

## Temasek (Singapore)

### Tapping Investment Expertise and Diverse Networks to Help Fight the Virus

January 2021



# Extraordinary Endeavors in Turbulent Times: Asian Innovation, Inclusion, and Impact during COVID-19

A Joint Report by the Asia Business Council and the  
Hong Kong University of Science and Technology

## Other case studies in the series

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Recommitting to a Broad Stakeholder Eco-system during the Pandemic

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Accelerating Financial Inclusion in a Time of Social Distancing

## Letter from the Directors

Dear Reader,

As the directors of this joint project by the Asia Business Council and the Hong Kong University of Science and Technology (HKUST), we are delighted to present the results of our study on the extraordinary endeavors of Asian companies in the turbulent times of COVID-19, as companies embrace innovation, promote inclusion, and drive social and economic impact across the region.

We hope that this series of eight case studies will illustrate the silver linings of the pandemic – in these trying times companies are more than ever realizing the importance of social responsibility, reimagining and reinventing traditional forms of philanthropy, and leveraging technology as a force for good in ways that will likely last well beyond the crisis.

While the articles are written with business leaders and business students in mind, the stories we tell have relevance for a wider audience as they show how Asian corporates took the lead in engaging a broad eco-system, including governments, academic institutions, religious groups, and the public health sector, in addition to start-ups, small and medium enterprises, and even competitor companies within the private sector.

True to the times of COVID-19, the smooth collaboration between our two organizations took place without any face-to-face meetings; all the research and interviews were conducted virtually and across multiple time zones. We are especially grateful to Asia Business Council Chairman Lim Boon Heng and Vice-chairman Daniel Tsai whose companies Temasek and Fubon Group were the first two companies to take part in the study. We would also like to thank the unfailing support of Mark Clifford, Executive Director of the Asia Business Council, and Roger King, Senior Advisor and Founding Director of the Tanoto Center at HKUST, without whom we could not have completed the project.

Amidst the continued risk and uncertainty surrounding the pandemic, we hope that this report will contribute to the ongoing discussions on stakeholder capitalism and the debates on the role of companies in the local and international community, in times of crisis as well as times of relative normalcy. Above all, we hope that you will enjoy reading the articles as much as we enjoyed writing them, and that the report will be a source of positivity and inspiration for audiences around the world.



**Winnie Peng**

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Hong Kong University of Science and Technology*



**Pauline Yeung**

*Program Director at the Asia Business Council*

## Temasek (Singapore)

# Tapping Investment Expertise and Diverse Networks to Help Fight the Virus

By Winnie Peng, Pauline Yeung, and Theodore Chow

## Temasek

### Region

Singapore

### Year of Founding

1974

### Headquarters

Singapore

### Type of Company

Global investment firm owned by the Singapore Government but managed according to commercial principles

### Number of Employees

c.800

### Net Portfolio Value in 2020 (SGD)

306 billion

### Net Portfolio Value in 2020 (USD)

214 billion

### Major Business

Investments

### COVID-19 Initiatives in a Nutshell

Medical Initiatives to Prevent Virus Transmission and Enhance Treatment; Mental Health Support Programs to Help Build Community Resilience; Distribution of Free Hand Sanitizers and Reusable Masks to All Households in Singapore and Surrounding Regions (Batam, Indonesia, and Johor, Malaysia) to Aid in Prevention; Food Aid Programs for Vulnerable and Disadvantaged Groups; Donation of Personal Protective Equipment (PPE) to 35 Countries Worldwide; among others

The following case study is based on written correspondence with Temasek in August 2020, and interviews with Lim Boon Heng, Chairman of Temasek Holdings (Private) Ltd., on May 7, 2020, and with Fidah Alsagoff, Joint Head of the Enterprise Development Group and Head of Life Sciences at Temasek International, on October 27, 2020.

## Introduction

On June 29, 2020, BioNTech, a German biotech company that specializes in patient-specific immunotherapies, announced a private investment of \$250 million by Temasek and other accredited investors.<sup>1</sup> Since BioNTech was developing a vaccine for COVID-19 at the time, this was described as a “vaccine bet” on Temasek’s part.<sup>2</sup> Around four months later, on November 9, Pfizer and BioNTech announced that their vaccine candidate was found to be more than 90 percent effective against COVID-19 in participants without prior evidence of SARS-CoV-2 infection.<sup>3</sup> This was great news for investors, and it also offered a ray of hope to millions of people around the world.

Temasek’s investment in BioNTech is just one example of how the government-owned but private-sector-oriented company went full out as an investor and a steward to fight the coronavirus. In fact, its investment expertise and diverse networks allowed Temasek to play an active role in areas that were new to the company: ensuring supplies for diagnostic kits, supporting the development of local manufacturing capabilities for much-needed equipment, and supporting medical research on COVID-19. In the process, Temasek demonstrated its solidarity with its portfolio companies as well as its commitment to giving back to the local and international community.

As Lim Boon Heng, Chairman of Temasek, recalls, in mid-February, two of Temasek’s portfolio companies in Singapore saw sharp falls in sales and revenue and realized



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that there would be hard times ahead. The top management knew that belt-tightening would be necessary for their businesses to survive and for jobs to be protected. So the C-suite, with the support of their boards, decided on voluntary wage cuts for themselves so that they would have the moral authority to introduce tough measures when needed.

What followed was a strong sign of Temasek's solidarity with its portfolio companies. On February 21, Temasek's senior management decided on voluntary wage cuts of up to 15 percent of their annual salaries. The most senior executives took the deepest cuts, while the less senior took lesser cuts. The rank and file did not have their wages cut.

The total salary forfeited was matched dollar for dollar by the company, and the funds were set aside for public health resilience initiatives. Temasek board directors also donated to this fund, and a total of S\$20 million (\$15 million) was raised.

Soon, government ministers in Singapore also took pay cuts, as did the management of several other leading companies in the city-state. In Lim's words, "Over the years, we have developed this understanding that when the country faces a crisis, leaders will set the example of belt-tightening."

## Investment Expertise and Diverse Networks

Indeed, it was *together* with its portfolio companies and the broader community that Temasek faced the COVID-19 crisis. Temasek Holdings and its philanthropic arm Temasek Foundation engaged in a whole array of initiatives, ranging from the distribution of free hand sanitizers to all households in Singapore; to developing food aid programs for vulnerable and disadvantaged groups affected by the crisis; to providing test kits, surgical masks, and specialized oxygen-related treatment equipment to some 35 countries around the world.

But it is Temasek's medical initiatives that fully demonstrate its agility, resourcefulness, and innovation, and attest to its role as one of the most sophisticated government-owned investors in the world. As Fidah Alsagoff, a physician by training and the Head of Life Sciences, and Joint Head, Enterprise Development, at Temasek reflects, just as there was a global shortage of swabs, testing equipment, masks, and more, Temasek brought together academics, local enterprises, and regulators to "dig deep and find solutions" that would potentially prevent virus transmission and enhance diagnostics and treatment.

Notably, while Temasek is an investment giant with a S\$306 billion (\$214 billion) portfolio, the collaboration with small and medium enterprises (SMEs) was a recurring theme in its initiatives to alleviate the public health crisis. In cases of

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SMEs willing to commit to production of medical supplies or equipment, Temasek was able to place substantive orders, giving them the capital and confidence to quickly scale up their production resources into the millions.

## 3D Printing of Swabs for COVID-19 Diagnostic Kits

To begin with, detection is crucial to contain the virus, and Temasek found itself working closely with its global and local medical partners to procure reliable diagnostic kits, find new ways of testing, and build up local development and production capabilities for essential supplies.



3D Printing of Swabs

One of the first things Temasek learned was that the full diagnostic kit for COVID-19 consists of the swab sticks, transport media, as well as the tubes to hold the media, with all of these being essential components. Rather than the test kits themselves, there was initially a global shortage of the swabs that enable the tests to be performed. One of the major suppliers of the nasopharyngeal or NP swab was a company based in Lombardy, Italy (itself an epicenter of the virus outbreak), and countries including Singapore were unable to access supplies speedily when Italy was in lockdown.

When it became clear that swabs would run out, Temasek turned to one of its portfolio companies based in San Diego, which was engaged in 3D printing of swabs with the University of California San Diego (UCSD). 3D printed swabs were around two times the price of regular swabs, but Temasek decided that this was a better option than running out of swabs.

Temasek brought together clinicians in hospitals for user feedback and developed the prototypes in engineering research labs with 3D printing capabilities. As Alsagoff remarked, “This took several months as we had to go through clinical trials – no shortcuts.”

In the next stage, Temasek worked with local SME production partners Eye2Eye and Structo, and local hospitals and Institutions of Higher Learning (IHLs) like the National University Health System (NUHS), the National Additive Manufacturing Innovation Cluster (NAMIC), and the National University of Singapore (NUS), to ramp up local manufacturing capabilities.

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Leveraging its investment expertise, Temasek supported the SMEs by placing orders in advance, enabling them to balance their financial commitments. Temasek also brought together all the stakeholders, giving input and responding to feedback. At the time of writing, the 3D printed NP swabs are ready for deployment, with a production capacity of approximately two million swabs per month.

## Production of Saline for COVID-19 Diagnostic Kits

But the story did not end there. After a person is swabbed, the swab stick needs to be placed into a tube to facilitate reliable transportation to the lab, and the tubes

After ensuring the supply of diagnostic kits, Temasek was also involved in ramping up testing...[It] led efforts to train the testers, plan the testing, and send teams out to test people. In Alsagoff's words, "it was considered necessary to implement ubiquitous testing, instantaneous isolation, and pervasive contact tracing."

have to contain a liquid mixture of reagents that allow the virus to remain viable. Not surprisingly, there was also a global shortage of tubes for this liquid reagent mix, which is called the Universal Transport Media (UTM). Again, Temasek had to go upstream to look at reagents that could be sourced and produced in Singapore.

When the scientific literature revealed Phosphate Buffered Saline to be an effective, locally manufacturable media that worked well for coronaviruses, Temasek partnered with the National University Health System (NUHS) and SMEs Racer Medical and Axil Scientific to produce the saline in Singapore to cater for local needs. This was not the first time Temasek had worked with these SMEs, having known them

through Enterprise Singapore, the government statutory board that champions the needs of SMEs. As with the swabs, it was Temasek that helped kick start the manufacturing capabilities of these local SMEs.

After ensuring the supply of diagnostic kits, Temasek was also involved in ramping up testing, especially for asymptomatic carriers. In order to swab and test as many people as possible, Temasek led efforts to train the testers, plan the testing, and send teams out to test people. In Alsagoff's words, "It was considered necessary to implement ubiquitous testing, instantaneous isolation, and pervasive contact tracing."

## Medical Research on Treatment of COVID-19

Aside from enabling testing and diagnosis, Temasek also recognized the importance of spearheading local research on treatment of COVID-19. To that end, Tychan, one of Temasek's portfolio companies, successfully gained approval from the Health Sciences Authority (HSA) to start clinical trials on a newly developed monoclonal antibody (mAb) that specifically targets the virus that causes COVID-19.

TyChan is a clinical stage biotechnology company that focuses on infectious diseases



As a clinical-stage biotechnology company, TyChan focuses on infectious diseases and monoclonal antibodies that began due to the Ebola outbreak. Alsagoff appeared heartened to see the company contributing to the global fight against COVID-19. “The founders are American and Singaporean, so they spend some time

in Singapore as part of the Singapore-MIT alliance,” he said. “They were confident that they had a solution to Ebola, and Temasek supported and funded them. Ebola died down, so it never went to Phase 2. They then focused on the Zika Virus and Yellow Fever outbreaks. For Yellow Fever, they worked very quickly and went from concept to Phase 1 trials in seven months, a process that usually takes 18 months. It took them four months to develop antibodies for the coronavirus.”

Temasek brought together clinicians in hospitals for user feedback and developed the prototypes in engineering research labs with 3D printing capabilities. As Alsagoff remarked, “this took several months as we had to go through clinical trials – no shortcuts.”

In addition, Temasek Foundation partnered with Temasek’s portfolio company Advanced MedTech (AMTH) to design and manufacture critical care ventilators in Singapore. As a medical device company, AMTH is currently getting approval from HSA for its Alpha range of ventilators, which allows for remote management and monitoring. This

would be the first ventilator to offer such capabilities and is especially relevant for pandemics and infectious diseases. The manufacturing facility has been set up at AMTH’s Technology Center in Tuas, which is a planning area in the West region of Singapore. When production is fully ramped up, 200 ventilators can be produced monthly, with the ability to scale up depending on market needs.



Advanced MedTech designs and manufactures critical care ventilators in Singapore



## Project MyMentalHealth

Beyond physical health, Temasek Foundation also sought to raise awareness of mental health issues, including the need for community resilience, and the importance of watching for signs of stress and mental health pressures. As part of its initiatives related to the pandemic, the Foundation began a public conversation about the mental health impact of isolation, stress, and the blurred lines caused by working from home for prolonged periods.

Pooling key resources such as mental health hotlines and support groups, and partnering with the Agency for Integrated Care, the Foundation sought to provide extra mental wellness support for those who may be struggling during the pandemic.

A MyMentalHealth web portal was also set up with specially curated articles from mental health professionals to encourage mindfulness, improve mental well-being, and enable people to access mental health support via a directory of services, online forums, and hotlines. The most accessed page contained information on anxiety and depression, and the second-most accessed page was on support groups and where to get help.

Indeed, with its wide-ranging initiatives that were designed to fight the virus, including many that went beyond the field of medicine and life sciences, Temasek demonstrated its access to information and resources that was useful in its dialogues with the Singapore government. With its expertise and networks, Temasek was able to back up suggestions for government initiatives with pilot studies and data, dealing with strategic questions such as how the economy can be reopened safely. During the process, Temasek hoped to be a trusted partner for the Singapore government.

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## Crisis Management at Temasek

To be sure, Temasek's response to COVID-19 was informed by its previous experiences in crisis management; throughout the years, it has weathered the SARS, H1N1 Bird Flu, MERS, and the Zika virus, among others. It was,

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therefore, relatively easy for Temasek to implement visitor-management systems, thermal scanning, and contact tracing when the coronavirus broke out in January 2020, and staff were also relatively experienced with crisis management through regular exercises.

In fact, Temasek had established a crisis management team more than ten years ago as a standing committee with representatives from various departments, including legal, communications, human resources, finance, and operations. In "peace time," the crisis management team has regular meetings twice a year to go through issues like security screening, cybersecurity breaches, and fire drills, but there is also a small, dedicated two-person team that works full-time to support business continuity planning.

For COVID-19, Temasek activated a team of 20-30 people that met every day at the height of the pandemic and shared its learnings with its portfolio companies along the way. Effective crisis management was no doubt an enabling factor for Temasek's innovative and impactful initiatives for the wider community.

## Future Outlook

Looking ahead, the main focus of Temasek is investing and creating value through the companies in which it invests. While China overtook Singapore in 2020 as Temasek's largest single country of exposure by underlying assets, the company invests globally, guided by four themes<sup>4</sup> and six trends.<sup>5</sup> It does not have country allocation targets, but as its portfolio is substantially marked to market values of its holdings, exposure will vary along with country market performance.

In relation to investments from a life sciences perspective, Alsagoff notes that there are, in general, challenges associated with aging, mental health, dementia, and more. The world is shifting toward artificial intelligence and machine learning, which can be integrated into healthcare models for the future. And while there may, in some instances, be inertia from doctors and the existing healthcare framework, technological enablers are coming to the forefront, transforming health care, diagnostics, therapeutics and standards of care. The investment opportunities in life sciences will include telemedicine and the internet of medical things, which will open new areas of potential growth.

From a broader angle, the digital landscape is changing lives, and COVID-19 has accelerated the transition into the digital realm. For example, given the persistence and complexity of cyberattacks, there is a need to constantly enhance

security for confidential information. As another example, there is a need for distributed ledgers and blockchains to do transactions safely and to safeguard sensitive information. In the future, there will be an emphasis on digital literacy in the workforce, and this will determine which companies can emerge and evolve, as well as which companies need protecting or nurturing.

Finally, COVID-19 has also resulted in the fragmentation of the global supply chain, and more governments and cross-border businesses will seek to ensure independent critical functionality, particularly in smaller countries like Singapore. Business costs will go up, but the cost of not having access to critical capabilities and essential products and services can be catastrophic. So, there will also be a need for more international cooperation, partnership, and education. A global investment firm like Temasek seems well placed to support initiatives on a global scale.

## Conclusion

In many ways, Temasek is a unique organization, wholly owned by the Singapore Government, yet managed according to commercial principles, and deriving its funds from investment returns. In 2020, Temasek showed that it could, among its many endeavors, leverage its investment expertise and diverse networks to bring rapid solutions to the public health crisis. In these highly unusual times, Temasek's response to COVID-19 no doubt prompts a rethink of the traditional bounds of philanthropy and social responsibility.

## Endnotes

- 1 "BioNTech to Raise USD 250 Million in Private Placement." BioNTech press release. June 29, 2020. <https://investors.biontech.de/news-releases/news-release-details/biontech-raise-usd-250-million-private-placement>
- 2 "Temasek-led investor group in US\$250 million vaccine bet on BioNTech." *Channel News Asia*. June 29, 2020. <https://www.channelnewsasia.com/news/business/covid-19-temasek-investor-group-vaccine-biontech-12881470>
- 3 "PFIZER AND BIONTECH ANNOUNCE VACCINE CANDIDATE AGAINST COVID-19 ACHIEVED SUCCESS IN FIRST INTERIM ANALYSIS FROM PHASE 3 STUDY." Pfizer press release. Nov. 9, 2020. <https://www.pfizer.com/news/press-release/press-release-detail/pfizer-and-biontech-announce-vaccine-candidate-against>
- 4 Transforming economies, growing middle income populations, deepening comparative advantage, emerging champions.
- 5 Longer lifespans (healthcare), rising affluence, sustainable living, smarter systems, more connected world, sharing economy.