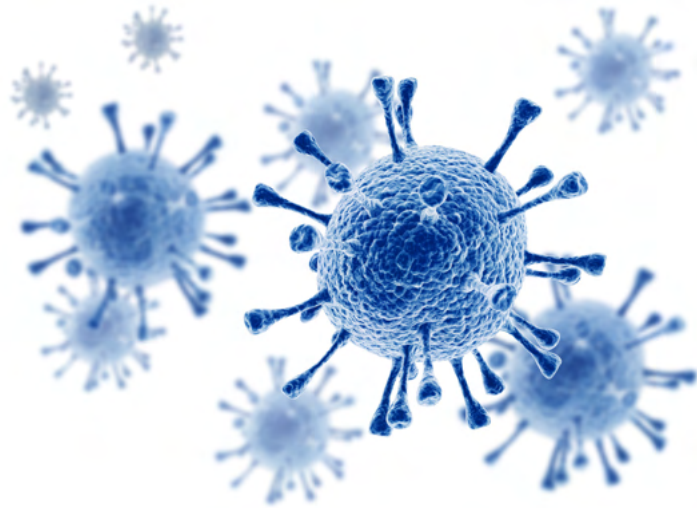
SCHEMATIC OF A VIRUS

In order to understand the impact of mutations and variations in a virus, it is important to understand the basic components of a virus particle.

Viruses are either DNA- or RNA-based. A virus is a very simple form of life and its main goal is to reproduce itself but it is unable to do this on its own. The virus can only reproduce itself by having its genetic material enter another cell.

When a virus infects a cell, it takes over the functions of that specific cell to reproduce itself, but by doing so it can manifest disease in the host.

Viruses often have surface proteins which enable the genetic material to enter the cells, and hence, understanding the surface protein is often important to stopping the virus from entering the cell.



IMPACT OF MUTATIONS ON DISEASE AND VACCINES

Mutations are common in viruses, and especially so for RNA viruses.

DNA viruses tend to be more stable, meaning that when the parental virus reproduces itself the progeny viruses are usually quite well preserved.

RNA viruses are not as stable, and often have random mutations when reproducing themselves, which is why the genetic material such as surface protein is very important. An example would be the influenza virus which has a different predominant circulating strain almost every year due to mutations, which requires an adapted vaccine to be developed accordingly.

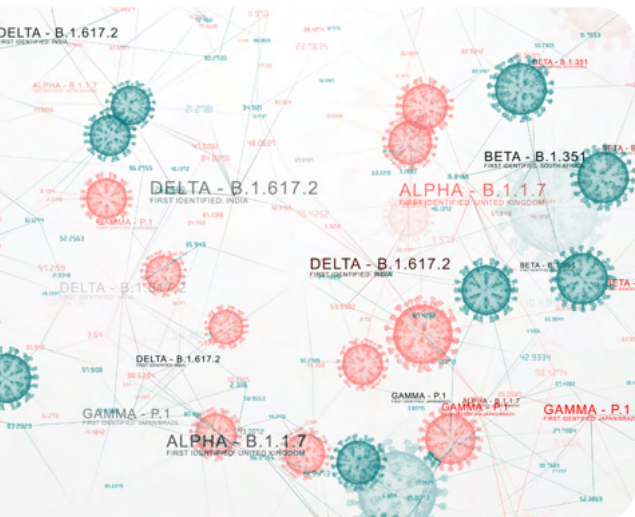
However, sometimes a shift can also potentially occur through reassortment of the genetic material, which creates an almost immunologically unrecognisable virus compared to the original. This is the case with the SARS CoV-2 virus.

Many types of coronaviruses are constantly circulating but a large shift in a virus is what can make it particularly dangerous to humans and starts a pandemic.

While the surface protein enables the virus to enter the cell, the surface protein is also easily recognised by the immune system which makes it an excellent vaccine antigen candidate.

However, as the virus mutates the surface protein may change, thus impacting the efficacy of the vaccine.

If the change in the surface protein is not too significant and similarities remain, the vaccine may yet still be protective. In some cases, it could also be an option to add an adjuvant to the vaccine (which almost behaves like a "turbo booster" for the immune system in terms of its response) which may enable broader protection to mitigate against mutations.



THERE ARE LIMITS TO HOW MUCH THE SPIKE PROTEIN CAN EVOLVE - BECAUSE IF IT MUTATES TOO MUCH, IT CANNOT INFECT AS WELL AS IT WOULD OTHERWISE.



Dr Sanjoy Datta
Vice President Medical & Clinical
Greater China & Intercontinental GSK Vaccines

Dr Datta explained why it is good news that present vaccines have selected the spike protein as an antigen.

VACCINE PASSPORTS

Following cases of fraudulent COVID-19 test results being reported around the world, there is a need for governments and health authorities to efficiently verify an individual's vaccine information to manage the risk of community infection once domestic and international movement is permitted.

Such verification processes place considerable strain on governmental resources, and a more efficient and secure method is needed.

A unique solution of digital vaccine passports, typically in the form of a mobile application, storing verifiable COVID-19 vaccination records can resolve this issue.

The technology to verify the authenticity of COVID-19 vaccination documents provides governments, immigration officials and airlines with a reliable method to ensure that an individual has been vaccinated. The vaccination schema could include which vaccine and when the vaccine was administered.

In addition, due to the nature of blockchain technology, which verifiable COVID-19 vaccination records leverage on, any changes made to the contents of an individual's vaccination record will be displayed once the document has been scanned for verification. A verifiable vaccination record's proof-of-tamper would hence provide relevant parties with the necessary information for their COVID-19 compliance policies which may be implemented once the world opens up for travel.

Digitally verified documents also provide the opportunity for automation which would be in line with automated processes many airports have already implemented for regular passports.

Currently, verifiable COVID-19 test results which are being issued in some countries allow authorities to easily verify a traveller's COVID-19 health status with a QR code scan within an individual's digital vaccine passport.

This solution can be integrated into international immigration gantries at airports or even domestically in offices and shopping malls to facilitate the safe reopening of international travel and re-entry into the workforce.



WE NEED A BETTER WAY TO ALLOW THESE VERIFYING PARTIES TO AUTHENTICATE (VACCINATION) INFORMATION.



Mr Simon Gordon
Chief Commercial Officer, Accredify

Mr Gordon demonstrated why it may be necessary to look into verifiable document solutions to overcome security risks related to the leak of healthcare information.

Questions

Expert answers

VACCINATION VERSUS ANTIBODIES:

How different will the results of an antigen test turn out, between a vaccinated person and that of someone who has recently recovered from COVID-19?

An antigen test attempts to diagnose an active COVID-19 infection. If a vaccinated person does get infected, and the antigen test is administered early enough, that antigen test will become positive. If a recently recovered COVID-19 patient gets infected (which is unusual), that antigen test will also become positive. So because they test for antigen and not antibodies, there really is no difference between a vaccinated and a recently recovered person or a vaccine-naive person.

Why are these two populations (vaccinated and unvaccinated) not treated equally for quarantine?

For people who have antibodies, and who have recovered, they are assumed to be free of the infection. As they have passed the period where they are infectious, they can be released relatively earlier. Whereas for a vaccinated person, currently, we still err on the side of caution because we understand that vaccinated persons can still be infected, so they are quarantined still for the full period when they are in Singapore.

MIXING VACCINES:

Many people have received the first dose of the Vaccine A, but there's a shortage and they will not be able to receive the second dose of Vaccine A. However, they have a large supply of Vaccine B. Should they receive a second dose of another vaccine?

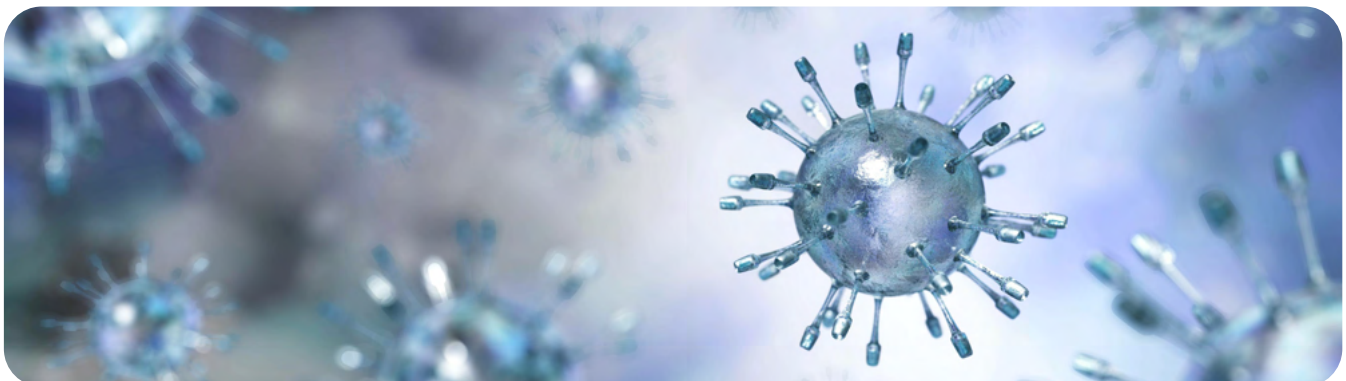
At this stage, there is no clear scientific or regulatory basis for the mixing of different vaccines in terms immunogenicity and the safety of one vaccine. However, the governments in some countries, have started also to use different vaccines for individuals due to supply shortages and the desire to protect populations. Ideally, the scientific basis for this should be available, whereas it currently is not.

IDEALLY, THERE SHOULD BE PROPERLY DESIGNED CLINICAL TRIALS TO HAVE THE DATA FOR REGULATORS TO MAKE THAT DECISION, AND THEN FOR THE MINISTRIES OF HEALTH TO IMPLEMENT THEM.



Professor John Lim
Executive Director
Centre of Regulatory Excellence Duke-NUS Medical School

Prof Lim shared his views on vaccine mixing.



Questions

Expert answers

MISINFORMATION:

Could you comment on the misinformation that is circulating and causing concern, and causing people to think twice about taking vaccinations?

It is good to acknowledge that these concerns are real and not all of these concerns are malicious. Vaccines are safe. In fact, virtually all vaccines have no long term side effects, or no side effects that come on long term after more than a few months. It is true that we don't know enough about mRNA vaccines, so we are collecting that data systematically as we go along. We should take an approach where we acknowledging what we do not know, while also strongly advancing what we do know about the safety of these vaccines when addressing such concerns.

IT IS GOOD TO ACKNOWLEDGE THAT SOME OF THESE CONCERNS ARE REAL. AND NOT ALL OF THESE CONCERNS ARE MALICIOUS.



Professor Hsu Li Yang
Vice Dean (Global Health) Programme Leader (Infectious Diseases)
NUS Saw Swee Hock School of Public Health

Prof Yang discussed addressing vaccination fears and misinformation about vaccines.

Is there a common clearing house for vaccine safety information?

At the global level, the regulators communicate. For example, there is the International Coalition of Medicines Regulatory Authorities (ICMRA) which played an instrumental role last year when evaluations were ongoing for new COVID-19 diagnostics and vaccines. And they continue to facilitate sharing of information, including on adverse events. There is also the Uppsala Monitoring Center under the World Health Organisation. So, there are mechanisms for sharing such information globally.

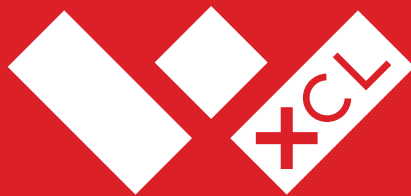
Can one safely assume that an infected person has recovered fully from the virus will no longer be infectious? And if that is indeed true, how have medical trials and treatment proven that the pathogen has been eradicated?

What different countries have done, (China, US, Germany, much of Europe and even Singapore) was to systematically test patients with COVID-19, at the start of the pandemic, and then cultured out the virus from the samples. We know that, for the most part, we are not able to obtain viable virus after about 11 days. This is borne out by the real-world experience of the US CDC. The US was releasing patients from isolation after one week, and in other jurisdictions after about two weeks. We have found that these people generally did not cause secondary infections. There are exceptions, for example those who are severely immunocompromised and who can still shed viable virus for several weeks. They, presumably, could still be infectious but those are just a very small part of the population.



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FUTURE OF HEALTHCARE & WELLBEING REPORT - 2021



European Chamber of Commerce (Singapore)



EXECUTIVE SUMMARY

This inquiry conducted by the European Chamber of Commerce (Singapore) surveyed respondents from 15 well-established European organisations relevant to the sector of healthcare and wellbeing and based in Singapore to assess their initiatives and strategies in the sector, as well as to gain a better understanding of their perceptions of Singapore's healthcare system.

The report highlights the organisations' recognition of healthcare-related trends in Singapore, and exposes some of the key challenges that they encounter while operating in the industry. Opportunities are also clearly identified in this report.

The intention of this survey is to raise awareness in the healthcare and wellbeing area and to advocate for closing the gap between companies' needs and government support programmes, while keeping in mind consumer trends.

INTRODUCTION

The year 2020 saw a crisis of unprecedented magnitude hit the world - an ongoing predicament in 2021. Even before the pandemic surfaced, world leaders and international organisations were expressing concern over the rapidly evolving demography trends in many countries, which consequently necessitated a rethinking of the ways in which to cater to the changes in healthcare and wellbeing needs.

The European Commission ran their Third Healthcare Programme from 2014 to 2020 and are currently in the midst of finalising and implementing their EU4Health Programme 2021. Singapore has also launched the CareShield Life programme in October 2020. All of these are a response to trends in healthcare needs such as the rise in lifestyle diseases and mental health concerns; the need for accelerated digitalisation and innovative technology to compensate for health concerns that cannot be dealt using only traditional methods; and an ageing population, to name a few.

EuroCham's Healthcare Programme 2021 is an ambitious project in line with the commitments and aspirations of Singapore, and towards the EU4Health Programme 2021. It also has the goal of showing the degree of involvement of European companies in the healthcare and wellbeing area.

The most pressing concern is the increased need for public awareness and accessibility to healthcare innovations, and healthier food and wellbeing choices, which many organisations are attempting to mitigate. However, organisations are experiencing a clear barrier as the broader public seems to lack trust towards initiatives by private entities.

When it comes to the future of healthcare and wellbeing in Singapore, almost all respondents indicated a need for more government incentives with broader applications as well as the establishment of a collaborative and cohesive ecosystem. This ecosystem should derive common goals from the general public, the government, and the private sector so as to create an environment that encourages and reinforces innovations in healthcare, healthy lifestyle and wellbeing choices, and healthy and sustainable food initiatives.

The focus is on 3 key strategic topics as identified by the industry as being important for any conversation around healthcare: Healthcare & Innovation, Healthy Lifestyle & Wellbeing, and Healthy & Sustainable Food.

In conducting this survey, the European Chamber of Commerce (Singapore) has the ambition of highlighting the perceptions regarding the healthcare system of Singapore - its areas of excellence and weakness, the initiatives in place and their challenges, and opportunities for growth.

All respondents have our deep appreciation and gratitude for their valuable contributions and inputs in this survey; we cannot neglect to mention the openness and transparency of the respondents of this survey, made up of 15 leading European companies who have shared their views with us and identified potential challenges for the future.

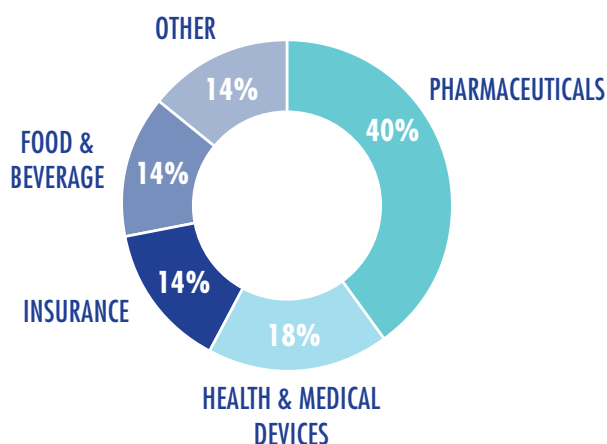
Alongside this initiative, EuroCham is also the organiser of a series of sharing sessions - known as the "Best Practice Sharing Sessions". This is another opportunity for our members to expose their healthcare best practices and start a dialogue between private entities, non-profits, government, and academia. Only by involving all existing actors, are we then able to tackle the enormous challenge that we face.

RESPONDENT DEMOGRAPHICS

INDUSTRY BREAKDOWN

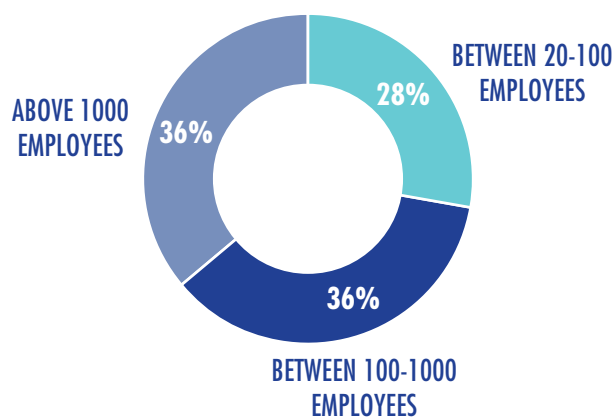
For this study, respondents from 15 European companies in Singapore were surveyed. All of these companies have a vested interest in the future of Healthcare & Wellbeing, and are well-established in the sector for their products and services.

40% of the respondents were employees of pharmaceutical companies. 18% of the respondents were employees of companies working with 'health & medical devices'. Respondents from 'insurance' companies, 'food & beverage' companies, and 'other' companies each made up 14% of the sample respectively.



COMPANY SIZE

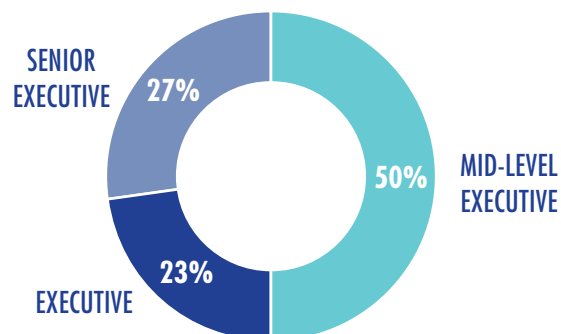
The ratio of respondents from various sizes of companies was fairly well-distributed. 28% of the companies reported have 20 to 100 employees, while both companies with number of employees being between 100 to 1000 and companies with number of employees above 1000 made up 36% of the sample each.



POSITION IN THE COMPANY

Majority of the respondents held mid-level executive positions, with 50% being mid-level executives, 27% being senior executives and 23% being executives.

This is an indication that the survey results were gathered from a well-rounded group of individuals with knowledge at various levels of a corporate business in the healthcare sector.

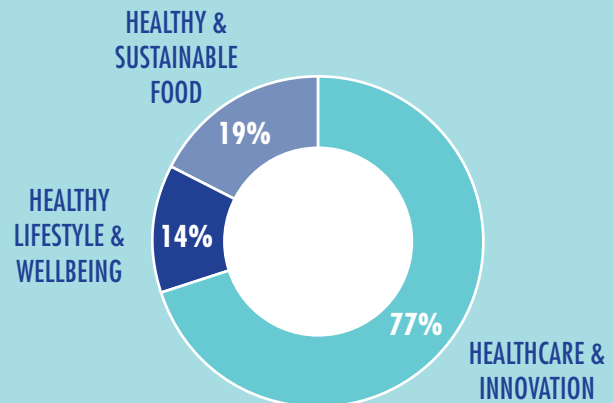


HEALTHCARE & WELLBEING PRIORITIES

Which of the following is the most relevant area of interest for your organisation?

77% of the organisations reported are involved in 'healthcare & innovation', indicating that this is an aspect of the healthcare system that is currently seeing a boost in terms of engagement from the private sector.

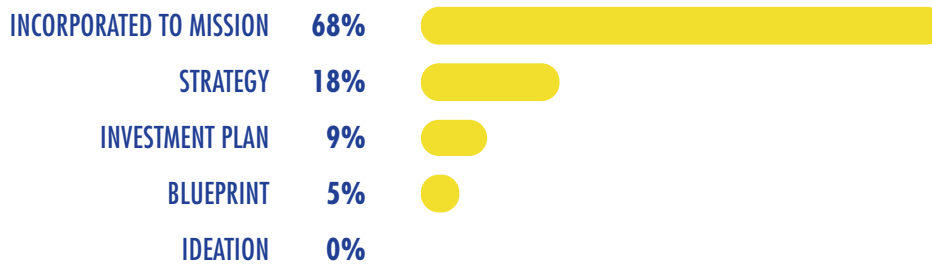
At the same time, organisations that are reportedly involved in 'healthy lifestyle & wellbeing' and 'healthy & sustainable food' make up 14% and 19% of the sample respectively.



At which stage are your organisation's efforts with regards to improving healthcare & wellbeing?

With regards to improving healthcare and wellbeing, 68% of the respondents have reported that their organisations are at the phase where their healthcare concepts are being 'incorporated to mission'. This shows that most organisations are invested in improving healthcare & wellbeing and are in the process of working towards it.

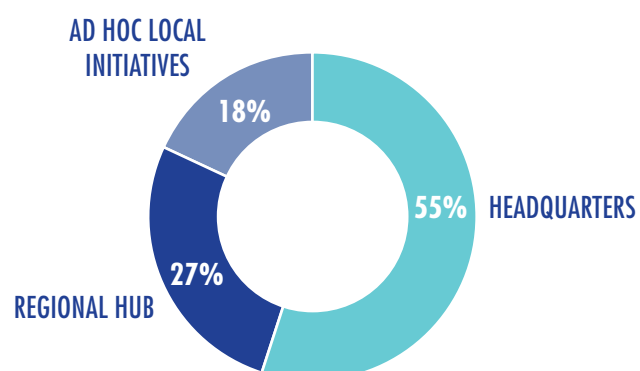
None of the organisations are at the 'ideation' level, 18% of organisations are at the 'strategy' stage, 9% in the 'investment plan' stage, and 5% at the 'blueprint' stage.





Which of the following is the main driver of these efforts in your organisation?

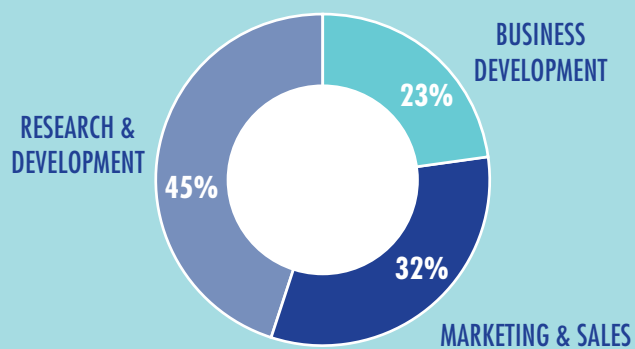
At 55% majority, 'headquarters' are the main drivers behind most efforts towards improving healthcare & wellbeing. 'Regional hubs' and 'ad hoc local initiatives' have been cited to be responsible for these efforts by 27% and 18% of the respondents respectively.



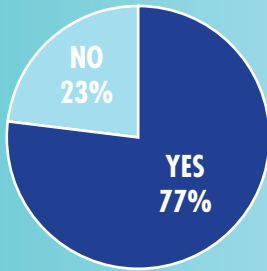
At which stage are your organisation's efforts with regards to improving healthcare & wellbeing?

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None of the organisations are at the 'ideation' level, 18% of organisations are at the 'strategy' stage, 9% in the 'investment plan' stage, and 5% at the 'blueprint' stage.



HEALTHCARE & INNOVATION



Does your organisation provide or promote innovative technologies to support the management of personal healthcare?

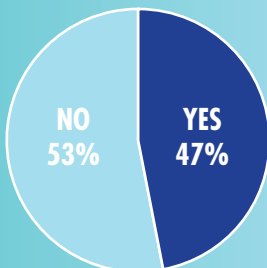
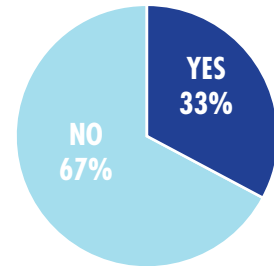
77% of the organisations were reported to provide or promote innovative technologies to support the management of personal healthcare.

23% do not provide or promote such technologies and this can be attributed to these organisations having other healthcare priorities.

In your opinion, is there widespread public awareness of the healthcare potential of innovation such as smart home technologies?

With majority 67% of the respondents disagreeing that there is widespread public awareness, this is a clear signal to address a potential knowledge gap for future community engagement with such innovation in the healthcare system.

Only 33% of the respondents agreed that there is, in fact, widespread public awareness of the healthcare potential of innovation such as smart home technologies.

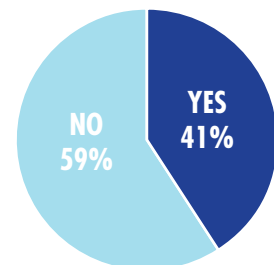


Do you believe that there is sufficient acceptance of healthcare innovations like smart home technologies among the general public?

There is an almost equal split between the number of respondents believing that there is sufficient acceptance of healthcare innovations among the general public, with 47% saying yes, and 53% saying no.

In your opinion, has the government done enough to help the public accept these healthcare technologies?

41% of respondents indicated that the government has done enough to help the public accept healthcare technologies, while 59% of respondents indicated that the government has yet to do enough.



From the above 4 questions and respective responses, it is clear that European organisations in Singapore are keen on providing and promoting healthcare technologies. While there is awareness amongst the general public of such technologies, there is still much room for improvement. At the same time, European organisations and the Singapore government can look towards opportunities of collaboration to make such healthcare technology-based efforts a success for both.

In your opinion, which of the following are the top three public concerns with regards to the use of smart technologies for managing personal health?

The no 1 concerns are tied at 72% each for both 'reliability and trust', followed by 'affordability' at 61% and 'accessibility' at 44%.

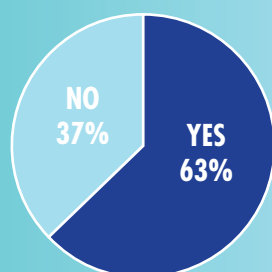
At 5.6% each, the other options included 'stigma', 'data ownership', 'privacy', 'understanding of choices', 'accuracy', 'adoption & know-how', and 'user experience'.



Which of the following stakeholders does your organisation collaborate with to promote the adoption of smart technologies for managing personal health?

Most organisations reportedly collaborate with the Singaporean 'government' the most, at 33%. Collaboration with 'academia' is the second most common, at 13%.

The following stakeholders are all collaborated with at an equal rate of 6.7% each - 'trade associations', 'MNCs', 'start-ups', 'business partners', 'private industry', 'in-house developments', and 'medical societies & associations'. 6.7% respondents also chose none of the above options.



Do you believe that the market for smart technologies for managing personal health is sufficiently regulated?

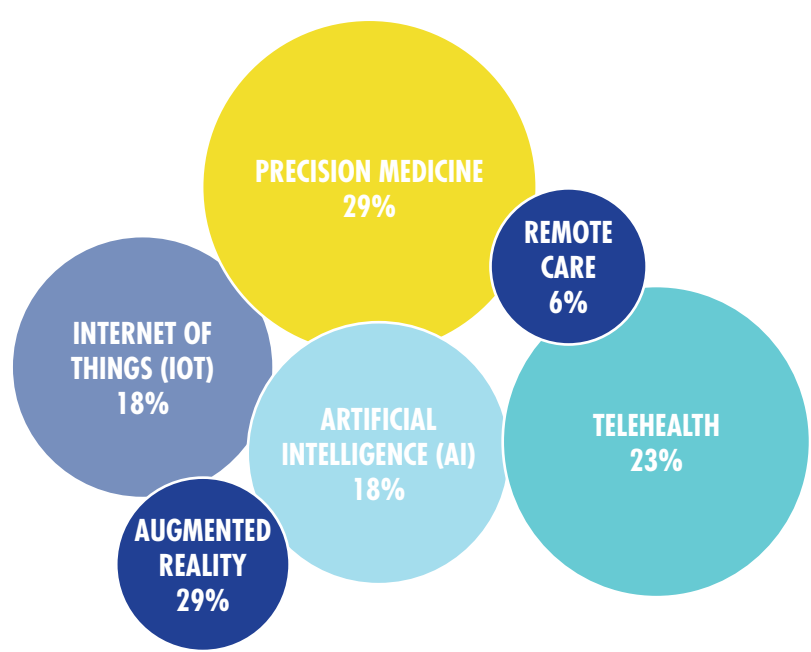
63% of the respondents agreed that the market for smart technologies for managing personal health is sufficiently regulated, while 37% disagreed on this account.



Which areas of innovation do you believe has the highest potential for improving today's healthcare system?

The mode area of innovation amongst organisations is 'precision medicine' at 29%.

'Telehealth' is at a close 23%, while the potential for 'artificial intelligence (AI)' and 'internet of things (IOT)' to improve today's healthcare system are at 18% each. The least likely to improve the healthcare system is 'remote care' at 6%.



In your opinion, how can key stakeholders help drive innovation in healthcare? Additionally, how can stakeholders help promote these technologies to the general public?

“

Legitimacy and trust are key enablers in the adoption of healthcare innovations by the general public, both of which can be achieved through a strong public-private partnership, especially between companies and the government.

Innovation can be achieved by having a novel mindset while inspiring teams to push through barriers. To promote these technologies, messages of benefits and reliability have to be emphasised.

There is a need for more funding and promotion of research on the efficacy of innovative approaches to healthcare. More platforms for healthcare tech startups to showcase solutions would also be beneficial.

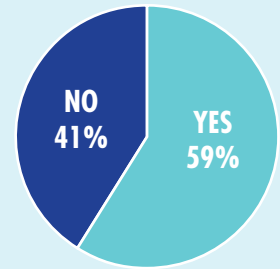
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HEALTHY LIFESTYLE & WELLBEING

Does your organisation adopt programmes to support the general public in pursuing a healthy lifestyle?

59% of organisations reported adopt programmes to support the general public in pursuing a healthy lifestyle, while 41% of organisations do not adopt such programmes.

This 41% could possibly be engaged in more niche healthcare areas, as opposed to programmes that support healthy lifestyle.



In your opinion, what are the 3 most efficient programmes to promote a healthy lifestyle amongst the general public?

At 57%, 'healthy lifestyle apps on mobile' is considered to be the most efficient programme to promote a healthy lifestyle amongst the general public. 'Corporate programmes for employees', at 50%, and 'government-led campaigns to promote healthy literacy', at 36%, round off the Top 3 most efficient programmes.

The least efficient programme is a tie between 'collaborating with existing communities beyond healthcare clubs' and 'public recreation facilities, bike lanes, parks, wildlife areas', both which are at 7% each.



In your opinion, how effective are mobile apps in advancing behavioural change towards a healthy lifestyle?

At 43%, most respondents believe that mobile apps are highly effective in advancing behavioural change towards a healthy lifestyle.

36% of respondents believe there is medium effectiveness and 21% of respondents believe there is low effectiveness of such mobile apps.



In your opinion, which age groups are more accepting of mobile apps?

Predominantly, the age group of 15-30 years olds are perceived to be more accepting of mobile apps, at 71%.

29% of respondents perceive the age group of 31-50 years olds as being more accepting of mobile apps, while none of the respondents chose the 50+ years old age group. These results are not an indication that either of these age groups are in any way opposed or unwilling to accept and use mobile apps, but simply that the 15-30 years olds are perceived to be more accepting.



In the wake of the pandemic, do you agree that there are sufficient programmes supporting public mental health?

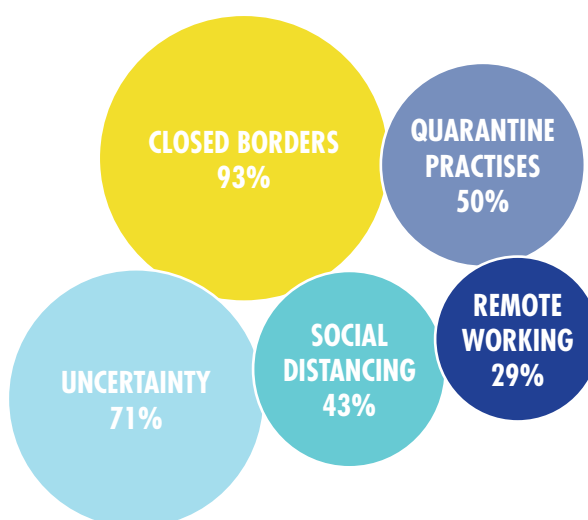
A large majority, at 64%, disagree that there are sufficient programmes supporting public mental health. Only 22% agree that there are sufficient programmes, while 14% are neutral on this matter.

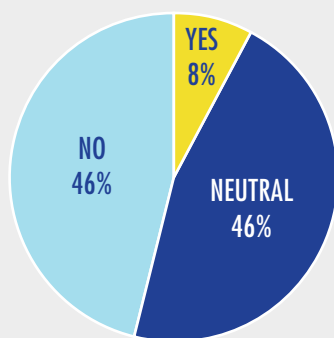


In your opinion, which are the top 3 challenges with the highest psychological toll on the public?

The perceived challenge with the highest psychological toll on the public is 'closed borders' at 93%.

'Uncertainty' at 71% and 'quarantine practices' at 50% round-off the top 3 challenges for the public. The challenge with the least psychological toll is perceived to be 'remote working' at 29%.





In your opinion, are existing programmes spearheaded by the government sufficient in supporting public mental health?

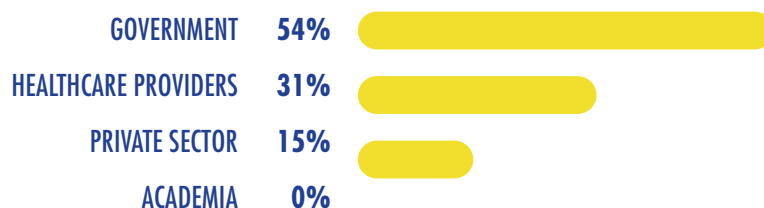
With the vast majority of the respondents choosing either 'no' or 'neutral', there is only 8% who agree that existing programmes spearheaded by the government are sufficient in supporting public mental health.

The large proportion of responses being 'neutral' could indicate a wait-and-see approach due to a lack of immediate data and/or self-censorship due to a conflict of interest or not having a clear enough perspective of the existing government programmes.

In your opinion, which stakeholders are best placed to conduct programmes to support public mental health?

54% of the respondents believe that the 'government' is best placed to conduct programmes to support public mental health.

While 31% chose 'healthcare providers' and 15% chose 'private sector' to be best placed, none of the respondents believe that 'academia' is in a position to conduct such programmes.



In your opinion, how can key stakeholders improve programmes to promote a healthy lifestyle and support public health?

“

Often the public sees a need for healthy lifestyle but due to lack of motivation, they do not engage in appropriate activities. Hence, programmes need to be user-friendly and incentivising to counteract this challenge.

Stakeholders need to understand the user, and provide a user experience that is as customized as possible to the individual.

There need to be better promotion and visibility of issues. This

can be achieved by establishing a robust partnership between the private and public sector.

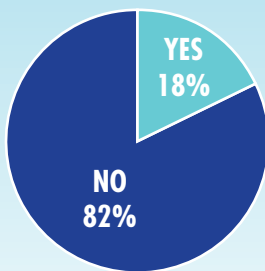
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HEALTHY & SUSTAINABLE FOOD

Does your organisation produce healthy and sustainable food?

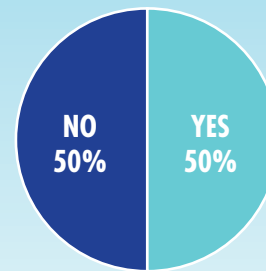
18% of respondents reported that their organisations produce healthy and sustainable food.

82% of respondents reported that their organisations do not produce healthy and sustainable food. This could be an indication that these organisations are not involved in the food sub-sector of healthcare and wellbeing.



Does your organisation conduct programmes promoting consumption of healthy and sustainable food?

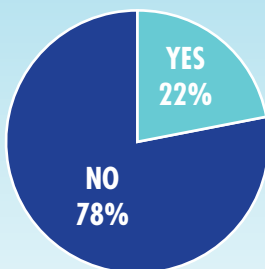
There is an even split between the number of organisations which conduct programmes promoting consumption of healthy and sustainable food.



Do you believe that there is adequate public awareness of the health and sustainability attributes of the food consumed?

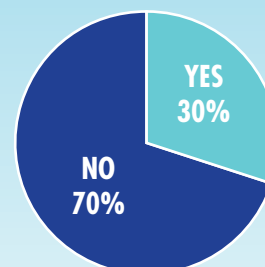
At 78%, most respondents believe that there is inadequate public awareness of the health and sustainability attributes of the food consumed.

Only 22% of respondents believe that there is sufficient public awareness.



In your opinion, is there sufficient labelling of food as healthy and sustainable?

70% of the respondents do not find there to be sufficient labelling of food as healthy and sustainable, while only 30% agree that there is in fact sufficient labelling.

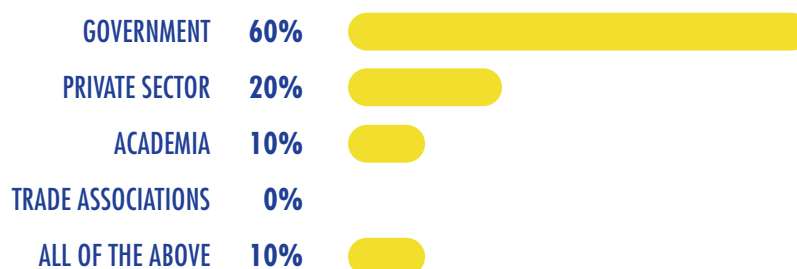




In your opinion, which stakeholders are best placed to improve public awareness on healthy and sustainable food?

'Government', at 60%, is the stakeholder best placed to improve public awareness on healthy and sustainable food.

At 20% and 10% respectively, there is a large gap between the 'government' and the next best stakeholders - 'private sector' and 'academia'. Although none of the respondents chose 'trade associations', 10% of the respondents believe that all of the mentioned stakeholders are important in improving awareness on healthy and sustainable food.



In your opinion, how can awareness and consumption of healthy and sustainable food be improved by key stakeholders?

“

Campaigns need to specifically target raising awareness through proper education on healthy and sustainable food. These campaigns need to be a joint, concerted effort from both the government and private sector.

Better regulation is important in that there need to be greater transparency regarding the parameters used when labelling food as healthy and/or sustainable - for example, country of origin, content of fat, content of sugar versus daily need, or what is the carbon footprint from producing this food, etc.

”

BUSINESS RECOMMENDATIONS TO SINGAPORE

AWARENESS AND EDUCATION

The public mindset and awareness regarding available healthcare technologies are crucial for its successful integration into Singapore's Healthcare System. The organisations highlight that information about healthcare innovations such as smart home technologies and their importance needs to be spread wider in Singapore, to the public and towards businesses.

Recommendations

- Educate the young in school about available healthcare mobile apps for the management of personal health.
- Run awareness campaigns for the general public on upcoming healthcare innovations relevant to their age-group, healthcare needs, etc.

INCENTIVISE

The private sector invests deeply in research and development through the appropriate use of patient data available to them. Companies are at the forefront of awareness of latest developments in healthcare trends and needs. Companies that are investing in and developing technologies that directly answers these needs should be encouraged to continue their operations in Singapore in this beneficial direction.

Recommendations

- While there are governmental funding and grant schemes in place for certain types of healthcare innovation research, funding should be made available for untapped areas of innovation that private organisations are exploring.

HEALTHY LIFESTYLE & WELLBEING PROGRAMMES

Given the current rise in both lifestyle diseases and public mental health concerns, it is imperative that the government, in conjunction with the private sector, run programmes to mitigate such negative trends.

Existing programmes are insufficient in tackling these issues - made exponentially worse due to the recent pandemic and other localised epidemics - and many respondents have highlighted their concerns.

Recommendations

- The public sector need to collaborate with the private sector so as to understand the consumer's choices and develop the most appropriate programme suited to smaller sub-communities of the general public. This is to ensure that the campaigns are nuanced enough to target specific lifestyle and wellbeing needs of the public.

HEALTHY FOOD LABELLING

Many respondents are of the opinion that there is room for improvement in the labelling standards for food in Singapore. While Singapore's Healthier Choice symbol is an excellent initiative from the Health Promotion Board, it can be further developed to be more eye-catching and consumer-friendly.

There is also a limited number of packaged food products carrying this symbol, as the onus remains on the consumer to make a healthier choice. Instead, it should be a joint effort between the public and private sector as well as the general public. It is necessary to encourage companies to not only provide healthy food but also apply for such labelling licenses, so that the consumer can make an informed decision.

Recommendations

- Adopt a healthy food labelling system that is more nuanced and understandable at a glance for the consumer. Encourage companies to practice healthy food labelling and apply for such licenses through tax incentives and subsidies to minimise cost of generating the necessary nutrition reports.

SUSTAINABLE FOOD LABELLING

Similar to the nutrition labelling in food products, there is a need for sustainable food labelling in Singapore. Currently, Europe is developing an Eco-score food labelling standard that scrutinises and informs the consumer of the sustainable practices behind the production of the food consumed. Singapore, as a nation that believes in the sustainable approach to living and working, needs to embrace similar methods in their food labelling practices.

Recommendations

- Develop a sustainable food labelling system, which companies in the food industry should also be encouraged to adopt.
- The general public needs to be educated and made aware of the need for food choices that are more sustainable.

COLLABORATION AND COORDINATION

Stronger collaboration between the public and private sector is necessary to accelerate and streamline the shift to healthier and sustainable living. The general public is seen to lack trust and feelings of reliability towards many of the private initiatives, a challenge that can be alleviated through cooperation and collaboration with the Singapore government.

By coordinating the initiatives across areas and platforms, authorities and companies can work more easily towards a common goal. Together with a sound regulatory framework, collaboration and coordination between entities will enable an improved healthcare and wellbeing system.

Recommendations

- Develop an ecosystem involving multiple actors that acts towards the betterment of the healthcare system.

These are the focus areas where the organisations feel the need to reinforce action from the government side. There is still a key takeaway that all of them have highlighted: there is an even greater need for intervention for the betterment of public healthcare and wellbeing; urgent needs arising from unprecedented crises such as pandemics will not adapt to our corporate or governmental agenda and we should be prepared for such emergencies. The way to achieve this is to ensure that the public is not only educated and aware of healthcare provisions but also have easy access to these provisions.

In tackling this enormous challenge, all entities have to work together. This is one of the most important elements; it is crucial for individuals, the government, and the private entities to not act in isolation, but instead work together to create a holistic ecosystem which provides goods and services that are reliable and affordable so as to ensure improved healthcare and wellbeing choices.





**FRESENIUS
MEDICAL CARE**

Improving lives together

Fresenius Medical Care is the world's leading provider of products and services for individuals with renal diseases of which around 3.7 million patients worldwide regularly undergo dialysis treatment.

In Singapore, we began operation in 1997. Under our service provider business, Fresenius Kidney Care, the company is now the largest private provider of dialysis treatments in the country. Together we deliver our vision - **Creating a future worth living. For patients. Worldwide. Everyday.**



Learn more about us:



@freseniusmedicalcare.sg



www.fmc-sg.com





EUROPEAN EXCELLENCE IN HEALTHCARE, WELLBEING AND SUSTAINABLE FOOD



European Chamber of Commerce (Singapore)



FRESENIUS MEDICAL CARE

Creating a Future Worth Living for Patients through Innovation and Care

Every 0.6 seconds, a patient somewhere in the world starts a Fresenius Medical Care dialysis treatment. This treatment uses modern technology to replace some of the kidneys' vital functions in people whose kidneys are failing them.

As the world's leading provider of products and services for individuals with renal diseases, Fresenius Medical Care provides dialysis care to patients around the world.

Continuously investing in research and development to provide innovative, high-quality dialysis therapies, the company and its people are driven by the singular vision of creating a future worth living, for patients, worldwide, every day.

One in two dialysis machines made worldwide is manufactured by Fresenius Medical Care.

With a presence in around 150 countries, the company partners with governments and healthcare professionals worldwide, reacting to fast-changing healthcare needs in an agile way, ensuring it can continue to deliver on its vision.

FRESENIUS MEDICAL CARE IN SINGAPORE

Fresenius Medical Care began its operation in Singapore in 1997 to provide advanced dialysis products and services. Under its service provider business, Fresenius Kidney Care, the company is now the largest private provider of dialysis treatments in the country.

Approximately 380 employees care for more than 1,800 patients across a network of 33 dialysis clinics and home dialysis programs.

Over the last 24 years, the company has focused on creating advances in dialysis care that benefit patients in Singapore. For instance, it pioneered the use of single-use dialyzers in the country. This is important because it means that dialyzers are not reused after treatments, which helps to reduce the risk of blood-borne infection and avoids chemical cleansing agents from entering the patient's bloodstream, further supporting patient safety.

Fresenius Kidney Care clinics in Singapore are benchmarked internationally, having achieved accreditation by the leading international accreditation agency, The Australian Council on Healthcare Standards International. This provides government, healthcare professionals and patients with confidence in the excellence of care provided in the company's clinics.

Fresenius Medical Care Singapore values and invests in its experienced and professional clinic staff, offering quality, systematic training for new nurses, as well as regular refresher training

and workshops focussing on new techniques and knowledge-building. This robust training framework guarantees nurses and clinical technicians are well-equipped to provide best-practice care for patients.

Every advance in dialysis therapy makes a difference in the lives of dialysis patients, and also contributes to better treatment outcomes, which can help to reduce costs for healthcare systems. For example, the company has made HighVolume Hemodiafiltration (HighVolumeHDF) therapy available in Singapore – a therapy that can help reduce all-cause mortality, and more specifically, cardiovascular mortality.^{1,2}

Fresenius Medical Care is committed to finding new and better ways to deliver dialysis and improve health outcomes by providing healthcare professionals with high quality products to help meet the challenges of modern healthcare. As such, the company also offers its critical care portfolio to healthcare professionals in hospital intensive care units across Singapore. This includes providing continuous renal replacement therapy that supports critically ill patients with acute kidney injury, as well as extracorporeal heart and lung therapies used to provide multi-organ support for patients in intensive care units or emergency departments.

RIISING TO THE CHALLENGE

Fresenius Medical Care is dedicated to supporting governments, healthcare



Fresenius Medical Care Singapore organized 'Corporate Social Responsibility Walk and Run' event in 2018 with employees, patients, doctors, families and friends to promote kidney disease awareness.



professionals, patients, and the communities in which it operates. In Singapore, throughout the COVID-19 pandemic, the company partnered with the Ministry of Health and Temasek Foundation to supply products and care at short notice, including dialysis machines, critical care products and consumables. This is a testament to the agility and resilience of their global manufacturing and supply chain operations.

In rising to the challenge, the company leveraged its global network to source in-demand supplies such as Personal Protective Equipment (PPE) for its clinic staff and to bring additional critical care and extracorporeal therapy solutions to Singapore. At the same time, the company sped up its digital transformation to cope with the various challenges of the pandemic.

THE DIGITAL TRANSFORMATION OF HEALTHCARE

Continuous innovations can contribute to improvements in treatment outcomes for patients, empowering them to lead fulfilling lives. The company's proprietary clinical management system, EuCliD, provides valuable big data to further such innovations. Connecting every dialysis machine at its clinics anonymously and in a standardized way, EuCliD allows data comparison on therapy methods and their results, and therefore the ability to focus on those treatments and procedures that lead to better therapeutic outcomes. The system also allows the doctors to use this information to make better treatment decisions.

To enable patients and doctors to make the right decision about their health and treatments, Fresenius Medical Care has launched digital plat-

forms such as the myCompanion App and Doctor App, enabling access to real-time health and treatment data directly via their tablets and smartphones.

Both the myCompanion and Doctor App have been rolled out in selected markets, with Singapore being the first market in the Asia Pacific region to run pilot programs. The myCompanion App pilot for patients commenced in late 2020 and, to date, the app has seen promising adoption, with the number of users consistently on the rise.

Fresenius Medical Care also uses artificial intelligence (AI) technologies and builds data prediction models to better anticipate patients' treatment outcomes, and to design effective interventions in response. Some of the company's data analytics tools are already showing promising results: prompt intervention in response to patient outcome data has contributed to a reduced rate of hospitalization for its dialysis patients in Singapore, a positive outcome for both patients and payers.

Through the knowledge generated by these prediction models, care teams can better understand the possible consequences of patients' conditions and act promptly to minimize the chance of them eventuating.

CONTRIBUTING TO LOCAL COMMUNITIES

In each location where Fresenius Medical Care operates, it forms an active part of the wider community. Working hand-in-hand with local and global health organizations who share its values, the company invests time and resources in programs that promote an

active lifestyle, increase awareness of kidney health, and assist in the prevention and early detection of kidney disease.

To achieve this, the company rolled out its global Corporate Social Responsibility initiative, The Kidney Kid, in Singapore in 2017. Represented by a colourful superhero character, the initiative provides 'edutainment' to children, teaching them about keeping their kidneys healthy in a fun and engaging way. In addition to face-to-face activities, the company has created digital platforms including a game app and a website to reach more children.

To further promote kidney disease awareness, Fresenius Medical Care Singapore works with various local organizations such as the Kidney Dialysis Foundation, National Kidney Foundation and regularly supports events such as World Kidney Day.

LOOKING AHEAD

Looking to the future, Fresenius Medical Care Singapore will continue to provide high-quality care to patients and stay agile to meet evolving healthcare needs.

In line with their global strategy, the company will continue to create a future worth living for chronically and critically ill patients across the renal care continuum by leveraging their core competencies – innovating products, operating outpatient facilities, standardizing medical procedures, and coordinating patients efficiently.

It will continue to introduce innovative solutions for multi-organ support and other critical care solutions, and further enhance its complementary assets through partnerships, investments and acquisitions.

With the trust of its partners, Fresenius Medical Care will find new ways to meet the pressures of growing patient numbers and costs that challenge health systems, while maintaining the highest ethical standards and upholding its social and environmental responsibilities.

References:

1. Peters S.A.E. et al., *Haemodiafiltration and mortality in end-stage kidney disease patients: a pooled individual participant data analysis from four randomized controlled trials*, *Nephrol Dial Transplant* (2016); 31: 978–984
2. Nubé, M.J., et al., *Mortality reduction by post-dilution online-haemodiafiltration: a cause-specific analysis*, *Nephrol Dial Transplant* (2017) 32: 548–555



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PHILIPS

Building a Healthier Society through Technology

Royal Philips (NYSE: PHG, AEX: PHIA) is a leading health technology company focused on improving people's health and wellbeing, and enabling better outcomes across the health continuum – from healthy living and prevention, to diagnosis, treatment and home care.

Philips leverages advanced technology and deep clinical and consumer insights to deliver integrated solutions. Headquartered in the Netherlands, the company is a leader in diagnostic imaging, image-guided therapy, patient monitoring and health informatics, as well as in consumer health and home care.

Philips generated 2020 sales of EUR 17.3 billion and employs approximately 78,000 employees with sales and services in more than 100 countries.

The company began its Singapore operations in 1951, and currently employs over 500 personnel in the city state. Philips APAC Center in Singapore, which also serves as the regional headquarters, signals the commitment to ground-breaking technology and innovative solutions, especially in health and wellness.

INNOVATION FOR BETTER HEALTH OUTCOMES

This multinational conglomerate unlocks insights leading to innovative solutions that address the quadruple aims: improved patient experience (including quality and satisfaction), better health outcomes, improved staff experience, and lower cost of care.

With leading research, design and innovation capabilities, Philips partners with its customers to transform the delivery of healthcare. In this journey, Philips looks beyond technology to the experiences of consumers, patients, providers and caregivers across the health continuum, from healthy living and prevention to diagnosis, treatment and home care.

With the depth of perspective across hospital and home, they are in a good position to break boundaries of organising patient-centric healthcare.

ECONOMIC REALITIES ARE DRIVING THE NEED FOR NEW APPROACHES IN HEALTHCARE

Philips intends to move from:

- Volume-based to value-based healthcare: Clinical and economic outcomes are driving provider reimbursement, compliance to standards of care and the 'consumerization' of healthcare.
- Responsive to preventive healthcare: Making the shift from treating illness to maintaining population wellness, meaning resource allocation will shift to preventive care and reduction of complications and readmissions.
- Episodic to continuous healthcare: Connecting information across the care ecosystem to enable more appropriate, timely clinical intervention and decision-making.
- Limited to accessible healthcare: Expanding affordable access to care for all will include solving challenges related to affordability, remote access, and clinical talent.

With innovation as the key driver, Philips is on the path to becoming a health technology front-runner. Though, it needs to break eggs to make an omelet. Fundamental changes in their business models are inevitable, such as shifting from selling products to selling whole solutions while building long-term relationships with customers and consumers.

LEGACY OF BREAKTHROUGH INNOVATION

Its long history of breakthrough innovation made Philips into a true legacy. The company began in lighting and found

ed its first research lab in 1914. Applying its technical knowledge to healthcare, Philips introduced a medical X-ray tube in 1918. This marked the point when the company began to diversify its product range and to systematically protect its innovations with patents in areas stretching from X-ray radiation to radio reception.

Along the way, Philips been behind some truly ground-breaking discoveries and standards in different industries, such as the Rotalix X-ray tube, the high-pressure mercury lamp, the triple-headed dry electric razor, the Compact Cassette, the Brilliance 40-slice CT scanner, CD, DVD, Ambilight TV, and more recent innovations such as, Lumify portable ultrasound, and the all-digital Vereos PET/CT scanner.

Recent innovations in the area of medical devices include Philips Azurion which is basically the next-generation image-guided therapy platform that enables clinicians to perform a wide range of routine and complex procedures, helping them to optimise interventional lab performance and provide superior care.

Besides, Philips has a large Informatics and Connected Care portfolio. These solutions have complemented local hospitals' efforts to deliver better and more efficient care for patients. Some of these solutions and technologies have also been used in the current pandemic.



DEVELOPING AND DELIVERING INNOVATIVE INTEGRATED SOLUTIONS

Taking their customer's strategy and needs as their starting point, Philips is now centralising innovative integrated solutions that really make a difference across health ecosystems. It translates into a better match for customer needs and the capturing of greater.

With a strong and focused portfolio Philips is driving innovative solutions through a three-pronged strategy:

1. Diagnosis and Treatment

Through this strategy, Philips provides Precision Diagnosis and Image-Guided Therapy.

With Precision Diagnosis, Philips contributes to smart and connected systems, optimises workflows, and integrates diagnostic insights, leading to clear care pathways and predictable outcomes.

With Image-Guided Therapy, Philips innovates minimally invasive procedures in a growing number of therapeutic areas with significantly better outcomes and productivity.

2. Connected Care

Philips commits to driving better care management where patients and caregivers from the hospital are seamlessly connecting at home.

3. Personal Health

It is also Philips' mission to create solutions enabling healthier lifestyles, enhancing personal hygiene and ameliorating the life with a chronic disease.

By connecting consumers to their caregivers via an app on their devices, Philips aims to generate added value to its consumers. For example, the Sonicare FlexCare Platinum Connected toothbrush offers smart new ways to help kids and adults improve the way they clean their teeth; their Pregnancy+ app gives personalised guidance to new parents; and their Dream Family solution supports those with obstructive sleep apnea.

In the clinical space, Philips has taken a deep dive into integrated solutions like packaged suites of systems, smart

devices, software and services that they put together with their partners and customers to solve a particular problem. In this way, the company is actively addressing the challenges that healthcare providers are facing, helping to improve patient outcomes and productivity. This might involve one department or service, an entire care pathway or even an entire hospital.

Integrated solutions require a full understanding of the healthcare strategy, a mastery of design and technology, a tenacious ability to integrate disparate parts, and strong program management. It helps that Philips has built strong ties with its customers. The company speaks their language, and has the world-class capabilities to design and develop – in a process of co-creation – the solutions that meet their evolving needs.

In short, the company has progressively been partnering with customers in new business models where products are no longer sold in a 'transactional' manner but where long-term strategic partnerships are rather centric to innovate care and manage risk.

It gives the ability to the healthcare providers to anticipate the latest technological trends as they can benefit from Philips' global reach and resources, with value measured by patient outcomes.

COLLABORATION IS THE KEY TO THE FUTURE

In partnership with Singapore General Hospital (SGH), Philips has announced the establishment of the Singapore General Hospital Digital and Computational Pathology Center of Excellence. The SGH Center of Excellence aims to advance pathology practice by implementing a fully digital histopathology workflow and deploying artificial intelligence (AI) to pursue increased productivity and enhanced patient care.

Furthermore, Philips and Changi General Hospital initiated a pilot project for a telehealth program enabling heart failure patients to monitor and manage their heart condition at home. The results from this pilot study were spectacular as it showed length of stay for heart failure-related readmissions shortened by 67 percent and the to-

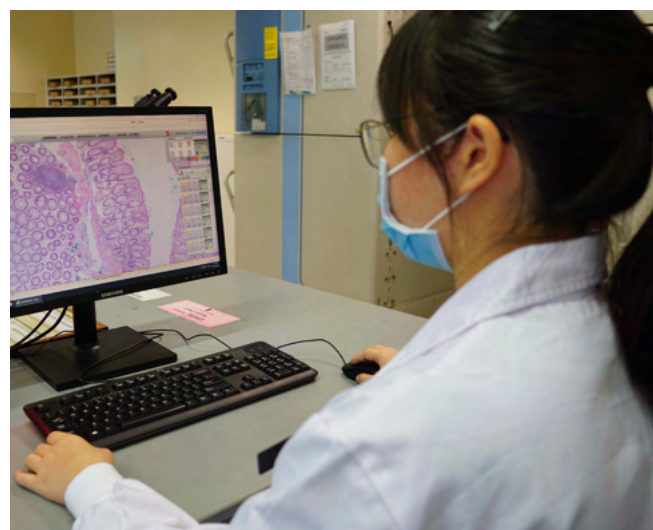


tal cost of heart failure-related care for each patient dropped by 42 percent.

Philips will continue partnering with local hospitals and engage with them in long-term strategic partnerships to innovate value-added, integrated solutions that deliver better outcomes and higher productivity. This combination of compelling solutions and consultative partnerships lifts growth rates and recurring revenues to exceptional levels.

Not only major hospitals looking to increase effectiveness along the health continuum see Philips as their technology partners of choice but also health insurers who want to give their consumers access to the right information to empower them to make the right health decisions.

The world is facing many longer-term challenges. At Philips Innovation Centers in Eindhoven, (Netherlands), Cambridge, MA (USA), Bangalore (India) and Shanghai (China) they take those challenges as opportunities. It is where Philips and its academic and industrial partners are enabling Open Innovation to apply their innovative competencies so as to create value for their stakeholders and to eventually improve people's lives.



PHILIPS

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SIEMENS HEALTHINEERS

We pioneer breakthroughs in healthcare.
For everyone. Everywhere.

Siemens Healthineers is a German based company with a long history of advancing medical technology through ground-breaking developments.

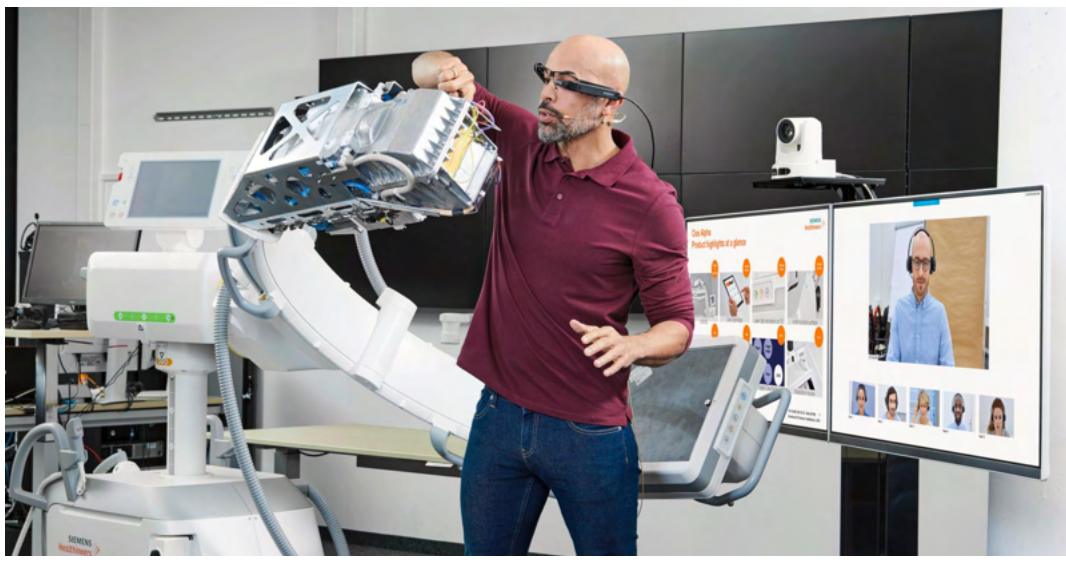
As a leading medical technology company headquartered in Erlangen, Germany, Siemens Healthineers and its regional companies is continuously developing its product and service portfolio, with AI-supported applications and digital offerings that play an increasingly important role in the next generation of medical technology. These new applications will enhance the company's foundation in in-vitro diagnostics, image-guided therapy, in-vivo diagnostics, and innovative cancer care. Siemens Healthineers also provides a range of services and solutions to enhance healthcare providers' ability to provide high-quality, efficient care. In fiscal 2021, which ended on September 30, 2021, Siemens Healthineers, which has approximately 66,000 employees worldwide, generated revenue of €18.0 billion and adjusted EBIT of €3.1 billion.

A GLOBAL PLAYER WITH GERMAN TECHNOLOGY

Every hour, more than 240,000 patients are touched by technologies provided by Siemens Healthineers. The organisation is at the center of clinical decision-making: almost three-quarters of all critical clinical decisions are influenced by solutions provided by Siemens Healthineers.

Built on a 120-year history of innovation, Siemens Healthineers is a global player with a strong heritage in German engineering. Just one year after X-rays were discovered by Wilhelm Conrad Roentgen in 1895, Siemens created the world's first medical X-ray device. The organisation's archives still hold a letter from Roentgen dating back to 1896 praising the quality of tubes provided by Siemens.

Today, Siemens Healthineers' engineers and researchers worldwide continue to build upon this legacy of innovation. Backed by an annual research and



development investment of 1.3 billion Euro and more than 18,500 patents, patent applications, and utility models, the organisation constantly brings ground-breaking innovations to market – for the benefit of patients, medical professionals and society.

Siemens Healthineers has continued its long history of advancing medical technology with the recent launch of the world's first CT scanner with photon-counting technology.

PRIORITIZING QUALITY OF CARE AND PATIENT EXPERIENCE

It is the goal of Siemens Healthineers to improve patient experience across the continuum of care. This starts with engaging people before they become patients and it continues with the diagnostic and therapeutic experience in a care setting. Ultimately what matters to patients are treatment outcomes that lead to higher quality of life.

To this extent the company is dedicated to cooperating with its customers to assess and address their needs, to provide innovative yet practical and necessary healthcare solutions.

Simultaneously, the company has a strong commitment to partner with healthcare providers in enabling them to deliver high-quality and affordable patient care and therefore Siemens

Healthineers seeks to expand the scope of precision medicine, robotics, augmented reality and artificial intelligence within the healthcare sector.

DRIVING THE DIGITAL TRANSFORMATION IN HEALTHCARE

Big data, Artificial Intelligence and Cybersecurity are the three biggest changes that will drive the digital transformation of the healthcare industry in Singapore.

Healthcare providers start to recognise that big data needs to be managed as a strategic asset. This requires new hardware, software as well as a cultural shift in the way data is integrated from various sources ranging from wearables to medical devices. Siemens Healthineers has already begun to reposition its digital offerings to help customers harness the power of this data and turn it into actionable insights that can help deliver value to their patients in Singapore.

In fact, Siemens Healthineers is already shaping the digitalization of the healthcare system by supporting healthcare facilities with digital innovations. For example, to connect care teams and patients to drive patient engagement and improve the treatment process – ultimately facilitating more cooperative care.

Artificial Intelligence is and will continue to be a significant driving force of change in the healthcare industry. With the help of analytical tools powered by AI-technologies, digital data can lead to better decision-making along every step of the patient journey.

Siemens Healthineers has always been at the forefront of developing AI-based solutions for its customers. It now has more than 65 AI-based products and applications in the global market that further increase its customers' productivity, as well as enable more precise and tailored clinical decisions.

Recently, the company introduced a new AI-powered application for radiologists in Singapore that helps take away the burden of their repetitive tasks and enables them to improve diagnostic precision when interpreting medical images.

CYBERSECURITY AT A CENTER STAGE POSITION

As medical devices are just like other computer systems, they face the growth of increasingly sophisticated cybercriminal tactics leaving healthcare organizations highly vulnerable to attacks. This vulnerability grows as networking and interoperability increases —especially when those devices are connected to a hospital network. That is why cybersecurity will take more and more a center stage position in the healthcare industry, as it is closely linked to the safety of patients and the confidentiality of their data.

SINGAPORE BECOMING A DIGITAL HEALTH HUB

One of the biggest factors that accelerated adoption of digital technologies

was COVID-19 and there is expectation of higher investments in digital technologies than pre-pandemic levels. Digital technologies will be used for patient-engagement, care coordination and enabling a remote workforce or telemedicine.

With plans for a hospital digitalisation roadmap, including cybersecurity management, a shift to cloud, and plans to secure digital talent through strategic partners, Singapore is well on its way to being a digital health hub leader.

But given the daunting scope and complexity of healthcare digitalisation, a coordinated effort between hospitals, the government, and solutions providers is crucial to make headway. With its Smart Nation initiatives, Singapore's government is offering precious support, while partnerships with vendors of new and relevant digital solutions can help hospitals successfully bypass the hurdles to digitalisation, and evolve well with the times.

In view of this digital transformation, Siemens Healthineers has set-up a IT & Digital Solutions team in Singapore to work closely with its customers to develop customised solutions to address their local IT requirements. In addition, the IT & Digital Solutions team will work with customers to deploy and operate its traditional healthcare IT solutions to comply with local regulatory requirements in Singapore.

AI AS AN INDISPENSABLE TOOL IN ALL FIELDS OF HEALTHCARE

Siemens Healthineers is a leader in deployment of artificial intelligence (AI) in imaging and diagnostics. It holds more than 650 patent families related

to artificial intelligence (AI). The company's portfolio owns more than 65 AI enriched offerings for products and solutions. Siemens Healthineers and Siemens are the global leader in Artificial Intelligence in life and medical science.

Through partnerships and an installed base of more than 600,000 devices worldwide, Siemens Healthineers is able to draw upon a massive pool of data that can be put into action. Aligned with AI, for example, this data offers vast opportunities to provide patients with better, more individualized treatments.

GREAT MINDS DRIVE THE ERA OF INNOVATION

Siemens Healthineers has a long history of innovative strengths and celebrates innovative minds, thought



leaders and R&D teams all around the globe. Many of them are awarded inventors, who until today make this company the world's market leader in most businesses and countries where it is active. Its R&D activities have so far resulted in more than 18,000 patents granted globally.

The sharing of knowledge and resources facilitates continuous innovation impulses and shorter innovation cycles. Today, Siemens Healthineers is a strategic partner of 90 % of the world's top 100 healthcare providers.

In Singapore, Siemens Healthineers has been able to tap into the strong intellectual power base through collaborative research agreements with top-notch academia and research centers; with a common mission to shape the future of healthcare in the region.



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Healthineers

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NOVARTIS

Reimagining Medicine

Novartis International AG is a global healthcare company based in Switzerland with a purpose to reimagine medicine and extend people's lives. The company seeks to deliver transformative treatments by pushing the boundaries of medical paradigms and exploring possibilities to cure disease, intervening earlier in chronic illnesses, and finding ways to exponentially enhance quality of life. The company has embraced the use of digital technologies, advanced analytics and artificial intelligence to continually drive innovation and improve efficiency.

Novartis began its Singapore operations in 1986. The company currently employs around 1,000 associates working across divisions covering innovative generic and biosimilar medicines, the operation of two manufacturing plants, and its Asia-Pacific regional headquarters. Novartis Singapore is one of the leaders in clinical trials with patients at the center of the science, making it a priority to explore areas of unmet medical need to bring new hope to patients.

COMMITMENT TO PATIENTS AND CAREGIVERS

The company has significantly invested in research and development which underpins its commitment to using science-based innovation to address some of society's most challenging healthcare issues.

But what is even more important for Novartis is the collaboration with pa-

tient communities around the world to discover new ways to improve and extend people's lives. It has been a strategy of the pharma company to work together to refine outcomes for patients and thereby changing the practice of medicine.

Novartis actively seeks out and listens to insights from the patient community throughout the development and commercialization process for their medicines. In that way Novartis has a better understanding of the patient community perspective, deliver a better healthcare experience and faster access to transformational treatments, for the mutual benefit of patients, healthcare systems and Novartis.

Research and development (R&D) at Novartis is the heartbeat of the company. Its R&D efforts span two units: the Novartis Institutes for BioMedical Research (NIBR) and Global Drug Development (GDD). NIBR leads drug

discovery and development from concept to early clinical evaluation. GDD leads clinical development to ensure pivotal registrational programs for regulatory approval and access to patients. Novartis engages patient communities to understand their needs and remain committed to patients who take part in its clinical trials. Ranked third in the 2021 Access to Medicine Index R&D category, Novartis was recognized as the only company that commits to both post-trial access for all eligible clinical trial participants and considers post-trial affordability for countries in scope.

EXPANDING ACCESS TO NOVARTIS' MEDICINES

Beside working with the patient community, Novartis is also engaged with other stakeholders, such as governments, payers, healthcare professionals and peer companies, to help get patients the medicine they need. Therefore the organisation is implementing access strategies for all their new medicines based on three principles: addressing the needs of underserved populations through research and development; further improving affordability of their medicines; and supporting approaches to strengthen healthcare systems.

DIGITAL AMBITION

Novartis has embarked on an ambitious transformation to become the leading medicines company powered by data science and digital technologies.

With the use of AI the pharma industry can improve patients' lives and optimize the healthcare ecosystem. These technological developments come with both opportunities and challenges. Therefore Novartis is dedicated to deploying AI systems in a transparent manner and through responsible channels.

NOVARTIS BIOME: A CATALYST FOR IMPACTFUL DIGITAL COLLABORATION

The pharma industry is facing major healthcare challenges on the road to digitalisation which require the collaboration of multiple ecosystem agents.



Novartis is committed to using science-based innovation to address some of society's most challenging healthcare issues.

Novartis Biome Singapore is Novartis' first innovation hub for the Asia Pacific Middle East and Africa region.

For Novartis, partnering with the best players in the tech world combined with their deep scientific experience will help to scale digital solutions that can improve and extend patients' lives.

With the creation of Novartis Biome the company created a bridge which helped their partners to become an extension of their own teams so they can collaborate as easily and productively as possible. It benefits joint innovation and the co-development of digital solutions at scale.

Novartis Biome Singapore is Novartis' first innovation hub for the Asia Pacific Middle East and Africa region dedicated to driving and managing partnerships with digital health start-ups, innovators and thought leaders in healthcare transformation. Novartis Biome Singapore is the latest inclusion of the global Biome network, following launches in San Francisco (USA), London (UK), Paris (France), Hyderabad (India), Montreal (Canada), Shanghai (China) and Berlin (Germany).

Biome Singapore will connect Novartis teams to the external digital ecosystem, allowing them to identify, establish and build on strong collaborations that produce significantly innovative and scalable solutions for patients. Similarly, partners who join this global network have access to an array of assets and expertise from the wider Novartis portfolio, to bring transformative impact.



ACCELERATING DIGITAL TRANSFORMATION

On December 4, 2019, Amazon Web Services (AWS) announced a strategic collaboration with Novartis that will leverage AWS's broadest portfolio of cloud services to build an enterprise-wide data and analytics platform that will transform business operations. Starting within Novartis Technical Operations, this multiyear alliance aims to put real-time analytics in the hands of associates, empowering them to make better business decisions and increase efficiencies across manufacturing processes and supply chain.

Novartis is thus collaborating with AWS to build an enterprise-wide data and analytics platform to transform the way medicines are manufactured and delivered.

GLOBAL RECOGNITION IN HEALTHCARE

Novartis has been showcasing consistently excellent performance on all areas related to innovative healthcare as evidenced by the global recognition accorded to the company over the years. Notably, Novartis rose to #3 in the Fortune World's Most Admired Companies Pharmaceuticals Industry list in 2021, from #4 in 2020 and 2019. Novartis ranks #3 in Innovation and #2 In Global Competitiveness (the same as 2020) in the same survey conducted by Fortune.

Novartis has also maintained its position in the 2021 Access to Medicine Index, leading in its approach to product delivery, while performing strongly across all other areas of the Index.



Novartis Singapore manufacturing plant.



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PRUDENTIAL SINGAPORE

Reading the Pulse of Wellness through Healthcare Innovation



WORKING TOGETHER TO PROMOTE HEALTH AND WELLBEING

As a life insurer serving close to a million customers who make up a sizeable part of the country's population, Prudential has been channelling its efforts towards helping people live well for longer.

The insurer is working closely with stakeholders in the healthcare ecosystem, such as industry, government, and community partners to help people achieve better health outcomes and live well for longer.

With its industry partners, Prudential is collaborating on developing digital healthcare solutions, as it believes technology can play a critical role in empowering individuals to take charge of their health.

Prudential Assurance Company Singapore (Pte) Ltd ("Prudential") is one of the top life insurance companies in Singapore, serving the financial and protection needs of the country's citizens for the last 90 years. It delivers a suite of well-rounded product offerings in Protection, Savings and Investment through multiple distribution channels including a network of more than 5,000 financial consultants.

PRUDENTIAL PLAYING A BIGGER ROLE IN HEALTH AND WELLBEING

Over the past few years, the insurer has made a shift beyond their traditional role of protecting lives and is now helping people to proactively take charge of their health and wellbeing.

This strategy pivot comes against a backdrop of changing demographic and lifestyle trends in Singapore.

GROWING HEALTH BURDEN

Singaporeans are living longer than ever before. At 83.9 years, they enjoy one of the highest life expectancies in the world. However, Singapore's population has also begun ageing faster. The United Nations projects that Singapore's rate of ageing over the next two decades will be the fastest that any country has seen over such a period. By 2030, an expected 900,000, or one in four Singaporeans, will be over the age of 65.

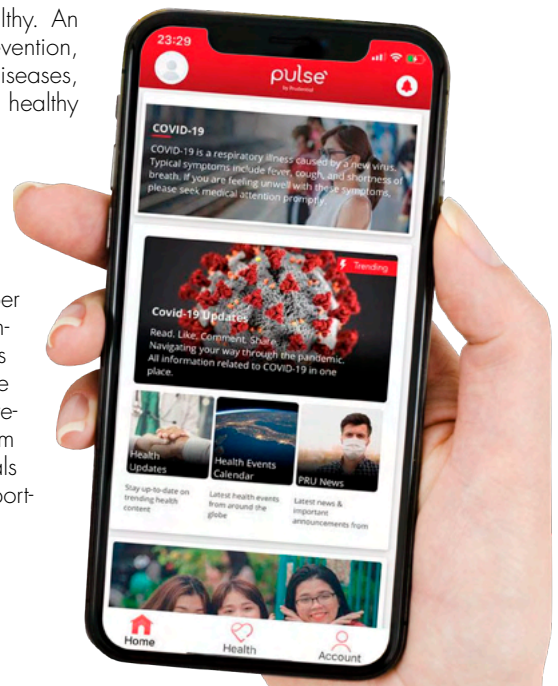
With this ageing population comes a host of challenges that compound existing trends the country is seeing, such as increasing rates of chronic diseases, co-morbidities, and growing healthcare costs.

To address these issues, the best strategy is for people to stay healthy. An approach that is centred on prevention, postponement of the onset of diseases, and protection, will be key to healthy ageing.

Findings from "Healthy for 100? Healthy care in Singapore", a study conducted by Prudential in 2019, corroborate this. Eight in 10 (84 per cent) of the healthcare practitioners surveyed said Singapore's healthcare system must place more emphasis on disease prevention. Nearly as many of them (70 per cent) said individuals need to be responsible for supporting their own healthy ageing.

HELPING PEOPLE STAY HEALTHY AND WEALTHY WITH PULSE BY PRUDENTIAL

A key example is Pulse by Prudential ("Pulse"), its artificial intelligence (AI)-powered digital health and wellness app. Pulse is part of Prudential's re-





gion-wide strategy to provide affordable and accessible healthcare to everyone across Asia and Africa, by leveraging digital technologies and best-in-class partnerships.

In Singapore, Prudential launched Pulse on 23 April 2020 during the Circuit Breaker period. Anyone above the age of 18 can download the app and users do not have to pay a subscription fee when they register themselves on it.

With Pulse, all Singapore residents have 24/7 access to healthcare services and real-time health information. Users can check their symptoms (Symptom Checker feature); conduct a digital health assessment (Healthcheck feature) to better understand future disease risks; and seek timely health advice (video consultation with a doctor), at any time and from anywhere. Pulse proved relevant during the current COVID-19 climate where social distancing is highly encouraged. Users can access healthcare services at the click of a button, from the comfort of their homes. Since its launch, several other health tools have been introduced on the app, such as features to locate the nearest clinic and connect one's wearables to track fitness goals, among others.

In addition to preventative healthcare tools, Prudential also wants people to be able to buy simple insurance plans conveniently from anywhere and at any time. Pulse offers bite-sized Dengue, Breast Cancer and Prostate Cancer plans, as well as complimentary coverage for side effects from COVID-19 vaccination.

Pulse has garnered more than 270,000 downloads in Singapore, as of July 2021. Across Asia and Africa, Pulse has been downloaded around 30 million times as of 11 August 2021 and is available in 17 markets.

WEALTH@PULSE

In July 2021, Prudential launched a suite of AI-powered wealth solutions on Pulse, called Wealth@Pulse. Now, the company has both health and wealth features on a single app. By making these solutions easily accessible to people, Prudential is helping them to focus on their two priorities in life – health and finances – so they can be healthier and more financially prepared for the future.

Wealth@Pulse was introduced to make it simpler for everyone to begin their financial planning journey, and provide them with easy-to-use and accessible solutions. Users can get wealth tips from Ruby, an AI-powered digital assistant, set and track financial goals and improve their financial

knowledge. Users who are Prudential customers can also view their policies with the company, via a single dashboard. And all users can connect to a Prudential financial consultant for in-depth financial advice. By giving users easy access to a human expert through this feature, Pulse marries AI and emotional intelligence to enable a more seamless and holistic customer experience.

STRONG ECOSYSTEM ENGAGEMENT

Through its partners in the government, Prudential is actively involved in state-convened advisory groups, trade associations, and chambers of commerce, on matters of policy-making and advancing thought leadership on healthy living.

In the community, Prudential's programmes are focused on helping beneficiaries who are seniors and young children, enjoy better health and wellness outcomes. For example, the organisation partners with KidSTART, an agency that supports children from low-income families, on a nutrition programme called "Healthy with KidSTART". Through this programme, Prudential provides families with young children fresh produce and healthy food items, as well as educational resources on healthy eating. This initiative helps children who are at an important stage of their development, build the foundation for a healthy lifestyle.



<https://www.singstat.gov.sg/find-data/search-by-theme/population/death-and-life-expectancy/latest-data>
<https://www.moh.gov.sg/ifeelyoungsg/about/what-is-the-action-plan-about>
 More information and link to the report at
<https://readyfor100.economist.com/wp-content/uploads/2019/07/ECO035-Ready-for-100-SG-Prudential-Healthcare-Whitepaper-Teal-11-Screen.pdf>



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UNILEVER

Promoting Healthy Lifestyle through a Sustainable Business Model

Unilever is one of the world's leading suppliers of Beauty and Personal Care, Home Care, and Foods and Refreshment products, with sales in over 190 countries and products used by 2.5 billion people every day. They have 149,000 employees and generated sales of 50.7 billion EURO in 2020.

Over half of Unilever's footprint is in developing and emerging markets. The corporation around 400 brands found in homes all over the world – including iconic global brands like Dove, Lifebuoy, Knorr, Magnum, OMO and Surf; and wellness brands including; OLLY, SmartyPants Vitamins, Equilibra, Liquid I.V. and Onnit.

DRIVING SUSTAINABLE AND RESPONSIBLE GROWTH

Unilever's vision is to be the global leader in sustainable business and to demonstrate how its purpose-led, future-fit business model drives superior performance. The company has a long tradition of being a progressive, responsible business. It goes back to the days of its founder William Lever, who launched the world's first purposeful brand, Sunlight Soap, more than 100 years ago, and it's at the heart of how Unilever runs their company today.

The Unilever Compass, its sustainable business strategy, is set out to help the company deliver superior performance and drive sustainable and responsible growth, while:

- improving the health of the planet;
- improving people's health, confidence and wellbeing; and
- contributing to a fairer and more socially inclusive world.

IMPROVING HEALTH AND WELLBEING THROUGH UNILEVER BRANDS

Unilever believes physical and mental health, wellbeing and inclusion are crucial contributors to a wider view of what good health is. Poor physical and mental health cause untold problems and deaths that are preventable for millions of people each year.

The company aims to take action through their brands to improve health and wellbeing and advance equity and inclusion, reaching 1 billion people per year by 2030. Unilever plans to focus on:

- gender equity
- race and ethnicity equity
- body confidence and self-esteem
- mental wellbeing
- hand hygiene
- sanitation
- oral health
- skin health and healing

OLLY: NATURAL GUMMY VITAMIN DEBUT IN SINGAPORE

Unilever has entered the vitamin, minerals and supplements (VMS) space with a clear vision: to create a world where health is a source of joy, not anxiety.

Positive nutrition is a key part of the company's purpose to make sustainable living commonplace and comes under the 'improving people's health and wellbeing' pillar of the Unilever Compass. This is very much Unilever's vision for VMS too. The company wants to see a world where health is a source of joy rather than anxiety, and their purpose is to make health a lifestyle pursuit. With their VMS portfolio (OLLY, Onnit, Liquid IV and SmartyPants Vitamins), Unilever will be able to support millions of people to achieve better health now and in the future.

Singaporeans have noted that taking vitamins and supplements daily can be a chore. It made Singapore a perfect market for the introduction of gummy vitamin supplements by OLLY, a US based company that was acquired by Unilever shortly before this launch. These kinds of products make health convenient and yet delicious while fulfilling one's daily vitamin needs effectively.

With marketing the OLLY products Unilever also seeks to address health concerns of millennials surrounding immuni-





ty, sleep, stress, healthy hair, skin and nails and daily energy. For instance, its sleep vitamins contain an amino acid, L-Theanine and botanicals like chamomile and lemon balm to encourage a calming feeling and support a healthy sleep cycle.

LIFEBUOY SOAP: UNILEVER'S GLOBAL TEAM LED COVID EFFORTS OUT OF SINGAPORE

The World Health Organization (WHO) has declared that handwashing with soap and water is one of the most effective and accessible ways to help reduce the spread of COVID-19.

As one of the world's largest manufacturers of soap, sanitisers and handwash with nearly 20 per cent of global market share, Unilever realises the importance of helping communities to improve hand hygiene through its soap brand Lifebuoy.

With awareness and the practice of handwashing so low among many societies worldwide, Lifebuoy has been helping to address this by running one of the world's largest behavioural change programmes on handwashing. Since 2010, Unilever has reached one billion people in more than 30 countries to improve people's health and hygiene.

In 2020, Lifebuoy increased its production and donated over 20 million products to various organisations and initiatives worldwide, including soap, hand sanitisers and antibacterial wipes. In Singapore, Unilever donated tens of thousands of hygiene products to help protect people in the front line.

THE SOCIAL KITCHEN: HEALTHY AND SUSTAINABLE EATING

The Social Kitchen at Jurong Bird Park serves up plant-based meat products and it has been doing so since December 2020.

The cafe at the tourist attraction is the second outlet of The Social Kitchen, and the first full collaboration with The Vegetarian Butcher - which was brought into Singapore by global food service provider Unilever Food Solutions.

Supported by Unilever and with the supply of plant-based protein products from The Vegetarian Butcher, The Social Kitchen wants to encourage consumers to eat less meat and adopt a more plant-based lifestyle for the good of the environment.

Unilever first brought its plant-based protein brand The Vegetarian Butcher to Singapore in December 2020 with the vision of bringing sustainable and nutritious food to consumers, while also enabling them to showcase the versatility of The Vegetarian Butcher's portfolio. The Social Kitchen's mission of providing employment for people with special needs, and supporting disadvantaged communities resonates strongly with Unilever's purpose of making sustainable living commonplace, thus the two became strong partners in this project.

GLOBAL RECOGNITION IN SUSTAINABILITY

While there is still more to do, Unilever is proud to have been recognised in 2020 as a sector leader in the Dow Jones Sustainability Index and, for the tenth-consecutive year, as the top ranked company in the 2020 GlobeScan/SustainAbility Sustainability Leaders survey.

In 2021, the company retained their leadership of the Globescan Sustainability Leaders survey. This global survey tracks expert opinion on the evolution of the sustainability agenda, and which companies are perceived as leaders. 2021 marked their eleventh consecutive year of leadership.



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SCOR

Emphasising the Value of Protection in Health & Wellness

Founded in France in 1970, SCOR SE is one of the major reinsurers in the world and has a presence in 160 countries globally with around 3,150 employees serving 4,400 clients. The organisation generated €16.4 billion of gross written premiums in 2020. SCOR offers diversified, innovative solutions and services to help their clients control and manage risk, balancing a global presence with industry-recognized expertise and cutting-edge financial solutions. SCOR's four cornerstones – controlled risk appetite, robust capital shield, high diversification and strong franchise – are proven creators of long-term value.



SCOR's raison d'être – combining the art and science of risk to protect societies – exemplifies the organisation's commitment to the welfare, resilience and sustainable development of society. SCOR achieves this by bridging the protection gap, (the difference between actual insured losses vs total economic losses), increasing insurance reach, helping to protect insureds against the risks they face, pushing back the frontiers of insurability and acting as a responsible investor.

Through its SCOR Global Life business unit, SCOR is dedicated to safeguarding human, social and relationship capital.

LOCAL OPERATIONS AND GLOBAL RECOGNITION

SCOR began its operations locally since 1977 and in 2008 it established

Singapore Hub, which continues to serve as the regional headquarters for APAC including Australia and India. The Singapore Hub provides back-office support including technical accounting, financial accounting, claims processing, consolidation reporting packages, human resources and IT system management to the nine offices located in different countries in APAC.

On a worldwide scale, SCOR has received recognition for its knowledge in critical illness, long-term care and longevity risks. The organisation received the "Outstanding Reinsurance Scheme Award - Life Insurance" during the Insurance Awards 2019.

BRIDGING THE PROTECTION GAP ACROSS SEA REGION

There is a large protection gap across the South East Asia region which com-

prises developed countries like Singapore as well as developing and emerging countries, such as Malaysia, Thailand, Indonesia, Vietnam, etc.

The healthcare system in Singapore is relatively high quality and affordable due to the national health programmes in place. However, due to a rapidly ageing population, there is much concern yet for long term care, dementia care and active ageing in Singapore – areas where SCOR is active by reaching out an expert hand to its policyholders.

In most other countries of the Southeast Asia region the healthcare infrastructure requires improvement in terms of quality and affordability. Government expenditure on healthcare in these countries remains low while out-of-pocket expenditure for residents remains high. Consequently, residents cannot afford to fall ill. However, due to poor health education and food quality, chronic conditions such as obesity, diabetes, hypertension remain high in these countries.

As a reinsurer, SCOR's role is to try to close the protection gap for people by providing insurance coverage that addresses their needs and is also affordable to them.

EMPOWERMENT THROUGH INNOVATION

As an innovative reinsurer, SCOR is at the forefront of utilizing big data and technology to help its policyholders live healthier lives. An example of SCOR's proprietary solution is its Biological Age Model (BAM), which leverages wearable health data such as step counts, heart rate, V2OMax, sleep hours, etc to calculate a health score for the policyholders. The health score allows policyholders to understand their health status through a continuous process and encourages them to lead healthier lives. The BAM solution has recently won the Gold Award of 2021 SFF Global Fintech Award (sponsored by MAS). Given its success, the model is currently in



COHESIVE COLLABORATION TO DRIVE CHANGE

The company is in the midst of innovating its solution offerings by partnering with other healthcare providers and insurtech/welltech players in the ecosystem, for example, diabetes care providers, mental health providers, telemedicine providers, etc.

As a reinsurer, SCOR is one of the many actors in the healthcare ecosystem. It is in constant engagement with the other players, such as TPAs, diabetes care providers, mental health counsellors, telemedicine providers. The organisation believes in utilising their offerings to embed them into its insurance products to help its policyholders live healthier lives.

As a notable player in the industry, SCOR is collaborating with the government and other industry bodies to better understand and address the challenges within the healthcare system. Typically, governments will solicit insurance associations for feedback before any new legislation is passed. Most recently in Singapore, SCOR participated in the workgroup for the MORATORIUM ON GENETIC TESTING application in the insurance industry.

the pipeline to be launched in Vietnam and Indonesia as well.

Mental wellbeing has also become one of SCOR's key areas of focus for the coming years.

Within its SGL Business Unit, "life is precious, we value life" has become SCOR's core purpose. The goal is to not only transform its business strategies and relationships with its clients, but also positively impact the lives of its many employees globally. SCOR's employees are proud to be a part of an organization committed to making a meaningful difference in the lives of millions through Life & Health insurance.

HIGHLIGHTING THE IMPORTANCE OF EMPLOYEE WELFARE

SCOR has always been a strong proponent of healthy living – both as a reinsurer and as an employer.

In this regard, the organisation is offering benefits to its employees on medical care as well as through an assistance programme. On top of that, SCOR organizes numerous wellbeing programmes for its employees to participate in such as yoga, meditation classes and has established a mental wellness line to assist stressed employees.

As part of its sustainable self-care program, SCOR is actively engaging its employees in health and wellness activities. In the last 2 years, SCOR has provided subsidized gym memberships to its employees and organised

step-count challenges amongst teams, which proved to be significantly engaging and successful. During the active pandemic period and lockdown that required work to be conducted from home, SCOR initiated virtual yoga classes, meditation classes, and bootcamps with high participation rates. The company also encouraged its employees to take time off and implemented 'Friday no-meetings' day.

Recognising that employees face greater isolation now than ever before, SCOR believes in creating a path towards prevention and protection, and boosting awareness around such issues. To achieve this, SCOR has deeply invested in its internal communication, thereby providing employees with the necessary information, articles, access to webinars, etc.



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EVONIK

Chemistry the driving force behind Healthy & Sustainable Food



Active in more than 100 countries around the world, Evonik is one of the world leaders in specialty chemicals. Leading beyond chemistry to create innovative, profitable and sustainable solutions for their customers, Evonik is grouped in five divisions — Nutrition & Care, Performance Materials, Specialty Additives, Smart Materials and Technology & Infrastructure.

Constantly developing and expanding its capabilities to meet its customers' expectations, Evonik helps to make modern lives more comfortable, healthier, and more sustainable every day.

First established in Singapore in 1969, Evonik Singapore has currently grown to employ more than 800 personnel here. Local activities had started out as sales, and has since diversified to include production and research. Today, it is the regional headquarters and innovation hub. Producing and supplying regionally, Evonik Singapore is constantly expanding their presence to strengthen the competitiveness of their customers through research and applications.

DEEP DIVE INTO EVONIK'S NUTRITION & CARE DIVISION

Evonik's Nutrition & Care division revolves around human wellbeing – health and quality of life. Most products are used directly on humans or animals.

One of Evonik's three growth divisions, its business lines are health care, care solutions, and animal nutrition. They are focused on long-term megatrends such as progress in medicine, the aging population, the expanding middle class and, above all, sustainability.

Sustainability is a guiding business principle for Nutrition & Care, specifically fighting climate change, driving circularity, ensuring health and wellbeing, and safeguarding ecosystems.

Evonik also aims to address structural market trends within planetary boundaries, offering effective and accessible health-care, and through climate- and nature-positive food systems.

INNOVATION GROWTH FIELDS & EVONIK'S ASIA RESEARCH HUB IN SINGAPORE

Evonik's research and development activities are aligned with six innovation

growth fields, three of which are related to healthcare and wellbeing – sustainable nutrition, healthcare solutions, and advanced food ingredients.

Another example of Evonik's drive for innovation is their investment in the Tissue Engineering team. Housed in the Evonik Asia Research Hub Singapore, its research on cell and tissue engineering has facilitated and progressed the development of products that address unmet needs in regenerative medicine. This includes animal-free biomaterials and cell culture ingredients, as well as biomimetic in vitro models that can be applied for testing and as grafts.

VALUING SYNERGY TO ENCOURAGE INNOVATION AND SUSTAINABILITY

The organisation's portfolio most efficiently utilizes ingredients, technological platforms and asset sharing to create innovative and sustainable solutions quickly.

With their Nutrition & Care division, Evonik holds most market-leading positions due to its ability to understand complex systems. Evonik's thinking goes beyond chemistry, working instead on interfaces between chemistry, biotechnology, medicine, nutrition, physiology and engineering, enabling the organisation to develop holistic solutions, which the world urgently needs in this new, disrupted healthcare system.

Evonik has also developed Next Generation solutions to address sustainability



focus areas that are directly linked to United Nations Sustainable Development Goals.

Fight Climate Change – Evonik's Precision Livestock Farming offers higher efficiency in feed material use, lower emission of nitrogen to air and water, and lower antibiotic interventions and better animal health and wellbeing.

Drive Circularity – As an alternative DHA and EPA source, Evonik's Veramaris Algal Oil reduces overfishing, produces zero waste and uses 100% renewable energy in its manufacturing process.

Safeguard Ecosystems – Evonik's Biosurfactants Rhamnolipids from a complex fermentation process enable cleaning with performance and reduced skin irritation. Based on deforestation-free raw materials, it uses 100% renewable energy for production.

Ensure Health and Wellbeing – As a global development partner and solutions provider for delivery systems for effective drugs and vaccinations, Evonik is a pioneer in the Lipid Nano Particle (LNP) field for mRNA technology.

SCIENCE AT THE CORE OF HEALTHY FOOD PRODUCTION

POTASSIUM DERIVATIVES

Potassium is a vital mineral that controls important cell functions. The right dose of potassium helps maintain normal blood pressure and so reduces the risk of heart disease. Most people get half their recommended intake a day while consuming 2-3 times their recommended daily sodium intake. Evonik's potassium derivatives resolve this imbalance, by helping them achieve their potassium intake while reducing sodium intake. As a leavening agent, Potassium Bicarbonate is a healthy alternative to sodium content, to help customers to achieve an improved diet and lifestyle.

SUSTAINABLE FOOD SOLUTIONS

ANIMAL FEED

Housed on Jurong Island, Singapore, Evonik's world-scale production complexes for essential amino acid DL-me-



thionine supply about 300,000 metric tons of MetAMINO® to poultry, swine and aquaculture businesses worldwide. Worth a combined investment of about 1 billion euros, these two complexes make up the largest methionine complex in the world within the Evonik network.

The growing consumer affluence in Asia supports the increasing demand for animal protein and producers are focused on more sustainable production of meat, eggs, milk, and fish. Evonik's MetAMINO® plays a key role to support these trends by providing innovative and sustainable solutions in feed additives, and digital software concepts for efficient farm management; making substantial contributions to a holistic approach to healthy animal nutrition and sustainable animal husbandry, while creating added value for its customers.

Audited and certified by TÜV Rheinland, the comparative life cycle assessment has further demonstrated the ecological advantages of Evonik's feed amino acids and feeding concepts compared with common animal nutrition practices.

STRONG PARTNERSHIPS TO PAVE THE WAY FORWARD

Serving more than 1,000 life science customers worldwide, Evonik Health Care works with 90% of the world's top 50 pharmaceutical companies by enabling development through the provision of cell culture, complex par-

enters, and active pharmaceutical ingredient and intermediaries. Being a worldwide, cross-functional network, it allows for agile, efficient performance ensuring that its stakeholders receive the support they need.

In the first half of 2021, Evonik helped to accelerate the production of Covid-19 vaccines by delivering first batches of the urgently needed lipids for the mRNA-based vaccine to BioNTech months earlier than planned. A few months later, Evonik signed a research collaboration with Stanford University on a technology to deliver mRNA to tissues and organs that goes beyond the capabilities of LNPs. This polymer-based platform complements Evonik's existing portfolio of lipid-based drug delivery, including LNPs.

Evonik has been the recipient of notable accolades over the past years for their excellent work including being the 2020 recipient of the Governor's Bioscience Award (recognition for making significant contributions to the Nebraska bioscience industry); the 2020 recipient of EuroCham Singapore Sustainability Award (Circular Economy) (recognition for exceptional sustainability efforts in Singapore and the region). In 2021, Evonik was voted as "Top CMO Performer" for Capabilities, Compatibility, Expertise, Quality, Reliability and Service by pharmaceutical companies in Life Science Leader CMO Leadership Awards.



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FRIESLANDCAMPINA

Nourishing by Nature, Sustainability for the Future



Royal FrieslandCampina N.V. is a Dutch multinational dairy cooperative with its roots going back to 1879. Each and every day FrieslandCampina provides hundreds of millions of people throughout the world with dairy products and valuable nutrients from milk. FrieslandCampina processes and sells the raw milk of dairy farms, whose owners are members of Zuivelcoöperatie FrieslandCampina U.A. Together with its member dairy farmers, FrieslandCampina manages the complete production chain: from grass to glass.

The organisation supplies consumer products, such as milk, yogurt, cheese, infant nutrition and desserts, products for the professional market, such as cream and butter products, ingredients and semi-finished products for producers of infant nutrition, the food industry and the pharmaceutical sector.

FrieslandCampina Singapore began their operations in the country in 1954 and has since then built the Development Centre Singapore. This centre, opened in 2013, focuses on the development of dairy-based beverages and infant and toddler nutrition, tailored specifically for Asian consumers.

HOLISTIC BETTERMENT OF GLOBAL NUTRITION

FrieslandCampina has a long history and exists in a cooperative tradition. A cooperative cannot thrive with a focus on the short term. That is why the organisation is future focused. FrieslandCampina is guided by the purpose: nourishing by nature.

With this purpose the organisation strives for:

- Better nutrition for the world
- A good living for their farmers
- Now and for generations to come

Under 'Better Nutrition for the World', FrieslandCampina contributes to food safety and food security for millions of people all over the world by providing them with access to dairy.

FrieslandCampina is continuously improving the nutritional value of its products. To guide this, it applies the FrieslandCampina Global Nutritional Standards (GNS). The objective is to increase the percentage of products that complies with FrieslandCampina Global Nutritional Standards 2.0 (at least 74% of sold volume in 2025).

The GNS are nutritional criteria aimed at retaining the natural nutrients in milk and reducing the amounts of calories, fat, sugar and salt in all FrieslandCampina products. Additionally the or-

ganisation ensures that its product portfolio has a good balance between the number of nourishing products intended for daily use and indulgence products for occasional use.

An important part of the FrieslandCampina purpose 'nourishing by nature' is providing better nutrition for the world population. This purpose is captured in the FrieslandCampina Nutrition Policy. This policy is based on the WHO Global Action Plan and is in line with the Sustainable Development Goals of the United Nations – to reduce hunger in the world and to promote good health and well-being. The Nutrition Policy includes four programs: Better Products, Responsible Communications, Lifestyle Education and Broadening access to nutrition.

ADDRESSING NUTRITIONAL GAPS IN THE ASEAN REGION

There are a lot of knowledge gaps in the ASEAN region about the nutritional status of the most vulnerable children. National efforts have not been always sufficient to determine macro and micro nutrient deficiencies that impact the development of stunting. The lack of information does not allow the execution of nutrient specific programs or fortification guidelines for overcoming the malnutrition in the region.

FrieslandCampina has been partnering with local universities in Malaysia, Indonesia, Vietnam and Thailand for running

regional trials to understand the macro and micro nutrient deficiencies.

In 2009, FrieslandCampina sponsored the first SEANUTS study (South-East Asian Nutritional Study) that collected nutritional information for more than 16,000 children in the region. Findings from SEANUTS study helped to define public health policies and roll out some national programs in the countries involved.

In 2018, FrieslandCampina initiated the second SEANUTS study (SEANUTS II) among children in Thailand, Malaysia, Indonesia and Vietnam in order to combat malnutrition. In this large-scale survey, the targeted 13,000 children, ranging in age from six months to twelve years, have since been surveyed with regard to nutrition, health and lifestyle. The results are expected to be available in the first quarter of 2022.

FrieslandCampina wants to help combat undernutrition by broadening availability and affordability of healthy and/or fortified foods, especially for consumers who have reduced access to healthy and affordable foods, like lower income groups. The company's 'Broadening access to nutrition' programme is aimed to actively reach these people especially in the lower income markets, with affordable products that have an optimal nutritional value. In Indonesia, Vietnam, Philippines, Pakistan, Ivory Coast and Ni-

geria projects are done to develop affordable products for lower income groups that have an optimal nutritional value.

SUSTAINABILITY AT EVERY STEP

The vast majority of FrieslandCampina's raw materials comes directly from farmers within its own chain, who themselves are part of the 'Nourishing a better planet' programme. But manufacturing sustainable proteins and ingredients also requires resources from outside its chain, such as vegetable and fish oils.

Not only has FrieslandCampina achieved its goal to source 100% of the agricultural raw materials sustainably, but the organisation is currently at 91% of its 92% target to ensure those sources are traceable by 2025. This will secure better livelihoods for farmers and animals, and directly benefit nature and the climate too.

FrieslandCampina has made great progress over the first years of its sustainable sourcing strategy. In 2014, just 23% of certain agricultural raw materials were sustainably sourced; last year, that figure reached 100%.

To that end, FrieslandCampina has also signed an agreement with ING Bank N.V. for a new 300 million euro loan linked to sustainability and once again, been chosen as the most sustainable dairy brand in the Netherlands.

A PILLAR OF STRENGTH IN THE ASEAN NUTRITION SECTOR

FrieslandCampina is continuously in dialogue with a wide range of stakeholders with diverging interests. These discussions take place by employees at all levels within the organisation and often form part of their daily work. Examples include:



- Implementation and data analysis of SEANUTS survey to measure nutritional status and lifestyle habits of children in collaboration with University of Kebangsaan, Malaysia; University of Mahidol, Thailand; University of Indonesia; National Institute of Nutrition of Vietnam.
- Proposal to include milk products in Healthy Breakfast & Milk in School Programmes in collaboration with Ministry of Health (MOH) of Malaysia; Ministry of Education (MOE) of Malaysia.
- Addressing the problems of malnutrition in school children through education and nutrition in collaboration with the Department of Education (DepEd) of the Philippines.
- Nutrition Labelling in collaboration with Health Promotion Board of Singapore.
- Nutrition and physical improvement for primary school students in collaboration with the Ministry of Education and Formation of Vietnam (MOEF).



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SIEMENS

Pioneering Healthy & Sustainable Food Technologies

Siemens AG (Berlin and Munich) is a global technology powerhouse that has stood for engineering excellence, innovation, quality, reliability and internationality for more than 170 years. The company is active around the globe, focusing on the areas of electrification, automation and digitalization. One of the largest producers of energy-efficient, resource-saving technologies, Siemens is a leading supplier of efficient power generation and power transmission solutions and a pioneer in infrastructure solutions as well as automation, drive and software solutions for industry.

In 2020 the Siemens Group generated revenue of €55.3 billion and net income of €4.2 billion. As of September 30, 2020, the company had around 293,000 employees worldwide.

PIONEERING AQUACULTURE TECHNOLOGY IN SINGAPORE

PARTNERING WITH SINGAPORE AQUACULTURE TECHNOLOGIES

First Aquaculture 4.0 closed containment system for tropical fish was launched in Singapore in February 2020. The containment systems combine Siemens cutting edge technologies and Smart Recirculating Aquaculture System for sustainable tropical sea-farmed fish. The systems also optimizes operations with Artificial Intelligence and cloud-based open IoT operating system MindSphere ensures reliable fish production with increasing yield.

On 17 February 2020, Singapore Aquaculture Technologies (SAT), a pioneer in utilizing closed containment systems for tropical fish, launched its commercial Smart Floating Fish Farm at a cere-



mony officiated by the then Minister for the Environment and Water Resources Mr Masagos Zulkifli.

The 3000 square meter offshore farm, located off Pasir Ris Coast, is the first known Aquaculture 4.0 floating closed containment fish farm using Recirculating Aquaculture System (RAS). It creates a controlled environment through a multi-level water treatment process. In addition, the farm integrates a high degree of automation, self-regulated control cycles and artificial intelligence within a Farm Management Information System to achieve a productive and environmentally friendly operation.

SAT has been using closed containment systems since 2012. This means the water where fish are kept is separated from sea water, allowing the farm to have more control of environmental factors that may harm the fish, such as pathogens, algae blooms, oil spills and effects of climate change.

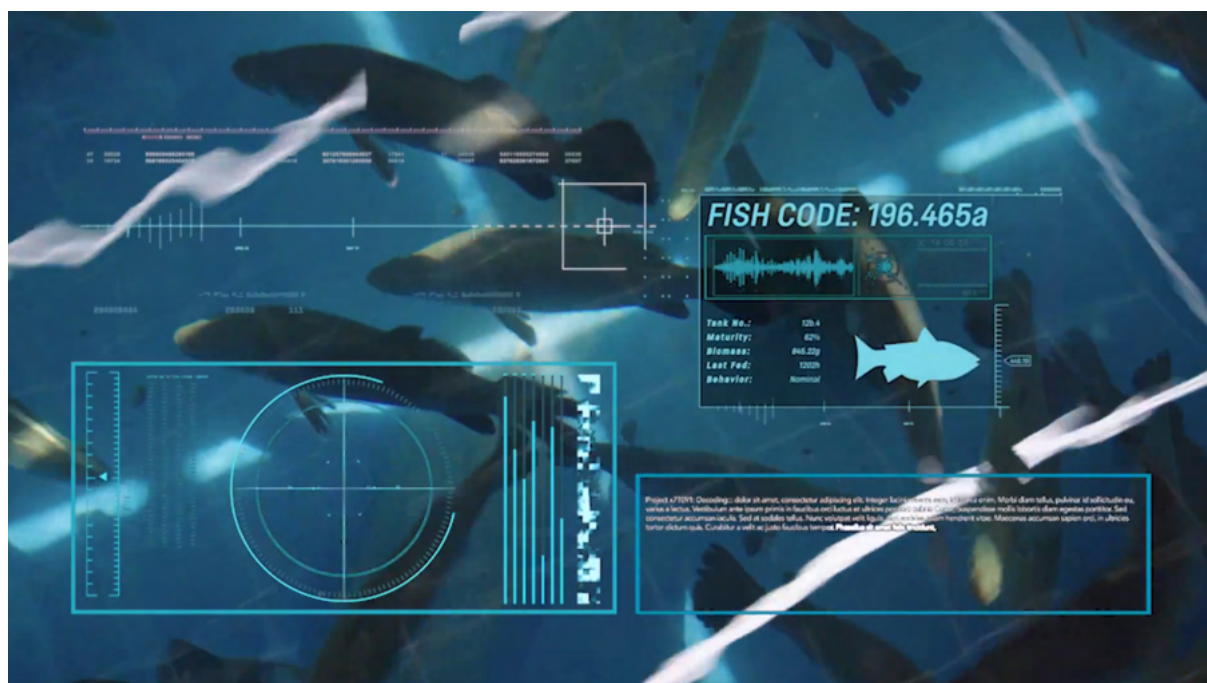
In addition to state-of-the-art water-treatment systems and on-site solar energy generation, SAT has now also integrat-

ed connectivity, artificial intelligence and a data management solution that provides the company with predictive analytics and helps them to monitor the quality and health of the fish. The end result yielded ensures a consistent supply of healthy fish, grown in a low-stress environment.

THE KEY ROLE OF SIEMENS' DIGITAL SOLUTION

Siemens, SAT's technology partner, implemented an end-to-end digital solution which included the IoT operating system MindSphere that provides a central repository and monitoring of critical sensor and process data across a secure network. As a result, the quality of the fish and potential savings for resources such as energy, oxygen and feed has already been improved with the knowledge derived from collected and visualized data.

By integrating cutting-edge technologies like artificial intelligence, edge computing and blockchain, Siemens is helping SAT to continuously optimize their operations. The use of innovative advanced



predictive analytics such as machine learning and video analytics helps to predict potential biomass growth and prevent the outbreak of diseases, hence reducing fish mortality. With this, SAT and Siemens are paving the way for scalable, highly flexible and above all environmentally efficient aquaculture across the entire value chain.

AQUACULTURE TECHNOLOGY A RESPONSE TO SINGAPORE'S 30-BY-30 VISION

An additional benefit of high-technology farming is food safety and traceability. As the fish is cultivated in a controlled environment free from contamination, there is minimal use of antibiotics and chemicals. As consumers increasingly demand to know the source of their food and whether it is sustainable, this enables them to better understand the journey of food from farm to table. At the launch of the Smart Floating Fish Farm, SAT and Siemens signed a Memorandum of Understanding (MoU) for enhanced collaboration in commercializing and scaling Aquaculture 4.0 technologies in Singapore and Southeast Asia.

The Smart Floating Fish Farm is a good example of a sustainable, scalable and innovative farming solution that can help increase yield and productivity, and boost Singapore's local fish supply. With Singapore's limited space and resources, there is a need for an even greater number of local farms to leverage technology to grow more with less, in a climate resilient and sustainable manner. This is crucial as Singapore works towards its "30-by-30" vision to produce 30 percent of the nation's nutritional needs by 2030."

Developed with support from Singapore Food Asia's Agriculture Productivity Fund, the Smart Floating Fish Farm, together with the existing floating steel-structure fish farm, can produce up to 350 metric tons of fish when it is operating at full capacity in 2021.

FINANCING SUSTAINABLE FOOD PRODUCTION IN SINGAPORE

On 6 August 2021, SAT announced the finalization of a Series A financing round totalling S\$9.2 million.

The main part of this equity investment comes from Siemens Financial Services (SFS) via Siemens Project Ventures GmbH - the financing arm of global technology company, Siemens AG. As SAT's first institutional shareholder, the investment from SFS accounts for a significant minority stake in the company.

Founders Dirk Eichelberger and Michael Voigtmann view Siemens' entry as a validation of their strategy to become the leading supplier of data - and artificial intelligence (AI)-driven aquaculture solutions, in addition to producing premium fish products under their BluCurrent label.

It also serves to further highlight Siemens' commitment to supporting sustainable food production and helping Singapore achieve its "30 by 30" goal of 30% local food production by 2030. Siemens recognizes that the commitment to sustainability needs to be reflected through both their technologies and their investments.

SIEMENS

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MEMBERSHIP TYPES AND BENEFITS

Membership fees for European companies on annual base (1 Jan -31 Dec)	GOLD	Regular LARGE (more than 20 employees worldwide)	Regular SMALL (less than 20 employees worldwide)
Usual annual membership fee	\$7,000	\$2,000	\$1,000
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AGM voting rights (not applicable for Associate membership)	✓	✓	✓

Terms and Conditions:

Applies to any European company that is a member of a bilateral National Business Group, which is a strategic member of EuroCham.

(***) Excludes Europe Day Summit, Schuman Lecture Gala Dinner and Awards Gala Dinner.

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Membership starts upon receiving the membership fee.

Payments are non-refundable.

Cancellation must be in writing, received by EuroCham before the 1st of November.

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