PITT STREET RESEARCH

Achiko AG

A rising telehealth play

Share Price: CHF 0.46

SWX: ACHI
Sector: Technology
1 October 2020

In 2020, Switzerland Stock Exchange listed Achiko (SWX: ACHI) became a health technology company with the rapid development of Teman Sehat, an open source software product that provides real COVID solutions. This was followed by 'Gumnuts', which, while not a software product, represents a potential step-change in terms of COVID testing. Following our evaluation report published on 31 August 2020, we have now prepared an in-depth report, including a valuation section, highlighting the financial opportunity for Achiko and its investors.

Investment case

The investment case for Achiko lies in its breakthrough and world-class action on the COVID-testing solution. Achiko believes its Teman Sehat and Gumnuts technologies will help the company to achieve this goal.

Teman Sehat is a downloadable COVID testing, passport and access app that allows individuals and businesses to be able to better manage their COVID risk. It is now being rolled out in Indonesia. We see potential for Teman Sehat to become the COVID telehealth infrastructure for Indonesia, and beyond that to other emerging countries.

Achiko's Gumnuts technology, on the other hand, allows very rapid and low-cost detection of viruses and bacteria from saliva using DNA aptamers. A COVID diagnostic has been developed from the technology and has now entered clinic validation trials. Achiko expects to be able to offer the diagnostic commercially before the end of 2020.

The Gumnuts technology is low-cost and user convenient, which means that it could be used to do frequent mass screening of whole populations. When combined with Teman Sehat, there can be a real-time information ecosystem alerting people to stay away from infection hotspots but allowing them to feel safe elsewhere. The result would allow economies affected by lockdown to be able to re-open safely.

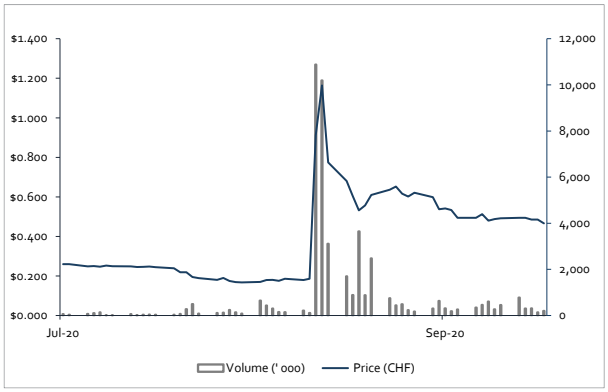
Valuation of CHF 1.63 per share

We value Achiko at CHF 1.63 base case and CHF 3.48 bull case using a probability weighted DCF methodology. We see Achiko being re-rated by the market once it receives positive clinical trial results for its Gumnuts technology and the company further expands its Gumnuts testing. Key risks we see include: 1) clinical trials may miss its primary or secondary endpoints; 2) regulatory risk and 3) funding risk.

Market Cap. (CHF m)	41.2
# shares outstanding (m)	89.6
# share fully diluted (m)	103.0
Market Cap Ful. Dil. (CHF m)	47.4
Free Float	64.1%
12-months high/low (CHF)	2.01 / 0.16
Avg. 12M daily volume ('1000)	797
Website	www.achiko.com

Source: Company, Pitt Street Research

Share price (CHF)[1] and avg. daily volume (k, r.h.s.)



Source: Capital IQ

Valuation metrics	
Fair valuation range (CHF)	1.63 – 3.48
Discount rate	16.0%
Assumed terminal growth rate	None

Source: Pitt Street Research

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[1] AUD/CHF: 1.53

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Eight reasons to look at Achiko

1. Achiko's Teman Sehat Swarm-style mobile ecosystem is potentially the natural COVID testing, passpport and access app for both developed and developing markets.
2. With Achiko having 'gamified' the Teman Sehat ecosystem, allowing businesses to provide rewards and coupons to users, there is potential for rapid uptake.
3. Achiko has a better COVID diagnostic in Gumnuts than what is currently being used in terms of cost and patient convenience.
4. Gumnuts has entered the clinical validation trial, the success of which will potentially lead to its commercial roll-out across many developig countries.
5. The combination of Gumnuts and Teman Sehat would allow economies affected by lockdown to be able to re-open safely in part because of the speed and low cost of Gumnuts.
6. Indonesia is a natural early market for Achiko's Covid-19 products, with a population of 270 million people where the Covid-19 curve is large and yet to be flattened.
7. Achiko has a pipeline of other markets that will take Gumnuts and Teman Sehat, starting potentially with other ASEAN markets.
8. We believe Achiko should be valued higher than its current market value. Our valuation using a probability-weighted DCF methodology yields CHF 1.63 per share base case and CHF 3.48 per share bullish case, both of which represent significant upsides to the current share price.

Introducing Achiko AG, SWX: ACHI

Achiko AG is a Swiss-based company which has developed important products related to the Covid-19 Pandemic. The company listed on the SIX Swiss Stock Exchange in November 2019, originally as a fintech company[2]. In early 2020, the world was stricken by the pandemic of Covid-19, which, as we all know, is highly infectious and has a severity and mortality rate that threatens healthcare systems around the world. Experts indicate that it may be late 2021 to 2022 before developed countries overcome the pandemic while developing countries may take several more years. Over the last four months, Achiko has transformed its business strategy to address the Covid-19 pandemic with two major initiatives that sit on top of its fintech investments, which combined can potentially deliver the archetype Telehealth Diagnostics Platform for the 21st century. The two pillars are Gumnuts and Teman Sehat.

Achiko has in Gumnuts a low cost, convenient and non-invasive Covid-19 testing solution

Gumnuts represents a low cost, convenient and non-invasive Covid-19 testing solution that's superior to what's currently out there. The Gumnuts technology, which originated from the laboratory of Australian Dr Michael Edel, is a technology that allows very rapid and low-cost detection of viruses and bacteria from saliva using DNA aptamers. A Covid-19 diagnostic test has been developed from this technology and will be entering clinical studies shortly. Achiko expects to be able to offer diagnostic tests commercially before the end of 2020.

Teman Sehat has the potential to become the contact tracing standard, initially in Indonesia, however it's applicable across developed and developing markets globally. Teman Sehat, is a downloadable app that allows individuals and businesses to be able to better manage their risk of coming into contact with the virus. It is now being rolled out in Indonesia. We see potential for Teman Sehat to become the contact tracing standard for that country initially, with other markets soon after.

Achiko believes that Teman Sehat and Gumnuts together can be a powerful combination. The low cost of the Gumnuts diagnostic suggests that it could be used to do mass screening of entire populations looking for both latent and active infections. When combined with Teman Sehat, this creates an information ecosystem operating in virtual real-time alerting people to stay away from infection hotspots while allowing them to feel safe elsewhere.

[2] It was originally a developer of game payment services in Indonesia with the intention of moving beyond that into being a general-purpose digital payment platform.

Significant market opportunity for Gumnuts and Teman Sehat

Why mass testing may be needed for many years to come

Up until now, despite the significant numbers of COVID vaccine development candidates world-wide, the timing for the launch of successful vaccines against COVID still varies amongst the medical experts.

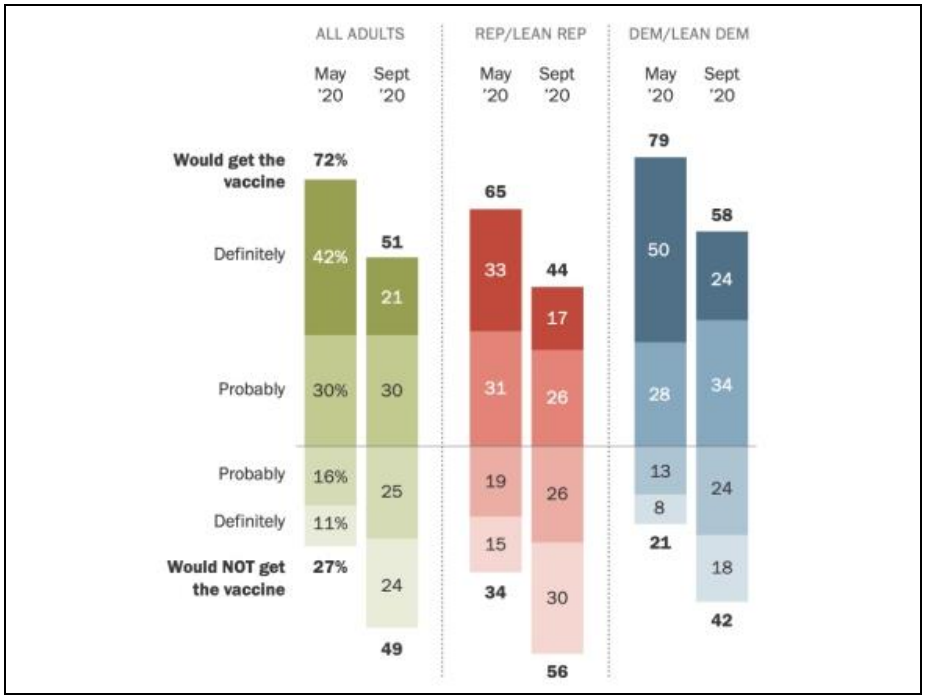
Currently, there are more than 150 COVID vaccines in development across the world.[3] Within this group, 11 candidates have entered the final and critical Phase 3 of the clinical trials[4]. In biotechnology, it can be reasonably assumed that a drug has a 50% chance of reaching market once it reaches the Phase 3 efficacy trials[5]. As such, it is equally likely that a COVID effective vaccine will not developed by any of these Phase 3 candidates. In the worst-case scenario that all these Phase 3 candidates fail, a COVID vaccine might not be developed and distributed across the world for many years to come.

According to management's discussions with various vaccine developers, the company is of the view that a vaccine may become available sometime in 2H CY21. But even if a vaccine is successfully developed and distributed, there are still issues that are yet to be confronted. For instance, how effective will the vaccine be, and more importantly, will it be widely accepted by communities across the world?

Based on the recent COVID survey conducted by the Pew Research Center in Washington DC,[6] it is worth noting that close to 49% of US adults now say they definitely or probably would not get vaccinated at this time if a vaccine is available today, which represents a +22% increase since May 2020 (Figure 1).

As of September 2020, ~50% of US adults would not get a vaccine even if one is developed and distributed

Figure 1: % of US adults to get vaccinated if a vaccine is available today

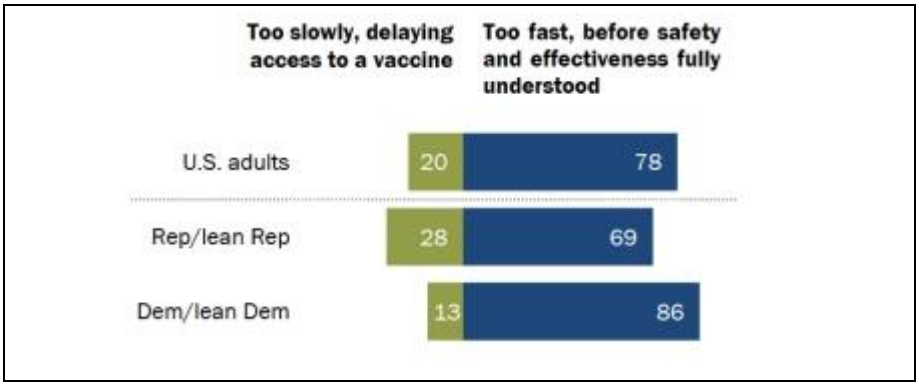


Source: Pew Research Center

[3] https://www.nationalgeographic.com/science/health-and-human-body/human-diseases/coronavirus-vaccine-tracker-how-they-work-latest-developments-cvd/
[4] https://www.nytimes.com/interactive/2020/science/coronavirus-vaccine-tracker.html
[5] https://www.investopedia.com/articles/stocks/06/biotechvaluation.asp
[6] https://www.pewresearch.org/science/2020/09/17/u-s-public-now-divided-over-whether-to-get-covid-19-vaccine/

Based on Pew Research Center's survey, it is understood that the public is currently concerned about aspects of the vaccine development process. Specifically, the survey finds approximately 78% of Americans believe "it is very or somewhat likely a vaccine will be approved in the US before its safety and effectiveness are fully understood" (Figure 2).

Figure 2: US public concern over moving too fast on vaccine approval process



Source: Pew Research Center

Further, the same article also noted that researchers are still unsure as to how effective a COVID vaccine will be. It is also worth noting that the US Food and Drug Administration (FDA) would authorise a COVID vaccine if it was safe and achieved at least 50% effectiveness at preventing the virus or decreasing the severity of infections.

50% vaccine take-up rate, coupled with an effective rate of 50% yields a mere ~25% COVID immunity

On balance, a 50% vaccine take-up rate, coupled with a 50% effectiveness rate would yield a mere 25% of COVID immunity. Given the likely relatively low COVID immunity level in a post-vaccine world, we think that COVID testing and contact tracing systems are still likely to be required in a developed country such as the US even if a vaccine becomes available today. In lower income and developing nations, our view is that the take-up rate of the vaccine will be even lower compared to developed countries, and as such, regular mass testing is likely to be needed in order to control the spread of the virus.

Why Gumnuts could address the significant demand for regular whole population testing

Following our discussion above, we can see that the market size for regular mass testing for COVID will likely remain large in a post vaccine world, especially in lower income and developing nations. If we assume that mass testing is needed for the working population once to twice per week, then we are looking at about 16BN to 32BN tests per month for the next several years based on an assumed working population of 4BN people.

Based on the current COVID testing options (discussed in more detail below), the company believes that it is not possible to run 16BN PCR tests per month and it is also not feasible to do the similar volume of tests for antigen.

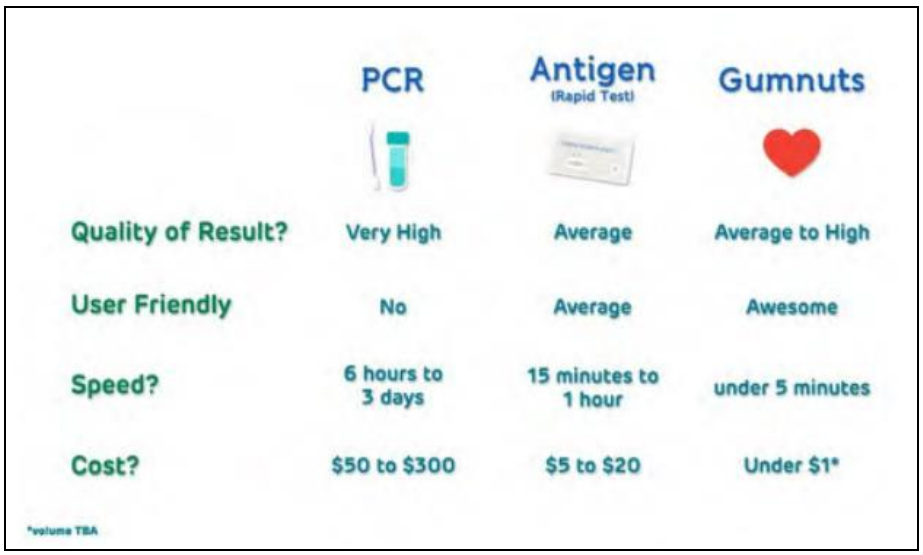
Cost of Gumnuts test may come in <US$1.00, falling to <US$0.10 in the long run

To address this significant market demand for frequent mass testing, Achiko has managed to come up with its breakthrough Gumnuts technology, which takes a leap away from current testing modalities such as RT-PCR, RT-LAMP and antigen testing, by offering a more rapid and low-cost detection technique (Figure 3). The company believes that the cost of one of their tests may be able to come in for under US$1.00, falling to under US$0.10 in the long run. The speed is comparable to a conventional lateral flow diagnostic, with results to be received in minutes (vs up to 1 hour for Antigen and up to 3 days for PCR test). Finally, the high affinity binding means that simply sourcing virus from saliva will do, making for an easy and non-invasive cheek swab. And, importantly, Gumnuts are more user friendly than the current testing options, as the discomfort associated with testing is gone – instead of 'bleed on this, thank you' or 'shove it up your nose', doctors can now say 'have a minty mouthwash and wait a few minutes'.

Gumnuts is currently in clinical validation trials which if successful will see this COVID diagnostic tool commercially rolled out soon

Gumnuts has generated positive in vitro results for its initial clinical trials. It is currently in clinical validation trials which if successful will lead to its commercial roll-out soon.

Figure 3: COVID testing technologies comparison



Source: Company

Four benefits to the Teman Sehat COVID testing, passport and access app

Teman Sehat is a COVID testing, passport and access app that effectively combines testing certificates, payments, and the benefits of the contact tracing without the fears that many contact tracing systems bring. It sits on top of a payments and couponing systems, where users can check into places in return for a coupon, or in some places be charged a small fee. Some places may require users to present a certificate showing a person has been recently tested. This has several benefits:

Teman Sehat respects the privacy of users and places

1) **Privacy (contact tracing without contact tracing).** Achiko puts the utility of contact tracing on the Teman Sehat network and privately notify infected users and places. If users of the app want to clear a flag on their certificates, they will need to either quarantine and be kept away from check-ins for some time; or get a COVID test. This is different to other contact tracing systems where opting in has no benefit other than being a good citizen; for instance, if users or places get infected, users are quarantined and the places they were exposed to get their names published and reputations and business prospects hampered. Therefore, Teman Sehat is a much user-friendly app that puts the power in the hands of the users, whilst ensuring the safety of the public.
2) **Connecting the dots between testing**. Teman Sehat means that there is a meaning, secure and credible process (a badge and a certificate) in place. This allows places to secure themselves and ensure that only recently tested people that can easily be traced can enter the areas. Additionally, it prevents situations where a person could buy a fake letter signed off by a doctor so that the person can use it as a passport to go places.
3) **Lowering the cost of testing**. Teman Sehat runs on micropayments. It sits on top of a payments and couponing systems. The cost burden of the testing can be borne by many check-ins. One test can be valuable 10 times over 3-4 days, hence reducing the cost and frequency of testing. The money collected from check-ins and coupon redemptions can be used to pay for testing. If there is a surplus, the funds can be applied to expanding healthcare and public education programs, relieving the current stretched government budgets.
4) **Vertical market applications**. Achiko could potentially deploy Teman Sehat to multiple verticals including cruise ships, meat processing, shipping, resort islands, planes, aged care facilities and so on.

Multiple technologies for COVID-19 tests

The symptoms of COVID-19 typically include mild to severe fever, dry cough, tiredness, respiratory illness and chest pain. While a majority of people infected with COVID-19 have recovered or are recovering without any special treatment, timely medical attention is required for patients experiencing serious symptoms. Thus, it becomes critical to quickly diagnose this infection among large sets of people. Prompt diagnosis also helps contain the spread of infection by facilitating timely quarantine or treatment of affected people.

What are the types of COVID-19 tests being used currently?

We have assessed the following key COVID-19 testing technologies with a view to highlight their strengths and weaknesses:

1) **Ribonucleic Acid (RNA) testing:** These are highly sensitive tests that capture a specific gene from genetic material (deoxyribonucleic acid/DNA or RNA) of the virus through a lab technique known as polymerase chain reaction (PCR). For sample collection, fluid from a nasal or throat swab, or saliva is gathered; this process remains unchanged across all the different types of RNA tests. Test results are available within minutes if analysed on-site, or in a few days or longer in locations with processing delays or if sent to an external lab. RNA-based tests are highly reliable and accurate; however, their results generally take longer.

   Some popularly used RNA tests are Reverse Transcription Polymerase Chain Reaction (RT-PCR), Reverse Transcription Loop-Mediated Isothermal Amplification (RT-LAMP), Cartridge Based Nucleic Acid Amplification Test (CB-NAAT)/GeneXpert and TruNat.

RT-PCR is the most accurate and expensive among the different diagnostic tests

   a. **RT-PCR:** In this test, the collected sample is treated with an enzyme called 'reverse transcriptase' to convert the virus' RNA into DNA – through a simple and widely used process called 'reverse transcription', accompanied by the PCR technique (hence the name RT-PCR). This test allows a single molecule of DNA to amplify exponentially (million times), wherein viral particles even in single digits can be reported using fluorescent dyes. RT-PCR can be performed quickly but reporting of final results takes more time.

   b. **RT-LAMP:** It is a simpler, cheaper and quicker version of RT-PCR involving one-step nucleic acid amplification to multiply specific sequences of RNA, to diagnose infectious diseases such as COVID-19. This test combines LAMP DNA detection with reverse transcription, for creating cDNA (a copy of messenger RNA produced by reverse transcriptase) from RNA before running the reaction. RT-LAMP does not require the PCR technique, and is instead performed at a constant temperature of 60–65°C. The results obtained from this test are less accurate than those reported by RT-PCR.

   c. **CB-NAAT/GeneXpert:** It is less expensive and provides faster results than RT-PCR and RT-LAMP, and is majorly being used for detection of tuberculosis globally. Outside India, CB-NAAT is known as GeneXpert. Currently, this test is being used for diagnosis of COVID-19 in lower- and middle-income countries. This test is conducted over cartridge-/chip-based equipment called CB-NAAT/GeneXpert, from where the name of the test comes. The collected sample is inactivated, and RNA polymerase enzyme (helps virus replication) is added for testing the sample using the equipment with a pre-programmed reaction that detects the virus gene, while holding the viral components together.

The qualitative results of CB-NAAT/GeneXpert test are preliminary in nature and can only be confirmed by conducting an RT-PCR test. Also, CB-NAAT/GeneXpert equipment requires uninterrupted power supply and air conditioning, and hence cannot be deployed in containment zones.

d. **TruNat:** This test is a locally developed, battery-operated and portable version of CB-NAAT/GeneXpert, allowing healthcare teams to set up mobile testing centres or kiosks in containment zones, instead of transporting the samples to labs. Unlike the traditional RT-PCR test, sample preparation in TruNat test is automated and results are available within 30 minutes. The processes of sample collection, preparation, testing and confirmation of reported preliminary results are the same as in the case of CB-NAAT/GeneXpert test.

2) **Antigen testing:** This testing methodology detects the presence of certain proteins/antigens, such as nucleocapsid phosphoproteins and spike glycoproteins that are present as protrusions on surface of the virus to confirm the infection. For conducting this test, a fluid sample from the patient is collected using a nasal or throat swab, which is then transferred onto a test strip after inactivating the virus. The test strip contains antibodies that bind to coronavirus proteins and hold them in place. If the sample is positive for the virus, coloured lines will appear on the paper strip in 15–20 minutes. These tests are faster and less expensive than RNA tests, and hence are preferred for testing larger populations. However, the chance of yielding accurate results is comparatively low.

Antigen testing is suited for countries with a large population and patient base

3) **Antibody testing:** This testing technology is meant for detection of immunity against the virus, along with diagnosis of infection. This is also known as serological testing, where infected persons are tested for specific antibodies/proteins (against pathogens they are exposed to) in their bloodstream, to find out whether an individual has been infected with COVID-19. However, the antibody test may not be able to accurately report whether the individual is under attack by the virus at the time of testing. Unlike a nasal or throat swab test that looks for traces of viral genes in the body, an antibody test looks for body's response to the virus, which can only be detected by testing the blood sample. This test is conducted for identifying two specific antibodies – (a) IgM, which develops early on once an individual is infected, and (b) IgG, which is mostly found after the individual has recovered from the infection.

What are the pros and cons of different testing technologies?

The relative strengths and weaknesses of key COVID-19 testing technologies have been summarised in Figure 4.

Figure 4: Comparison of COVID-19 testing technologies

Testing Technology	RNA	Antigen	Antibody
Pros	– Higher accuracy and lower error margin in results – Confirmative or repeat testing not required	– Less expensive – Faster results than RNA and antibody tests – Can be used as an alternative to RNA tests for mass testing purpose	– Lower cost – Quicker results than RNA tests – Helps assess infection rate – Also assists in development of therapies for treatment (e.g., plasma transfer)
Cons	– Most expensive among the COVID-19 testing technologies – Longer duration to receive results, sometimes up to a week – Not preferred for mass testing of large populations	– Low accuracy – Samples prepared for testing are less sensitive – High accuracy of positive results, but negative results may need to be confirmed with an RNA test	– Detects infection only after 5–14 days of onset of disease – Low accuracy and sometimes a second antibody test is needed to get accurate results – Diagnostic usage currently limited

Source: WHO, FINDDX, CDC USA, Pitt Street Research

There is a general consensus among governments worldwide that at this stage of the pandemic, lockdowns will no longer be effective to contain the spread of COVID-19. Until the time an effective vaccine hits the market and becomes available to the larger world, the best hope for containing this infectious disease is frequent mass testing of entire populations, particularly in low-income countries. Achiko, with its breakthrough Gumnuts technology, can help achieve this objective as it takes a leap away from current testing modalities such as RT-PCR, RT-LAMP and antigen testing, by offering a more rapid and low-cost detection technique.

Contact-tracing technologies vital in controlling spread of COVID-19

Contact tracing is a critical public health measure for controlling the spread of COVID-19 as it helps break the chain of human-to-human transmission through timely identification of people exposed to infected individuals. Major components of the typical contact-tracing mechanism include community engagement and support, consideration of local contexts and cultures, trained contact tracers and supervisors, logistics support to tracing teams, and well-developed information systems to collect and analyse data. Currently, the widely used mechanisms/technologies by governments and health authorities for contact tracing and case identification include **outbreak response**, **proximity tracing** and **symptom-tracking tools** — these can either be combined as one mechanism or used as standalone tools.

Outbreak response tools are designed for public health personnel involved in contact tracing and outbreak investigations. These tools facilitate all contact tracing activities, including case investigation and identification, listing and tracing of contacts, and data management and analysis. These are primarily used for initial localised outbreak response and early-cluster investigations, tailored case investigations, contact listing and follow-ups. Outbreak response tools enable electronic data capture by contact tracers directly through smartphones or tablets, and help streamline the data management process by avoiding data entry errors. Some of them may also have monitoring dashboards, along with software packages that can allow automated and semi-automated analytical outputs. One of the **examples** of these tools is **Go.Data** – jointly developed by the World Health Organization and the Global Outbreak Alert and Response Network, specifically for field workers; it is being used in many countries as a COVID-19 response tool.

Proximity tracing tools, also known as proximity tracking devices, leverage either the global positioning system (GPS) or Bluetooth technology to identify individuals who have been in close physical proximity and/or have had prolonged contact with an infected person. GPS-technology-based applications use the location of users to determine if they have travelled to an infection venue to facilitate contact identification. Linking of the GPS tools with other information systems provides users direct notifications of contact events with confirmed cases, testing locations and information related to essential medical supplies such as face masks. Bluetooth-based devices alert users only about their close proximity to an infected person. Thus, the use of both these devices together can boost the efforts of field workers/tracers. An **example** of a proximity tracing solution is **TraceTogether**, a mobile application developed for the Government of Singapore, for tracing COVID-19 contacts. This application has already been downloaded by ~2.4 million users, and ~1.4 million of them actively used it in August 2020. Download, installation and activation of the application have been made mandatory for high-risk populations by the government.

Integration of tracing technologies can lead to better containment of COVID-19

Symptom tracking tools are designed to collect self-reported signs and symptoms from people through mobile applications or messages. These are used for assessing disease severity or probability of infection and for contact tracing. These tools can also be helpful when integrated into the contact tracing process, especially when there are physical or security barriers to in-

person visits by the tracing teams. Besides, symptom tracking tools can augment in-person visits by receiving reports from contacts of confirmed cases more than once a day. However, while integrating symptom tracking tools with contact tracing systems, a robust safeguarding mechanism is necessary to ensure that suitable follow-up actions are taken if a contact does not self-report for a predetermined number of days. One of the **examples** of these tools is **COVID Near You**, a crowdsourced COVID-19 symptom tracker created by epidemiologists and software developers at Boston Children's Hospital. The COVID Near You team aims to support public health surveillance measures with respect to COVID-19 using self-reported data.

All the key technologies discussed above have their specific strengths and weaknesses (Figure 5), and generally, a combination/integration of these tools is required for best results with respect to containment of the pandemic.

Figure 5: Comparison of COVID-19 contact tracing and/or management technologies

Tracing Technology	Outbreak response	Proximity tracing/tracking	Symptom tracking
Advantages	– Improves timeliness of monitoring by reducing data processing time – Increases transparency due to open-source software – Acts as an alternative to electronic surveillance tools	– Augments contact identification and listing – Requires only a small pool of workers for data processing and management – Can be used to conduct contact tracing in a large population set	– Helps in daily monitoring of contacts, replacing in-person contact tracing – Is similar to proximity tracing tools, requires only a small pool of workers – Monitors self-reported data in real time, even for a large population set
Limitations	– Suitable for only a limited population size – Requires a large number of field workers for contact tracing – Requires standardised data formats and reporting templates	– Requires that every individual have a smartphone with a proper mobile network – Involves data privacy and protection concerns – Does not directly provide information about exposure to infection	– Limited ability to offer differential diagnoses – Data interpretation limited due to uncertainty in reporting denominators – Need for written consent from individuals before sharing of health-related data – Possibility of individuals reporting inaccurate data

Source: WHO, CDC USA, Pitt Street Research

Achiko's technology, Teman Sehat, falls under the ambit of proximity tracing tools. While the Teman Sehat application is currently being used in Indonesia, there is potential for it to be used in several other Asian countries with huge populations, e.g., India and the Philippines, where the COVID-19 curve is yet to flatten. Such countries are finding it challenging to trace and manage contacts through existing mechanisms and are in need of better technologies to complement the efforts of public health agencies. Further, there is potential for the uptake of the Teman Sehat ecosystem in Latin America, which continues to be one of the most severely affected regions.

Comparable companies in the COVID-19 space

For Achiko's peers, we have considered public companies involved in COVID-19 vaccine, drug or diagnostics development, with a market capitalisation below US$500m. While several pharmaceutical majors are leading the race to develop COVID-19 vaccines, numerous companies in the small- and mid-cap categories are also part of this race.

Several small- and mid-cap firms across the globe are striving to develop COVID-19 vaccines

- **Tonix Pharmaceuticals Holding Corp** (NasdaqGM: TNXP) is a New York-based clinical-stage biopharmaceutical company developing pharmaceutical products to treat psychiatric, pain and addiction conditions. Tonix is also currently developing a COVID-19 vaccine, in a strategic partnership with Southern Research. Its lead vaccine candidate is TNX-1800, a live replicating vaccine based on its proprietary horsepox viral vector platform.
- **Qualigen Therapeutics Inc** (NasdaqCM: QLGN) is a California-based biotechnology company developing therapeutic products for the treatment of cancer and infectious diseases. Recently, Qualigen signed a license agreement with the University of Louisville to develop its AS1411 DNA aptamer as a drug candidate for COVID-19 treatment.
- **Kiadis Pharma NV** (ENXTAM: KDS) is a Netherlands-based fully integrated biotechnology company developing cell-based immunotherapy products in the field of blood building system. The company's infectious disease programme, K-NK-ID101, is focussed on developing K-NK cells as a potential treatment for COVID-19. In September 2020, it received US$9.5m from the Advanced Regenerative Manufacturing Institute's BioFabUSA programme to fund the development of its COVID-19 treatment.
- **Destiny Pharma plc** (AIM: DEST) is a UK-based biotechnology company engaged in the development of novel anti-infectives, with its lead asset focussed on the prevention of post-surgical infection. In September 2020, Destiny announced collaboration with SporeGen Ltd, for the co-development of SporeGen's SPOR-COV product as a preventive treatment for COVID-19.
- **Acer Therapeutics Inc** (NasdaqCM: ACER) is a Massachusetts-based pharmaceutical company engaged in acquiring, developing and commercialising therapies for serious rare and life-threatening diseases. In May 2020, Acer entered into a research collaboration agreement with the National Center for Advancing Translational Sciences, for the development of emetine hydrochloride as a potential treatment for COVID-19.
- **Brickell Biotech Inc** (NasdaqCM: BBI) is a Colorado-based clinical-stage pharmaceutical company, primarily focussed on developing prescription therapeutics for debilitating skin diseases. In September 2020, Brickell announced a collaboration agreement with AnGes Inc to develop AnGes' proprietary investigational adjuvanted plasmid DNA vaccine for COVID-19.
- **Vaxil Bio Ltd** (TSXV: VXL) is a Canadian–Israeli immunotherapy biotech company developing neo antigen-like peptide products and antibodies to treat cancer and infectious diseases. In September 2020, Vaxil received positive results for the in vivo (animal) immunogenicity study of CorVax, its potential peptide vaccine to treat COVID-19.

Besides COVID-19 vaccine and drug makers, the following public companies that are providing or developing diagnostic tests for COVID-19 can be considered as peers for Achiko.

- **Applied BioCode Corp** (TSEC: 6598) is a California-based in-vitro diagnostics solutions provider that designs and develops multiplex testing products. The company offers a number of diagnostic solutions for COVID-19, including its BioCode SARS-CoV-2 assay – a high-volume automated nucleic acid multiplex assay for the detection of SARS-CoV-2 nucleic acid in nasopharyngeal swabs. In June 2020, the assay, which can run up to 564 tests per day, was granted emergency use authorisation (EUA) by the US FDA.
- **EKF Diagnostics Holdings plc** (AIM: EKF) manufactures point-of-care devices and tests to check the levels of haemoglobin, glycated haemoglobin, glucose and lactate. It also provides PrimeStore MTM (Molecular Transport Medium), which is a viral transport media for infectious diseases including COVID-19, influenza A, influenza B and mycobacterium TB.
- **Atomo Diagnostics Ltd** (ASX: AT1) is an Australian researcher, manufacturer and seller of rapid diagnostic test platforms for professional use as well as self-testing. One of its offerings is the AtomoRapid COVID-19 (IgG/IgM) Rapid Antibody Test. It is a single-use, handheld, integrated device that enables the detection of IgG and IgM antibodies to SARS-CoV-2 virus in whole blood, serum or plasma samples.
- **Biosynex SA** (ENXTPA: ALBIO) is a French manufacturer of rapid diagnostic tests, for both individual (self) and professional use. The company recently developed a rapid test – Biosynex Covid-19 BSS serology tests – for the detection of IgM and IgG antibodies against COVID-19. The test has been authorised by the French Ministry of Health.
- **Chembio Diagnostics Inc** (NasdaqCM: CEMI) is a New York-based provider of point-of-care diagnostic tests based on its patented Next Generation DPP (Dual Path Platform) technology. In September 2020, Chembio submitted the EUA application with the FDA for its new rapid antibody test system targeted at COVID-19. This test system was developed in partnership with LumiraDx UK Ltd, a diagnostics and diagnostics-led care solutions provider.
- **AXIM Biotechnologies Inc** (OTCPK: AXIM) is a California-based R&D company engaged in developing diagnostic solutions and treatments related to oncology and COVID-19. It offers NeuCovix, which is a rapid diagnostic test that measures the levels of functional neutralising antibodies that are believed to prevent SARS-CoV-2 from entering the host cells. Axim recently filed the EUA application for its test and had previously signed a licensing deal with Empowered Diagnostics LLC for high-volume production of NeuCovix.
- **Biomerica Inc** (NasdaqCM: BMRA) is a biomedical technology company in the diagnostic and therapeutic products space. Biomerica's COVID-19 IgG/IgM Rapid Test is a lateral flow chromatographic immunoassay for detection of IgG and IgM antibodies specific to COVID-19. The test is available only for professional use.
- **AnteoTech Ltd** (ASX: ADO) is an Australian provider of products for the life sciences research, vitro diagnostics, energy and medical device markets. It is developing a multiplex rapid test platform for detection of COVID-19. The test is based on its AnteoBind activated europium

particles, and the company is currently seeking partners for its development and commercialisation.

Market capitalisation of healthcare firms involved with COVID-19 treatments has surged so far this year

While the COVID-19 crisis has taken a toll on most sectors, healthcare stocks have benefitted from the pandemic, particularly those involved in potential COVID-19 treatments. The market values of most of the selected peers of Achiko have witnessed a sharp rally this year, with the market capitalisation of COVID-19 vaccine/drug companies showing an average growth of 71% so far in 2020 (Figure 6). Similarly, the market capitalisation of comparable COVID-19 diagnostic firms registered a robust growth of 103% on a YTD basis (Figure 7). Notably, we believe that there is further scope for re-rating of some of these stocks, driven by forthcoming clinical trial results and approvals from regulatory agencies.

Figure 6: Market capitalisation (US$m) of COVID-19 vaccine candidate companies (Achiko's peer group)

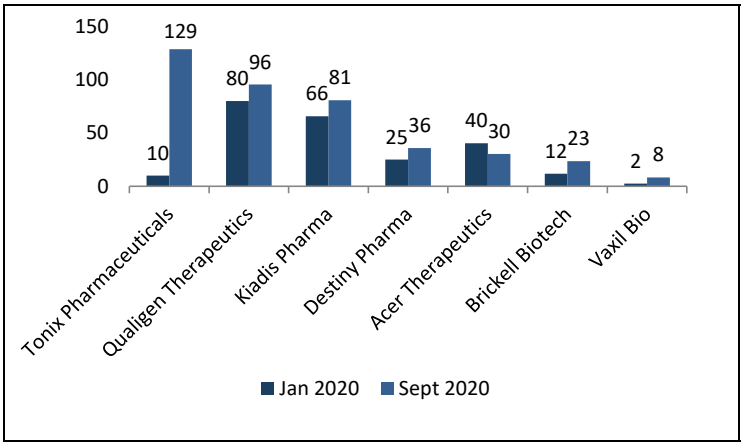
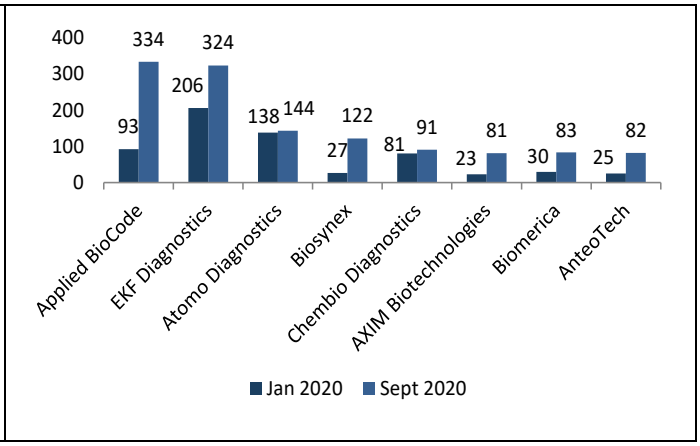


Figure 7: Market capitalisation (US$m) of COVID-19 vaccine companies (Achiko's peer group)



Source: S&P Capital IQ

Aptamers gaining traction in diagnostics

Aptamers, due to their high affinity and specificity as binding agents, have a strong potential for use in diagnostics

Aptamers are small pieces of nucleic acid molecules with the capacity to bind biological targets of interest. These small DNA or RNA molecules can form tertiary structures capable of binding proteins or other cellular targets, and are essentially a chemical equivalent of antibodies. Specifically, they are short, single-stranded oligonucleotides of 20–60 nucleotides in length. Oligonucleotides are simply short strings of DNA and RNA – the name is derived from Greek word *oligos*, which means 'little/small/few'. Aptamers have long been of interest to the biotechnology industry due to their ability to bond all sorts of targets, including proteins, peptides, carbohydrates and small molecules, with high affinity and specificity.

To understand aptamers, it is necessary to understand nucleic acids, DNA and RNA. **DNA can be considered as the code of life, while RNA is its messenger.** Inside the cell of just about every living being is a complicated molecule known as DNA, which is the body's 'operating system', i.e., it houses all the instructions to create the body. RNA is the photocopier of DNA, copying individual strands of DNA and taking it to ribosomes, the body's protein-making factories, where the protein for which the DNA is coded is 'expressed'.

One of the early, and indeed revolutionary, capabilities developed by the biotechnology industry in the 1970s and 1980s was the ability to easily and inexpensively assemble oligonucleotides, to genetically engineer all sorts of useful products. Aptamers were invented in the early 1990s, when scientists at the University of Colorado developed a process called SELEX[7] to sort through a large library of oligonucleotides and pick the ones that best bound with targets of interest[8].

Aptamers potentially make great diagnostics, because they can be engineered using SELEX to be highly stable as well as highly binding with the target of interest. Moreover, they are easier and cheaper to make than monoclonal antibodies, until recently the 'gold standard' for diagnostics[9]. Similar to monoclonal antibodies, aptamers can be used for the molecular recognition of their respective targets. Aptamers have been used successfully for pathogen and cancer recognition, and as stem cell markers.

Besides applications in diagnostics, aptamers can be used in biosensors to monitor environmental contaminants and ensure food safety. **Owing to their ability to compete with small molecules and protein ligands and inhibit their targets, aptamers also have promising applications in therapeutics.** In 2004, Pegaptanib (brand name 'Macugen'), a vascular endothelial growth factor (VEGF)-specific aptamer, was approved for therapeutic use for age-related macular degeneration. Since then, a number of aptamers have entered clinical trials, such as for ocular diseases, hematologic diseases and cancer. Notably, aptamers are predicted to be highly useful in producing general and theranostic drugs for certain diseases, including cancer and Alzheimer's.

In 2020, few of the applications of aptamers that made headlines included the following:

– During March 2020, researchers at the Pohang University of Science and Technology developed a diagnostic tool to determine whether a person is infected by COVID-19, within 15 minutes using an aptamer. This method can be used not only for examination but also for treatment.

[7] Systematic Evolution of Ligands by Exponential Enrichment.
[8] Science. 1990 Aug 3;249(4968):505-10.
[9] Acta Naturae. 2013 Oct-Dec; 5(4): 34–43.

- In June 2020, Qualigen Therapeutics signed an exclusive licence agreement with the University of Louisville to facilitate the development of its AS1411 DNA aptamer as a drug candidate for the treatment of COVID-19.
- During August 2020, Qualigen Therapeutics was issued a patent related to its Selective Target Antigen Removal System (STARS) technology. STARS is a DNA-/RNA-based treatment device candidate for the removal of viral and tumour-produced compounds from a patient's blood. The STARS technology utilises a filtration cartridge designed for use in a standard dialysis machine, and contains aptamer-coated microparticles that bind to specific agents in circulating blood for targeted removal.
- In September 2020, the Kyungpook National University (KNU) devised a novel method to detect key biomarker proteins associated with colorectal cancer. One of the biomarkers found in high concentrations in the blood plasma of patients with colorectal cancer is heterogeneous nuclear ribonucleoprotein A1 (hnRNP A1). The scientists at KNU used an aptamer and an antibody to bind to the hnRNP A1 protein, forming a 'sandwich complex' that can be easily detected on the sensing platform, thus ensuring effective diagnosis and timely treatment.

Aptamers may also serve as drug carriers or nanoparticles that facilitate the release of drugs in specific target regions. Their target-specific binding properties, combined with less off-target toxicity effects, offer a plethora of opportunities for novel drug discovery and delivery.

High number of COVID-19 cases in middle-income countries is an opportunity for Achiko

With over 31 million cases and about 974,000 deaths so far, the COVID-19 pandemic has had a devastating impact across the globe. Middle-income countries currently top the list of total COVID-19 cases, primarily driven by rising incidences in India and Brazil (Figure 8). Globally, among the top 10 countries in the COVID-19 tally, all countries except the US and Spain belong to the middle-income category. India and Brazil have now emerged as the countries with the second- and third-highest cumulative COVID-19 cases, respectively. Notably, in the middle-income category, India, Brazil and Russia have surpassed ~5.6 million, ~4.5 million and ~1.1 million cases, respectively, so far, contributing the most to the global count of cases. Further, in Brazil, the infection rate stands high at 2.2%, while this is on the lower side for Russia (0.8%) and India (0.4%) – at least till date.

The testing rate is being ramped up in several middle-income countries, including India and Indonesia

With testing being ramped up in several middle-income countries, reported COVID-19 cases are expected to rise in these regions. The testing capacity in India has significantly surged to over 1 million tests daily, compared with 4,000 samples at the start of April. Likewise, the Government of Indonesia, the fourth-most populous country in the world, aims to increase the PCR testing rate by improving its laboratories' testing capacity. Indonesia has registered ~0.25 million COVID-19 cases and 9,837 deaths so far. New COVID-19 cases are still on the rise in the country, as it has recently reported a new daily record with each subsequent day, currently hovering at ~4,500.

Relatively stronger recovery rate in middle-income Asian countries

While India is currently ranked second in the COVID-19 tally, the death rate stands at ~1.6%, far lower than the world average. The mortality situation is, however, very different in Latin American countries with the average death rate in these countries being above the 3% level. The situation remains

worrisome in Mexico with a death rate of 10.5%, and Brazil with a death rate of 3%. The death rate in even smaller countries such as Peru and Colombia stands at 4.1% and 3.2%, respectively.

Similarly, the overall mortality rate has been high in developed countries, largely driven by Italy, the UK, France and Spain. While the US has reported the highest number of COVID-19 deaths (over 200,000) so far, its death rate at ~3% (Figure 9) is better than several European countries. In the recent past, the infection rate has stabilised or declined in high-income countries, including the US and European countries, but that does not seem to be the trend for most middle-income countries.

Another important observation is that low-income countries appear to be less impacted by the COVID-19 pandemic till date, as both the total number of cases and death rate are on the lower side compared with high- and middle-income countries. However, this could be a function of lower reporting of cases as these countries have limited testing infrastructure. There is also a possibility that the COVID-19 pandemic wave may still be in an early stage in these countries.

Figure 8: Average COVID-19 cases (million, ls) and infection rate (%, rs)

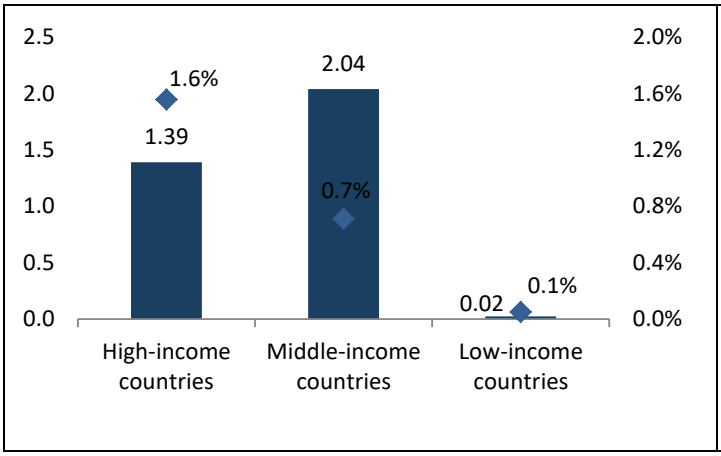
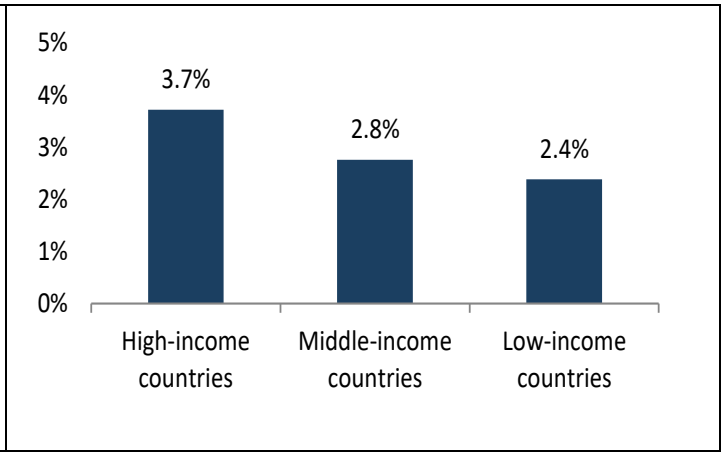


Figure 9: Average COVID-19 mortality rate



Note: For our analysis, we have considered the top seven countries by COVID-19 cases in each category – high (US, Spain, France, Chile, UK, Saudi Arabia and Italy), middle (India, Brazil, Russia, Colombia, Peru, Mexico and South Africa) and low-income (Ethiopia, Afghanistan, Madagascar, Sudan, Democratic Republic of the Congo, Guinea and Tajikistan)

Source: worldometers.info; Data as of 22 September 2020

Valuing Achiko

We value Achiko on a probability-weighted risk adjusted DCF basis at CHF 1.63 per share base case and CHF 3.48 per share bull case.

Addressable Markets

We apply a top-down approach to forecast sales revenues of Gumnuts and Teman Sehat when and if they get commercialised. We forecast future sales volume by estimating the size of the respective user group and the potential market penetration of each product.

In terms of user group, we extract it from the mass population of a country. For instance, for Indonesia, our estimated testing volumes for Gumnuts are derived by first determining the current population size of the country, and then applying a smartphone penetration rate to extrapolate smartphone users in the country. We model the sales volumes for Teman Sehat to be perfectly correlated to Gumnuts as users will need to undergo Gumnuts testing in order to effectively use the Teman Sehat smartphone-based contact tracing app.

Rolling forward, we progressively increase population size and smartphone penetration to factor in population growth and technological advancement. Based off this scope, we then apply it to our expanded geographical markets including India, Philippines, Brazil and Argentina where the Gumnuts and Teman Sehat technologies can be potentially deployed and rolled out.

Market Shares

On market shares, we conservatively estimate Gumnuts and Teman Sehat will eventually capture 30% base case and 50% optimistic case of their respective addressable markets. Our market share assumptions consider the presence of a competitive COVID-19 testing market as several testing options are already on the market now. However, as discussed in our evaluation report, our view is that the Gumnuts technology represents a superior solution to the current testing options, which we think will help drive up its adoption rate across the end markets, should its clinical testing results prove to be positive.

Explicit Forecast Period

We assume around 10 years of commercial exclusivity for both Gumnuts and Teman Sehat with no follow-on revenues. We expect Achiko to be able to offer both products commercially by early 2021.

For 2021, our model considers only Indonesia, India and Philippines as end-markets. Post 2021, we assume Achiko to also tap into other Latin America countries such as Brazil and Argentina. Our revenue model by geography for the 2021 to 2025 period is mapped out in Figure 12, of which India is expected to be the largest contributor to the group revenue due to its highest population density.

As pharmaceutical companies world-wide are working relentlessly to develop a viable COVID-19 vaccine, we conservatively assume that the vaccine will be available and widely distributed to the global markets by 2023. Thereafter, we expect Achiko to continue to deploy their Gumnuts and Teman Sehat technologies on many other infectious diseases, such as dengue, tuberculosis and various forms of cancer. As mentioned in our evaluation report, we expect Achiko will start building out a pipeline of Gumnuts-based diagnostics once its COVID-19 testing has been approved and rolled out.

Our other valuation assumptions are set out as below:

- **Discount rate**. Our discount rate is set at 16% to price in the high-risk nature of biotechnology development story[10].
- **Probability factor**. As Gumnuts is yet to commence clinical trials, we factor in a 30% probability of obtaining its first regulatory approval for a COVID-19 diagnostic. This should allow for the appropriate de-risking of our projected cashflows. When and if Achiko obtains clinical approval, we will increase our probability factor accordingly.
- **Pricing**. We tentatively assume US$1.00 per Gumnuts testing and US$1.50 per user for the Teman Sehat contacting tracing app. We note however that these pricing points may vary among our targeted markets as Achiko will give preferential pricing to jurisdictions where both the Gumnuts and Teman Sehat systems are deployed.
- **Gross margin**. Our model factors in a gross margin of 66.9%, in line with the industry average for biotechnology companies.
- **Cash operating cost**. We assume future cash operating costs to comprise approximately 40% of sales revenue, which include continuous R&D expenses for developing a pipeline of Gumnuts-based diagnostics for use post COVID.
- **Tax**. Our corporate tax rate is set at 30%.

Figure 10 shows our key DCF assumptions.

Figure 10: DCF assumptions

DCF Assumptions	Base Case	Bull Case
Estimated population size (M)		
Indonesia	274	274
India	1,383	1,383
Philippines	110	110
Brazil	213	213
Argentina	45	45
Smartphone penetration (%)		
Indonesia	31%	31%
India	37%	37%
Philippines	34%	34%
Brazil	46%	46%
Argentina	47%	47%
Population Growth Factor (%)	1.05%	1.05%
Smartphone User Growth (%)	3.00%	3.00%
Avg. Gumnuts Pricing per test (US$)	1.00	1.50
Avg. Teman Sehat App Fee per user (US$)	1.50	2.00
Gross margin (% Sales Revenue)	67%	67%
Cash operating costs (% Sales Revenue)	40%	40%
Probability Factor	30%	30%
Discount rate	16%	16%
Tax rate	30%	30%

Source: Pitt Street Research

[10] 16% WACC would represent a risk-free rate of 4%, a market risk premium 8.5%, and a beta of 1.4.

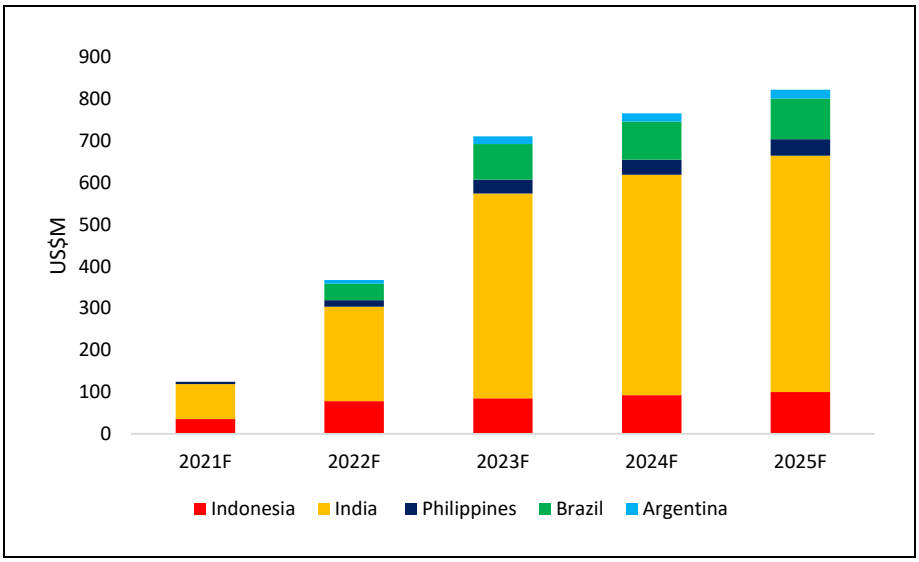
Figure 11 shows our DCF valuation summary.

Figure 11: DCF valuation summary

Gumnuts & Teman Sehat Valuation	Base Case	Bull Case
NPV (US$M)	322	685
Risk Factor	50%	50%
rNPV (US$M)	161	342
CHF/USD	0.91	0.91
rNPV (CHF M)	**146**	**311**
Shares outstanding (M)	89.6	89.6
Implied Price (CHF)	**1.63**	**3.48**
Current Price (CHF)	0.46	0.46
Upside (%)	*255%*	*656%*

Source: Pitt Street Research

Figure 12: Revenue split by geography, actual and forecasts



Source: Pitt Street Research

Re-rating

We see a number of factors contributing to a re-rating of Achiko towards our valuation range:

- Positive clinical trial results for Gumnuts;
- Announcements of new Teman Sehat implantations in Indonesia;
- Announcement of contract manufacturer for Gumnuts Covid-19 test;
- Development of new Teman Sehat ecosystems for other markets; and
- Development of new Gumnuts tests.

Risks

Risks specific to Achiko. We see five major risks for Achiko as a company and as an investment;

- **Timing risk**. There is the risk that Achiko may take longer to develop and clinically study products than the time we have postulated in this note.
- **Clinical risk.** There is the risk that Achiko' clinical trials may miss its primary or secondary endpoints.
- **Regulatory risk**. There is the risk that regulators may decline to approve those products even if Achiko consider the data submitted to be adequate.
- **Funding risk.** Achiko is publicly traded on the SIX Swiss Stock Exchange but may still find capital raising hard in the event it does not execute as well as investors had hoped in previous rounds.
- **Commercial risk**. There is the risk that Achiko's products may fail to be taken up by clinicians due to lack of reimbursement or other clinical concerns.

Risks related to pre-revenue Life Science companies in general.

- The stocks of biotechnology and medical device companies without revenue streams from product sales or ongoing service revenue should always be regarded as speculative in character.
- The fact that the intellectual property base of most biotechnology and medical device lies in science not generally regarded as accessible to the layman adds further to the riskiness with which the sector ought to be regarded.

Caveat emptor. Investors are advised to be cognisant of the abovementioned specific and general risks before buying any the stock of any biotechnology and medical device stock mentioned on this report, including Achiko.

Appendix I - Background on aptamers

Aptamers are small pieces of DNA or RNA with the capacity to bind biological targets of interest. Specifically, they are short, single-stranded oligonucleotides of perhaps 20 to 60 nucleotides in length. Aptamers have long been of interest to the biotechnology industry due to the ability to bond all sorts of targets, including proteins, peptides, carbohydrates and small molecules, with high affinity and specificity. To understand aptamers, it's first necessary to understand the nucleic acids, that is, DNA and RNA.

DNA is the code of life, RNA is its messenger. Inside the cell of just about every living being is a complicated molecule known as DNA. Short for deoxyribonucleic acid, DNA is the body's 'operating system' in that it houses all the instructions to create the body. The physical shape of DNA, which we've known about since Watson and Crick's famous 1953 discovery, is a long, long string of what are called 'base pairs' in the form of a 'double helix', that is, two curves twisting around the same cylinder. A 'base' in DNA is one of four substances – adenine, thymine guanine and cytosine. Mix any of these four with sugar and phosphate and attach it to one of the two invisible DNA 'strands' (known in the trade as the 'phospho-diester backbone') and you've got one of the pairs. To complete the base pairing simply place, on another strand and opposite the aforementioned base, another base made up of thymine if you originally used adenine (and vice versa), guanine if you used cytosine (and vice versa). Now repeat this for as long a 'ladder' as is required to complete the code for the species you wish to create, and you've got DNA. RNA, short for ribonucleic acid, is the photocopier of DNA, copying individual strands of DNA and taking it to the 'ribosomes', the body's protein making factories, where the protein for which the DNA coded is 'expressed'. In DNA and RNA a 'nucleotide' is the base plus the requisite sugar and phosphate.

Oligonucleotides are simply short strings of DNA and RNA, the name being derived from the Greek word *oligos*, meaning, little, small, few. One of the early, and indeed revolutionary, capabilities developed by the biotechnology industry in the 1970s and 1980s was the ability to easily and inexpensively assemble oligonucleotides, so as to be able to genetically engineer all sorts of useful products. Aptamers were invented in the early 1990s, when scientists at the University of Colorado developed a process called SELEX[11] to sort through a large library of oligonucleotides and pick the ones that best bound targets of interest[12].

Aptamers potentially make great diagnostics because they can be engineered using SELEX to be highly stable as well as high binding affinity for the target of interest, while they are easier and cheaper to make than monoclonal antibodies, until recently the 'gold standard' for diagnostics[13].

[11] Systematic Evolution of Ligands by EXponential enrichment.
[12] Science. 1990 Aug 3;249(4968):505-10.
[13] Acta Naturae. 2013 Oct-Dec; 5(4): 34–43.

Appendix II – Recent announcements

- **27/7/2020 -** Initial rollout to Pekanbaru and hospitals.
- **29/7/2020 -** Steven Goh appointed as CEO and Ruediger Petrikowski as CFO. Issuance of 10.8m shares to MNC, small financiers and a convertible note to NEGMA (market based) for US$2m.
- **19/8/2020 -** Completion of laboratory testing and provisional patent filing in Australia for Gumnuts.
- **20/8/2020 -** Expansion to hotels, theme parks, markets, etc. Now including payments.

Appendix III – Capital structure

- 89.6m shares
- 9.0m shares (non-redeemable, convertible notes)
- 13.4m options

Appendix IV – Major shareholders

Achiko's major shareholders are mostly based in Asia (68%) with the remainder divided between Europe (16%), Australia (15%) and elsewhere (1%)

- **Founders and management** (25%)
- **MNC Group** (10%) **-** MNC[14], founded by Hary Tanoesoedibjo[15] and based in Jakarta, is the largest media company in Southeast Asia
- **MOX (**1%) **-** MOX, Short for 'Mobile Only Accelerator'[16], is a global accelerator for cross-border mobile internet. It is based in Princeton, NJ and is operated by the venture capital firm SOSV[17].

[14] mnc.co.id/en.
[15] forbes.com/profile/hary-tanoesoedibjo.
[16] mobileonlyx.com.
[17] sosv.com.

Appendix V – Analyst Qualifications

Stuart Roberts, lead analyst on this report, has been an equities analyst since 2002.

- Stuart obtained a Master of Applied Finance and Investment from the Securities Institute of Australia in 2002. Previously, from the Securities Institute of Australia, he obtained a Certificate of Financial Markets (1994) and a Graduate Diploma in Finance and Investment (1999).
- Stuart joined Southern Cross Equities as an equities analyst in April 2001. From February 2002 to July 2013, his research speciality at Southern Cross Equities and its acquirer, Bell Potter Securities, was Healthcare and Biotechnology. During this time, he covered a variety of established healthcare companies, such as CSL, Cochlear and Resmed, as well as numerous emerging companies. Stuart was a Healthcare and Biotechnology analyst at Baillieu Holst from October 2013 to January 2015.
- After 15 months over 2015–2016 doing Investor Relations for two ASX-listed cancer drug developers, Stuart founded NDF Research in May 2016 to provide issuer-sponsored equity research on ASX-listed Life Sciences companies.
- In July 2016, with Marc Kennis, Stuart co-founded Pitt Street Research Pty Ltd, which provides issuer-sponsored research on ASX-listed companies across the entire market, including Life Sciences companies.
- Since 2018, Stuart has led Pitt Street Research's Resources Sector franchise, spearheading research on both mining and energy companies.

Cheng Ge is an equities research analyst at Pitt Street Research.

- Cheng obtained a B.Com in Finance and LL.B from University of New South Wales, in 2013, and has passed all three levels of the CFA Program.
- Prior to joining Pitt Street Research, he has worked for several financial services firms in Sydney, where his focus was on financial advice.
- He joined Pitt Street Research in January 2020.

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