



安侯建業

Taiwan investing survey in Digital Health

2021

Foreword

As technology and healthcare are interlinked, new technologies will lead the biotechnology industry into a new era and enhance its competitiveness. In Taiwan, we've seen many leading technology companies joining the biotech industry in recent years and applying their own technology to create new values. Despite the chaos it caused, the pandemic had the effect of advancing biomedicine and facilitating the development of digital health, which is expected to attract much investment in the future. KPMG has long followed global trends in industrial integration and transformation, and we provide services for both ICT and Biotech giants in the world. For them, we offer cross-industry services to assist in company expansion.

In recent years, government policy and the tax incentives both encouraged healthcare and technology integration, and many enterprises have become more pro-active in making such moves. In this report, KPMG dives into the tech industry's investment allocation and development in the Biomedical industry.

We present both qualitative interviews and quantitative survey in this report; in addition to interviewing eight experts from enterprises that have invested in medical technology, we also commissioned China Credit Information Service, Ltd. to conduct a survey to analyze domestic technology giants' investment trends in and give us a market overview. We discovered changes in the development of digital health: current focuses are on improving the current healthcare environment and emphasizing prevention; diagnostics & testing, telemedicine, and healthcare are the most promising investment trends.

Digital health, healthcare data analysis and application of medical statistics will not only change healthcare behaviors inside medical institutions, but also will expand the definition of healthcare from actions of care to a holistic health and welfare industry. KPMG will be working with the technology and healthcare industries to face the new norms of the post-pandemic era and carry out the next wave of the digital health revolution.



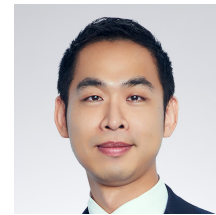
Astor Kou
Co-Head of Healthcare
& Life Science Service
KPMG in Taiwan



Jarret Su
Co-Head of Healthcare
& Life Science Service
KPMG in Taiwan



Lillian Lien
Head of Technology,
Media &
Telecommunications
KPMG in Taiwan



Archie Cheng
Deputy Head of
Technology, Media &
Telecommunications
KPMG in Taiwan

Introduction

As technology and biomedicine complement each other, they can increase the value and benefits created by the whole industry

In recent years, in the wake of 5G, AI, and big data, intellectualization for biomedical industry has also become one of the corporation's strategy; in addition, as Taiwan gradually becomes an Aged society country, we will see an ever-greater healthcare demand, and emerging technologies will help to speed up the development of the biomedical industry. This is the reason why many tech giants have joined the biomedical industry and are expanding the scope of their research & development and using innovative business models to create new products for the new market. This combination of technology and biomedicine increases the value of the whole industry and the benefits it creates.

Globally, there has been an increasing demand for digital health services, and the rapid development of this market is a key driver of the integration of emerging technologies and the biomedical industry, as many large enterprises and startups are working towards creating a complete industry chain. According to CB Insights statistics, investment in the biomedical industry has continued to grow in recent years and the market is extremely active. The outbreak of the pandemic speeded

up the development of newly-emergent digital health services, including remote, mobile, and virtual services, and digital health has become a highly coveted market among enterprises.¹

According to an analysis by market survey company Global Industry Analysts, the global digital healthcare market size will reach US\$ 456.9 billion in 2026 and US\$ 508.8 billion in 2027; this exponential growth shows the limitless potential of the market.² Digital health covers a broad realm, including medical equipment and assistive devices, wearable devices, medical information and telecommunication platforms, healthcare, precision medicine, biopharmaceuticals, and smart hospital solutions. How can an enterprise organize its resources to strengthen its connections with healthcare industries in Taiwan and abroad? Such is the challenge enterprises must face when establishing investment allocation strategies in order to achieve sustainable development.

KPMG invited enterprises to share insights on the domestic tech industry's deployment into the biomedical industry

KPMG has long followed issues in different industries, and provides services for technology and biomedical enterprises. We offer cross-industry services to assist in company

¹ FINDIT Taiwan Early Investment Column – Healthcare Series: *Amid the Pandemic-Driven Headwinds, Digital Healthcare Has Soared*: <https://findit.org.tw/researchPageV2.aspx?pageld=1800>

² Covid-19 Led to a Huge Amount of Investment in Digital Medicine, Reaching US\$ 456.9 B in 2026: <https://iknow.stpi.narl.org.tw/Post/Read.aspx?PostID=18023>

expansion. In recent years, we have seen a more proactive attitude in many enterprises' investment efforts; therefore, we conducted a survey to analyze trends in biomedical industry investment by large domestic technology enterprises so that we gain a solid market overview. KPMG commissioned China Credit Information Service, Ltd. to conduct the survey, and the results show that the top three choices for technology companies are medical equipment/assistive devices, wearable devices, and medical information and telecommunication platforms. Investment has mainly taken the form of capital investment and the formation of strategic alliances. In terms of the investment amount, most investments, including those already made and those in the planning stage, are under 10%, with a few reaching 11-20%. In addition, when asked about developments in technology, enterprises investing in digital health development think that healthcare (39.71%), telemedicine (32.35%), and diagnostics & testing (30.88%) are the fields with the most potential, which shows that future healthcare trends will focus on the concept of prevention. The survey report will also discuss challenges enterprises may find themselves facing and future allocation trends for enterprises to reference when formulating strategies.

In addition, in the qualitative research, KPMG interviewed scholars and senior managers from the technology and biomedical industries, who shared the challenges and opportunities they have encountered and the strategies they took. Many senior managers in the technology industry mentioned that while R & D and innovative technology applications present only minor issues, problems related to the healthcare system, the industrial ecology, and market demand need to be dealt with as

soon as possible before entering the market. Several industry professionals pointed out that a united effort is required when doing business in the domestic and foreign markets simultaneously. Enterprises need to first define the target audience for their products and services, whether hospitals, patients, or research institutions; each market has its own distinct needs for data and medical equipment. Therefore, the lack of a complete ecosystem will hinder an enterprise's development.

In an article published in *Common Wealth Magazine*, Pei-ling Liu, director of smart-life center of National Taiwan University, shared the findings of *Healthcare Weekly* and listed out five common shared her findings of five major reasons why technology companies fail in their attempt to enter the healthcare industry: 1. They have a limited understanding of the healthcare ecosystem; 2. They don't possess enough expertise of healthcare; 3. They can't respond to customers' needs in time and overlook customer relationship; 4. They don't have a well-planned strategy for entering the market; 5. They lack a good business model, a factor any enterprise should consider when entering another field.³

Methodology

For this Digital health investment Survey Report, KPMG commissioned China Credit Information Service, Ltd. to survey technology companies whose annual revenue over NT 100 Million in consecutive three years, or listed companies, and technology companies that have launched IPOs. They interviewed 101 senior managers from May to June 2021 to explore the technology industry's investment trends and development in biomedicine and its allocation in the biomedical market.

³ *Common Wealth Magazine: How Do Major Technology Companies Overcame Obstacles When Entering the Lucrative Smart Healthcare through Design Thinking?*
<https://www.cw.com.tw/article/5117774?from=search>

Contents

01	Current status of Digital Health investment	6
02	Digital Health investment overview	9
03	Investment trends in Digital Health	18
04	The pandemic's impact on the investment market	24

Current status of Digital Health investment

As the AI era arrives, technology giants have started to deploy resources in the biomedical industry

For technology giants around the world, tapping into healthcare seems to have become a key mission in terms of their business strategy. Multiple international technology companies began preparations a few years ago, including the five global tech giants Facebook, Apple, Amazon, Microsoft, and Google.⁴ In recent years, Apple has been committed to turning iPhone into a tool for researching illnesses through collecting data relevant to healthcare, illness, and diagnosis. Through 24 hours monitoring, symptoms of concussion, epilepsy, depression, and autism can be recorded and reported to industry-academia collaboration centers for research to facilitate the development of precision medicine.⁵ Microsoft uses AI, the cloud, mixed reality, and IoT to provide more thorough healthcare results in patient monitoring, clinical analysis, and genomics.⁶ In recent years, the maturing Azure Healthcare API has proved Microsoft's level of achievement in healthcare. In addition to data capturing and management, which allows users to process healthcare data in the cloud, this service also meets real-world medical needs.⁷ Amazon has also made significant strides in digital health and owns

joint venture Haven together with J.P. Morgan and Berkshire Hathaway. This non-profit entity provides healthcare products and is committed to promoting reasonable drug prices.

In terms of the development of the tech industry in Taiwan, the ICT industry holds an advantage. Many technology giants have been tapping into biomedicine for many years, including electronics companies Largan Precision Co., Ltd., Delta Electronics, Advantech Co., Ltd., and MediaTek. In the past, these companies mostly focused on the research and development of ICT medical equipment, but as AI and 5G began to show bright prospects, both the government and major enterprises recognized the great potential of Taiwan's healthcare market, and there has been an increase in potential business opportunities. According to Industrial Technology Research Institute statistics, annual revenues in Taiwan's electronic information industry amount to around US\$220 billion, accounting for 5% of the entire global market. Moreover, revenues in the Taiwanese healthcare market come to around US\$44 billion, of which only around US\$4.68 billion results from Digital Health. Therefore, there is still room for Taiwanese enterprises to bring their capabilities into play when it comes to applying their technology to the biomedical industry.⁸

⁴ FAAMG, the Five Global Technology Tycoons Branched out to Smart Healthcare, Digital Empowerment Announces the AI Era: https://ibmi.taiwan-healthcare.org/zh/news_detail.php?REFDOCTYPID=&REFDOCID=0qekgwfn89na mt55

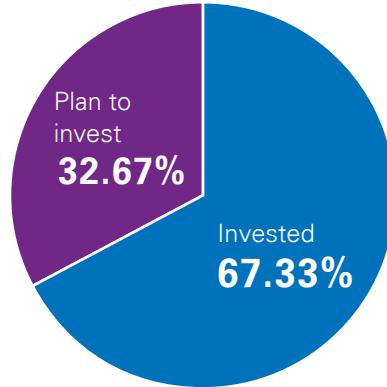
⁵ Apple: <https://www.apple.com/tw/researchkit>

⁶ Microsoft: <https://azure.microsoft.com/zh-tw/industries/healthcare>

⁷ IT Home *Microsoft Expanded Cloud Healthcare Services and Released Azure Healthcare API*: <https://www.ithome.com.tw/news/146018>

⁸ Gene Online *AI in Taiwan Should Break the Norm: Crux of the Slow Development of AI Healthcare*: <https://geneonline.news/ai-healthcare-conference>

Digital Health investment overview

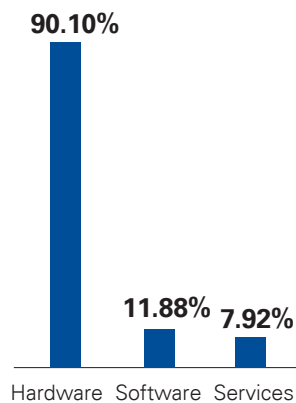


In the beginning of these surveys, about 18.46% of total companies, who respond to plan to invest or has invested in Digital Health, entered into the following valid surveys. Among valid surveys, 67.33% of companies stated they have started investing in Digital Health, and 32.67% have launched plans but have not made the move. According to the survey results, around 12.43% of large technology companies in Taiwan have invested in Digital Health, and 6.03% are planning to invest. This result shows that a considerable percentage of technology companies in Taiwan have branched out into biomedicine, and this increase in cross-industry collaboration will become a future market trend.

90% of the technology industry comprises hardware suppliers, who have branched out to healthcare to create a new industry chain

More than 90% of companies participating in this survey are suppliers of hardware including chips, screens/monitors, semi-conductors, packing components, printed circuit boards, passive components, uninterruptible power systems, laser diodes, optoelectronic devices, and quartz crystal oscillators; 11.88% of respondents are software suppliers, and service providers account for a further 7.92%.

Main service items of surveyed enterprises



In Taiwan the maturation of the domestic ICT industry chain has pushed major IC design and OEM companies to seek transformation in order to reach new markets and boost their profit margins. In the past, the healthcare industry was considered a highly specialized field with a prohibitive barrier to entry, but thanks to recent efforts in industry innovation, biomedicine is now hailed as one of the most promising industries. For example, the Wistron Group has invested in more than ten domestic and foreign healthcare startups. They drew on their strengths in software design and hardware manufacturing to pour effort into five areas of the Digital Health field including life sciences

instruments, in vitro diagnostic medical devices, optical imaging equipment, and walking assistive robots. The Wistron Group stated that though it relied on solid OEM hardware manufacturing technology to branch out to the biomedical market, what really made long-term development possible and ultimately lead to success was software applications.⁹ Just like many other major technology companies in Taiwan, Wistron first entered the healthcare OEM supply chain through products such as chips, semi-conductors, monitors, and passive components, then with the aid of software design and information services, the company was able to create new value for Digital Health.



⁹ IBMI *Zun-Dong Huang, Wistron's Medical CEO: the New Blue Ocean of Technology + Medicine*: https://ibmi.taiwan-healthcare.org/zh/news_detail.php?REFDOCTYPID=0o4dd9ctwhtywmw0&REFDOCID=0qupy8iuxtuor8cf

Digital Health investment overview

As the pandemic spread around the world in 2020, it disrupted people's lives and wreaked havoc on economies and supply chains around the world. In the face of this disaster, many large enterprises and SMEs began focusing on investing in technology and launching digital transformation, resulting in the disruptive development of emerging technology applications in traditional industries. According to a recent issue of KPMG Venture Pulse: Global Analysis of Venture Funding,¹⁰ many industries, including logistics and delivery, fintech, biomedicine, and food science & technology, are deemed promising due to the pandemic. They have attracted attention from many investors, especially those focusing on medical technology and biotechnology. In this investing survey, we specially surveyed large tech enterprises who plan to invest or have invested in biomedicine to gain an overview of biomedicine investment allocation in Taiwan.

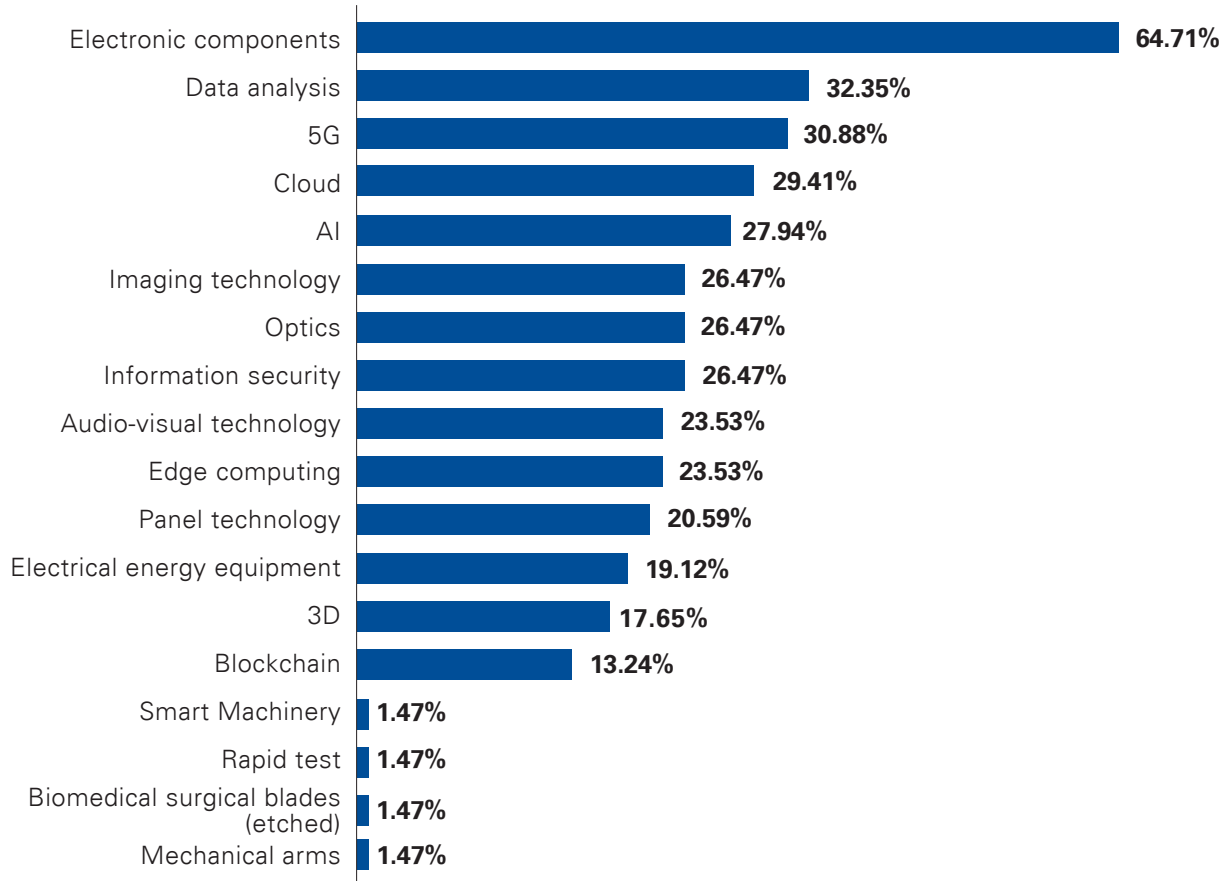
Fields of investment

As healthcare facilities in the European and US markets are highly reliant on high tech, many technology giants are actively participating in the field to facilitate the development of biomedicine. In Taiwan, we have also seen many technology enterprises branching out into biomedicine in recent years, where they create value through applying their own technology.

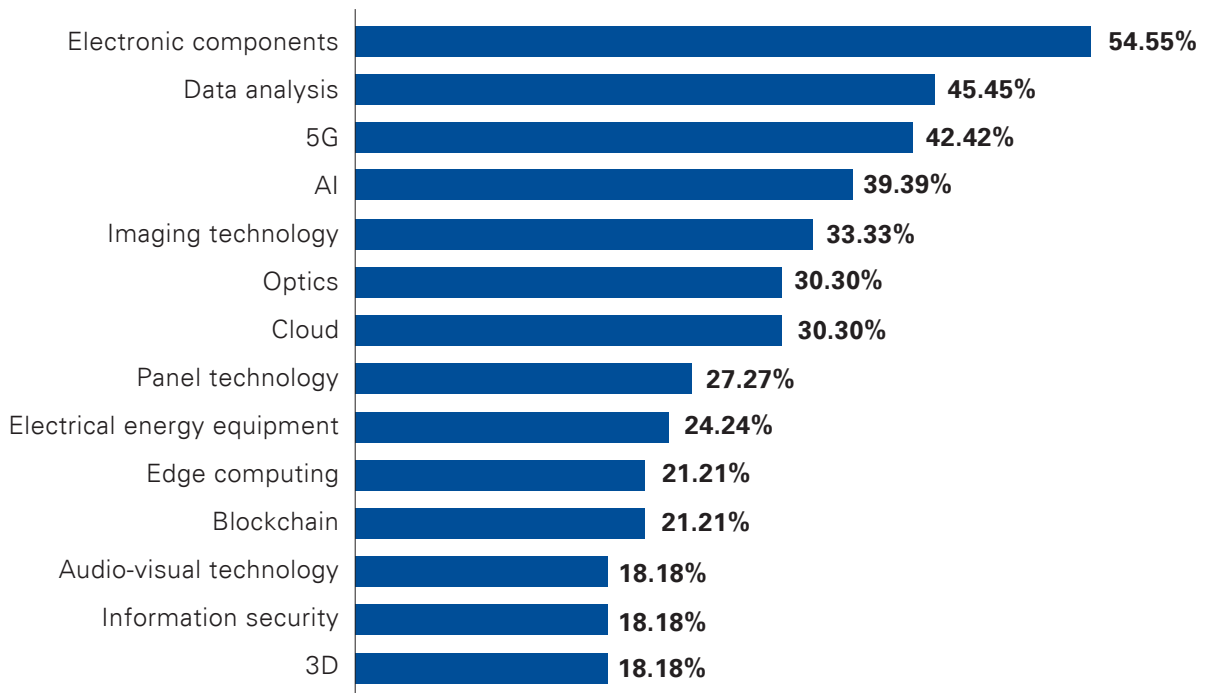
Experts have noted that despite the chaos, the pandemic supported the advancement of biomedical technology and facilitated the Digital Health industry to such an extent that it has become one of the most popular investment targets. Possibly because AI technology and 5G applications have made such huge advances in recent years, it has become a strong trend for technology enterprises to invest in biomedicine. Emerging technologies have widespread applications in biomedicine, particularly in improving healthcare quality and the accuracy of diagnosis. In Taiwan, large tech companies have applied numerous technologies to biomedicine; electronic components manufacturing technology accounts for the highest percentage of investors (64.71%) and prospective investors (54.55%), with data analysis and 5G technology, which have been particularly popular in recent years, taking second and third place. According to industry experts, many large technology enterprises in Taiwan added healthcare to their service items, not only because they already have healthcare products, but also because they are trying to find new business opportunities and diversify their business through applying their existing technology. Technology and healthcare are interlinked, and new technologies will lead biomedicine towards a new era and increase its competitiveness.

¹⁰ KPMG Venture Pulse: Global Analysis of Venture Funding: <https://home.kpmg/tw/zh/home/services/startups-innovation/venture-pulse.html>

Technologies investors have applied to Digital Health



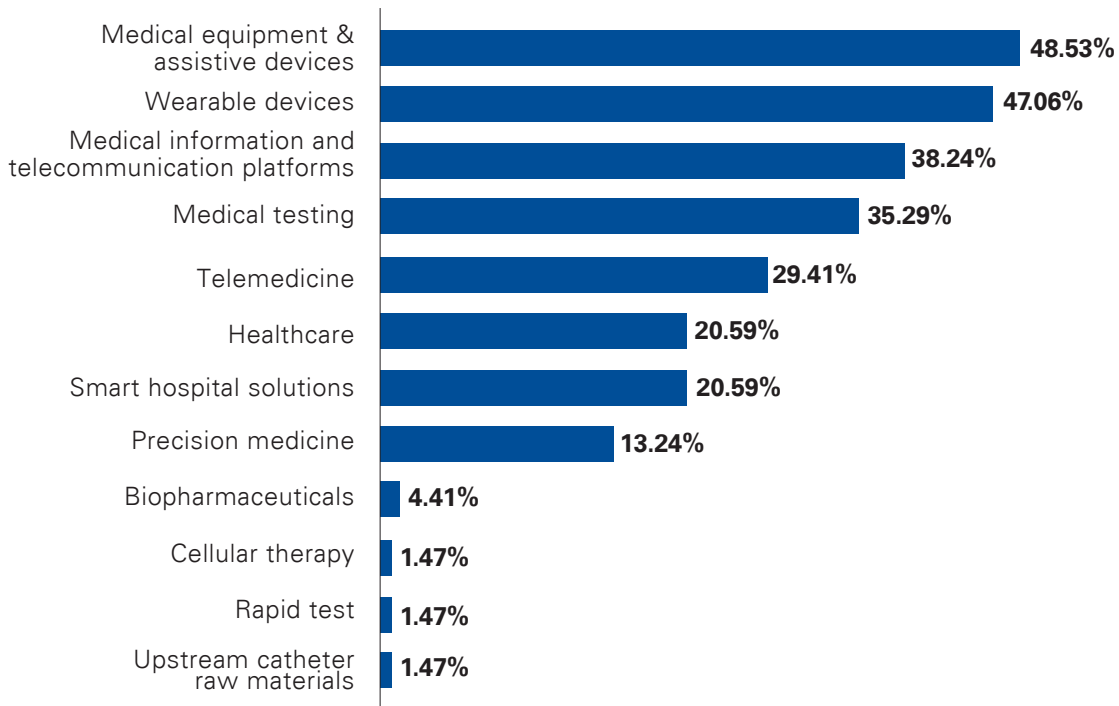
Technologies prospective investors are considering applying to Digital Health



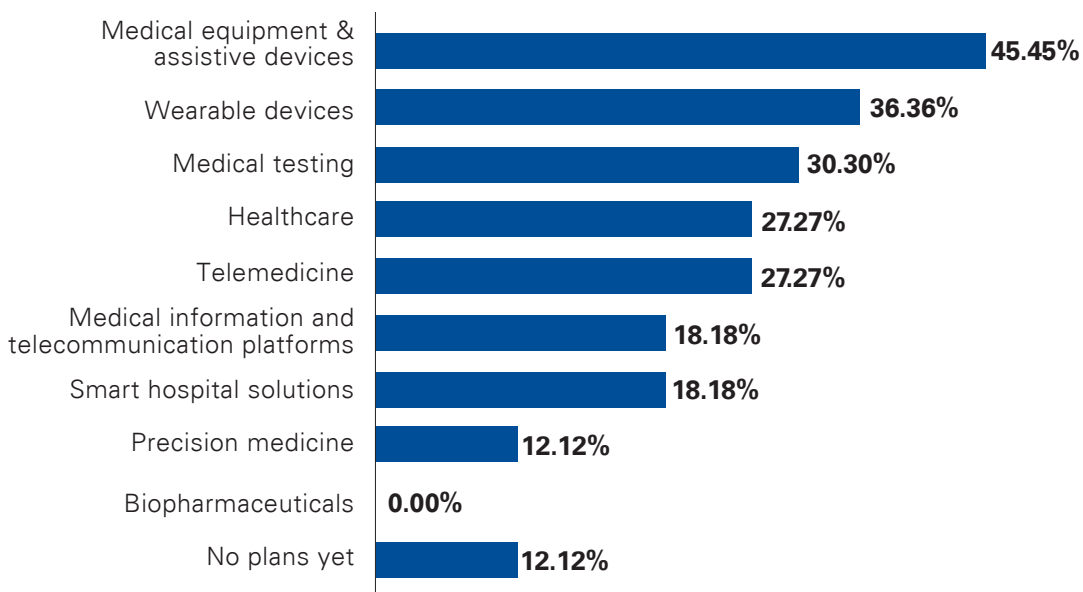
In this survey, KPMG discovered that among investors' investment choices, medical equipment and assistive devices, wearable devices, and medical information and telecommunication platforms are the top

three targets. From the chart below, it can be seen that prospective investors also prioritize medical equipment, assistive devices, and wearable devices.

Investors' investment choices in Digital Health



Prospective investors' investment choices in Digital Health



From technology to Digital Health, Hon Hai Precision Industry Co., Ltd. (Foxconn Group) has established digital health as one of their major business items and actively take part in biomedicine for many years. In 2009, Hon Hai re-invested in Health conn, using the high-tech advantages of its parent group to concatenate AI and big data then applied it on personal health information integration, with the goal of branching out into preventive healthcare and providing customized services for medical professionals and patients.¹¹ In 2021, Hon Hai also announced a collaboration with British startup Gyro Glove. While focusing on the research and development and marketing of digital healthcare and wearable devices, they also plan to establish an R&D center in Taiwan to utilize AI and data technology to develop even more innovative medical product applications.¹² In addition to Digital Health, Hon Hai is also expanding its healthcare business by investing in the pharmaceutical industry with EirGenix. As Taiwan is becoming an aged country, long-term healthcare and precision medicine have attracted attention from many investors. In addition to Hon Hai, Wistron, Quanta Computer, Compal Electronics, Inc., and Qisda Corporation are also major players in the biomedical field. The Wistron Group has invested in healthcare for many years. They use their own ICT technology to target business opportunities in life sciences instruments, in vitro diagnosis, exoskeletons, and digitalized healthcare platforms.¹³ Compal Electronics

and Quanta Computer have used 5G and network communication technology to develop IoT products and target the wearable device and real-time body sensor markets. Compal, targeting the needs of an aged society, has rolled out elder healthcare and telemedical platforms and worked with the government and local institutions to provide a wide-ranging healthcare support for the elderly.¹⁴ Qisda Corporation focuses on medical equipment and is committed to building smart operating rooms and smart wards and medical consumables. The company has also invested a great deal of effort into incorporating subsidiaries to develop kidney dialysis machines and established dialyzer production lines abroad to target that specific niche in the biomedical market. Technological advancement drives changes in consumption behavior, and AI applications take the lead; they can be applied to numerous fields including precision medicine, preventive healthcare, elder care, diagnosis, and healthcare management.¹⁵

Types of investments

Indeed, domestic technology giants are seeking to increase their stake in biomedicine in a variety of ways. Our survey shows that as many as 72.06% of current investors are entering the biomedical sector through capital investment. The second most popular method is the formation of strategic alliances, which are actually prospective investors' top choice when it comes to planned future investment.

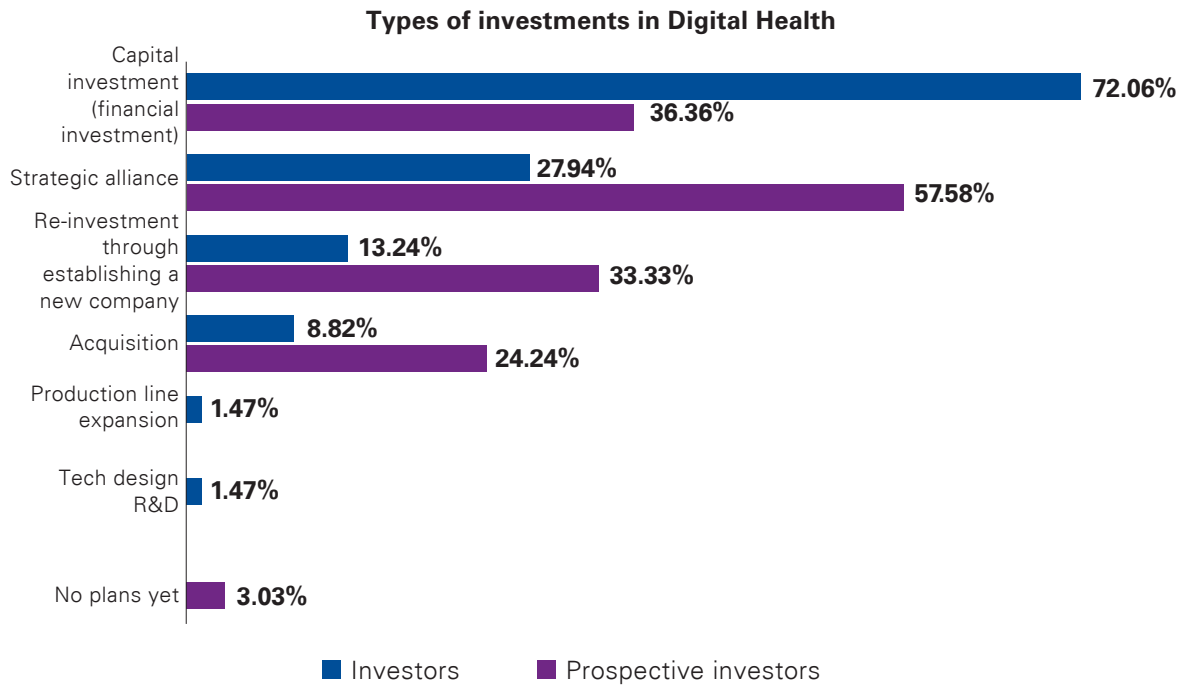
¹¹ Healthconn: <https://www.healthconn.com>

¹² *In addition to Electric Cars, Hon Hai Works with GyroGear to Dive into Digital Health*: <https://finance.technews.tw/2021/02/12/hh-gyrogear>

¹³ Wistron Medical Technology: <https://zh.wistronmedtech.com>

¹⁴ Compal Electronics CSR Report: <https://www.compal.com/CSR/ZH/download.aspx>

¹⁵ *Smart Business/Harry Yang, CEO of Qisda Corporation's Medical Equipment Business, Expands Medical Fleet through Acquisition and Alliance*: <https://money.udn.com/money/story/8944/5126232>



Possibly due to their unfamiliarity with the field in comparison to those who have been in it for a longer period, partnering with other businesses and looking for collaboration opportunities is the top choice for enterprises new to the field.

Compal Electronics, for example, has re-invested in more than ten enterprises in the healthcare industry. In addition to investing a large amount of capital in Raypal Biomedical Co., Ltd., which focuses on cellular therapies, and ARCE Therapeutics, which conducts R&D in cellular therapies and products, Compal has also branched out to medical equipment and facility manufacturing. In the meantime, it actively collaborates with healthcare institutions to establish smart hospital and healthcare management platforms; in doing so, Compal has built a complete biomedical supply chain for itself.¹⁶

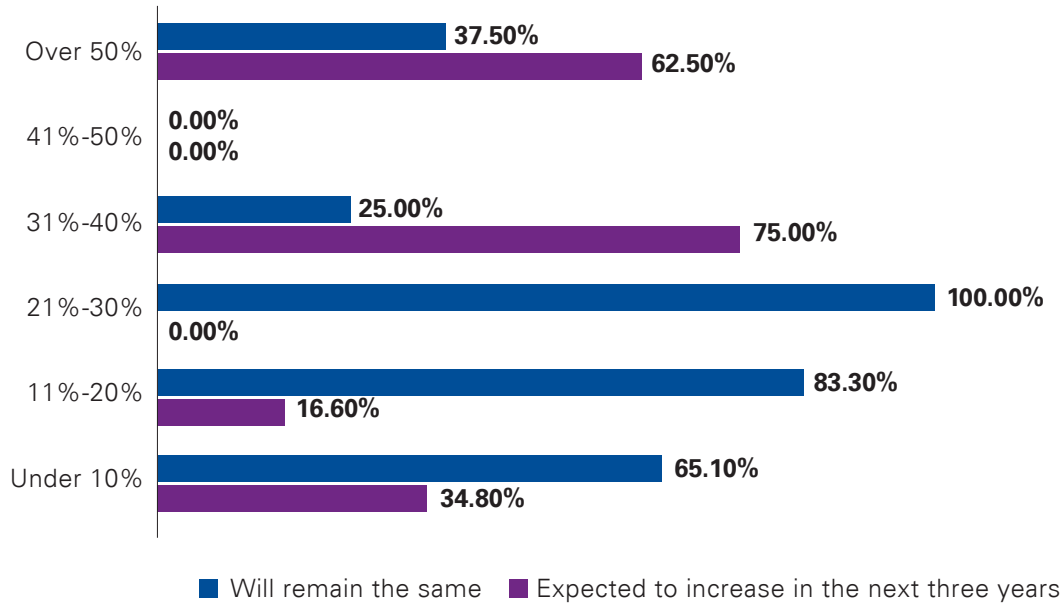
On the other hand, the Wistron Group, which has built a solid foundation in information and telecommunication technology, was an early re-investor in healthcare and biomedicine. In recent years, Wistron has established two holding companies and integrated the resources of subsidiaries and external businesses to speed up its development in biomedicine and precision medicine.¹⁷ Qisda Corporation, who has been doing business in the healthcare industry for more than 15 years, has two general hospitals in China, other acquired businesses, and a self-operated medical business group. In its 2021 Q1 business report, Qisda noted that its four major development areas include improving the performance of existing business, making great progress in 5G network communication technology, speeding up the development of intelligence solutions, and expanding its healthcare services.¹⁸

¹⁶ Compal Electronics CSR Report: <https://www.compal.com/CSR/ZH/download.aspx>

¹⁷ Wistron Medical Technology Corporation: <https://zh.wistronmedtech.com>

¹⁸ Qisda Corporation 2021 Q1 Business Report: [https://www.qisda.com.tw/UserFiles/2021%20Q1%E6%B3%95%E8%AA%AA%E6%9C%83%E4%B8%AD%E6%96%87%E7%B0%A1%E5%A0%B1\(Final\).pdf](https://www.qisda.com.tw/UserFiles/2021%20Q1%E6%B3%95%E8%AA%AA%E6%9C%83%E4%B8%AD%E6%96%87%E7%B0%A1%E5%A0%B1(Final).pdf)

Investors' current investment and increases in the next three years



Investment percentage

In addition to discussing investment fields and methods of investment, from the following chart, we can also observe the ratio of survey participants' investment in healthcare compare to their total investment. Most investors and prospective investors have invested/plan to invest less than 10% of their total investment into digital health; a few have invested/will invest 11-20%. Cross analysis shows that most investors' percentages will stay the same over the next three years; however, it is worth noting that 62.5% of technology enterprises that have invested 50% or more in the information and biomedicine industries will continue to increase their investment over the next three years, a strong indicator of the potential of digital health applications.

Government support

In recent years, the Taiwanese government has been committed to the "Five plus two" innovative industries plan in the hope of facilitating industry transformation and creating economic growth by jumping on the digital health bandwagon. The plan covers seven industries and projects: intelligent machinery, Asia Silicon Valley, green energy, biomedicine, national defense and aerospace, new agriculture and the circular economy. Biomedicine, the defense industry, new agriculture, and circular economy. Biomedicine is a focal point of this plan. Taiwan's technology, information, and telecommunications industries occupy important positions in the global economy. Therefore, different government agencies have been working together to utilize the island's high-tech advantages and the niche fields it dominates to continue the BioMed Taiwan plan.

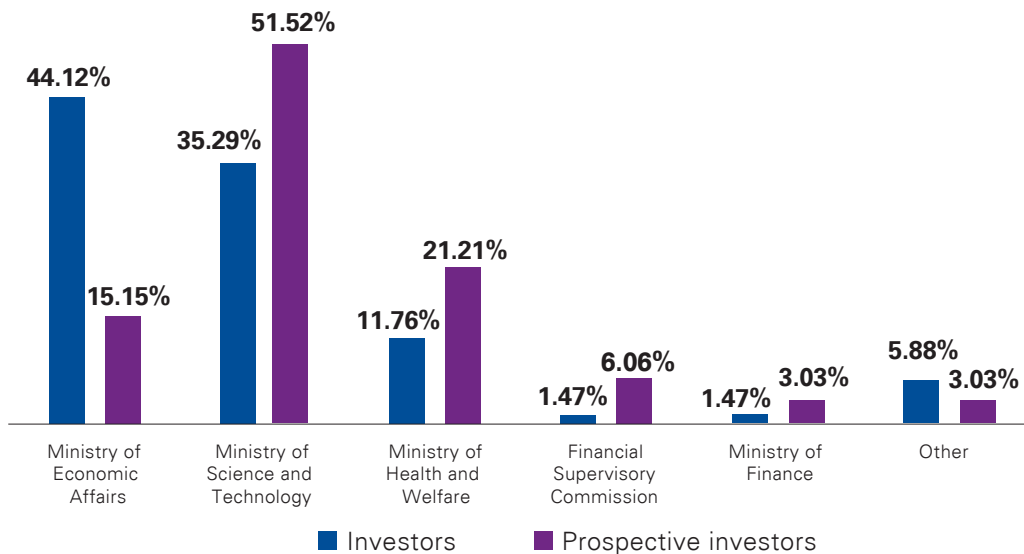
Introducing digital technologies such as AI, 5G, and cloud computing into biomedical R&D to advance digital health, explore business opportunities, and prepare for entering the international market.

In this report, KPMG also surveyed domestic technology giants who are investors or prospective investors in healthcare regarding the government’s role in developing the biomedical industry and what resources the government should provide. The results show that investors mainly require help from the Ministry of Economic Affairs (44.12%), and prospective investors mainly require help from the Ministry of Science and Technology (51.52%). We speculate that this is because there is a need for subsidies or tax incentives after applying the technology to the field; additionally, prior to entering the field, prospective investors may need subsidies for technological application/technology planning, which would also help to improve their own R&D capabilities.

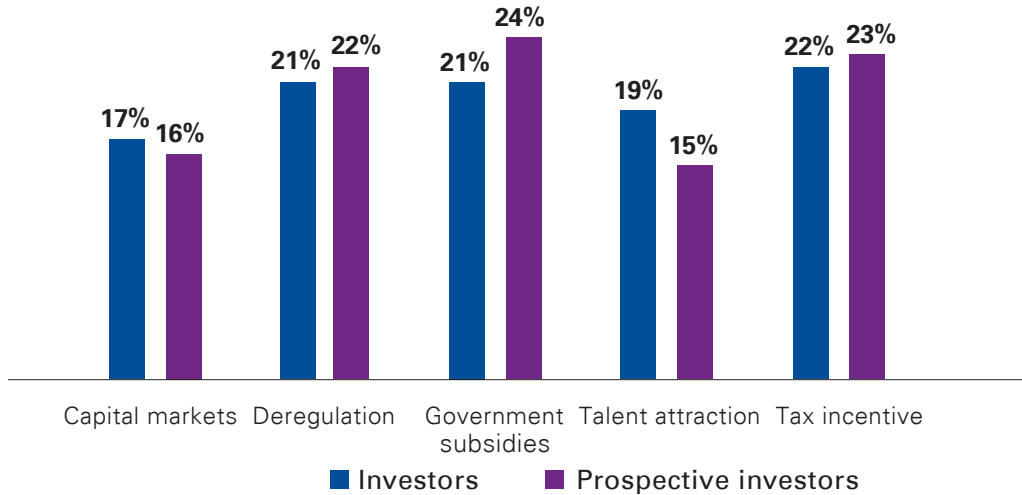
In the meantime, we also surveyed domestic technology giants on what kinds of resources they need the most from the government to invest in biomedicine. This survey categorizes the assistance and consultation the government provides into five categories: deregulation, subsidies, tax incentives, talent attraction, and capital markets; we asked respondents to put these in order of priority. As indicated in the chart below, both investors and prospective investors give higher priority to deregulation and tax incentives; investors consider tax incentives the most important, while prospective investors consider subsidies to be their most critical need.

Currently, the Ministry of Economic Affairs has promulgated the Act for Development of Small and Medium Enterprises and the Statute for Industrial Innovation, both of which stipulate tax incentives for equipment, R&D, and talent cultivation to encourage ICT companies to invest in digital health and facilitate industrial upgrading through business transformation.

Departments whose assistance is most required for investing in Digital Health



Resources most needed from the government when investing in Digital Health



The newly amendment of the Act for the Development officially adds digital health to the range of tax benefits, which, in addition to encouraging the biomedicine and information and telecommunications industries to pursue cross-industry development, also puts equal weight on R&D and manufacturing through making the regulations applicable to businesses in the digital health, precision medicine, regenerative medicine fields, and “Contract Development and Manufacturing Organization” (CDMO). To create a complete supply chain for the biomedical industry, the draft amendment now emphasizes the equal importance of R&D and manufacturing (as opposed to the priority placed on R&D in the past) and uses tax incentives to attract capital investment and attract and retain talent. The tax incentives include investment tax credits for the costs involved in cultivating talent, income tax deductions for manufacturing equipment for profit-seeking enterprises, employee rewards, company tax deferment when employees acquire company shares or equity securities for having specific technology

abilities, tax-free benefits for angel investors, and investment tax credits for corporate stockholders. These will help to speed up the development of interdisciplinary Digital Health and facilitate industry diversity.

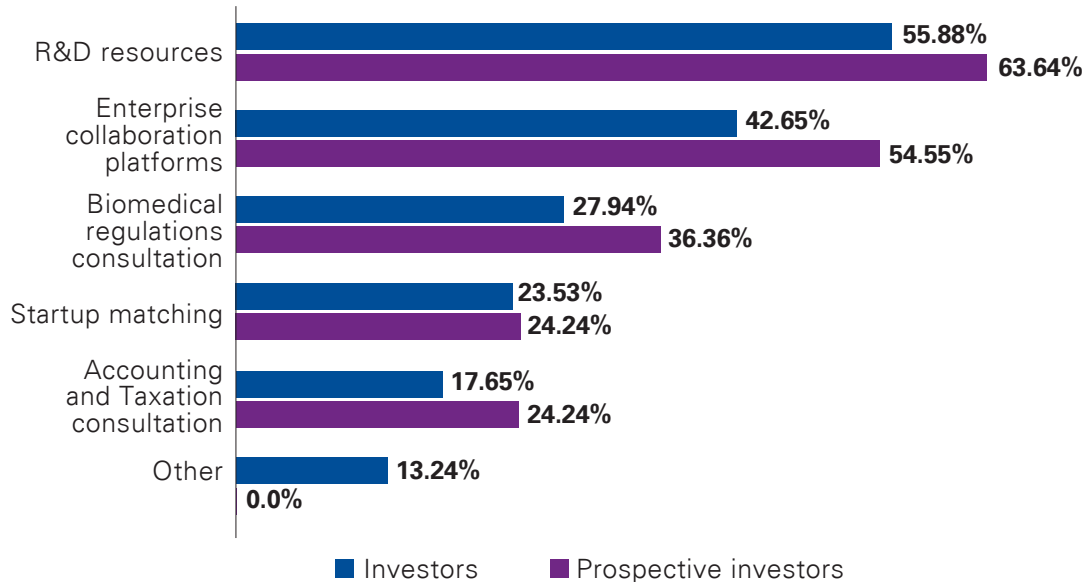
In addition to the promulgation of and reformations to government policies and regulations, support from the private sector, including industry, academia, and R&D facilities, also plays an important role in building a strong biomedical industry chain. In the survey, both investors and prospective investors view resources for their R&D departments as their most pressing need, followed by business collaboration platforms. This report shows that novel or complete technologies and matching channels for enterprises can help to create more business opportunities and increased profits. Technological convergence, innovation and transformation, and talent cultivation are three key elements in Digital Health. Currently, there are many industry-academia R&D facilities for Precision medicine and biopharmaceuticals, including the Industrial Technology Research

Institute, Academia Sinica, the National Applied Research Laboratories, and local healthcare facilities. Uniting technology and healthcare requires support from talent with expertise in multiple fields.

In Taiwan, there have been numerous instances in which enterprises have worked jointly with R&D facilities to form medical teams. Many technology giants have also established their own research centers or work with startups to recruit industry experts to pursue innovative R&D. For example, the fields of telemedicine and smart hospitals have seen breakthroughs due to developments in 5G and AI. Quanta Computer collaborated with National Taiwan University Hospital to build a smart remote home care platform.

For this collaboration, it drew on its strengths – information and telecommunications technologies – to get involved in the field of telemedicine and allow patients to receive comprehensive care both in the hospital and at home.¹⁹ This year, Hon Hai invested substantial R&D resources into establishing the Hon Hai Research Institute with the goal of extending its AI, Semi-conductor, telecommunications, information safety, and AI quantum computing technologies into automated vehicles, Digital Health, and robot technologies in the future.²⁰

Support and subsidies most needed from the private sector when investing in Digital Health



¹⁹ Please see https://www.most.gov.tw/folksonomy/detail/c4c164b5-3909-41bd-9ad8-f2674589b260?l=CH&utm_source=rss

²⁰ Please see <https://www.bnext.com.tw/article/58117/foxconn-2020-3plus3-institution>

Investment trends in Digital Health

Enterprises generally consider healthcare and clinical testing to be the two most promising fields in the future

- Investors consider healthcare (39.71%), telemedicine (32.35%), and clinical testing (30.88%) to be the most promising fields in the next three years. For prospective investors, medical testing (36.36%), wearable devices (36.36%), and healthcare (33.33%) are viewed as the most promising fields.

In recent years, tech enterprises have collaborated with healthcare systems to increase the rate of Digital Health, AI, and R&D innovation. Due to the pandemic, there has been a great increase in business opportunities in testing, digital health, and telemedicine. According to 《KPMG 2021 Healthcare CEO Future Pulse》,²¹ 65% of healthcare CEOs think that the pandemic led to a fundamental change in digital health models; 62% believe that healthcare overall has experienced a major shift. Technology plays a vital role in this healthcare transformation, whether in the provision of medical care services, expanding the workforce, or facilitating a patient-centered model. The draft amendment of the *Act for the Development of Biotech and Pharmaceutical Industry* produced by the government this year includes digital health in its scope; meanwhile,

the government has established the Smart Medical Device Project Office to speed up the application of AI to healthcare and the commercialization of smart medical devices, and to provide a space for technology trials in the future.

This report surveyed long-term and prospective investors into biomedicine to analyze their views on trends in and the prospects of the digital health investment market in the next three years. Digital health, health analytics, and applications will not only change healthcare behavior within medical institutions, but also expand the definition of healthcare from acts of care to a holistic health and welfare industry.

- Both investors (39.71%) and prospective investors (33.33%) consider healthcare is a promising industry

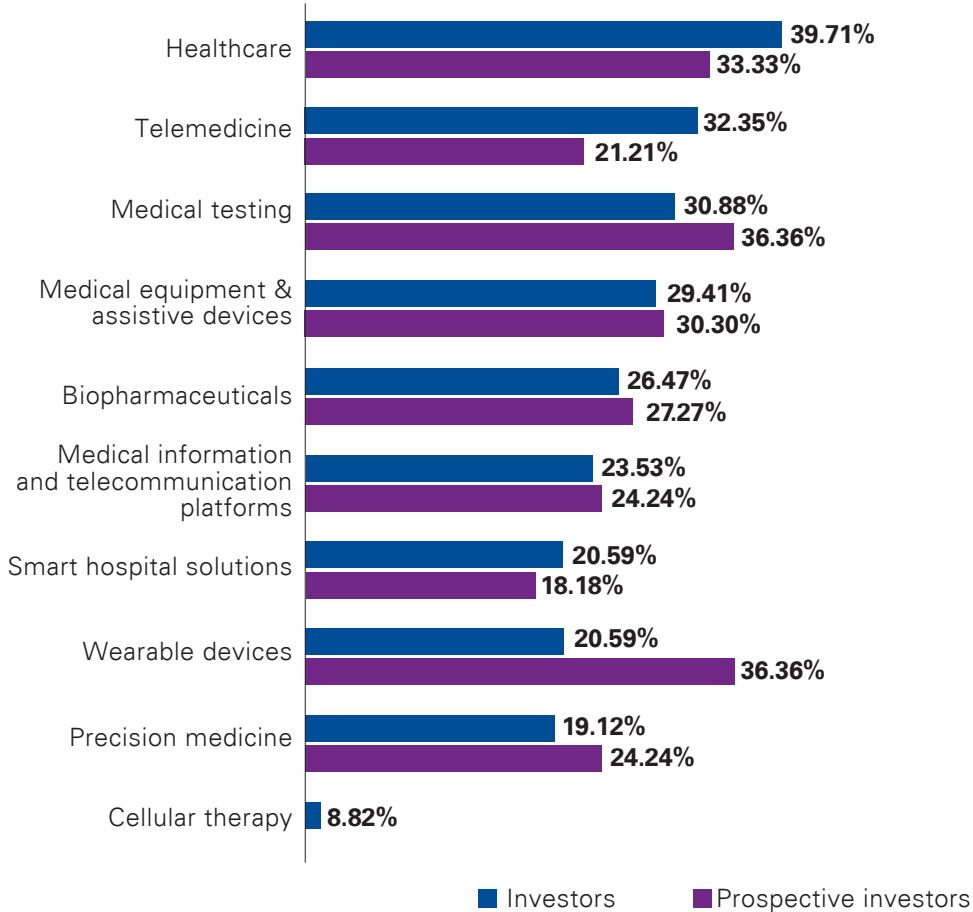
Survey participants in the technology industry generally believe that healthcare will continue to be the most promising field in the future. According to *2020 Biotechnology Industry in Taiwan*,²² to adapt to Taiwan's approaching



²¹ *Healthcare CEO Future Pulse* (<https://assets.kpmg/content/dam/kpmg/xx/pdf/2021/07/healthcare-ceo-outlook-report.pdf>)

²² *2020 Biotechnology Industry in Taiwan* (https://www.biopharm.org.tw/images/2020/Biotechnology-Industry-in-Taiwan-2020.pdf?fbclid=IwAR1IXuQfem183sFO5A51PmjVT1wFFWFtKNX1fPP_QiFChmFIJQ7W4Zlp4)

Promising Digital Health fields for investment in the next three years



status as an aged society, the government’s LTC 2.0 policy has attracted many enterprises to start manufacturing products or providing services in the healthcare field, and ICT applications have become more and more common in health monitoring and healthcare products. According to the Ministry of Health and Welfare, 74% of home care facilities in Taiwan have only 1-4 employees, which implies a strong reliance on mobile and easily-operable testing equipment. In addition, revenue of healthcare and welfare industries is estimated to reach US\$7.39 billion in 2022 with an annual growth rate of 6.8%.

- Tech enterprises that have invested in biomedicine consider telemedicine (32.35%) and medical testing (30.88%) to be the two most promising fields.

In addition to the pandemic impacts in Taiwan, it facilitated the transformation of many industries globally throughout the past year, and the healthcare industry is no exception. The pandemic made us realize that telemedicine is a safe and cost-effective healthcare model.

KPMG Opportunities and Challenges in an Evolving Market – 2021 Healthcare and Life

*Sciences Investment Outlook*²³ points out that telemedicine will become the most attractive investment target in healthcare information and telecommunications in the next 12 -24 months.

According to a forecast by Frost and Sullivan,²⁴ telemedicine will become a standard healthcare service for primary healthcare virtual consultations in advanced healthcare systems by the end of 2020, and it will be approved by authority and gain support from clinicians within five years. Moreover, a CB Insights report²⁵ indicates that investment in telemedicine increased by 169% in the second quarter of 2021 with a focus on telemedicine suppliers, platforms, and markets. In Taiwan, to reduce the number of patients in hospitals, which in turn reduces infection risk, the Ministry of Health and Welfare has gradually begun to approve remote appointments for those with chronic disease, and healthcare institutions have also started seeking technologies to assist in handling remote appointments. In KPMG *2021 Healthcare CEO Future Pulse*, 66% of interviewed CEOs in the healthcare industry stated their belief that telemedicine will continue to deliver greater profits in the future.

More than half (59%) of interviewed CEOs believe that a huge portion of diagnosis, consultation, and treatment will be conducted using digital tools instead of in face-to-face meetings.

Business opportunities in medical testing correspond with the pandemic trajectory. In the past, patients were passively diagnosed by doctors in healthcare facilities, but the pandemic shifted the emphasis to timeliness and diagnostic accuracy. This year, diagnostic equipment manufacturers around the globe became more active in investment due to their participation in manufacturing COVID-19 testing kits and equipment.

It is worth mentioning that the survey participants' choice of three most promising fields indicates that prevention will become a future trend and thus the importance of preventive healthcare will increase.

A lack of the necessary technological capabilities and expertise are the biggest challenges when investing in Digital Health

Developing talent with combined expertise in the technology and healthcare fields is a focal point for both industry and the government. Precision medicine requires collaboration between doctors and engineers, but medical knowledge can be too complicated for engineers to understand, and equipment produced based on engineering thinking can be difficult to use.

²³ *Opportunities and Challenges in an Evolving Market 2021 Healthcare and Life Sciences Investment Outlook* (<https://assets.kpmg/content/dam/kpmg/tw/pdf/2021/03/2021-healthcare-investment-outlook.pdf>)

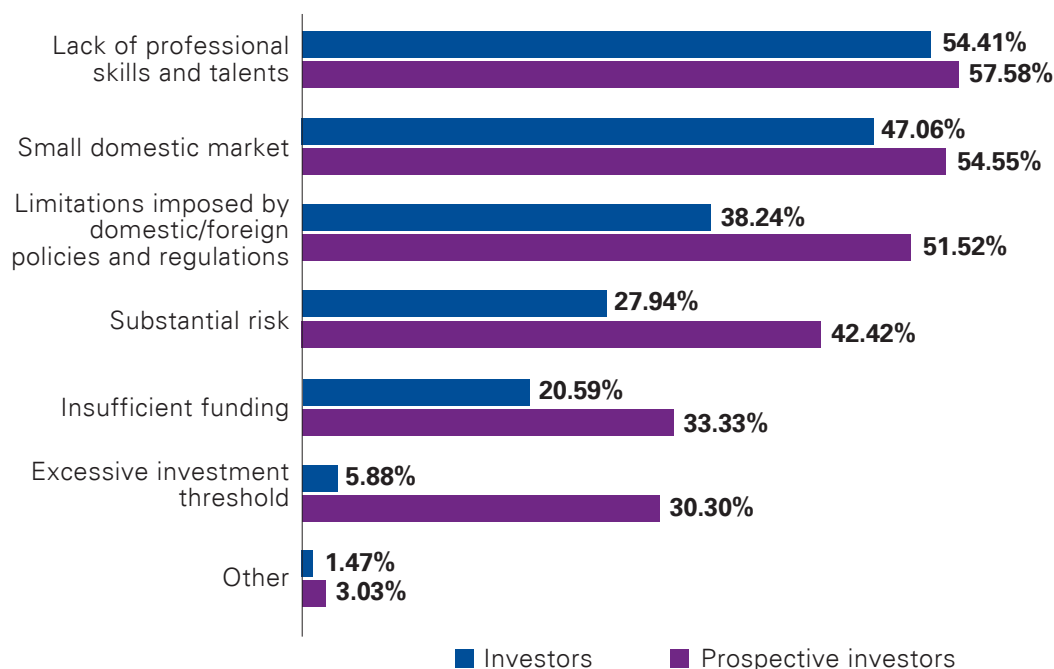
²⁴ Please see <https://findit.org.tw/researchPageV2.aspx?pageId=1262>

²⁵ Please see https://www.digitimes.com.tw/iot/article.asp?cat=158&cat1=20&cat2=15&id=0000616650_EP3716AZ4LW3R01PNBT39

Therefore, individuals with data analysis and bioinformatics expertise play a key role in the integration of and communication. Policies, regulations, and other guidelines or rules help to propel the cultivation of talent. A good example is the Ministry of Science and Technology and Ministry of Economic Affairs' Industry-Academia Collaboration Projects, which focus on key industrial technologies and the cultivation of cutting-edge R&D talent. Another example is the Program to Foster Startups in the Medical Device Industry and Promote Existing Enterprises in the International Arena, which connects the science and industrial parks in northern, central, and southern Taiwan to speed up the innovation of the biomedical industry and assist businesses in entering the international market, exploring business opportunities in different environments, and acquiring the necessary talent and technologies.

In addition, the Executive Yuan, in response to the 5+2 industry innovation plan proposed by the government in 2017, promulgated the BioMed Taiwan plan, which coordinates interdepartmental resources to create a complete ecosystem in the hope of strengthening capital, talent, choice of R&D fields, intellectual property, regulations, and resources; the plan also aims to link up innovation clusters and connect them with international resources. By attracting high-level talent, technologies, and capital from overseas with a complete regulatory framework, the plan hopes to facilitate acquisition by foreign businesses, further improving the competitiveness of the domestic market while actively seizing critical business opportunities in industry chains in Southeast Asia and the Asia Pacific region.

Challenges for enterprises investing in Digital Health



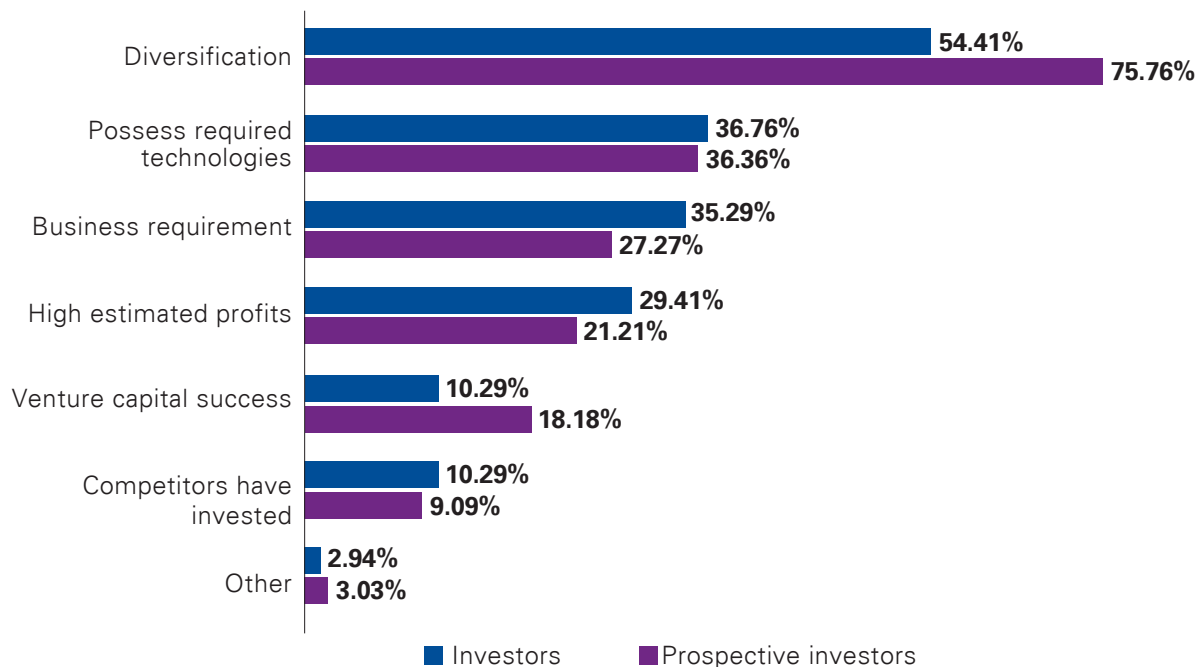
The main motivation for investing in Digital Health is the need to diversify

In order to handle the challenges of supply chain disruptions in the post-pandemic era, Taiwan’s technology industry needs to recognize that transformation through adapting to market changes using a different mindset and strategies and thoroughly examining their strategic investment allocation has become an urgent issue. In recent years, Biomedicine has experienced a boom, with large amounts of capital flowing into the industry to aid its growth, resulting in a continuously rising

number of R&D projects. According to research into startup investment trends in healthcare published in the *2020 Agricultural Biotechnology Industry Quarterly*,²⁶ the healthcare field accounts for a clearly higher percentage of large-scale transactions, which is even higher than its percentage of the overall transactions in Taiwan.

Amazon acquired startup Pillpack in 2018 with US\$ 753 million, currently runs online pharmacy Amazon Care, and has invested millions of dollars in a biotechnology enterprise this year.²⁷

Tech industry’s main motivation for investing in Digital Health



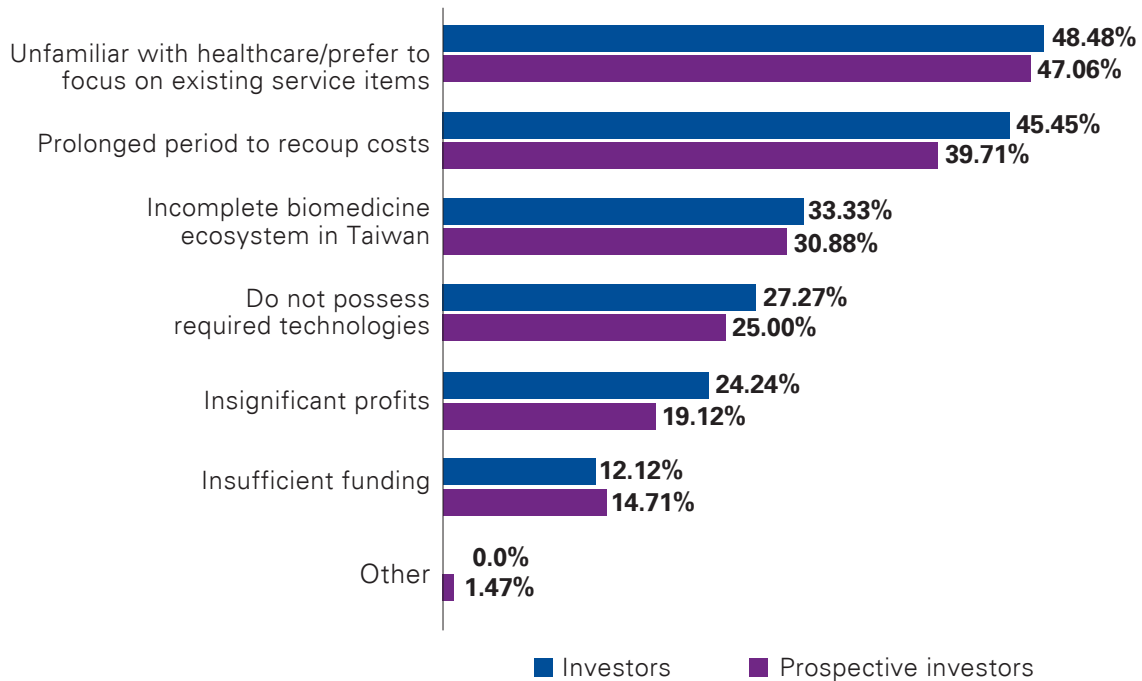
²⁶ Please see http://www.biotaiwan.org.tw/MAG/image_doc/64/05%E5%8F%B0%E7%81%A3%E5%81%A5%E5%BA%B7%E9%86%AB%E7%99%82%E9%A0%98%E5%9F%9F%E6%96%B0%E5%89%B5%E6%8A%95%E8%B3%87%E8%B6%A8%E5%8B%A2.pdf

²⁷ Please see https://fbmi.taiwan-healthcare.org/zh/news_detail.php?REFDOCTYPID=0o4dd9ctwhtyumw0&REFDOCID=0qxwrm89zee7g637

Microsoft partners with Teladoc, a leading telemedicine enterprise, to make it possible for doctors to participate in remote appointments and review electronic medical records online in the future, with the goal of optimizing integrated virtual healthcare services.²⁸ Domestically, in response to the promulgation of the draft amendment of the *Act for the Development of Biotech and Pharmaceutical Industry*, which makes tax incentives applicable to CDMOs, Hon Hai invested NT\$ 5 billion in EirGenix’s development as a CDMO this year.

Several tech giants also work with domestic and foreign healthcare startups: ASUS has embarked on a collaboration with Olive, an American healthcare unicorn start-up,²⁹ and Wistron invested in Jubo in the hope of applying AI to the elder care market³⁰. Technology enterprises have chosen specific areas in which they can apply their own technologies to create value, further improving their the manufacturing flexibility of their supply chains and their ability to diversify across different fields.

Reasons tech companies don’t consider investing in Digital Health at the present time



²⁸ Please see https://fbmi.taiwan-healthcare.org/zh/news_detail.php?REFDOCTYPID=0o4dd9ctwhyumw0&REFDOCID=0qwkmiz1g8hw0xo
²⁹ Please see <https://www.ithome.com.tw/pr/145752>
³⁰ Please see https://fbmi.taiwan-healthcare.org/zh/news_detail.php?REFDOCTYPID=0o4dd9ctwhyumw0&REFDOCID=0qxwse31k9vieu28

The pandemic's impact on the investment market

The pandemic has had a major impact on healthcare systems, patient care, and the biomedical industry, the last of which has sped up its digital transformation due to the pandemic. For the biomedical industry and technology enterprises that are interested in investing in biomedicine, the first few things they will have to think about are how to build connections between healthcare, big data and industry information, how to expand online and physical sales channels, and how to build a complete healthcare ecosystem and innovative business models. Changes in healthcare behavior and the healthcare ecosystem are two major trends in digitalized biomedicine in the post-pandemic era.

When expanding into digital health, tech enterprises' top pick in digital health applications is electronic components manufacturing (such as sensors); data analysis and 5G are also popular points of entry. The 2020 pandemic sped up the digital transformation of healthcare, but the electronic technology industry in Taiwan had already begun deploying integrated solutions in smart medicine and smart healthcare before the pandemic. The Industrial Technology Research Institute's *Prospects of Industries in Taiwan*³¹ estimates that the production value of electronic components manufacturing technologies will increase by 8.1%.

Looking into 2021, we estimate that the global increase in vaccination rates in the second half of the year will boost consumption, and domestic tech enterprises are already actively investing in innovative technologies such as wearable devices. The Industrial Technology Research Institute estimates that the production value of the domestic sensor industry will reach NT\$ 219.8 billion in 2021, an increase of 2.2% over the previous year. On the other hand, the medical device industry, due to the pandemic, is still in short supply of testing kits and medical consumables; it is estimated that demand will continue to grow. In addition, according to the Taiwan Industry Economics Services' *Report on the Prosperity Dynamics of Medical Devices and Equipment*,³² medical consumables and niche market digital healthcare assistive devices will continue to increase due to the world-wide normalization of COVID-19 prevention, testing, treatment, and rehabilitation. Moreover, the demand for in vitro diagnostics, medical consumables, and masks will continue to drive the production value of medical devices in 2021. It's estimated that the medical device and equipment manufacturing industry will experience slight growth in the second half of 2021.

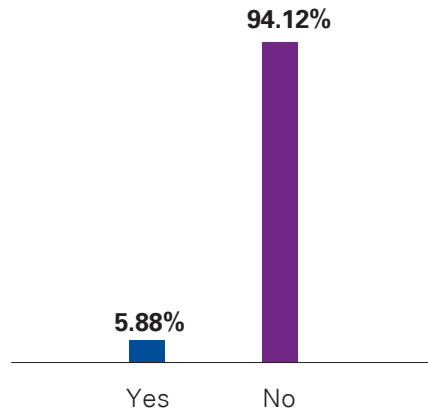
³¹ Industrial Technology Research Institute: *Prospect of Industries in Taiwan* https://ieknet.iek.org.tw/iekppt/ppt_more.aspx?actiontype=ppt&indu_idno=0&domain=2&slid_preid=6205

³² Taiwan Industry Economics Services: *Report on the Prosperity Dynamics of Medical Devices and Equipment* <https://tie.tier.org.tw/db/content/index.aspx?sid=0L180569124817662442>

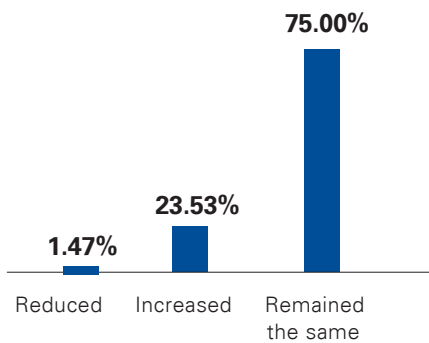
Investors into digital health think that their overall investment allocation has not been affected by the pandemic

According to the survey, 75% of technology enterprises who have invested in healthcare technology have not changed their investment amount due to the pandemic, while 23.53% of them increased their investment, probably because they envisioned the increasing importance of healthcare technology in the future. In terms of investment targets, close to 95% of companies did not change their targets; Speaking of investment schedule, 76.47% of the investors retained the same investment schedule. 16.18% of them even moved up their schedule while 7.35% moved their schedule back.

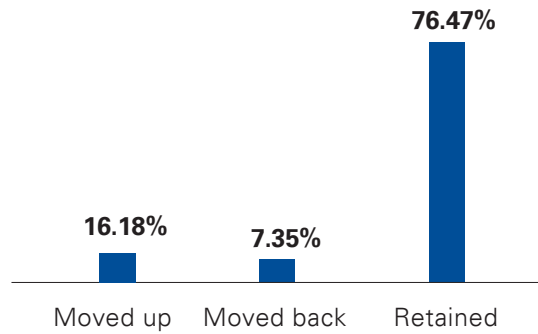
Whether investors' investment targets were affected by COVID-19



Whether investors' investment amount was affected by COVID-19



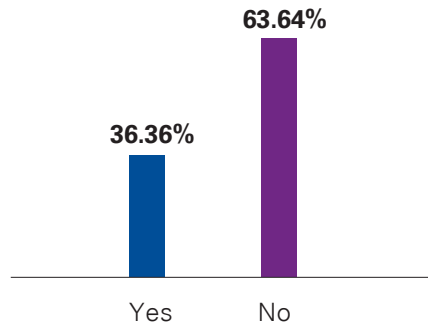
Whether investors' investment schedule is affected by COVID-19



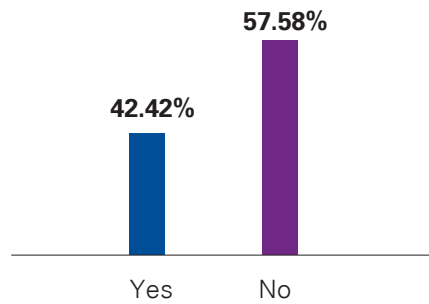
Close to half of prospective investors believe that the pandemic has sped up enterprises' investment plans or actual action to invest in digital health

63.64% of prospective investors did not change their plans to accommodate the changes brought by the pandemic, but overall, they held a different view from investors. In comparison to the beliefs of prospective investors, fewer investors actually increased their investment amount, and more investors moved their schedule forward while more than half (57.58%) of the prospective investors do not think that the pandemic will cause enterprises to move their investment plans forward or take action to invest in healthcare.

Whether prospective investors' investment allocation is affected by COVID-19



Whether prospective investors agree that the pandemic will make enterprises move up their investment plans or take action to invest in healthcare





kpmg.com/tw



@KPMGTaiwan



The information contained herein is of a general nature and is not intended to address the circumstances of any particular individual or entity. Although we endeavor to provide accurate and timely information, there can be no guarantee that such information is accurate as of the date it is received or that it will continue to be accurate in the future. No one should act on such information without appropriate professional advice after a thorough examination of the particular situation.

© 2021 KPMG, a Taiwan partnership and a member firm of the KPMG global organization of independent member firms affiliated with KPMG International Limited, a private English company limited by guarantee. All rights reserved. Printed in Taiwan.

The KPMG name and logo are registered trademarks or trademarks of KPMG International.

2021 Taiwan
investing survey
in Digital Health

