

Opportunities for Queensland businesses in Taiwan's aged-care market

TIQ international market report

March 2019



TIQ has prepared this report based on primary and secondary sources of information. Readers should note that TIQ does not guarantee the accuracy of any of the information contained in this report, nor does it necessarily endorse the organisations listed herein. Readers should independently verify the accuracy and reliability of the information.

Content is current as at March 2019.

© 2019 Trade and Investment Queensland.

Contents

Executive summary	1
1. Introduction	3
2. Medical technology for aged-care environments	4
2.1 Market analysis	4
2.1.1 Segment description, including drivers and trends	4
2.1.2 Issues and challenges	7
2.1.3 Taiwan telehealth developments	7
2.1.4 Local procurement channels for medical devices and equipment	8
2.1.5 Regulatory and business requirements	8
Case study 1: How Tunstall Healthcare partnered with Taiwan's Revlis Biotech to enter the China market	9
2.2 Tips for market entry	11
2.2.1 Popular business models for engaging with Taiwan companies	11
2.2.2 Competitors	12
2.2.3 Finding a 'Market Authorization Holder' partner	12
2.2.4 Finding a medical-device distributor	13
3. Aged-care facility design	15
3.1 Market analysis	15
3.1.1 Segment description, including drivers and trends	15
3.1.2 BOT (build-operate-transfer) program	16
3.1.3 Residential aged-care facility landscape	16
3.1.4 Taiwanese ILU facilities – examples	17
3.1.5 Private-sector investment	19
3.1.6 Opportunities	19
3.1.7 Issues and challenges	19
3.1.8 Investment by Taiwan companies in aged care in China	20
3.1.9 Regulatory and business requirements	20
3.2 Tips for market entry	21
3.2.1 Market-entry strategy and business models	21
4. Aged-care facility management	23
4.1 Market analysis	23
4.1.1 Segment description, including drivers and trends	23
Case study 2: How Japan Genki Group installed management systems in a Tainan aged-care community centre	23
4.2 Tips for market entry	24
4.2.1 Market-entry strategy and business models	24
4.2.2 Competitors	24
5. Conclusion	25
Appendix 1 – Company and other industry data	26
Appendix 2 – Websites, regulations and other resources	40
Appendix 3 – Further reading	41



Executive summary

Taiwan became an 'aged' society in 2018, when the proportion of its population aged over 65 surpassed 14%. It is expected to become a 'super aged' society by 2026 (with more than 20% of its population in this age group), making it one of the fastest-ageing societies in the world.¹

With this ageing population profile, Taiwan will increasingly require sophisticated aged-care infrastructure, products and services, and presents interesting opportunities for Queensland's aged-care sector.

Medical technology for aged-care environments

The evolution of health care towards mobile health, home diagnostics and monitoring, and internet-connected medical devices has been driven in part by the needs of growing numbers of elderly people worldwide.

In April 2018, Taiwan officially moved from being an 'ageing' society – where the proportion of a country's population over the age of 65 has surpassed 7% – to being an 'aged' society, with more than 14% of the population aged over 65.

With its rapidly ageing population, Taiwan offers Queensland medtech companies significant potential for collaboration, along with the product-development resources they need to successfully enter China and other major global markets.

The rapid development and uptake of digital-health products and services has driven an interest in mobile diagnostics, wearables, remote monitoring and internet-connected medical appliances.

With a current emphasis in Taiwan on 'ageing in place', demand for such technologies and solutions will only grow as Taiwan's population continues to age.

Aged-care facility design

Although Taiwan has a rapidly ageing population, the demand for residential aged-care facilities remains relatively low due to a number of factors but, in particular, cultural norms around filial piety.

In addition, the government's newly enacted Long Term Care 2.0 (LTC 2.0) policy is directing resources and funds towards 'ageing in place', where an elderly person remains in their house for as long as possible, supported by community resources. This reduces the demand for new residential facilities, as do uncertainties in LTC 2.0 funding sustainability and some regulatory difficulties.

Unlike China, government agencies in Taiwan have set no percentage targets for housing the elderly in residential facilities, nor have they openly encouraged or incentivised foreign participation in the industry. Where residential facilities are planned or already built, these projects are almost entirely a local undertaking. Taiwan's most significant large-scale residential facilities (including the largest independent living community, the Chang Gung Health and Culture Village, with 3,800 rooms) have almost exclusively used in-house designers and other local resources.

1. Ministry of the Interior, 2018: https://www.moi.gov.tw/chi/chi_news/news_detail.aspx?type_code=02&sn=13723
<https://www.taiwannews.com.tw/en/news/3402395>



One of the few identifiable areas of potential for Queensland firms is in the design of small-scale community daycare centres, or in the upgrading or retrofitting of existing properties into such centres. Daycare centres are a cornerstone of LTC 2.0 and, with hundreds more centres expected to be established throughout Taiwan, demand is assured in the short- to mid-term. At least one local architecture firm in Taiwan is already focusing almost exclusively on this market with apparent success.

Nevertheless, with the local population ageing at a rapid rate, demand for residential facilities will eventually rise, and with it the demand for overseas expertise. Queensland companies wishing to take advantage of such a shift should begin building a network of industry contacts now – for example, with architects, construction companies, medical associations, and policy-makers.

Aged-care facility management

The same is true in the area of facility management; current opportunities are few but the future holds promise. A handful of Japanese companies have made inroads into this market on a small scale. It is also inevitable that demand for overseas management expertise will eventually rise, and Queensland companies that have networked diligently will be poised to take advantage of this tipping point when it occurs.

In summary, Taiwan presents current business opportunities in aged-care medical technology, and possible future opportunities in the design, construction and management of residential aged-care facilities.

1. Introduction

Taiwan is a smart and diversified economy, with unique demographic trends, economic policies and Asian trade relationships that make it an important market for Queensland companies. Taiwan is currently Queensland's fifth-largest export market.

Taiwan became an 'aged' society in 2018, when the proportion of its population aged over 65 surpassed 14%. It is expected to become a 'super aged' society by 2026 (with more than 20% of its population in this age group), making it one of the fastest ageing societies in the world.¹

With this ageing population profile, Taiwan will increasingly require sophisticated aged-care infrastructure, products and services, and presents interesting opportunities for Queensland's aged-care sector.

1. Ministry of the Interior, 2018: https://www.moi.gov.tw/chi/chi_news/news_detail.aspx?type_code=02&sn=13723
<https://www.taiwannews.com.tw/en/news/3402395>



2. Medical technology for aged-care environments

2.1 Market analysis

2.1.1 Segment description, including drivers and trends

Taiwan as an ageing society

In April 2018, Taiwan officially moved from being an 'ageing' society – where a country's population over the age of 65 has surpassed 7% – to being an 'aged' society – with over 14% of the population aged over 65. The island nation is now advancing towards 'super-aged' status – where the proportion of over 65s is over 20% – and is expected to reach this milestone in 2026.¹

Passing through these stages at a rapid rate, Taiwan is now one of the fastest ageing societies in the world. This rapid shift in demographics is the result of increases in life expectancy resulting from improved health care and living conditions, combined with Taiwan's very low birth rate of 1.13 (the world's third-lowest after Macau and Singapore).

Currently, Taiwan has over 3,434,000 people aged 65 and over, with this number expected to reach 4,883,000 by 2026. By 2061, this total is expected to surpass 7,000,000, or almost 39% of the population.

The impact of this change in years to come will be far-reaching, affecting society, family, and culture, and putting immense strain on Taiwan's finances, as it struggles to support growing numbers of retirees with fewer and fewer adults of working age.

Characteristics of the aged-care medical technology sector

Worldwide, the rapid development and uptake of digital-health products and services – referred to variously as 'e-health', 'mobile health' or 'smart health' – have been driven in part by the growing global elderly population. Mobile diagnostics, wearables, remote monitoring, internet-connected medical appliances and so on are all highly suited for mobility-limited elderly populations.

More broadly, this sector has been described in terms of the 'internet of medical things' (IoMT), encompassing telehealth systems and connected medical devices and related technologies. Consulting firm Frost & Sullivan² recently described nine ways this sector is currently revolutionising senior health care around the world:

- > vitals-tracking wearables
- > medication adherence tools
- > virtual home assistants

1. Ministry of the Interior, 2018: https://www.moi.gov.tw/chi/chi_news/news_detail.aspx?type_code=02&sn=13723
<https://www.taiwannews.com.tw/en/news/3402395>

2. Frost & Sullivan, 2017, <https://ww2.frost.com/frost-perspectives/10-ways-internet-medical-things-revolutionizing-senior-care/>

- > portable diagnostics devices
- > personal emergency response systems
- > disability assistance tools
- > smart implants
- > smart senior homes
- > family caregiver remote monitoring tools.

Taiwanese companies are active in all of these areas to varying degrees.

Medical consulting firm Pacific Bridge Medical (pacificbridgemedical.com) has also identified a number of medical-device product categories that will be in particular demand by a growing elderly population, including:

- > orthopedic devices (joint replacements, biomaterials, etc)
- > diagnostics, particularly for cancer
- > cardiovascular devices (stents, etc)
- > imaging equipment and systems
- > wound care, particularly for chronic wounds
- > mobile health-monitoring or treatment equipment (including all telemedicine peripherals)
- > home care assistive-living equipment.

Of the product categories listed here, Taiwan manufacturers are particularly strong in orthopedic devices, diagnostics and mobile health equipment.

Whether broadly in terms of IoMT products or services, or specifically in terms of medical devices for use in aged care, Queensland medtech companies are well placed to succeed in the Taiwan aged-care market due to their strong advanced manufacturing capabilities, proximity to the Asia-Pacific, and highly educated and specialist workforce.

Size of Taiwan's medical-device sector

Taiwan's medical-device market is one of the most advanced in Asia. With a market size of around AUD \$6.1 billion, expectations of 7% growth annually over the rest of the decade, and imports currently accounting for more than 70% of the market, prospects are excellent, particularly for high-end devices.

In addition, with universal healthcare insurance coverage, an officially designated 'aged' society, and scope for increased healthcare spend as a percentage of GDP in coming years, growing demand for devices is assured.



Table 1: Taiwan's medical-device sector breakdown

	2016	2017
Revenue	6.4	6.6
No. of companies	861	873
Personnel	39,500	40,300
Export value	3.9	4.0
Import value	3.3	3.4
Domestic market demand	5.9	6.1

Units: AUD billion

Source: 2018 *Taiwan Biotechnology Industry White Paper*, Ministry of Economic Affairs, Taiwan

Local medical-device industry characteristics

The Taiwan Food and Drug Administration (TFDA) separates medical devices into Class I (low risk), Class II (moderate risk), and Class III (high risk). A further category is the class of 'New Medical Devices', which are devices with no equivalent device in Taiwan. Taiwan's classification system is similar to the system used by the US Food and Drug Administration.

Taiwan's medical-device industry is heavily weighted towards Class I product. With very few high-end or Class III device manufacturers, imports meet most of the demand.

Compared to most western countries' medical device industries – where hospital-use, higher-revenue equipment dominates (eg in MRI- or hospital-based diagnostics or treatment products) – Taiwan focuses more on consumer-level equipment such as blood-pressure monitors, glucose monitors and mobility devices.

While government authorities are aware of this lost opportunity at the high end of the market, and are encouraging the industry to upgrade, in the short to mid term this gap presents an excellent opportunity for overseas manufacturers to meet this need.

Strengths of Taiwan's medical-devices sector

Key strengths of Taiwan's medical-devices sector are:

- existing strengths in precision machinery and engineering, electronics, metal and plastics molding, etc, which can be transferred to the development of medical devices
- ease of fund sourcing, due to low stock-market listing requirements and a vibrant venture capital industry
- a strong public healthcare system, including universal health insurance and high numbers of doctors
- government support, including incentives, research funding, development of industry clusters, academia-industry interaction and established technology-transfer mechanisms.

Trends driving growth in this sector

Key trends driving growth in the sector are:

- > growing worldwide demand for home-use medical devices
- > growing demand for lower-cost equipment generated by rising demand in China
- > a growing trend towards outsourcing by international companies
- > the shifting focus of many of Taiwan's largest industrial conglomerates towards the healthcare sector (such firms have access to massive resources and funding; for example, contract electronics manufacturer Hon Hai is now funding many new medical ventures, including medical research foundations and a biomedical engineering centre)
- > an ageing population in Taiwan and in its main target markets.

2.1.2 Issues and challenges

Opportunities in Taiwan for low-end devices used in aged care (eg basic consumables, mobility equipment) are not great for overseas companies, because this segment is well covered by Taiwan's almost 800 medical device companies, most of them relatively low-end.

Taiwan is also strong in particular high-end segments of the industry, such as digital health. Therefore, overseas companies need to undertake careful analysis to identify potential areas for differentiation and market opportunity.

2.1.3 Taiwan telehealth developments

A number of large-scale telehealth pilot programs have been launched in Taiwan in recent years.

The first was the U-Care Program set up in 2006 by the Department of Industrial Technology, followed by the Taiwan Telehealth Pilot Program in 2007, run by the Industrial Technology Research Institute to support long-term care environments.

The Taiwan Telehealth Pilot Program integrated medical institutions, communications-technology providers, home-security firms and device manufacturers. It was based on three care models:

- > community-based care services
- > home-based care services
- > institution-based care services.

Preliminary results revealed both the community-care and home-care models facilitated a rapid medical response to health emergencies. The success of the Taiwan Telehealth Pilot Program was significant in forging a greater acceptance of telehealth among all relevant stakeholders in Taiwan, and greater opportunities for participation in the industry by both Taiwanese and overseas device, system and service providers.

The Suang-Lien Living Lab was established by the Center of Innovation and Synergy for Intelligent Home and Living Technology (INSIGHT Center, National Taiwan University) in the Suang-Lien Elderly Care Center in 2009.



Currently, several local hospitals offer telehealth services, including the China Medical University Hospital, which has joined forces with clinics in central Taiwan to offer a trial service, and Taipei's National Taiwan University Hospital Telehealth Center.

2.1.4 Local procurement channels for medical devices and equipment

Queensland businesses considering entering the Taiwanese market need to be aware of the major procurement channels for medical devices and equipment. Key procurement channels are listed below:

- **Government Procurement Office website (tender-based):**
<http://web.pcc.gov.tw/pishtml/pisindex.html>
- **Taiwan Food and Drug Administration (TFDA) procurement website (tender-based):**
<https://www.fda.gov.tw/TC/tender.aspx?cid=50&cchk=b5c022ec-5bf1-4384-a849-3d15a-82cac38&pn=8>
- **A private-sector procurement website with many hospitals listed:**
https://www.taiwanbuying.com.tw/Query_TypeAction.ASP?Category=365

Most hospitals also run their own tender-based procurement websites. Two examples are:

- **Taichung Armed Forces General Hospital**
<https://803.mnd.gov.tw/news/cate1/sn4/>
- **Mackay Memorial Hospital**
<http://www.mmh.org.tw/info-news-detail.asp?id=4961>

2.1.5 Regulatory and business requirements

All medical devices must be registered and approved before being imported for sale or use in Taiwan.

The Industrial Technology Research Institute provides a website to help determine the category and classification of your device at this link: <http://mdlicense.itri.org.tw/DB/MDClassification.aspx>.

Note also that products must be registered individually, as licences apply to individual products only and not to product lines.

Recommended steps:

- STEP 1:** Determine if the product is considered a medical device under a Taiwan classification and, if so, to which category and class it belongs.
- STEP 2:** Evaluate business considerations such as market size, regulatory ease and reimbursement issues.
- STEP 3:** Consult legal experts on the need for local product or company intellectual property protection.
- STEP 4:** Find and select a suitable and certified local distributor for the product, as well as a suitable local Market Authorization Holder.

Note: A foreign company not only needs to appoint a certified medical-device distributor but must also designate a separate Market Authorization Holder, which will register the device on behalf of the manufacturer and is the official holder of the registration in Taiwan.

Your distributor could also complete the registration on your behalf and be the registration holder, but it is recommended to separate the roles to provide greater security and flexibility in future dealings with the distributor. The Market Authorization Holder will typically charge a registration service fee on top of the existing registration fees charged by the TFDA, as well as an annual fee for retaining the registration.

STEP 5: Prepare documents required for registration with the TFDA. The Market Authorization Holder will submit the documentation on your behalf.

STEP 6: Wait for approval, and once the Medical Device Product License is received from the TFDA, your distributor can apply for and begin to import the product for sale in Taiwan.

Product registration review times (approximate, actual review times may differ):

- **Class I device:** 1–5 months, depending on whether a Quality System Documentation Certificate is required
- **Class II device:** 8–17 months
- **Class III device:** 12–17 months. If the device is considered high-risk, the TFDA Medical Device Committee will review the device, with this step adding around 8 months to the approval timeline.
- **New Medical Device:** 14–24 months. The product will be required to undergo review by the TFDA Medical Device Committee.

Case study 1: How Tunstall Healthcare partnered with Taiwan's Revlis Biotech to enter the China market

Tunstall Healthcare (<http://www.tunstallhealthcare.com.au/>) provides connected care and connected health solutions, supported by assistive technology and 24/7 monitoring. The Tunstall system is well established and backed by 60 years' company history. Tunstall reports that it has 30,000 systems in place around the world, with around 3.5 million users globally.

Initial entry into Taiwan, and early relationship building with Revlis Biotechnology

Tunstall entered the Taiwan market in 2006, setting up a fully owned business without partnering with a local entity. Its main business at that time was medical alarms, with the back-end to manage the resultant data.

A 24/7 call centre was set up and, at its peak, Tunstall's Taiwan office employed 40 staff. Setting up the business went smoothly, and finding and entering business premises took only a matter of weeks. It was also easy to find staff with good English and technical skills. Product registration was straightforward.

Over time, Tunstall got to know Taiwan's Revlis Biotech (<http://www.revlis.com.tw/main.php>) and identified them as a potential partner to help market and sell Tunstall's alarm systems. Revlis had originally focused on selling consumer products such as cosmetics, but had recently decided to change focus and enter health care.



At the time, Revlis was developing a remote ECG device, and Tunstall became its market consultant for this health peripheral. Revlis didn't have a monitoring system or a system to take action on information provided by the ECG to intervene with a patient, while Tunstall didn't want to develop all possible peripheral devices, but had a unique monitoring system developed over many years. It made sense for the two companies to collaborate.

China as a target

Revlis saw the value of bringing Tunstall on board to include a service component in its offering and to enter China as a one-stop healthcare-solutions provider, providing alarms, sensors, smart home technologies and medical devices, so that a patient exiting hospital could have a nurse at the end of that line. In June 2016, Tunstall Healthcare entered into an exclusive connected health and care distribution agreement with Revlis Biotech to target China.

With a good understanding of both markets, Revlis saw better business volumes in China than in Taiwan. Taiwan's already well-developed health delivery practice based around its National Health Insurance system is very good for patients but means the private pay market is small. Also, Taiwan's telehealth providers are more established than China's, so competition in Taiwan is greater. Government support for aged-care initiatives is also particularly strong in China, creating more opportunity to work with local governments than in Taiwan.

To date, the partnership is doing well, with three demonstration units up and running in China (eg at Qingdao Connected Healthcare Center). It has also secured private business through a local hospital. Revlis Chief Operating Officer Martin Chang has noted that the consortium aims to reach 32,000 connected health patients by 2019.

Advice for other companies considering forming a consortium with a Taiwan company to enter China

- First and most important – find the right partner. Using a Taiwanese partner will have advantages in terms of language, culture and often in-market experience when it comes to China. You may also have to navigate a unique political environment, and only a local partner can really do that.
- Set up a demonstration facility for your products or services. Teleconferences won't adequately demonstrate your offering because of language and cultural differences.
- Get to know the best channels to pursue for business opportunities. For example, should you pursue private or government business?
- Be patient; success doesn't happen overnight. Five years from the first contact until the first solid deal or contract is the norm. You will have to visit often.
- Be region-specific; don't commit to the whole of China with one partner. For example, the distribution agreement with Revlis is for specific provinces initially. This allows for partnership opportunities with other companies to enter other regions.

2.2 Tips for market entry

2.2.1 Popular business models for engaging with Taiwan companies

Overview

There are many ways a Queensland medical technology company can successfully engage with Taiwan's medical technology and digital health sector, either to distribute products in Taiwan or to use Taiwan's expertise and development infrastructure for further reach into global markets.

The best place to start is to talk to TIQ about developing a strategy for entering the market. Contact a TIQ representative today at tiq.qld.gov.au/contactus

Other engagement methods include:

- › Going it alone and setting up a presence and distribution operation in Taiwan without a partner (not generally recommended for smaller companies).
- › Finding a local distributor to represent your product in Taiwan.
- › Finding a company or system to integrate your product with.
- › Finding a partner, integrator or system to integrate your product into to enter a third-country market, typically China (see below for more details).
- › Using Taiwan's rapid prototyping and repurposing capabilities to develop medical devices for global markets (see below for more details).
- › Manufacturing a medical device in Taiwan for global markets (ie find an original equipment manufacturer or original design manufacturer partner).
- › Seeking supply-chain partnerships with local vendors and 'module' providers.
- › Transferring/licensing technology or a module to a local medical-device development entity.

Partnering with a Taiwanese company to access other markets

Digital and smart-health products, systems and services, such as telemedicine, are particularly suited to aged-care settings. Taiwan developers are already very strong in areas such as networked hardware (including monitoring devices and peripherals, software and networking systems). These products and services are also a focus for many Queensland companies.

However, Taiwanese digital and smart-health companies lack the international reach of many Australian companies, other than in China and certain Asian markets. Similarly, Queensland companies may lack a workable strategy for entering China. Therefore, a cooperative venture between Taiwan and Queensland companies may present the perfect solution for both sides. Tunstall Healthcare's cooperation with Revlis Biotech and their joint entry into China is a good example of this model. (See Case study 1 for more details.)

Use Taiwan's rapid prototyping and repurposing capabilities to develop medical devices for global markets.

With strengths in the electronics sector and in manufacturing, precision engineering, electronic control, and miniaturisation, Taiwan is an ideal location for outsourced product development and product repurposing. Working in partnership with a seasoned Taiwan operator, Queensland companies can take advantage of fast development times to ready their products for global markets in a cost-effective manner.

The Taiwan Rapid Innovation Prototyping League for Entrepreneurs (TRIPLE, www.triplelinkage.com/) program, run by the Industrial Technology Research Institute, is a window into such services. TRIPLE provides services to five main innovation-based industries: wearable devices, the internet of things, advanced manufacturing, advanced medical devices, and advanced materials. You can learn more about TRIPLE from this YouTube video <https://www.youtube.com/watch?v=9kuQic8RhNk>.

Queensland IoMT or medical-device companies at the early stage of product development should consider partnering with some of the many Taiwanese universities, research institutes or private companies with a focus on developing medical devices. A list of some of Taiwan's leading medical-product development entities can be found in Table A-1, Appendix 1.

2.2.2 Competitors

Japan

The Panasonic Home division of Japan's Panasonic Group provides and integrates wireless smart-home equipment, including IoMT devices. Their products also include assisted-living devices. Panasonic is now developing nursing-care facilities for the elderly in Japan, through its housing subsidiary PanaHome and elderly-care services subsidiary, ComHeart.

USA

Medtech giants Medtronic and Stryker have acquired local competitors in China in order to sell local companies' products with a western label. These companies have a strong presence in Taiwan, as does Johnson & Johnson.

Europe

A number of European high-end assisted-living and mobility-device manufacturers are represented in Taiwan, including nursing-home equipment provider Wissner Bosserhoff from Germany and assistive-tools manufacturer R82 from Denmark.

2.2.3 Finding a 'Market Authorization Holder' partner

Most Taiwanese medical-device consulting firms will provide a Market Authorization Holder service. Typically this service will include:

- > submission of all registration documentation to the TFDA on your behalf
- > assistance in obtaining the Quality System Documentation Certificate
- > serving as a regulatory liaison between you and the TFDA

- › overseeing any Serious Adverse Event reporting for your device
- › assistance in maintaining your Quality System Documentation Certificate and device registration
- › authorising your Taiwan distributor to import the product from the manufacturer directly.

See Table A-2, Appendix 1, for a selection of medical-device consultants who provide Market Authorization Holder services.

2.2.4 Finding a medical-device distributor

Taiwan has thousands of distributors of medical devices. While there are no dedicated industry associations for medical-device agents, many of the firms selling pharmaceuticals distribute devices. Organisations such as the Chinese Association of Pharmaceutical Agents or the Taipei Pharmaceutical Agent and Distributors Association are good places to start to seek potential partners. In particular, the Chinese Association of Pharmaceutical Agents is a proactive organisation and receptive to overseas enquiries.

Choosing a distribution partner for an aged-care market medical device requires systematic selection and vetting to find the most suitable partner for your product. Consider the larger, more established pharmaceutical wholesalers who also distribute medical devices, such as DKSH Taiwan, which employs over 1,000 staff at 40 locations. Ask yourself the following questions during the selection process:

- 1 Does the potential distributor sell products that are synergistic or similar to your own? This can be an advantage if it shows that the company has expertise in this therapeutic area, or a disadvantage if it means your product will be competing with existing products in the distributor's portfolio.
- 2 Does the distributor have strong sales and marketing personnel? Set some vetting qualifications: for example, that the distributor is large enough that at least one salesperson can be dedicated to the promotion and sale of your products.
- 3 Relationships are important in Taiwan, as in the rest of Asia. How well do you know your potential distributor? How will you develop the relationship going forward?
- 4 Do you speak the distributor's language or is their English good enough to communicate?
- 5 Does the distributor understand conflict of interest, contracts, and international business best practices? Are you both on the same page with regard to ethical business practices and conduct?
- 6 Do you have a plan in place if the relationship with your distributor takes a turn for the worse, or if sales expectations are not met?

See Table A-3, Appendix 1, for a selection of the largest medical-device distributors and integrators in Taiwan with an aged-care focus.



If your device or peripheral can be integrated into part of a larger system, consider contacting a company involved in the development or integration of telehealth systems. A list of such companies can be found in Table A-4, Appendix 1.

If your company is involved in telehealth systems, system integration, software, or app development, consider contacting a health periphery, diagnostics or e-health operator with an existing connection to the aged-care market. A list of such companies can be found in Table A-5, Appendix 1.

1. Ministry of the Interior, 2018: https://www.moi.gov.tw/chi/chi_news/news_detail.aspx?type_code=02&sn=13723
<https://www.taiwannews.com.tw/en/news/3402395>

3. Aged-care facility design

3.1 Market analysis

3.1.1 Segment description, including drivers and trends

Taiwan as an ageing society

As noted previously, in April 2018, Taiwan officially moved from being an 'ageing' society – where a country's population over the age of 65 has surpassed 7% – to being an 'aged' society – with over 14% of the population aged over 65. The island nation is now advancing towards 'super aged' status – where the proportion of over 65s is over 20% – and is expected to reach this milestone in 2026.¹

Passing through these stages at a rapid rate, Taiwan is now one of the fastest-ageing societies in the world. Currently, Taiwan has over 3,434,000 people aged 65 and over, with this number expected to reach 4,883,000 by 2026. By 2061, this total is expected to surpass 7,000,000, or almost 39% of the population.¹

Senior Citizen Condition Survey

Market demand for residential aged care in Taiwan can be gleaned from the Senior Citizen Condition Survey administered by the Ministry of Health and Welfare. The most recent results are from the 2013 survey of those aged 55–64 and 65 and over, with questions included on living conditions as well as future plans and expectations.

For those aged 65+, 25.8% lived in a two-generation household, while the proportion living in a three-generation household was 37%. A total of 20.6% lived only with their spouse, while 11.1% lived alone. In total, then, almost 63% of those aged 65+ were living in either a two- or three-generation household. This reflects strong local cultural values of filial piety, which lead sons and daughters to take care of their parents in old age under the same roof. However, this total has dropped slightly since the last survey in 2009, when it was almost 68%, while the percentage living alone has risen slightly from the 2009 figure of 9.2%.

The same survey enquired about willingness to live in an aged-care facility; in the 55–64 age group, only 27.2% said they would be willing to live in such a facility eventually. Among those aged 65+, an even smaller 14% said they would be willing. When asked if they would be willing to live in such a facility if their health condition declined to the point that they were unable to care for themselves, the percentage of those responding 'yes' rose to 72.2% for the 55–64 group, but only 43.1% for the 65+ group. Elderly Taiwanese people's desire to stay in the community, remain in their home or live with their offspring, regardless of their health condition, is very strong.

While these numbers show that demand is currently low, Taiwan's rapidly changing demographics will inevitably increase demand for residential aged-care facilities at some point in time.



Long Term Care 2.0

The government enacted its 10-year Long Term Care 2.0 plan (LTC 2.0) in January 2017, overriding an earlier LTC plan enacted in 2008, formalising its goal to provide accessible and affordable long-term care for its growing elderly population. The plan focuses on four care categories:

- > home care services
- > community-based services, including drop-in community centres for the elderly
- > institutional care
- > respite care.

‘Ageing in Place’ is the policy goal, and the option supported by the World Health Organisation. LTC 2.0 has a strong emphasis on providing community-based and home-care services, at affordable rates with subsidies for the poor.

The elderly receive and pay for these services based on an assessment of their current health condition and income level, and receive an allocation of service hours at a subsidised rate. The government pays up to 90% of the cost of such services (typically around NT\$200 per hour, or AUD\$9 per hour) for low-income recipients, and less for those in higher income categories.

With an initial budget of NT\$20 billion (AUD\$884 million), which is scheduled to rise to NT\$30 billion (AUD\$1.32 billion) this year, funding sources for directives under LTC 2.0 include revenue from raised levels of estate tax, gift tax and tobacco tax. Insurance premiums such as those that fund the National Health Insurance are not currently being considered.

3.1.2 BOT (build-operate-transfer) program

In the early 1990s in Taiwan, private-sector interest in investing in aged-care residential facilities was growing, and the government saw the opportunity to further kickstart the sector by setting up a BOT-style program, the Promoting Private Participation in Senior Citizens’ Housing Project. The program included incentives such as tax breaks and land acquisition to encourage private investment in large-scale elderly housing. However, the project was a failure, with only 27 applicants and only 1 project getting off the ground, which failed soon after. The BOT program was shelved in 2008.

Even today, private participation in facility development is relatively low, notwithstanding a few larger developments. Reasons include an under-appreciation of the costs of constructing and setting up large developments, ongoing low occupancy rates, low return on investment, restrictive laws governing management and resident financing models, and unclear government funding and assistance programs.

3.1.3 Residential aged-care facility landscape

As in other countries, several levels of facility exist in Taiwan depending on care needs and a resident’s ability to live independently.

At one end of the scale are independent living units (ILUs), where residents are generally healthy and can live independently, taking care of themselves in apartment-style rooms; in the middle are facilities with staff to assist in certain tasks such as dressing or bathing, but also with nursing staff and hospital-style wards on hand; on the other end of the scale are full nursing homes with medical facilities for residents who are bedridden or close to it. Respite facilities also exist where the aged can stay for a short time under care so that their at-home caregiver can take a break.

More than 220,000 foreign workers, mostly females from South East Asia, currently work in Taiwan in both home-based care and in nursing homes.

In 2016, the number of residential aged-care facilities in Taiwan totalled 1,082. This was only a small increase from 2015 and the total has been almost constant over the last 10 years. The number of available beds totals 61,082, with the actual number of residents being 47,192, an occupancy rate of 77.3%. This surprisingly low occupancy rate shows that Taiwan's aged-care supply-demand dynamics are still in flux, and explains why the government's expected boom in construction of aged-care facilities never materialised.

3.1.4 Taiwanese ILU facilities – examples

The Chang Gung Health and Culture Village is a large facility affiliated with the Chang Gung Memorial Hospital, itself a part of the Formosa Plastics Group.

The facility opened in 2000, with planning beginning in 1995 when the development group visited aged-care facilities in the USA, Japan and Australia to learn from best practices.

Covering a 25-hectare site (250,000 square metres) in rural Taoyuan and housing 3,849 living units and 5,530 beds at its current stage of development, the facility currently comprises six residential buildings, with two further buildings planned. One of the few facilities in Taiwan with a waiting list (currently about 100), it accepts only residents who are healthy at the time of entry, with no mobility issues, contagious diseases, epilepsy, memory concerns, dementia, etc. The campus contains a wide range of indoor and outdoor recreation facilities. While popular, its isolation from nearby communities and its distance from Taipei are a deterrent to some potential residents. Interestingly, 40% of its residents were previously living overseas and returned to Taiwan to retire.

The facility is operated as a non-profit foundation to take advantage of various tax, regulatory and brand goodwill benefits, according to representatives of the organisation. Its fee is between NT\$19,000 to NT\$36,500 per month, depending on apartment size – 13 ping (45 square metres) to 23 ping (72 square metres) – and whether the room is for one or two people. This is considered high for the average pensioner in Taiwan. Bond is NT\$250,000 to NT\$400,000.



Image 1: Chang Gung Health and Culture Village – artist's impression



Note: B and D blocks pictured above have not yet been built. According to company representatives, there are no plans to set up additional facilities around Taiwan as there remains ample room to expand the current facility. In addition, Chang Gung executives suggest that the government does not want to see the organisation set up similar facilities in other locations in Taiwan until the industry develops further, to encourage competition in the marketplace.

Another ILU facility is the Ruen Fu New Life Retirement Home, situated next to Tamkang University in Tamsui, New Taipei City. This proximity to a community of young people has proved popular and provides residents with a more diverse experience than if they were only with other seniors. Ruen Fu used aged-care facility-development and management specialists Nakagin Integration Inc. of Japan as technical consultants in the planning stage of this project.

Suang-Lien Elderly Care Center, Taipei, was founded in 1995 by the Suang Lien Presbyterian Church. The facility is well regarded and the operating organisation is a strong supporter of smart-health and telehealth applications for elderly-care environments. Its Suang-Lien Living Lab was established at the facility by the Center of Innovation and Synergy for Intelligent Home and Living Technology (INSIGHT Center, National Taiwan University) in 2009. Additionally, it has at least 40 ongoing projects in China, Singapore and Taiwan that showcase Taiwan's 'smart care' service model, integrating hardware, software, services, training and supporting tools.

3.1.5 Private-sector investment

While Taiwan's aged-care sector has attracted some interest from major local investor groups and conglomerates, there has been no significant overseas investment to date. For a list of local ownership, investment or operator interest in Taiwan aged-care facilities, see Table A-6, Appendix 1. Consider contacting these entities to explore future cooperation opportunities.

3.1.6 Opportunities

An identifiable opportunity for Queensland aged-care architecture firms may be in the design of small-scale community daycare centres, or in the upgrading or retrofitting of existing properties into such centres. Drop-in daycare centres are a cornerstone of the LTC 2.0 policy, with the plan to have hundreds established throughout Taiwan. Several architecture firms in Taiwan are already focusing on this market with good results.

3.1.7 Issues and challenges

Quality of low-end aged-care facilities

Facility standards and management of nursing homes and lower-end aged-care residential facilities in Taiwan are often poor, at least compared to a typical facility in Queensland. Typically, they may have:

- > mostly bare rooms (basic or hospital-style)
- > dementia patients restrained in chairs or beds
- > low carer-training requirements (eg 100 hours)
- > many workers from other countries and language backgrounds, which can make carer-resident communication difficult
- > few outings (facilities are often in crowded urban areas where it can be difficult to safely visit parks, etc).

The need to upgrade standards has been raised, but provisions in the LTC 2.0 Act stipulate that institutions established before the Act came into effect in January 2017 are exempt from certain laws and standards governing newer facilities. As a result, the expected upgrading of the sector across the board because of new standards requirements under LTC 2.0 has failed to materialise.

Pricing

In Taiwan, mechanisms for funding senior citizens' lifestyles after retirement remain the domain of life insurance firms, but asset-transfer models for funding the move to an aged-care facility (which are more common in the west) are not typically found in Taiwan. An exception is the Chang Gung Health and Culture Village, which offers asset sale and financing assistance to new residents.

The government is promoting a 'house-for-pension' policy that is mostly handled by banks through their credit businesses, but this is still in its early days. In Taiwan's ILU-style facilities, the model is 'rent to live' rather than the purchase model that is common in Australia. This limits return on investment and financial options for the developer, making it a less attractive proposition. The typical NT\$30,000 per month rent for such an ILU unit is still considered expensive for Taiwan, and attracts only wealthier senior citizens.

Land acquisition and land density

Taiwan is densely populated and has high land values in urban areas, making land expensive to secure. Acquiring land for development projects can be a long process. Therefore, larger retirement villages are unlikely to be built in the major cities; Chang Gung Health and Culture Village is in a rural area, for example. However, setting up multi-floor hotel-style residential accommodation for the elderly within urban areas is certainly possible.

Taiwan's falling birth rate is already reducing the number of high-school and university students and, with the university market long oversaturated (until 2015 over 160 universities), the government is pushing for the closure or merger of universities. Therefore, an attractive option may be to convert disused schools and universities into aged-care facilities, addressing both the falling birth rate and rising numbers of elderly.

Investment and ROI concerns

Factors holding back overseas investment in Taiwan's aged-care facility industry include:

- uncertainty around the extent and sustainability of government funding
- low profitability, limiting opportunities for foreign entrants
- strict regulations governing development, operations, profitability, etc
- no incentives or targets for housing old people in residential facilities (unlike China).

3.1.8 Investment by Taiwan companies in aged care in China

A number of Taiwan companies and conglomerates are planning to enter, or have already entered, the China market in aged-care facility development and/or management. See Table A-7, Appendix 1, for a list of such entities.

3.1.9 Regulatory and business requirements

Foreign entities can enter the Taiwan market as an aged-care facility operator but can only be minority owners in a locally held joint venture (owning up to 49%), and may hold only up to one-third of the board seats of this entity. They must also still comply with local architect licensing and other business requirements.

Therefore, a preferred strategy is to partner with an existing Taiwanese architecture firm.

3.2 Tips for market entry

3.2.1 Market-entry strategy and business models

Under current conditions, there are few worthwhile opportunities for Queensland aged-care architecture firms in the Taiwan market in the short to mid term. Several respected industry experts and consultants who have visited Taiwan in recent years have reached the same conclusion. However, if key factors change, then companies who already understand the market and have developed contacts in the industry will be poised to benefit.

These key factors include:

- › numbers of elderly reaching a point where demand creates enough opportunity
- › clarity within LTC 2.0 around grants and subsidies to enter the industry
- › increased LTC 2.0 funding over current numbers, and with more secure funding sources
- › legal changes to allow greater bond payment by ILU residents, purchase of units by residents, etc
- › government incentives to encourage overseas expert involvement
- › government targets set for numbers of elderly to be housed in residential facilities.

One current area with potential is the design of community daycare centres for the elderly, or the upgrading/retrofitting of existing properties into such facilities. Drop-in daycare centres are a cornerstone of the LTC 2.0 program, and hundreds are planned throughout Taiwan, so demand is assured in the short to mid term. At least one architecture firm in Taiwan is focusing exclusively on this market, with good results.

Given this context, these are the recommended steps to enter the Taiwan aged-care facility design market:

STEP 1: Understand the LTC 2.0 Act and its implications for this industry.

STEP 2: Make connections: Talk to Trade and Investment Queensland and Austrade, government and major corporate groups, investment houses, local connections and whoever you can find who might have a strategy around investing in this market.

STEP 3: Attempt to secure training, lecturing, and consulting projects, to establish contacts and build your reputation in the Taiwanese market. Make sure to target organisations that can see the benefit of getting good advice. Be willing to engage. Possible training or speaking topics include international training standards, design innovations and management systems.

Those that may be interested in such services include:

- › investors / owners / operators of existing aged-care facilities
- › other large private hospitals or their parent companies that may be considering entering this market

- > relevant industry associations
- > investment firms
- > nursing associations
- > national or local government health departments
- > national conferences or gatherings in the aged-care sector
- > architectural offices.

See Table A-8, Appendix 1, for a selection of Taiwan architectural offices with an interest in, focus on or prior involvement in the aged-care sector.

STEP 4: The next step is to develop relationships with local architectural firms that are looking to add an international edge to their appeal (eg promoting to investors or clients that there will be an international designer or partner involved).

The jump from consulting to working with a local architect on a new facility is a significant one; Australian companies that have already spent time in this market have not yet successfully taken this step.

STEP 5: As the project moves along, your involvement as a foreign partner will slowly diminish and it will be time to move on to the next project.

4. Aged-care facility management

4.1 Market analysis

4.1.1 Segment description, including drivers and trends

Driven by Taiwan's rapidly ageing population and the apparent urgent need to upgrade Taiwan's aged-care residential facility standards, there should be strong demand for overseas aged-care facility management expertise, with ample opportunities for experienced Queensland operators in this space.

However, save for a few Japanese companies, overseas involvement in this field is almost non-existent. This indicates that it is probably harder than it appears to make inroads in this market, at least compared to China, where a number of Australian companies have successfully set up and are managing aged-care facilities. The reasons are essentially the same as those discussed in relation to aged-care facility design: that is, issues around pricing; return on investment; lack of government incentives, targets or policies to entice overseas involvement; and lack of clarity regarding long-term funding under LTC 2.0.

As discussed previously, foreign entities can enter the Taiwanese market as aged-care facility operators, but can only be minority owners in a locally held joint venture (owning up to 49%), and may only hold up to one-third of the board seats of this entity.

Case study 2: How Japan Genki Group installed management systems in a Tainan aged-care community centre

Established in 1993, Japan Genki Group develops and operates hospitals, aged-care and educational facilities in Japan, Korea and China, and provides the management systems, staffing and training for such facilities. They pitch themselves as the largest private provider of social-welfare services in Japan.

Development efforts in Taiwan

In 2015, Japan Genki Group set up an entity in Taiwan, Sanga Taiwan (<http://www.sangataiwan.com.tw>), to explore and develop similar opportunities locally.

In 2017, the subsidiary announced a memorandum of understanding with the Department of Senior Citizen Service Business at St. John's University in Tamsui, New Taipei City, to develop service systems for use in aged-care environments and to cooperate in educational areas. Currently the department is developing computerised management systems with Taiwan's Compal Electronics Inc., as well as service-connection device technology with a Kaohsiung-based technology company.

Management systems for aged-care facilities

Sanga Taiwan opened its first facility in August 2018, an aged-care daycare community centre in Tainan, utilising the full range of its services, such as staffing, meals, and wellness and activity programs for the elderly drop-in visitors.



At the SenCARE 2018 exhibition in Taipei, Sanga Taiwan promoted its turnkey solution as being well suited to the Tainan region because of land availability. They also encouraged those with land or vacant building space in the region to consider renting to Sanga to develop and operate aged-care or hospital facilities.

4.2 Tips for market entry

4.2.1 Market-entry strategy and business models

Under current conditions, there are few worthwhile opportunities for Queensland aged-care facility-management firms in the Taiwan market in the short to mid term.

Strategies for market entry and appropriate business models are similar to those in facility design. Please see Section 3.2.1 for details.

4.2.2 Competitors

Japan

Japan has hosted a number of aged-care industry delegations from Taiwan in recent years and, with the strong bilateral business relationship between the two nations, it is not surprising that Japan appears to have been the first and so far only overseas entry into this market, albeit with few projects. Japan is probably the main competitor to any involvement in this sector by Queensland's many facility-management entities.

Japan Genki Group

The Japan Genki Group set up a Taiwan subsidiary Sanga Taiwan, which, in August 2018, started managing a community daycare centre for the elderly in Tainan. (See Case study 2 for more details.)

Nakagin Integration Inc.

Hospital and aged-care facility management company Nakagin Integration Inc. worked with Taiwanese entity Ruen Fu as technical consultants in setting up of the Ruen Fu New Life Retirement Home, next to Tamkang University in Tamsui, New Taipei City.

Panasonic Group

The Panasonic Group's housing subsidiary PanaHome, and elderly-care services subsidiary ComHeart, are now developing and managing nursing-care facilities for the elderly in Japan. According to company statements, the group wants to expand this concept into other Asian markets with ageing populations, presumably including Taiwan.

PanaHome, which constructs and manages smart homes with connected Panasonic appliances, has an entity in Taiwan (<https://www.panasonic.com/tw/company/homes.html>), with a showroom in Hsinchuang and at least one project under construction. While the company's smart homes target all markets (not just the elderly), PanaHome is currently working with Taiwan's Sampo Group in the development of a residential facility in Tucheng, New Taipei City.

Asia Welfare Consultants Co., Ltd.

Asia Welfare Consultants Co., Ltd. of Japan provides a range of consultancy services, including management, to Japan's aged-care industry.

It has an entity in Taiwan of the same name (<http://www.asiawelfare.tw/>), which currently only markets wheelchairs and similar assisted-living devices. However, during a delegation to Japan in 2017, led by Taiwan's Industrial Technology Research Institute, Asia Welfare Consultants signed a memorandum of understanding with Taiwan's Hon Yang Healthcare (<http://www.hyhealths.com.tw/>), service providers to the aged-care market. With this agreement, it is likely the company will soon expand its service offerings in Taiwan.

5. Conclusion

Taiwan's rapidly ageing population is driving increased demand for aged-care services and products. The greatest commercial opportunities for Queensland companies lie in providing Class III medical technology for aged-care environments. In addition, Taiwan's manufacturing capabilities and relationship with China make it an ideal location for the collaborative development of medical devices for other, larger markets.

Taiwan's cultural norms around family care of the elderly, combined with government policies encouraging 'ageing in place', mean that demand for aged-care residential facilities is low. Therefore, in the short term, there are few commercial opportunities for Queensland businesses in the design, construction or management of aged-care facilities in Taiwan. However, commercial opportunities lie in the design of small-scale community daycare centres, or the upgrading or retrofitting of existing properties. This may change in the longer term, and Queensland aged-care businesses looking to take advantage of such a shift would be well advised to start building a network of industry contacts in Taiwan.



Appendix 1 – Company and other industry data

Table A-1: Taiwanese organisations developing medical-device technology

Name	Website and notes
The Yuan Ze University Gerontechnology Research Center	http://grc.yzu.edu.tw/ Established in 2003. Developed an early proof-of-concept portable telehealth homecare monitoring system (PTMS) for elderly environments. In 2016 established the spin-off company SEDA G-Tech Co., Ltd., partnering with bedding company SEDA Chemical Products. G-Tech stands for Gerontechnology. Product range includes WhizToys for rehab purposes, and WhizLiving; monitoring devices for aged-care use. https://www.seda-gtech.com.tw/whizliving.html
National Cheng Kung University (NCKU)	http://web.ncku.edu.tw/bin/home.php?Lang=en Pitching itself as the ‘Engine for Taiwan’s Medical Devices Industry’. NCKU contains a medical school, engineering, biotechnology and management colleges. The campus also houses the Medical Device Innovation Center (MDIC, see below). The Medical Electronics and Device Technology Center (MED), an offshoot office of Hsinchu’s Industrial Technology Research Center (ITRI), is located on the NCKU campus. NCKU organised the ‘2018 Smart Health and Wellness Industry Forum’ held in Tainan on 27 April 2018, an event focused on long-term care applications, with notable speakers from both government and industry.
Medical Device Innovation Center (MDIC)	http://mdic.ncku.edu.tw/en/ Located at National Cheng Kung University, MDIC funds academic and collaborative research initiatives as well as generally supporting the medical device sector. Core technologies are in precision manufacturing, medical imaging, biomaterials, ICT applications, orthopedics and particularly implants, rehabilitation robotics and neuro-rehabilitation. MDIC operates two research units: the Digital Medical Design Center, and the Intelligent Manufacturing Research Center.
National Health Research Institutes (NHRI), Institute of Biomedical Engineering and Nanomedicine	http://iben.nhri.org.tw/ NHRI, a division of the Ministry of Health and Welfare, is responsible for the generation of medical research for eventual transfer to industry. The Institute of Biomedical Engineering and Nanomedicine, established in 2013, holds 68 such patents in these disciplines.

Name	Website and notes
Industrial Technology Research Institute (ITRI), Biomedical and Device Research Laboratories	https://www.iti.org.tw/eng/Content/Messagess/contents.aspx?SiteID=1&MmmID=617751556055761436 The Industrial Technology Research Institute (ITRI), located in Hsinchu, is Taiwan's largest applied research institute with 5,800+ personnel, including 1,300+ Ph.Ds. ITRI has spun off more than 240 companies including some of Taiwan's largest electronics companies such as Taiwan Semiconductor Manufacturing Company and UMC. ITRI's Biomedical and Devices Research Laboratories hosts over 100 researchers with Ph.Ds. Core technology and expertise includes biomedical electronics and imaging, biomarkers and in-vitro diagnostics, and innovative technology development and integration.
INTAI	http://www.intai.com.tw/business_unit_medical.php INTAI offers the co-development of innovative medical products and orthopedic implants faster and more cheaply using certified project management professionals, an in-house design team, and utilising its own manufacturing facility.

Table A-2: Selected Taiwanese medical-device consultants that provide Market Authorization Holder services

Name	Website and notes
BSI Group BSI 集團 infotaiwan@bsigroup.com +886-2-2656-0333	http://www.bsigroup.com/zh-TW/ British-headquartered
Sinew Consulting Group 樞紐科技顧問 service@e-sinew.com +886-3-5733-684	http://www.e-sinew.com/
Emergo Group Emergo集團 +886-2-2910-6575	https://www.emergogroup.com/ Texas, USA-headquartered GM in Taiwan: Ricky Liu
Pacific Bridge Medical hongkong@pacificbridgemedical.com	http://www.pacificbridgemedical.com/ Maryland, USA-headquartered Has unnamed Taiwan affiliate



Name	Website and notes
Brandwood Biomedical help@brandwoodbiomedical.com +61-2-9906-2984	http://brandwoodbiomedical.com/ NSW, Australia-headquartered Has unnamed Taiwan affiliate
K&C Associates christinenatalia@kc-medical.com.tw +886-2-2910-8777	https://www.kc-medical.com.tw/

Table A-3: Taiwanese medical-device distributors and integrators with an aged-care focus

Name	Website and notes
Chunghwa Senior Care Co., Ltd. 中化銀髮事業股份有限公司 +886-412-8178	http://www.cscicare.com/ Operates its own stores and online shopping platform. Distributes to hospitals and aged-care facilities. Also a provider of non-medical aged-care services including companionship, home helper, personal services, health improvement, dementia care, cancer care, hospice care, postoperative care, companionship during the medical visit, etc. An affiliate of China Chemical and Pharmaceuticals Co., Ltd., one of Taiwan's largest pharmaceutical companies.
Taiwan Stipendiary Co., Ltd. 台灣受恩股份有限公司 +886-7-3494408	http://stipendiary.com.tw/ Runs smart hospitals and respite care centres, with Taiwan-made hardware and software. Is also an integrator / distributor of medical device product lines into turnkey solutions. Investment from Sino-Life Group, a Hong Kong-based funeral business (NT\$20 million); company owned by father of Stipendiary GM. GM has mentioned at local forums that he hopes Stipendiary can partner with local Taiwan IoT vendors to promote smart elderly care throughout the group's existing network of locations in Taiwan, China and Vietnam.
DKSH Management Ltd. 台灣大昌華嘉股份有限公司 +886-2-8752-6666	http://dksh.com/tw-en/home Large company, 1,000 staff in Taiwan. Distributes a wide range of products in health care. Headquartered and publicly listed in Switzerland. First company in Taiwan to be certified with the Good Distribution Practice (GDP) standard by the TFDA.

Name	Website and notes
Unison Co., Ltd. 友信醫療集團 +886-2-2706-2121	http://www.unison.com.tw/ One of Taiwan's largest medical distributors, with capability in a wide range of product lines
A-Strong Co., Ltd. 亞博實業股份有限公司 +886-2-2763-3767	http://www.a-strong1987.com.tw Large company with four offices around Taiwan Represents range of medicines, medical device brands and products
Lab System Inc. 嘉旺股份有限公司 +886-2-2658-6518	http://www.labsystem.com.tw/ Product lines include lab equipment, wearables, hospital equipment, and assistive technology products
Greenmay Social Welfare 均懋福祉國際股份有限公司 +886-2-2778-0777	https://greenmay.co/ Integrator and distributor, imports assistive living devices and equipment Works on promoting accessible environments for physically challenged and elder groups, and offers courses to encourage architects and designers to consider accessible environment in their works
ProMedical Co., Ltd. 普達康股份有限公司 +886-7-397-2468	http://www.promedical.com.tw/ Distributes medical devices and equipment for physical and occupational therapy, geriatrics, fitness, and sports medicine, etc
Just 4 U / Strengthen Medical Instrument Co., 強生醫療儀器有限公司	https://www.just4u.tw/ Distributes high-end aged-care and assisted-living equipment from Europe
Hi-Clearance Inc. 杏昌生技股份有限公司	http://www.hiclearance.com.tw/ Large company, distributors of a wide range of medical device brands



Table A-4: Taiwanese smart-health/telehealth systems-development or integration companies with a focus on aged-care environments

Name	Website and notes
IEI Integration Corp. 威強電工業電腦股份有限公司 sales@ieiworld.com +886-2-8691-6798	www.ieiworld.com/_index/en/ Gave keynote speech 'Healthcare 4.0 – Smart Hospital' forum in Taipei, 2018 Contact person is Dr. Jordan Jiang, CEO
MiTAC Inc. 神通資訊科技股份有限公司 +886-2-26576666	http://www.mitac.com/ Partnership with Min-Sheng Healthcare to run home-care telehealth project (http://www.e-ms.com.tw/)
ELAN Microelectronic Co. 義隆電子股份有限公司 webmaster@emc.com.tw +886-3-5639977	http://www.emc.com.tw/eng/ Partnership with Min-Sheng Healthcare to run home-care telehealth project (http://www.e-ms.com.tw/)
TaiDoc Technology Co. 泰博科技股份有限公司 sales@taidoc.com +886-2-6625-8188	http://www.taidoc.com/ Telehealth partnership with the Yun-Lin Senior Association in cooperation with 3 teaching hospitals and 18 clinics
Taiwan SECOM Co. 中興保全股份有限公司 service@secom.com.tw +886-2-2162-6288	http://www.secom.com.tw/ Security solutions company, set up telehealth systems with Taipei Medical University Hospital Smart home / IoMT website: http://www.myvita.com.tw/
Smart eCare 悅康健康管理顧問科技股份有限公司 service@catchyourhealth.com.tw +886-2-2701-1100	http://www.catchyourhealth.com.tw/

Name	Website and notes
Taiwan Stipendiary Co., Ltd. 台灣受恩股份有限公司 +886-7-3494408	http://stipendiary.com.tw/ Runs smart nursing homes and respite care centres, with Taiwan-made hardware and software Considered an integrator / distributor of medical device product lines into their turnkey solutions Investment from Sino-Life Group, a Hong Kong-based funeral business (NT\$20 million), company owned by father of Stipendiary GM Stipendiary hopes it can partner with local Taiwan IoT vendors to promote smart elderly care throughout the group's existing network of locations in Taiwan, China and Vietnam
SYSCOM Computer Engineering Co. 凌群電腦股份有限公司 info@syscom.com.tw +886-2-2191-6066	http://www.syscom.com.tw/health/ Expertise in health care and system integration
iMedtac 慧誠智醫股份有限公司 sales@imedtac.com +886-2-2252-3030	http://www.imedtac.com/ Smart-health systems, such as MiHealth, a comprehensive, intelligent, yet more humane medical system integration service
EBM Technologies 商之器科技股份有限公司 info@ebmtech.com +886 2 8751 4567	http://www.ebmtech.com/ Develops and markets medical information technology solutions such as enterprise and mobile PACS and systems for patient health records (PHR), electronic medical records (EMR) and e-health
Crux Healthtech 克魯斯健康科技股份有限公司 crux1030721@gmail.com +886-7-3129-958 ext. 314	http://www.crux-healthtec.com/ Crux Healthtech provides health-data tracking and monitoring systems and services, including for 24-hour physiological monitoring and activity tracking; emergency medical services; member health management, medication safety guidance, real-time medical consulting, life event consulting, hospital return visit arrangement, special equipment consulting, etc Already has an Australian interest point in founder and serial medical device entrepreneur, Dr. Por Lai (eg has collaborated with Australian companies before with his previous company, A-Spine Asia)
Suang-Lien Elderly Center 雙連安養中心 sleh@ms35.hinet.net +886-2-2636-5999	https://www.slehtaiwan.com/ Founded in 1995 by the Suang Lien Presbyterian Church Reportedly currently has 40 different projects in China, Singapore and Taiwan that showcase Taiwan's smart-care service model, integrating hardware, software, services, training and supporting tools



Name	Website and notes
ZCON Telehealth Co., Ltd. 日康科技有限公司 service@zconhealth.com +886-7-2863100	http://www.zconhealth.com Telehealth systems, full solution including devices President Bob Pan bobbypan9988@gmail.com
TASHI Health (part of the Unitech Group) 達碩智慧科技股份有限公司 info@hq.ute.com +886-2-8912-1122	http://www.tashi.ute.com/health/ Telehealth systems
Melten Inc. 美爾敦股份有限公司 info@melten.com +886-2-2267-0607	http://www.melten.com/ Smart healthcare start-up applying IoT and blockchain technology to create smart healthcare solutions to help nurses deal with complicated workflows
Full Enterprise Corp. 富欣實業股份有限公司 fullbiz@fullcorp.net +886-2-2222-0707	http://www.fullcorp.com Systems and peripherals
NTUH Telehealth Center 臺大醫院要成立遠距照護中心 telecare@ntuh.gov.tw +886-2-2356-2872	https://www.ntuh.gov.tw/en/telehealth/default.aspx Provides 24-hour, personalised care to patients over its remote monitoring and care platform Platform keeps track of each patient's health status by continually updating and integrating new health information
Golden Smart Home Technology Corp. 高登智慧科技股份有限公司 service@goldensmarthome.com.tw +886-3-5770-693	http://www.goldensmarthome.com.tw/en/ B2B integrated solutions with cloud-enabled smart devices, applications, gateways, backend platform and big data analysis
MediCrowd SmartHealth 醫聯網	https://med-net.com/ Recently set up medical-service platform to facilitate exchange and communication between those who need physical checkup services and the providers of such services So far over 60 health examination entities in Taiwan have signed up to use the platform
Long-term Care 愛長照照顧	https://www.ilong-termcare.com Aged-care network of services including telehealth

Name	Website and notes
Oenix Biomed Solutions 陽明創新育成股份有限公司 info@oenix.com.tw +886-2-2821-3126	https://www.oenix.com.tw/ Smart home and telehealth systems, also peripherals

Table A-5: Taiwanese medical-device, telehealth, smart-home and peripherals companies, particularly those focused on aged-care applications

Name	Website and notes
Taiwan Biophotonic Corp 臺醫光電科技股份有限公司 tina@tbpchc.com +886-3-667-0888	http://www.tbpchc.com/eng/ Develops non-invasive wearable vital-sign monitoring devices, including pulse oximeter and heart rate monitors, and non-invasive blood glucose meters
Accurate Meditech Inc. 精準醫電科技股份有限公司 info@accurate-meditech.com +886-2-2975-1032	https://accurate-meditech.com/ Develops continuous blood-pressure monitoring devices
Health2Sync 慧康生活科技股份有限公司	https://www.health2sync.com/ Mobile blood-glucose tracking devices with software
iXensor Co., Ltd. 安盛生科股份有限公司 info@ixensor.com +886-2-87511335	https://www.ixensor.com/ixensor_web/ iXensor's PixoTest technology can turn mobile devices into in-vitro diagnostic medical devices PixoHealth App test readings can be measured, recorded and uploaded to the PixoHealth Hub on the cloud, enabling the monitoring of a range of diseases, including diabetes, cardiovascular diseases, etc
SEDA G-Tech Co., Ltd. 世大福智科技股份有限公司 sedagtech@gmail.com +886-3-455-5726	https://www.seda-gtech.com.tw/whizliving.html Monitoring devices for aged-care use: WhizMat, WhizLiving Spin-off company from Yuan Ze University Gerontechnology Research Center



Name	Website and notes
Huijia Health Life Technology Co., Ltd. 滙嘉健康生活科技股份有限公司 service@ubabycare.com +886-3-5585186	http://www.hijia-tech.com Baby and elderly sleep monitoring devices, also some telehealth system products, apps, etc
Full Enterprise Corp. 富欣實業股份有限公司 fullbiz@fullcorp.net +886-2-2222-0707	http://www.fullcorp.com Peripherals for smart homes, aged-care environments, using ZigBee protocol
Somnics, Inc. 萊鎂醫療器材股份有限公司 info@somnics.com +886-3-5509-623	http://www.somnics.com/ Created the iNAP One sleep-therapy system utilising oral negative pressure technology to treat obstructive sleep apnea patients
MedicusTek Inc. 美思科技股份有限公司 info@medicustekusa.com +886-2-2655-8672	https://www.medicustekusa.com/ Remote system for tracking the elderly in bed for fall prevention and other applications
Habitz Medtech Co., Ltd. 晁禾事業股份有限公司 core@habitz.com.tw +886-2-8789-9985	http://www.habitz-medtech.com/ Aged-care assisted movement, rehabilitation and transfer devices, other medical devices
IMEDIPLUS Inc. 創心醫電股份有限公司 info@imdiplus.com +886-3-658-7700	http://www.imediplus.com/ Electronic stethoscopes, wireless ECGs, telehealth equipment
Sohot Technology Service Co., Ltd. 說哈科技服務股份有限公司 sohotcare@gmail.com +886-2-2926-5968	https://www.facebook.com/sohotcare/ Mobile movement, respiratory and heart-rate monitoring systems for aged-care settings; includes app

Table A-6: Local ownership, investment or operator interest in Taiwan aged-care facilities existing or under development

Name	Website and location	Owner, operator or significant investor, and website
Chang Gung Health and Culture Village 台塑長庚養生文化村	https://www1.cgmh.org.tw/cgv/ Taoyuan	Formosa Plastics Group, multinational diversified conglomerate https://www.fpg.com.tw/tw
Ruen Fu New Life Retirement Home 潤福生活新象	http://www.ruenfu.com.tw/ Tamsui, New Taipei City	Ruentex Group, real estate developer http://www.ruentex.com.tw/
Sheng En [residence] 國寶聖恩養生休閒會館	https://www.sheng-en.com.tw/ Miaoli County	Sheng-En Living Business, resort operators, insurance https://www.sheng-en.com.tw/
Yung Shin Eder Nursing Home for Senior Citizens 松柏園老人養護中心	http://care.yungshingroup.com/ Taichung	Yungshin Pharm Ind. Co., Ltd. Pharmaceutical company http://www.yungshingroup.com/en/
(No English name) 奇美悠然山莊	http://www.yuzen.org/ Tainan	Chi Mei Optoelectronics, electronics industry http://www.chimei.com.tw/en/
Suang-Lien Elderly Center 雙連安養中心	https://www.slehtaiwan.com/ Taipei	Suang Lien Presbyterian Church https://www.slpcetaipei.org/
(No English name) 新板傑仕堡 (In planning)	Banqiao, New Taipei City	Shin Kong Life https://www.skl.com.tw/
(No English name) 健康享老宅 (In land development)	Sanchih, New Taipei City	Radium Life Tech Co., Ltd. http://www.radium.com.tw
(No English name) 銀髮養生宅 (In planning)	Jinshan, New Taipei City	Highwealth Construction http://www.highwealth.com.tw/



Table A-7: Selected Taiwanese companies or conglomerates active in China in aged-care facility development and/or management

Name	Website and notes
Guangen Senior Care Center	http://www.guannenn.org.tw/ Elderly community-care-facility operator, has recent cooperation project in China
Suang-Lien 雙連安養中心	https://www.slehtaiwan.com/space Already a major operator of facilities in Taiwan, also has a number of cooperative ventures in China to operate aged-care facilities
北京三开科技股份有限公司 info@sankai.com	http://www.sankai.com/team.html Formed by team of Taiwanese businesspeople to develop and operate hospitals and aged-care facilities in China, 23 set up to date
ZHZ Team 北京华正养老服务股份有限公司	http://www.zhzteam.com/ Another team of Taiwanese businesspeople developing aged-care apartments, hospitals, etc in China
Zhonghsiao Group 中孝(福建)投资管理有限公司	http://www.chinabiz.org.tw/Company/Show?pid=47&cat_id=362&id=1143 Another team of Taiwanese businesspeople developing aged-care facilities in China, six to date; active in investment, planning, construction and management areas

Table A-8: Selected Taiwanese architectural offices with an interest in, focus on, or prior involvement in the aged-care sector

Name	Website and notes
WZWX Architecture Group 澤新建築 info@wzwx-group.com +886 2-2577-2650	www.wzwx-group.com/ Hospital and aged-care design experience
C.Y. Lee & Partners, Architects & Planners 李祖原联合建筑师事务所 +886-2-2719-8288	https://www.cylee.com/ Vice President: V.T. Wu Project Manager: K.C. Chang Project Manager: Tsai Chin-lung

Name	Website and notes
TMA Architects & Associates 三門聯合建築師事務所 tma@tma.com.tw +886-2-2702-7146	http://www.tma.com.tw/ Principal Architect: Chou Hen-chi
Ricky Liu & Associates, Architects & Planners 劉培森建築師事務所 ricky@rickyliu.com.tw +886-2-2719-9633	http://www.rickyliu.com.tw/ Principal Architect: Ricky Liu
AOE Architects & Associates service@aoe.com.tw +886-2-2231-7766	http://www.aoe.com.tw/en/ Director Architect: Allen Huang
ACHL Architects 林嘉慧建築師事務所 archizlin@achlin.com.tw +886-2-2822-8859	Six-person firm. Began designing aged-care facilities in 2013. Focus is on community daycare centres. All business currently relates to aged-care or social-welfare-related projects. Principal Architect: Lin Chia-hui
Chen Cheng-Hsiung Architects 陳政雄建築師事務所 +886-2-8911-8640	Principal Architect: Jason Chen Cheng-hsiung

Table A-9: Taiwanese exhibitions and conferences with an aged-care focus

Name	Website and notes
SenCARE: Taiwan Int'l Senior Lifestyle and Health Care Show Taipei, Taiwan 21–24 June, 2018	https://www.sencare.com.tw/ Held with Medicare Taiwan: Taiwan Int'l Medical & Healthcare Exhibition

Name	Website and notes
Elder Care Asia 4th International Exhibition and Conference on Healthcare and Wellness for Seniors Kaohsiung, Taiwan [1–4 November, 2018]	https://www.eldercareasia.com/en/
ATLife: Assisted Technology for Life Taipei Nangang Exhibition Hall [19–22 July, 2018]	https://www.atlife.com.tw/en/
Smart Healthcare Expo 2018 Taipei Nangang Exhibition Hall [27–30 March, 2018]	https://en.smartcity.org.tw/index.php/en-us/expo/she
Aging Innovation Week Taipei, Taiwan [2–4 November, 2018]	http://www.silverliningsglobal.com/tw/index.html A week of conferences, forums, summits, workshops, organised by Silver Linings Group

Table A-10: Relevant Taiwanese associations

Name	Website and notes
Taiwan Elderly Care Industry Association 社團法人台灣銀髮產業協會 tecia@tecia.org.tw +886-2-2797-0880	http://www.tecia.org.tw/
Taiwan Medical Care Assistive Technologies Association 台灣醫療照護輔具協會 tmcata@fmh.com.tw +886-2-8227-3638	http://hero030.so-buy.com/m/

Name	Website and notes
Taiwan Medical and Biotech Industry Association 台灣省藥棉工業同業公會 tmbia@tmbia.org.tw +886-2-2995-6099	http://www.tmbia.org.tw/
National Association of Architects, ROC 中華民國全國建築師公會 service@naa.org.tw +886-2-2377-5108	http://www.naa.org.tw/
Architects Institute of Taiwan 臺灣建築學會 archi.tw@msa.hinet.net +886-2-2735-0338	http://www.airoc.org.tw/
Taiwan Cross-Strait Medical Interchange Association 台灣海峽兩岸醫事交流協會 +886-2-2725-2799	http://www.tcmia.org/ Holds occasional forums promoting cooperation between Taiwan and China on aged-care issues
Association of Cross-Strait Medical Service Exchange 台灣海峽兩岸醫療事務交流協會 pr51399@gmail.com +886-7-312-0513	http://www.mse.org.tw/ Holds occasional forums promoting cooperation between Taiwan and China on aged-care issues



Appendix 2 – Websites, regulations and other resources

- 1 **Ministry of Health and Welfare website**
<https://www.mohw.gov.tw/mp-2.html>
Starting point for any and all Taiwan government regulations pertaining to health and welfare

- 2 **Medical Devices Classification Database (in Chinese)**
<http://mdlicense.itri.org.tw/DB/MDCClassification.aspx>
Determine the classification of any medical device type; Class I, II, III or New Medical Device

- 3 **Regulations for Registration of Medical Devices**
<https://www.fda.gov.tw/EN/lawContent.aspx?cid=5063&id=1440>

- 4 **Standards of Review Fees for the Registration of Western Medicines and Medical Devices**
<https://www.fda.gov.tw/EN/lawContent.aspx?cid=5063&id=2983>

- 5 **Regulations for Governing the Management of Medical Devices**
<https://www.fda.gov.tw/EN/lawContent.aspx?cid=5063&id=1437>

- 6 **Ministry of Health and Welfare Annual Report**
<https://www.mohw.gov.tw/dl-44682-2644622d-3e42-495a-bbdc-ebb6e6d55092.html> (pdf)
Includes section on long-term care with detailed statistics on type and number of facilities, number of beds, recent trends in the sector, etc

- 7 **Long Term Care Services Act (LTC 2.0)**
<https://law.moj.gov.tw/ENG/LawClass/LawAll.aspx?PCode=L0070040>

- 8 **Regulations for the Establishment, Approval and Management of Long-Term Care Institutions**
<https://law.moj.gov.tw/Eng/LawClass/LawAll.aspx?PCode=L0070044>

- 9 **Institutional Long-Term Care Juridical Entities Act**
<https://law.moj.gov.tw/ENG/LawClass/LawAll.aspx?PCode=L0070051>

Appendix 3 – Further reading

- 1 **10 Ways The Internet of Medical Things Is Revolutionizing Senior Care**
Reenita Das, Frost & Sullivan
22 May 2017
<https://www.forbes.com/sites/reenitadas/2017/05/22/10-ways-internet-of-medical-things-is-revolutionizing-senior-care/#6b2265985c8f>

- 2 **Senior Citizen Condition Survey (in Chinese)**
Ministry of Health and Welfare
Published: October 2013
<https://www.mohw.gov.tw/dl-4707-e91899c0-d62d-49d9-9dbe-4a2def8e516c.html>

- 3 **Aging in Taiwan: Building a Society for Active Aging and Aging in Place**
Yi-Yin Lin, PhD, Chin-Shan Huang, PhD
The Gerontologist, Volume 56, Issue 2, 1 April 2016, Pages 176–183,
<https://doi.org/10.1093/geront/gnv107>
Published: 19 November 2015

- 4 **Through The Lens Of Taiwan's Elderly Care**
Aged Care Group Sdn Bhd
<http://www.agedcare.com.my/taiwans-elderly-care/>

- 5 **Long-Term Care for Taiwan's Elderly**
10 March 2017
<https://topics.amcham.com.tw/2017/03/caring-taiwans-elderly/>

- 6 **An Analysis of Telemedicine in Taiwan: A Business Model Perspective**
Tung-Cheng Lin, Hong-Jer Chang, Chung-Chien Huang
International Journal of Gerontology 5 (2011) 189e192
Available online 21 January 2012
<https://www.sciencedirect.com/science/article/pii/S1873959811001104>

- 7 **Ageing in Place: Successful Housing Community for Elderly in Taiwan – A Case Study of Taipei City**
T.Y. Chao, Y.Y. Yang
Paper Presented in Track 3 (Housing and Community Development) at the 3rd World Planning Schools Congress, Perth (WA), 4-8 July 2011
<http://ir.lib.ncku.edu.tw/handle/987654321/126651>

- 8 **Long-Term Care for the Elderly**
Taiwan Review, 1 December 2011
<https://taiwantoday.tw/news.php?unit=29&post=23657>

- 9 **Taiwan's health care system: The next 20 years The Brookings Institution**
Tsung-Mei Cheng
14 March 2015
<https://www.brookings.edu/opinions/taiwans-health-care-system-the-next-20-years/>



- 10 ***Biomedical and Taiwan's Aging Population***
10 May 2017
<https://topics.amcham.com.tw/2017/05/biomedical-taiwans-aging-population/>

- 11 ***The Elderly Care System***
Pei-Chen Tseng, Li-Ching Lu
Accepted 5 July 2013
<http://www.csroc.org.tw/journal/JOC24-2/JOC24-2-1.pdf>

- 12 ***Taiwan: 5 things you need to know about the aging population***
DBS Group Research
18 August 2016
https://www.dbs.com/aics/pdfController.page?pdfpath=/content/article/pdf/000000_reports/specials/2016/160818_tw.pdf

- 13 ***The Industry Analysis of The Hospital and Nursing Home in Taiwan***
Taiwan Institute of Economic Research
April 2011
[http://www.biotaiwan.org.tw/download/core3/3-6%E5%9C%8B%E9%9A%9B%E5%90%88%E4%BD%9C/100/The%20Industry%20Analysis%20of%20Hospital%20and%20Nursing%20Home%20in%20Taiwan%20\(201104\).pdf](http://www.biotaiwan.org.tw/download/core3/3-6%E5%9C%8B%E9%9A%9B%E5%90%88%E4%BD%9C/100/The%20Industry%20Analysis%20of%20Hospital%20and%20Nursing%20Home%20in%20Taiwan%20(201104).pdf)

- 14 ***Technological Health Intervention in Population Aging to Assist People to Work Smarter not Harder: Qualitative Study***
Sonia Chien-I Chen, BA, MSc, PhD
Journal of Medical Internet Research
4 January 2018
<https://www.ncbi.nlm.nih.gov/pubmed/29301736>

- 15 ***Taiwan Turns Healthcare and Long-term Care to its Advantage in Creating a Brighter Future of Smart Health and Wellness***
May 2018
<https://bio.taiwan.gov.tw/news/taiwan-turns-healthcare-and-Long-term-care-to-its-advantage-in-creating-a-brighter-future-of-smart-health-and-wellness/>

- 16 ***Initiation of the Suan-Lien Living Lab – a Living Lab with an Elderly Welfare Focus***
International Journal of Automation and Smart Technology
1 September 2012
<https://www.ausmt.org/index.php/AUSMT/article/view/132/116>

- 17 ***A Comfortable Place to Grow Old: Designing Homes for the Elderly***
Taiwan Panorama
24 September 2018
<https://nspp.mofa.gov.tw/nsppe/news.php?post=141629&unit=410>





For further information or help with your trade and investment enquiries, contact TIQ.



+61 7 3514 3147



@tradeinvestqld



tiq.qld.gov.au/contactus



Trade and Investment Queensland



tiq.qld.gov.au



Trade and Investment Queensland
