

## Better Covid-19 testing

31 August 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 an elegant way to do Covid-19 contact tracing. This was followed by 'Gumnuts', which, while not a software product, represents a potential step-change in terms of Covid-19 testing. We summarised the various reasons one should look at this stock on page 2 of this report.

Sector: Technology

### A potential contract tracing standard

Teman Sehat, Indonesian for 'health buddy', is a downloadable app that allows individuals and businesses to be able to better manage their Covid-19 risk. It is now being rolled out in Indonesia. We see potential for Teman Sehat to become the contact tracing standard for Indonesia, and beyond that to other emerging countries.

### Better Covid-19 testing than what's out there

The Gumnuts technology, which originated from the laboratory of Dr Michael Edel at the University of Barcelona, allows very rapid and low cost detection of viruses and bacteria from saliva using DNA aptamers. A Covid-19 diagnostic has been developed from the technology and will be enter the clinic shortly. Achiko expects to be able to offer the diagnostic commercially before the end of 2020.

### Low cost frequent testing plus contract tracing is a powerful combination

The low cost and convenience of Gumnuts 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 be a virtual re-opening of economies even as badly impacted as the city of Melbourne in its July-August 2020 lockdown.

### Upside from here

We see the potential for the Gumnuts technology to rapidly deliver shareholder value as it proceeds into clinical testing, at the same time as Teman Sehat continues its rollout in Indonesia and to the rest of the world.



*"We believe that mass testing of whole populations for Covid-19 infection can become possible with our diagnostic at very low cost, allowing a way through this pressing health Crisis for emerging countries the world over"*

- Steven Goh, CEO of Achiko

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## Seven reasons to look at Achiko

1. Achiko's Teman Sehat Swarm-style mobile ecosystem is potentially the natural contact tracing 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-19 diagnostic in Gumnuts than what is currently being used in terms of cost and patient convenience.
4. Gumnuts will be in the clinic shortly, with the trial sites currently being prepared.
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.



## 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<sup>1</sup>. 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 potential 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, based at the University of Barcelona, 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.

## Teman Sehat represents a viable Covid-19 contact tracing solution for a large emerging country

**An ongoing obstacle to managing the Covid-19 pandemic is contact tracing.** As widely understood today, Covid-19 has a 5-6 day incubation period whereby the infected patient does not exhibit symptoms, but is still contagious<sup>2</sup>. This is why authorities in most countries have instituted systems allowing for contact tracing when a person tests positive for the virus. Once it is established that other people have had contact with the infected person, those people are generally ordered into quarantine of some kind.

**Contact tracing in Western countries is progressively becoming digital.** At the beginning of the pandemic, contact tracing was done manually, with health workers using detective-style skills to establish a chain of contacts<sup>3</sup>. As the pandemic has progressed, the level of sophistication has improved, with

<sup>1</sup> 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.

<sup>2</sup> Source: World Health Organisation, *Report of the WHO-China Joint Mission on Coronavirus Disease 2019 (COVID-19)*, 16-24 February 2020.

<sup>3</sup> See, for example, *Life as a Covid-19 contact tracer: sleuthing, stress, and veering off-script* by Suzanne Sataline, Stat News, 18 May 2020.



*Teman Sehat is potentially the natural contact tracing app for both developed and developing markets*

many public places such as cafes and bars allowing patrons to check in via a QR Code connected to an app or a website. So far, the next level, where contact tracing is more-or-less automated via smartphones, has proven elusive. Australian readers will recall that early in the pandemic their government spent about A\$2m to develop the COVIDSafe app, now widely regarded by the public as a failure<sup>4</sup> even after in excess of 7 million downloads<sup>5</sup>. With Apple and Google collaboratively developing their own contact-tracing technology<sup>6</sup> we see better systems emerging in the near future.

**Teman Sehat is potentially the natural contact tracing app for both developed and developing markets.** Teman Sehat is Indonesian for 'health buddy'. It's an app similar to Swarm<sup>7</sup>, the check-in app from the American company Foursquare<sup>8</sup>, whose location technology platform has become a social media mainstay in recent years. Users download the app from Google Play or the temansehat.co web site. Teman Sehat allows public places such as shopping malls to help pay for testing and to bias traffic towards safe zones. Users check into places in exchange for rewards. If a person has had a recent Covid-19 test, then that user has a 'passport' to progress to a place where the test is valuable. This allows Achiko to both create safety bubbles of similarly tested people, and to connect the dots between paying for a test and where the test is valuable as well. Where implemented, the company intends to make this compliant with GDPR<sup>9</sup>. Teman Sehat differs from contact tracing apps used elsewhere is that Achiko has 'gamified' the ecosystem, allowing businesses to provide rewards and coupons to users as a way to promote app downloads and registrations.

**Achiko has initially launched Teman Sehat in Pekanbaru.** This relatively small city, with a metro area of just over 1 million people, is capital of Riau province in the eastern part of the island of Sumatra. Launching in Pekanbaru allows Achiko to beta test the Teman Sehat ecosystem before it moves it to bigger cities such as Bandung and from there to the massive opportunity in Jabodetabek<sup>10</sup> with its 30-40 million people.

**Indonesia's Covid-19 curve has yet to flatten.** While globally the number of new Covid-19 cases seemed to be flattening by late July, in Indonesia the curve has only continued to rise. The country has so far recorded about 158,000 cases and close to 7,000 deaths<sup>11</sup>. While Indonesia is still only about No. 45 on the list of countries with large levels of Covid-19 infections, as at late August 2020 it was registering in excess of 2,000 new cases of the virus daily.

**Should Teman Sehat enjoy widespread uptake, initially in Indonesia, we expect the company to quickly secure and roll out across other countries.** In this case, the commercial upside could be extremely significant for Achiko. Indonesia is the fourth-most populous nation on Earth and the seventh-largest national economy, with an estimated mid-2020 population of 267 million and GDP of US\$3.25 trillion<sup>12</sup>. As well as the gigantic Jakarta metropolitan area with its more than 30 million people, and Bandung and

<sup>4</sup> The app was released on 26 April 2020. The big problem with COVIDSafe is that the iOS version of the app wouldn't work when it was closed or the screen of the iPhone was locked...in addition to compatibility issues between iOS and Android phones in terms of the phones swapping data through the app. See *The COVIDSafe app: Just another expensive fail?* by Sonic Hickey, The Big Smoke Australia, 12 August 2020.

<sup>5</sup> Source: Digital Transformation Agency press release dated 25 August 2020 and headlined 'COVIDSafe helps slow the spread of COVID-19'.

<sup>6</sup> See *Apple And Google Covid-19 Tracking Apps—Now On U.S. Phones* by Zak Doffman, Forbes, 22 August 2020.

<sup>7</sup> swarmapp.com.

<sup>8</sup> foursquare.com.

<sup>9</sup> GDPR is the General Data Protection Regulation, a regulation in EU law on data protection and privacy that was announced in April 2016 and implemented in May 2018.

<sup>10</sup> That is, Jakarta, Bogor, Depok, Tangerang and Bekasi, the five main urban areas that make up greater Jakarta.

<sup>11</sup> [google.com/search?q=indonesia+covid+case](https://www.google.com/search?q=indonesia+covid+case), accessed 26 August 2020.

<sup>12</sup> Source: CIA World Factbook – GDP is Purchasing Power Parity.



*Beyond Indonesia, there are other markets where Tehan Semat can be deployed*

Surabaya with 7 million and 6.5 million people respectively, there are 11 other metro areas with more than 1 million people each<sup>13</sup>. Those 267 million people that make up Indonesia represent a lot of potential contact tracing, most of which can notionally be done using the smartphones carried by an estimated 70% of the population<sup>14</sup>.

**Beyond Indonesia, there are many other markets where Tehan Semat can be deployed.** Basically, any emerging country with high enough levels of smartphone ownership, and where smartphone-based contact tracing systems have not been rolled out, is ready for Achiko's ecosystem. In Asia, Achiko is looking in particular at the Philippines and India. Many African and Latin American countries are also of interest. Achiko's ambition for Teman Sehat (the name will be localised in other markets), is for it to become the diagnostics infrastructure of choice for infectious diseases whenever the next Pandemic occurs. Achiko can supply either Gumnuts or Tehan Semat but will give preferential pricing to jurisdictions where both systems are deployed.

## Gumnuts represents a better diagnostic testing product for Covid-19

**Achiko is developing a better Covid-19 diagnostic with 'Gumnuts'.** Achiko has secured the sole commercialization rights to Gumnuts, a DNA aptamer bound to nanoparticles for Covid-19 testing. This represents a breakthrough in testing technology and takes a leap away from current testing modalities such as PCR/RT-PCR, LAMP<sup>15</sup>, and antigen testing. Mainstream testing technologies for Covid-19 are, by design, dependent on hardware and reagents, or in the case of antigen testing there are design issues with the active testing materials. If it is successful with its aptamer-based approach, Achiko believes it is possible to scale almost indefinitely with what may be a test kit that is saliva-based. The material costs may be less than USD\$0.25 per test with delivery of results in minutes. Clinical trials are expected to commence shortly, with initial results expected in mid-September. The pathway to commercialization will be through control of production, licensing and pre-sales.

**Gumnuts is based on DNA aptamers.** In biotechnology when people say 'aptamers' they generally mean small pieces of DNA capable of binding a target molecule with high affinity and specificity. To be more specific, an aptamer is a short single-stranded oligonucleotide, so it can be either DNA or its RNA counterpart, but using only one side of the usual double-strands that make up the double helix we're all familiar with. Science has known for many years that aptamers can make great diagnostics because they are easier and cheaper to make than antibodies, are chemically robust, and are neither immunogenic nor toxic. We look in more detail at the science of aptamers in Appendix I below.

**Gumnuts is simply DNA aptamers that can bind to conserved parts of the Covid-19 virus, conjugated to gold nanoparticles for easy detection.** Gumnuts originated in the laboratory of Dr Michael Edel, an Australian national who researches stem cells at the University of Barcelona<sup>16</sup>. When Covid-19 emerged as a global public health issue Edel and various collaborators realised that aptamers to Covid-19 would make an ideal

<sup>13</sup> Medan, Semarang, Makassar, Palembang, Yogyakarta, Malang, Denpasar, Batam, Pekanbaru, Surakarta and Cirebon.

<sup>14</sup> Source: Statista, *Smartphone penetration as share of population in Indonesia 2015-2025*.

<sup>15</sup> Loop-mediated isothermal amplification, a nucleic acid amplification technique known for its low cost.

<sup>16</sup> [neurociencias.ub.edu/michael-edel](http://neurociencias.ub.edu/michael-edel).



*Clinical trials of Gumnuts will commence shortly, with a view to rapid approval.*

diagnostic. They developed a library of them and selected the sequences with the highest affinity binding. They used gold particles so that the aptamers could be detected using low-cost colorimetric tools. Edel and his colleagues set up a company around the project called Regenacellx.sl<sup>17</sup> and filed for provisional patent protection over the technology<sup>18</sup>. Achiko has licensed the commercial rights from Regenacellx.sl.

**Clinical trials of Gumnuts will commence shortly, with a view to rapid approval.** Trial sites have been selected in Indonesia and elsewhere for Gumnuts and recruitment is expected to commence shortly. Achiko expects to gain its first regulatory approval for a Covid-19 diagnostic before the end of 2020. Currently, the company is selecting manufacturers as well as distribution partners. As we noted above, the technology around Gumnuts is now patent pending, meaning that the lab work has been completed and the product works *in vitro*. As for approval, the 2015 promulgation of the ASEAN Medical Device Directive suggests it can be rolled out quickly in multiple Asian jurisdictions<sup>19</sup>.

**There are drawbacks with the testing options that are available now.** There are two main ways that doctors currently test for Covid-19. One is RT-PCR and the other is antibody-based testing. **RT-PCR** stands for 'Reverse Transcription - Polymerase Chain Reaction'. It involves a swab taken from inside the mouth or nose and then using standard methods of nucleic acid detection<sup>20</sup> to find the RNA of the virus. The trouble with RT-PCR is that it can be expensive compared to other kinds of diagnostics, takes time to yield results, and needs specialised equipment and trained technicians. **Antibody-based testing** involves coating a test tube with virus particles and then seeing if antibodies in the virus are present in a blood sample from the patient. The trouble with antibody-based testing is that it can miss the infection cycle, and there are also accuracy issues<sup>21</sup>. We've all heard about two major drawbacks of current testing regimens - that it takes a while for test results to come back whether it's RT-PCR or antibody-based, and that, for RT-PCR, the swabs required are so far up the nasal cavity that this highly invasive procedure can be uncomfortable or downright painful<sup>22</sup>.

**Gumnuts represents a superior solution to what's available now.** DNA aptamers are known to be stable, with a long shelf life at room temperature<sup>23</sup>. Also, as the science of making oligonucleotides has improved over time the cost has dropped dramatically, to the point where Achiko believes that the cost of one of their tests may be able to come in for under US\$1.00 (and possibly under US\$0.25 in the long run). The speed is comparable to a conventional lateral flow diagnostic<sup>24</sup> (ie results in minutes). Finally, the high affinity binding means that simply sourcing virus from saliva will do, making

<sup>17</sup> regenacellx.com.

<sup>18</sup> See the Achiko press release dated 19 August 2020 and headlined 'Achiko Announces Provisional Patent Filing for Novel Low-Cost Saliva Covid-19 Test Kit'.

<sup>19</sup> ASEAN is the Association of South East Asian Nations (asean.org), founded in 1967. It current consists of Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand and Vietnam. The Medical Device Directive means a common regulatory platform for medical devices across the region.

<sup>20</sup> That is, the science of which won Cary Mullis the Nobel Prize for Medicine in 1993 and created the whole field of DNA testing. The Polymerase Chain Reaction is a 'method of DNA photocopying' that scientists use to enlarge the size of a DNA sample so as to be able to adequately analyse it. Scientists frequently need to amplify DNA because often in a sample they haven't got enough to work with. Polymerase is an enzyme common to most life forms that can copy genetic material. In PCR the lab worker blocks out the portion of the DNA that he's interested in amplifying by attaching 'primers' of DNA material to the DNA either side of the area of interest, and then heats the DNA until the two strands of DNA in the sample split apart. The scientist then adds polymerase, whose role is to synthesise the DNA on each strand within the area of interest, thereby creating two copies where there had been only one before, a process that only takes a few minutes. Since anything that doubles continually quickly becomes massive before too many doublings, the scientist can have millions of copies of the DNA he's interested in available within the hour. Generally the polymerase used is 'Taq DNA polymerase' because PCR needs a polymerase that can withstand high temperatures, and the ideal polymerase has proved to be that synthesised from a small organism which proliferates in hot springs called *Thermus Aquaticus*, or 'Taq' for short. RT-PCR is based on PCR, but the aim is to expand RNA, not DNA

<sup>21</sup> See, for example, *Why can't we use antibody tests for diagnosing COVID-19 yet?* by Lucy Nicholson, *The Conversation* 14 May 2020.

<sup>22</sup> See *Why Some People's Covid-19 Tests Hurt More Than Others* by Eleanor Cummins, *Elemental*, 4 August 2020.

<sup>23</sup> *Proteomics Clin Appl.* 2012 Dec; 6(0): 563-573.

<sup>24</sup> Lateral flow immunochromatography is the technology that goes into most hand-held single use test kits for particular biological conditions, such as home pregnancy tests. Such tests are immunochromatographic in the sense that they rely on colour to allow the user to read a positive or negative result on the test (*khroma* being the Greek word for colour).



*After Covid-19, there are many other infectious diseases to which Gumnuts could be applied*

for an easy and non-invasive cheek swab. And, importantly, 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 could have particular significance in Indonesia and other developing countries.** If the Gumnuts Covid-19 diagnostic product is sufficiently inexpensive so that the Indonesian government can afford to do mass screening, much as South Korea did early on<sup>25</sup>, the potential upside for Achiko is significant, because the testing would naturally interface with the Teman Sehat app, resulting in highly efficient contact tracing to allow authorities to flatten the curve ahead of the arrival of the first Covid-19 vaccines<sup>26</sup>.

**After Covid-19, there are many other infectious diseases to which Gumnuts could be applied**, such as, for example, dengue, tuberculosis, and various forms of cancer. We expect that Achiko will start building out a pipeline of Gumnut-based diagnostics once the Covid-19 product has been approved and is starting to roll out.

**The Gumnuts team consists of a solid scientific team**, featuring, alongside Michael Edel:

- **Dr Thomas Pouplin**, a pharmacologist at the Mahidol-Oxford Tropical Medicine Research Unit in Thailand<sup>27</sup>, whose speciality is bioanalytical methodologies to evaluate drug quality.
- **Dr Jittaporn Wattanaseree**, a regulatory specialist based in Bangkok.
- **Dr Joalin Lim**, a Singapore-based clinical research consultant.

## Potential upcoming news flow

- Announcements of new Teman Sehat implantations in Indonesia.
- Announcement of contract manufacturer for Gumnuts Covid-19 test.
- Commencement of clinical studies for Gumnuts.
- Development of new Teman Sehat ecosystems for other markets.
- Publication of Gumnuts data and science in peer-reviewed publications.
- Development of new Gumnuts tests.
- More patent filings related to Gumnuts.

<sup>25</sup> See *Seoul's Full Cafes, Apple Store Lines Show Mass Testing Success* by Kanga Kong, Bloomberg, 18 April 2020.

<sup>26</sup> Indonesia has already negotiated access to vaccine candidates -see *Indonesia secures massive supply of potential COVID-19 vaccine until end of 2021* by Dian Septiari, The Jakarta Post, 25 August 2020.

<sup>27</sup> A collaboration between the University of Oxford and Thailand's Mahidol University.



## 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 photocopy 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<sup>28</sup> to sort through a large library of oligonucleotides and pick the ones that best bound targets of interest<sup>29</sup>.

**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<sup>30</sup>.

<sup>28</sup> Systematic Evolution of Ligands by EXponential enrichment.

<sup>29</sup> Science. 1990 Aug 3;249(4968):505-10.

<sup>30</sup> 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

- 100.8m shares
- 8,963,214 shares (non-redeemable, convertible notes)
- 13,448,821 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<sup>31</sup>, founded by Hary Tanoesoedibjo<sup>32</sup> and based in Jakarta, is the largest media company in Southeast Asia
- **MOX (1%)** - MOX, Short for 'Mobile Only Accelerator'<sup>33</sup>, is a global accelerator for cross-border mobile internet. It is based in Princeton, NJ and is operated by the venture capital firm SOSV<sup>34</sup>.

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<sup>31</sup> mnc.co.id/en.

<sup>32</sup> forbes.com/profile/hary-tanoesoedibjo.

<sup>33</sup> mobileonlyx.com.

<sup>34</sup> sosv.com.



Figure 1: Achiko share price on the SIX Swiss Stock Exchange since listing



Source: Yahoo Finance



## The 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.

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