OLIVER WYMAN | LIEN foundation

NAVIGATING A NEW REALITY

COVID-19 challenges and opportunities for long-term care in Singapore

CONTENTS

FOREWORD

The world is in the midst of the biggest health crisis in more than a century, with a novel coronavirus — unknown a year ago — infecting more than 42 million people worldwide and reaping a grim harvest of 1.1 million lives[1] as of late October, 2020. Numbers continue to jump by the minute. Seniors constitute the vast majority of deaths worldwide. COVID-19 has claimed an especially heavy toll among the most frail and vulnerable of older adults — those living in care homes across many parts of the Western world. In countries like Canada, Australia, Spain and Belgium, long-term care facilities have accounted for 60 to 80 percent[2] of all pandemic-related deaths, despite being home to a small fraction of seniors.

Singapore was one of the earliest countries to be affected outside China, reporting its first case on January 23. The first known infection in a nursing home was announced on March 31. This report provides a quick, contemporaneous account of the first six months of the COVID-19 crisis as seen through the eyes of some of Singapore's long-term care (LTC) operators. It elaborates on the challenges faced — many of them inevitable — and lessons learnt as LTC operators worked round-the-clock in tandem with the government health and care agencies to safeguard and serve the seniors who live in nursing homes or use day center or formal homecare services. Crucially, the report also identifies emerging opportunities and local and global best practices from the care sector and other industries — especially with regard to technology — which are worth emulating to help make the sector stronger, more integrated and resilient in a post-pandemic world.

Despite being one of the fastest aging countries in the world, seniors here — though vulnerable — have been largely safe so far, thanks in part to prompt policy changes and some strict measures aimed at isolating residents of foreign worker dormitories, where 94 percent of the cases occurred as of October. This was complemented by collective, coordinated and continuous effort by the health authorities, care sector leaders and staff, and seniors, their families and the public at large. Overall, nursing home residents currently account for only 0.03 percent of 58,000 cases and 14 percent of 28 COVID-19 deaths in Singapore. There have been no cases among users of daycare or formal homecare services so far. But protecting seniors is a marathon, not a sprint, as the pandemic rages, with a resurgence of cases in several countries in late October. We cannot let our guard down. There is also an increasing need to balance valid safety concerns with mental and physical wellbeing, whether of the seniors, staff or the community at large.

We would like to thank our partner, management consulting firm Oliver Wyman. Its six-member team, led by Kitty Lee, who heads the firm's health and life sciences practice in Asia Pacific, put in long hours pro-bono on this worthy project. The bulk of this report was researched and written over three months from June to August. The team spoke to around 50 people, including representatives of 21 LTC operators in Singapore, and 15 experts overseas, many of whom are on the frontlines of the crisis. We are especially grateful for their time and insights.

Lien Foundation
October 30, 2020

METHODOLOGY

This point-of-view (POV) report was produced in collaboration with the Lien Foundation, a Singapore-based philanthropic organization focused on innovative solutions in senior care. It addresses the following topics:

- Operational and structural challenges in Singapore's long-term care (LTC) sector during the first six months of the COVID-19 pandemic.
- Opportunities — informed by COVID-19 lessons to date — to drive a new reality for the sector and the role of digital and technology-based solutions.
- Ambitions for the future of LTC.
- International perspectives and best practices.

The POV consists of two main components. The first (Chapters 1 to 3) provides a review of the six months from end-January to end-July. It identifies principal challenges faced by operators and the actions taken by operators and policymakers. The second (Chapters 4 to 6) covers tangible opportunities for the sector. These include digital and other technology applications that have emerged in response to COVID-19, which may form part of the new reality as the response moves to a new phase.

The long-term care sector in this POV includes the following types of care providers:

- **Nursing homes:** Long-term residential care settings that provide a range of services to frail seniors who may have little or no family support and are unable to be cared for at home by family members, caregivers, or service providers.
- **Daycare:** Center-based care services during the day — the POV focuses mainly on daycare services in senior care centers and dementia care.
- **Homecare:** Services provided in the homes of frail and home-bound seniors — the POV focuses mainly on home medical and home nursing care.

In this POV, we broadly use the term "seniors" to describe people above 60 years of age, in line with most COVID-19 databases. In some cases, seniors are defined as those over 65 years of age — these exceptions are noted throughout the POV where applicable.

Research was conducted over a three-month period from June to August 2020, and we conducted interviews with about 50 people. We interviewed over 30 LTC operators (primarily CEOs and heads of operations), academic and sector experts, and civil servants and policymakers in Singapore. Among the operators, seven were nursing home operators, eight were daycare operators, and six were homecare operators. We also interviewed over 15 global LTC experts and digital and technology experts. The interviews are supplemented by a review of new policies implemented in Singapore since the beginning of the pandemic, as well as additional secondary research.

Both the Singapore Ministry of Health's Ageing Planning Office and the Agency for Integrated Care were consulted, and all available data and perspectives from the agencies are included in the POV. Additionally, we have included a comprehensive listing of the advisories and resources provided to the sector up to early July in Exhibit 3.

EXECUTIVE SUMMARY

Chapter 1
Vulnerable and exposed: The impact of the "new normal" on Singapore's seniors

As the COVID-19 pandemic has upended normal life around the world, seniors[3] remain especially vulnerable. Globally, as of October 16, there were over 39 million cases and more than 1.1 million deaths linked to COVID-19[4], and estimates indicate that seniors constitute about 80 percent of the deaths.[5] Physically, many seniors have chronic conditions, and their immune systems have usually weakened with age. Environmentally, some seniors are more likely than others to be in relatively cramped and crowded settings with other seniors, such as in nursing homes and daycare centers. As of October, 46 percent[6] of COVID-19 deaths across a sample of 21 countries have been linked to care home residents. Significantly, Singapore had the second lowest number of care home deaths as a percentage of total care home residents among the 21 countries — South Korea was the lowest.

Seniors who are not care home residents may also find themselves in vulnerable positions, for example living alone without a support system. The pandemic has disrupted the delivery of medical care and social care, and there has been a multiplier effect on seniors' physical and mental wellbeing, even for those who have not contracted the COVID-19 virus. Thus, there has been a broad impact on the aged population, as well as the industry — the long-term care sector — that serves it.

Singapore has done well to prevent large-scale outbreaks among nursing homes and to maintain a lid on community transmissions so far, though it is no exception to these vulnerabilities given its rapidly aging population. The country had 57,901 cases — 2,263 community, 54,487 migrant worker dormitory, and 1,151 imported cases — and 28 deaths as of mid-October[7] and has maintained a low mortality rate of 0.5 deaths per 100,000 people.[8] That compares to other countries in the region such as Australia with 1.85 and Japan with 0.91.[9] However, while seniors who are in their 60s or above accounted for a small minority of COVID-19 cases[10], 89 percent of deaths were seniors in Singapore.[11] As of May, nearly one in six seniors diagnosed with COVID-19 had required intensive care in the hospital, compared to 0.2 percent of non-seniors.[12] The disproportionate risk to seniors' lives is stark, especially in the context of Singapore's aging population: 15 percent of Singaporeans are above the age of 65 today and this will grow to 25 percent by 2030.[13] If one includes those aged between 60 and 64, 22 percent of the resident population is already considered "senior." The long-term care (LTC) capacity has grown significantly in recent years to keep pace with aging, especially in community- and home-based care: Daycare capacity has grown nearly fourfold over the past decade and homecare capacity threefold.[14] As of FY 2017, the latest period for which such figures are available, around 45,100 people received formal long-term care.[15] Nine in 10 were in their 60s or older. These individuals are among the most vulnerable of an already high-risk population.

Hence, it is important to look at how the pandemic has impacted long-term care — nursing homes, daycare, and homecare in the scope of this report — to date, as well as how the sector can serve seniors in a manner that protects them against infectious diseases yet also continues to enable quality of life.

Within long-term care, Singapore has done relatively well in preventing mass COVID-19 outbreaks. At the time of this report's publication, among 80 nursing homes and nearly 16,000 residents[16], 25 COVID-19 cases had emerged from the long-term care sector — 20 residents and five staff from nursing homes.[17] Four residents have died, accounting for 14 percent of overall COVID-19 deaths[18] in Singapore. Of these residents, there were three women and one man, all in their 80s or older with multiple co-morbidities, and they were residents of a single home, which had 14 cases overall.[19] Based on a total of 16,000 nursing home residents, the infection and mortality rates per nursing home resident are 0.13 percent and 0.03 percent respectively. Five cases — four residents and a staff nurse — were surfaced during free testing of all residents and nursing home staff, which began in end April. In all cases, the residents were transferred to acute hospitals for their care. There have been no cases reported so far among seniors who use daycare or homecare services in Singapore.[20]

Meanwhile, care homes have accounted for a disproportionately high number of COVID-19 deaths in many countries. Residents of these homes made up 80 percent of all pandemic-related deaths in Canada, 63 percent in Spain, 40 percent in the US, and 36 percent in the UK. Japan, on the other hand, fared much better. Despite a larger proportion of citizens living in care homes (around 1.7 percent of Japan's overall population lives in these facilities, compared to around 1 percent in the US and 0.3 percent in Singapore[21]), only around 14 percent of Japan's COVID-19 deaths occurred in long-term care facilities.

Other vulnerable populations were not spared by the pandemic, however, and there were mass outbreaks in migrant worker dormitories from the end of March. Overall, as of mid-October, those living in crowded migrant worker dormitories accounted for 54,487 cases — more than 94 percent of all infections in Singapore.[22] Many were asymptomatic and discovered through targeted testing. As many as 2,500 cases were linked to a single dormitory[23], resulting in Singapore having the highest cumulative number of cases in Southeast Asia from April until June.[24] Cases in the community, meanwhile, have remained generally low and stable and there have been days when no cases were reported at all.

Yet risks remain high, given the country's fast-growing senior population, and LTC operators continue to be on defense against the virus. There remains a risk of future waves of infections, and phenomena, such as asymptomatic cases, and limited immunity to reinfection mean protection is hardly guaranteed. In particular, the heightened emphasis on safety has come at the expense of social interaction and quality of life — a forced compromise that has affected the wellbeing of seniors, caregivers, and staff. This cannot be sustained indefinitely. The sector must prepare for a new reality in long-term care, balancing the realities of the "new normal" with their continued mission to provide fulfillment and services to seniors.

Chapter 2
Safeguarding seniors: Singapore's COVID-19 policy response to date

In order to understand the potential path forward, we must first assess how LTC operators in Singapore navigated the first six months of the COVID-19 crisis — roughly the period from end-January to end-July. The country's Ministry of Health and Agency for Integrated Care co-directed the response to COVID-19 in the LTC sector and the principal channel of communication from the government to operators was pandemic advisories — guidelines to operators for infection prevention and control — and provision of special COVID-19 resources, which ranged from funding to knowledge sharing. Reminders were also circulated through messaging platform groups such as WhatsApp and Telegram set up for LTC operators. Throughout the country, the so-called "circuit breaker" lockdown mandated the majority of the population to stay home and ordered most businesses to close or reduce operations. In long-term care, guidelines on safe distancing applied to residents and clients of facilities, as well as people entering them, such as healthcare workers, other staff, and visitors. The living quarters of nursing home workers were also closely observed, and many were forced to relocate and live in temporary living quarters to minimize the risks of cross-infection as well.

Throughout the pandemic, MOH and AIC have sought to avoid drastic actions and to suggest more incremental changes — though this then summed up to nearly 100 updates[25] in the first six months of the crisis. Operators commended the support from the government, from providing on-the-ground support to listening to operator feedback in further adapting its policies. However, operators included in the study say they also struggled to navigate changes with short turnaround times and the large volume of advisories. Though the government generally allowed for some time between advisory changes and public announcements for operators to prepare, this was occasionally not enough, say operators. For example, nursing home operators had only two days to prepare after the announcement that nursing home visits could be resumed, leaving them scrambling to set up an online scheduling system, a new visitor management process, and visitation areas for families who were eager to return. MOH recognized that operators needed time and encouraged the public to give the operators time to implement the precautionary measures and to plan visits over the subsequent weeks, rather than immediately upon announcement; however, families — who had not seen their loved ones for a couple months — rushed to book visitor slots.

Chapter 3
First six months of the pandemic: Challenges and lessons for long-term care operators

On the ground, long-term care faced challenges in five areas: Continuity of care, physical space, manpower, seniors' wellbeing, and primary caregivers. Nursing homes and daycare centers bore the brunt of the impact of COVID-19. Keeping cross-infection risks low in their facilities was paramount given the sharing of spaces between seniors and movements of others such as staff and visitors.

Nursing homes had to quickly adapt their operations to COVID-19 stopgap measures for infection prevention and control. Operators urgently needed solutions to ensure care continuity amid restrictions on the movements of care workers and allied health professionals. It is especially commendable that providers and authorities swiftly rose to the challenge and have managed so far to prevent large-scale outbreaks in nursing homes. The risks were especially high, given that many homes still have dormitory-style accommodation. Sporadic outbreaks — in at least six nursing homes — were quickly quelled. To minimize infection risk, the operators needed to retrofit their facilities, especially in communal areas, split zones, and staff living quarters. But this safety — while essential — has come at a cost. Nursing home staff, for instance, have faced high stress, both in their workplace — with some moving from eight- to 12-hour shifts — and personal lives, as some have had to relocate to on-site accommodation, hotels, or new off-site residences.

In all, 3,600 resident-facing staff[26] — or around 40 percent of all 9,000 nursing home staff — were moved to designated accommodation facilities on-site or at hotels. Most lived in on-site staff dormitories and slept in bunk beds, which were considered an infection risk. After the circuit breaker was lifted, providers were supported with funding to transit their staff into the new accommodation, which adhered to principles such as observing split zones and safe distancing measures, minimizing inter-mixing of staff, and ensuring the accommodation is well-ventilated.

Residents' emotional wellbeing was affected amid the frenzy of changes and a period without visitations from loved ones, leading to disengagement and stress — especially for seniors with dementia, who had a difficult time adjusting to changes, such as staff in PPE — as well as the risk of physical deterioration, with reduced therapy sessions. Nursing homes need sustainable, longer-term solutions.

Daycare centers have been put to the test, as their offline model came to an abrupt standstill during center closure, and many were forced to go online with mixed success. While there was reasonable take-up of digital services among less-frail and younger seniors, operators noted that this translated to only between 20 and 50 percent of seniors regularly engaging in virtual activities. For frailer and older seniors, only phone calls or messages were feasible, especially for seniors with no Internet connectivity and technology. Seniors with caregiving support at home were able to better engage.

Overall, this period of isolation at home posed difficulties to seniors and primary caregivers. Operators and geriatric experts have observed the mental and physical deterioration of seniors, and centers are now focused on deconditioning these effects, which include forgetting how to perform daily activities and clients with dementia not remembering the center at all. In some cases, seniors have not been able to return to centers due to their weakened conditions. Caregivers faced a slew of challenges at home, navigating personal difficulties from COVID-19 along with new responsibilities to care for seniors with minimal support from other family members, due to community-wide lockdown, or services like home personal care. Even as centers have reopened, they must operate safe-distancing and other infection-control routines. Centers that were interviewed, as of August, were hovering at between 50 and 80 percent of typical capacity, with uncertainty over how long this will continue.

Meanwhile, COVID-19 has been a catalyst for further adoption of homecare, with demand growing for home medical and nursing care. Operators included in this study saw up to 20 percent growth in home nursing and 25 to 50 percent growth in home medical care. Homecare operators saw a promising foray into telehealth, with many piloting the service for the first time: One operator reported a 90 percent growth in telehealth adoption and sees high potential for further expansion of teleconsultation services going forward. While homecare operators did face other challenges, the momentum of digital adoption was positive for them. Sustaining this will require a review of structural gaps such as financing coverage, as well as further innovations from operators in expanding their services.

Chapter 4
Opportunities and tech innovations: Preparing for long-term care's new reality

Technology adoption may be a silver lining in the forced disruption during COVID-19. The crisis brought concerns over the senior population to the forefront of policymaking, but it also demonstrated the importance of digital and technology solutions and the public's willingness to use them. The next step is to identify opportunities to address emerging needs from COVID-19 and future-proof the sector against infectious diseases. Many of these ideas — such as concerns around nursing home spaces and adoption of telehealth — were conceptualized or piloted before COVID-19, yet progress has been slow; now, there is a revitalized case for change, with an unprecedented appetite for digital and tech solutions. Effective implementation will also require policy changes, funding, and the realignment of processes and operations.

We focus on six opportunities that are linked to the areas of challenge, from continuity of care to caregivers.

- **Greater focus on digital-led models is urgent.** Telehealth is here to stay, so operators must integrate telehealth use cases into their operations, and virtual care must further improve after lessons from the first widescale trial.

- **Preventive health and wellness —** considered non-essential during the circuit breaker — require renewed focus, and patient empowerment should ideally be the first line of defense. Both are fundamental to ensuring the continuity of care, but care provision is expected to be disrupted again.

- **Another priority is to retrofit existing spaces to minimize infection risks.** This implies not only the continuation of key measures such as split zones, but also looking to practical technology solutions, such as automated guided vehicles and remote monitoring.

- **The mental health and wellbeing of seniors must be embedded in overall care planning,** with regular checkpoints for assessment and rigorous prescribing of interventions such as physical and social activities.

- **The wellbeing of staff must also be prioritized.** Empowering the workforce for the future with lessons from COVID-19 is urgent. This entails redesigning certain roles, such as more care-ambassador-type positions for daycare staff, in which they can holistically oversee a senior's care in center and at home, and communicate more effectively with seniors and caregivers. Staff also require enhanced training to fill newly found skill gaps, such as remote client management, recreation and activity design, and tech skills to bring care to virtual platforms (such as telehealth training for doctors and nurses).

- **Finally, caregivers need renewed support,** with a focus on training and wellbeing initiatives, such as forming more online community groups and migrating best-practice training to virtual platforms.

The above opportunities can benefit from a re-evaluation of existing technologies — such as remote monitoring, medication adherence solutions, assistive robots, and social platforms — in the light of use cases from the COVID-19 period. We also provide a comprehensive global scan (see Appendix) of other digital health and technology solutions for long-term care.

There are other key points beyond the six opportunities discussed, which will be important for structurally transforming the sector. One opportunity is to sustain the mindset shift towards homecare, which will require other enablers such as financial coverage and more care options available in the home. COVID-19 also reminded us of the need for more integration of care and services by streamlining the activities of different organizations — including long-term care providers, social care agencies, and Regional Health Systems. Furthermore, all new nursing homes and daycare centers will need fundamental rethinking. Nursing homes must be purpose-built, with fewer residents per bedroom and decentralized communal areas. Daycare centers must become large, flexible spaces that can be compartmentalized, while void-deck spaces — the open spaces on the ground floors of apartment blocks — should be repurposed altogether, given their physical peculiarities that make the space difficult for infection control. The workforce continues to be a critical issue, and the sector will need to expedite certain agendas, such as hiring more local professionals and establishing a more sustainable form of foreign recruitment. All of this will require modifications to established policies for career paths, salaries, and longer-term stay options for foreign workers.

Chapter 5 and 6
Long-term care 3.0: Vision and guiding principles
& **Conclusion:** Mobilizing long-term care for the future

Over the next few years, these opportunities will not only help the sector become more pandemic-resilient, but also amplify the overall transformation of the sector. We recognize a lot of progress has been made compared to before 2015, when the sector was largely institutionalized and medicalized — and primarily offline. That was LTC 1.0. Since then, there has been a trend towards aging-in-place and services that are holistic, personalized, and delivered through a variety of channels. Initiatives include the pilot of an integrated "kampung" — a traditional village — of health, social, and community needs, as well as innovative homecare tech platforms. Nursing homes have also seen a gradual shift from open wards — sleeping up to 30 people — to newer, smaller bed "clusters," with four to eight residents in a room. This is LTC 2.0. We now envision a future system that is more tech-enabled, allowing seniors to seamlessly move across various online and offline settings for care and services, while receiving a lighter-touch care. The COVID-19 experience has emphasized the importance of these components.

It is imperative to transform a range of activities towards integrated, tech-enabled models. Long-term care can draw inspiration from the guiding principles of such a transformation, as evidenced by the experiences of other industries. The existing model needs to be challenged — the ideal future is light-touch, with aging-in-place as the default and custodial support as a last resort. This means the sector must shift more care services into the home and the community, while also making a long-overdue pivot towards more habilitative care and to a more diverse range of homes, including assisted-living facilities. Change does not require a big-bang, overnight transformation, and can instead be carried out through small, rapidly executed actions, adhering to a roadmap of key changes for services, with frequent testing and iterating. Any new service must be designed by viewing seniors as consumers of care rather than just patients. This will help the sector better cater to seniors' preferences as consumers, such as observing seniors' pain points in their homes and trialing new digital programs and solutions on their behalf. Finally, great partnerships can spur great innovations: Early in the COVID-19 crisis, AIC collaborated with GovTech to develop tech solutions, and Regional Health Systems and private homecare providers stepped in to provide mass training in swabbing. The sector should continue to seek partnership opportunities in areas such as virtual programs design and staff training, so as to share knowledge and value across the wider community.

Long-term care is ripe for change, but this journey will not be an easy one unless the entire sector comes together, including operators, government, private players, caregivers, and seniors. The sector has shown collective strength throughout the crisis — leveraging multisectoral co-creation, for example — and this will further catalyze the transformation to a better new normal and, ultimately, a shift to LTC 3.0.

1. VULNERABLE AND EXPOSED

The impact of the "new normal" on Singapore's seniors

In Chapter 1, we describe the disproportionate impact of COVID-19 on seniors, especially those in long-term care — defined in this report as nursing homes, daycare, and homecare for seniors. We also highlight the omnipresent danger that the pandemic continues to pose to Singapore's rapidly aging society.

The COVID-19 pandemic brought normal life and activities to an unprecedented halt. As of October 16, 2020, there have been over 39 million cases and more than 1.1 million deaths linked to COVID-19 globally[27], with early estimates indicating that seniors constitute about 80 percent of deaths.[28] More than half of the world has experienced a lockdown[29], and global GDP is projected to decline by 4.9 percent in 2020, with the GDPs of advanced economies to decline by 8 percent on average.[30] Meanwhile, multiple subsequent waves of infections are expected. The race to understand COVID-19's epidemiological characteristics continues, yet this has at times been marred by inconsistent narratives from science and politics. However, there is universal consensus on one aspect of the disease: Seniors are one of the most vulnerable population groupings.[31]

Seniors are vulnerable for both physical and environmental reasons. Older adults have weaker immune systems. They are more likely to have chronic conditions[32], such as heart disease and diabetes, or comorbidities, all of which tend to weaken their bodies' ability to fight infectious disease. From an environmental perspective, some seniors are more likely than others to live in close proximity with other seniors, such as nursing homes and daycare. As of October 2020, 46 percent of COVID-19 deaths, in a sample of 21 countries, were linked to care home residents. This ranges from 0.01 percent of South Korea's care home residents to above 4 percent of those in Belgium, Ireland, Spain, the UK, and the US. Singapore had the second lowest number of care home deaths — as a percentage of total care home residents — among these 21 countries.[33] Seniors who live alone also find themselves in vulnerable positions without a regular support system. The pandemic has not only posed direct health risks to seniors through potential exposure or risk of transmission, but has also severely disrupted the delivery of medical care and social care, multiplying the impact on seniors' physical and mental wellbeing, even for those who remained free from COVID-19 (see Appendix for COVID-19 morbidity and mortality rates in different populations and in nursing homes).

Exhibit 1: Disproportionate impact of COVID-19 on seniors in Singapore

89% OF COVID-19 DEATHS ARE SENIORS

NEARLY ONE IN SIX SENIORS

diagnosed with COVID-19 required intensive care in the hospital vs. only 0.2 percent of non-seniors
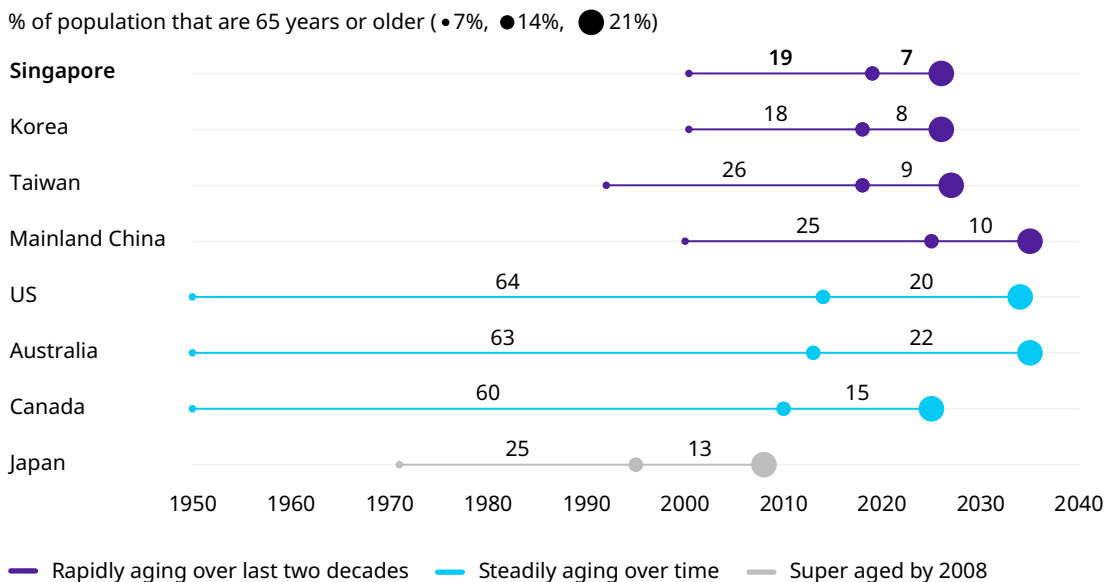
Note: In this data, seniors are defined as age 60 and above.

Source: MOH's Ageing Planning Office; Ministry of Health; The Straits Times

For Singapore, these vulnerabilities will be compounded as the senior population continues to grow. Today, 15 percent of Singaporeans and residents are aged 65 or older and by 2030, this is expected to rise to 25 percent — or nearly one million.[34] If one includes those aged between 60 and 64 as well, 22 percent[35] of residents — nearly 900,000 people — in Singapore are already considered "seniors" today. Globally, Singapore is the second fastest aging nation[36], experiencing unprecedented aging together with other Asian countries such as Japan, South Korea, China, and Taiwan. With its rapidly aging — and already aged — population, Singapore's long-term care (LTC) sector has grown significantly in recent years.[37] As of FY 2017, the latest period for which such figures are available, around 45,100 people received formal long-term care.[38] Nine in 10 were in there 60s or older. These seniors are among the most vulnerable of an already vulnerable population. It is therefore important to look at how LTC operators have navigated the pandemic to date.

Exhibit 2: Rate of population aging (Singapore vs. other countries)
Years to reach key aging milestones

% of population that are 65 years or older (• 7%, ● 14%, ⬤ 21%)

Country	Years		Years	
Singapore		**19**		**7**
Korea		18		8
Taiwan		26		9
Mainland China		25		10
US	64		20	
Australia	63		22	
Canada	60		15	
Japan	25		13	

1950 1960 1970 1980 1990 2000 2010 2020 2030 2040

━ Rapidly aging over last two decades   ━ Steadily aging over time   ━ Super aged by 2008

Note: Seniors defined as those above age of 65 in this database.

Source: SingStat, Population.sg, UN Population, Oliver Wyman analysis

As of October 16, Singapore had 57,901 COVID-19 cases.[39] At the time of this report's publication, Singapore has, to a large extent, been successful in containing mass outbreaks and deaths in the context of long-term care, with four — three women and one man, all in their 80s or older with multiple co-morbidities — out of 28 COVID-19 deaths[40] (14 percent) among nursing home residents and relatively few cases having emerged since the largest nursing home cluster (14 residents linked to Lee Ah Mooi Old Age Home[41]). Based on a total of 16,000 nursing home residents, the infection and mortality rates per nursing home resident are 0.13 percent and 0.03 percent respectively. In total, there are 25 cases linked to Singapore's long-term care — 20 residents and five staff from nursing homes between March 31 and June 4.[42] In all cases, the residents were transferred to acute hospitals for their care. There have been no cases reported so far among seniors who use daycare or homecare services in Singapore.[43]

Meanwhile, the nursing home mortality rate is as high as 80 percent in Canada and 40 percent in the US. Japan, on the other hand, has coped much better, despite a much larger proportion of citizens living in care homes: Roughly 14 percent of its COVID-19 deaths occurred in long-term care facilities.[44] Around 1.7 percent of Japan's overall population lives in these facilities, compared to around 1 percent in the US and around 0.3 percent in Singapore. The limited outbreaks in Singapore's long-term care facilities to date can largely be attributed to intensive prevention and control measures. While critical for public health, these measures have put long-term care operators into defensive mode, stretching resources and capacity in an unsustainable manner.

The stakes for Singapore's senior population remain high, given the size of this population segment and COVID-19's complexity, with asymptomatic cases and re-infections.[45] Furthermore, other vulnerable populations have not been spared, with the broader community having seen major outbreaks in the dormitories of foreign migrant workers beginning in end-March, with as many as 2,500 cases linked to a single dormitory at one point[46], resulting in Singapore having the highest cumulative number of cases in Southeast Asia from April to June. As of mid-October, 54,487 cases — more than 94 percent of all infections — were migrant workers.[47]

Cases in the community, meanwhile, have remained generally low and stable — there were 2,263 such cases overall as of mid-October — and there have been days when no cases were reported at all. Singapore has maintained a low mortality rate of 0.5 deaths per 100,000 people[48], compared to 1.85 in Australia and 0.91 in Japan[49], but cautionary tales abound: While Hong Kong largely avoided mass outbreaks during the six months from the beginning of February, the virus resurfaced in an aged care center in July. Both continued vigilance and longer-term solutions are critical in bringing the sector to the new normal, where the impact of the pandemic will linger but actions will be more sustainable than before.

Key takeaways:

- COVID-19 has had a disproportionate impact on seniors globally. Physically, many seniors have chronic conditions and their immune systems have weakened with age. Environmentally, some seniors are more likely than others to be in crowded settings with other seniors, such as nursing homes and daycare centers, or to find themselves in vulnerable positions like living alone without a support system.

- This disproportionate impact of COVID-19 on seniors is especially pressing for Singapore, as the country is rapidly aging, with the second fastest rate of aging in the world. Today, 22 percent of Singapore's population is 60 years or older. 89 percent of COVID-19 deaths in Singapore have been of seniors.

- To date, Singapore's long-term care has fared better than other countries. With about 46 percent of COVID-19 deaths linked to care home residents in 21 countries, Singapore had the second lowest number of care home deaths — after South Korea — as a proportion of total care home residents. Four out of 28 COVID-19 deaths are nursing home residents in Singapore. There are no cases linked to daycare and homecare to date.

- As Singapore's LTC capacity has grown significantly in recent years to keep pace with aging, it is important to look at how COVID-19 has impacted long-term care to date as these individuals — 45,100 as of 2017, with 90 percent in their 60s or older — are among the most vulnerable seniors in Singapore today.

2. SAFEGUARDING SENIORS
Singapore's COVID-19 policy response to date

In Chapter 2, we explore Singapore's response to COVID-19 in the long-term care sector, particularly through advisories and resources from the Ministry of Health and the Agency for Integrated Care. We describe how the government's response has evolved over the past six months and how local operators perceived and reacted to this guidance. These insights are based on interviews with policymakers and operators.

Context
Singapore has taken a whole-of-government, coordinated approach in responding to COVID-19, led by its Multi-Ministry Taskforce. Launched on January 22, the taskforce is co-chaired by the Minister for Health and the Minister for National Development and was set up to establish multiple lines of defense across the island in preparation for a long-lasting emergency.

The country's COVID-19 response preparedness was partially informed by the collective memory of the Severe Acute Respiratory Syndrome (SARS) outbreak in 2003. Its legacy includes systems and processes that enabled agile decision-making within multi-ministerial committees set up in response to the pandemic[50], as well as increased public awareness for cooperating in contact tracing. The Disease Outbreak Response System Condition (DORSCON) framework — a color-coded framework[51] to indicate the country's current disease situation and to specify actions to be taken at each level of severity — was also developed after SARS and was further refined during the H1N1 pandemic in 2009. Despite this level of preparedness, three notable differences from 2003 have made the impact of this pandemic more pronounced: A larger number of seniors[52], a proliferation of long-term care operators at more than two times in number[53], and the far higher transmissibility and novel nature of COVID-19, including asymptomatic spread.

Overview: MOH and AIC's approach
The overall directives for the LTC sector's COVID-19 response have been led by the Ministry of Health (MOH) and the Agency for Integrated Care (AIC[54]), the two main organizations that oversee the sector on a regular basis.[55] Throughout the pandemic, AIC — which coordinates the delivery of aged care services in Singapore — has been the main contact point for operators and seniors needing assistance, recognizing that having a single point of contact would improve awareness and minimize confusion on the ground. When interviewed, MOH and AIC outlined their safe management strategy for COVID-19, which focuses on reducing the likelihood of COVID-19, containing the impact once infection is suspected or confirmed among staff or clients, and resuming services quickly after a case.

MOH and AIC's COVID-19 directives are channeled to the LTC sector through the following means:

- **Advisories:** Recommended guidelines for infection prevention and control. Between January 23 and June 30, 41 advisories were issued to long-term care operators, in addition to 48 other updates.[56]

- **Checklists:** Self-assessment tools that compile guidelines and provide detailed instructions. Checklists were first available to nursing homes and daycare operators in April and June respectively, including topics like split team implementation and how to conduct communal activities. These, along with advisories, became available on a self-service web portal for operators to access conveniently.

- **Resources:** Support in the forms of funding, technology, non-technological solutions, and knowledge sharing.[57] MOH and AIC coordinated and distributed personal protective equipment (PPE, distributing supply from the national stockpile to each operator), and swab tests across the sector (for example, tests for all nursing home staff and residents from April to June[58]). The widescale testing was particularly intended for early detection to prevent clusters from emerging. With the support of National Public Health Laboratory, AIC adopted pooled testing and received test results within 24 hours. MOH and AIC continue to study alternative surveillance protocols to further enhance early detection.

To date, MOH does not have an official figure for total funding invested into LTC sector's COVID-19 response, as the efforts include a mix of existing resources (such as PPE from the national stockpile), support from AIC, MOH, and hospitals, and in-kind support from corporate partners (such as those who offered and sponsored hotel stays for nursing home staff). Funding was awarded to long-term care providers, regardless of whether they receive government subventions, that applied for funding opportunities such as:

- Video conferencing set up on a case-by-case basis (up to 5,000 Singapore dollars per center and SG$20,000 per organization). Repurposed digital tablets were also issued to nursing homes to enable residents to do video calls with their family members and caregivers, especially during the circuit breaker period.

- Implementation of a subscription-based appointment scheduling system (SG$75 per month).

- Staff transportation (up to SG$3,000 per organization).

- Staff welfare through two tranches:

  - Staff Appreciation Fund (up to SG$3,000 per voluntary welfare organization and private nursing home for each tranche).

  - Sayang Sayang Staff Appreciation Fund (up to SG$3,000 per organization[59]).

- Pristine Fund to keep eldercare centers hygienic and clean (SG$300 per center).

AIC also set up the StrongerTogether Fund to support long-term care providers who are hit by a confirmed COVID-19 case. The Fund helps long-term care providers defray cost incurred (up to SG$50,000 per nursing home and up to SG$10,000 per center) due to the COVID-19 related incident.

Specific to nursing homes, additional one-time funding was announced in May and June on a per-person basis for staff relocation to alternative accommodation (SG$500 hardship allowance in May for temporary relocation, SG$6,000 transitional grant, and SG$4,400 additional housing allowance for moving off-site residences). Funding was also provided for facility renovations for staff remaining on-site (SG$250 per staff member).

Furthermore, AIC worked closely with partners throughout the crisis. For example, it collaborated with GovTech to develop self-service thermometer scanners, which helped reduce the need for dedicated staff to check the temperatures of visitors to LTC facilities. AIC also worked with MediaCorp to produce an Elderly Learning Series television program for seniors at home, broadcasted on national TV during the circuit breaker. Furthermore, Regional Health Systems (RHS) and private homecare providers were asked to train staff across care facilities to perform swabbing.

Navigating the government's directives in the first six months of COVID-19

Overall, MOH and AIC have sought to balance seniors' safety with continued wellbeing throughout the pandemic. The agencies avoided making drastic actions in the LTC sector, such as banning nursing home visitations immediately, even when other countries have done so. They decided to instead introduce various measures incrementally in accordance with how the pandemic was evolving in the country.

Operators have commended the responsiveness of MOH and AIC, which was carried out largely through online communications channels and resources, as well as their adjustment of policies and support based on feedback from operators. Operators also acknowledged AIC's on-the-ground support, especially in nursing homes. For example, one nursing home appreciated AIC staff coming to the facility at 2 a.m. to assist staff during the night shift, filling in manpower gaps.

However, given the unprecedented nature of the pandemic, many operators were overwhelmed by the fast pace of change in the recommended global guidance and advisories implemented in Singapore. Some operators interviewed in this study perceived some local advisories to be reactionary at times, suggesting they could have been planned and announced in advance. For example, based on how COVID-19 was developing globally, they noted that nursing homes could have been informed earlier about certain measures as being imminent for Singapore — such as discontinued nursing home visitations and mask usage for long-term care staff — so that they could anticipate and formulate contingency plans, if needed. Instead, without clear guidance, some operators opted into precautionary measures early — for instance, one nursing home asked triage staff to still wear masks even when the mask wearing was not yet mandated by the government at the time.

Given the pandemic's threat to lives, timely advisories were required in accordance with the latest information available. On the ground, however, this did pose some challenges to operators. First, operators had to keep up with a high volume of advisories. Many were incremental changes that piled on over time, in response to the rapidly changing speed at which the pandemic was evolving on the ground. Examples include PPE usage guidelines and the repeated suspension and resumption of senior-centric activities between end-February and mid-March (see Stages 2 and 3 below). Operators had limited clarity on the endpoints for these guidelines, even when they sought to prepare in advance — as was true across many other industries. Meanwhile, operators and staff — in nursing homes, in particular — were stretched to keep up with numerous advisories and frequently following up with AIC to clarify the details of incremental changes.

Second, operators say they were afforded short turnaround times to implement changes. This created an urgent need to put in place the necessary processes and tools to adhere to new guidelines (see Stage 3 below). Similarly, short notice was given when advisories were pulled back. For example, nursing home operators had only two days to prepare after the announcement on visitation resumption, leaving them scrambling to set up an online scheduling system, a new visitor management process, and visitation areas for families who were eager to return. MOH recognized that operators needed time and encouraged the public to give operators time to implement the precautionary measures and to plan visits over the subsequent weeks, rather than immediately upon announcement; however, families — who had not seen their loved ones for a couple months — rushed to book visitor slots. One operator noted staff being verbally abused by family members when slots were released gradually.

AIC recognized that the quickly evolving information about COVID-19's transmission and effect on the senior population "often resulted in new restrictions and tightened measures being announced with short lead time." AIC added that the ongoing feedback channels with providers had been useful in iterating certain policies and that this experience had "deepened [their] relationship with providers, which will be valuable even after COVID-19."

Evolving approach to MOH and AIC's COVID-19 response
A comprehensive view of MOH and AIC's COVID-19 response to date is a key component of the experience of long-term care operators throughout the pandemic. Their response has broadly followed the shifts in the spread and transmission risk of COVID-19 in the community and the governmental response nationwide. The responses can be framed in four stages (see Exhibit 3 for more detail)

Stage 1: Cautious preparation
January 23 to February 6 — First COVID-19 case in Singapore to activation of DORSCON orange

To prepare for a potential escalation of infections, AIC formed a crisis management committee prior to the first confirmed COVID-19 case in Singapore on January 23, 2020. It also set up a virtual WhatsApp chat group[60] on January 25 with more than 200 long-term care operators[61]

to provide timely updates on COVID-19 policy changes. Furthermore, AIC set up a sector-specific call center in February to clarify policies and to pass on on-the-ground feedback to MOH.

Advisories during this time were primarily related to the recent travel histories of staff, seniors, visitors, and volunteers, which incrementally expanded to include more countries as the number of cases climbed globally. MOH also decided to suspend external excursions and large-scale gatherings of seniors and issued preparedness measures for community-based services to follow if DORSCON were to be raised to orange.

Stage 2: Ramp-up of advisories
February 7 to March 31 — Activation of DORSCON orange to the first COVID-19 case linked to a nursing home

Overall, in the health sector, elective surgical procedures and non-essential healthcare services were placed on hold. In long-term care, center-based operators saw a ramp-up in the number of advisories during this period, as senior-centric activities — such as those conducted in community clubs and senior activity centers — were suspended for two weeks, then resumed, then suspended again two weeks later. Meanwhile, senior care centers, which tend to seniors with more-complex needs, remained open.

MOH placed restrictions on the movement of healthcare workers, allowing them to rotate across a maximum of four long-term care facilities (no more than two places being renal dialysis centers or inpatient/day hospices) and recommended safe-distancing guidelines for daycare centers that remained open. Self-service temperature scanner solutions and video-conferencing subventions were also provided by the government. To support at-risk seniors at home, AIC leveraged its existing volunteer network managed by its Silver Generation Office. Since February, volunteers — who typically engage in door-to-door visits of seniors — have reached out to about 47,000 seniors in the broader community.[62]

Stage 3: Intensified supervision
April 1 to June 18 — First COVID-19 case in an LTC facility to end of Phase 1 of gradual reopening after the circuit breaker

The first COVID-19 case in an LTC facility emerged on March 31, which prompted increased vigilance from MOH and AIC. This overlapped with the circuit breaker period, from April 7 to June 1, Singapore's equivalent of a lockdown in the wider community, which was declared following mass outbreaks among migrant workers living in close quarters. During this time, only essential services, such as supermarkets, could operate.[63]

At this stage, nursing homes became the focal point of intensified government advisories. Beginning in April, enhanced precautionary measures for nursing homes were introduced, including a ban on visitation and the implementation of split zones. These advisories were summarized in checklists from April onwards. By July, the checklists included detailed instructions on topics such as visitation areas and communal activities to minimize transmission risks, as well as care for residents displaying ARI symptoms. The nursing home self-assessment checklist includes the following categories:

- Visitor management (caregivers and volunteers, such as number of people, length, area, and scheduling for face-to-face visitations).

- Vendor management (designated drop-off point, deferring deliveries and maintenance that require access to resident areas).

- Resident management (number of people, length, area, and cleaning guidelines for group activities).

- Staff management (temperatures and respiratory symptoms recorded twice daily, avoidance of social and physical interaction with staff from both same and other healthcare organizations).

- Split zone implementation (physical set up, staff and residents to stay within designated zone).

- Availability of PPE and hygiene products; setting up an isolation room; ward and medical supplies.

- Other guidelines around training, cleaning, and infection control standard operating procedure.

In parallel, MOH and AIC made unannounced spot visits to some facilities (in March) and announced "readiness assessments" (from end-April to end-May[64]). The government continued to offer financial support, such as a SG$500 allowance for staff who relocated residences in May; operational support, such as same-day swabs[65]; mass testing for nearly 25,000 nursing home staff and residents in May[66]; and knowledge support, such as facilitating the sharing of best practices among facilities through webinars.

Meanwhile, daycare centers were given a three-day notice to close by April 7, except for 13 white-listed centers (senior care centers, psychiatric day centers, and hospice daycare centers) that remained open for seniors with inadequate family support and intensive care needs. On April 6, the day before the daycare centers closure, AIC announced funding, referral workflow, and screening information for white-listed centers. For senior care centers, operators submitted a list of clients who needed care at open centers for AIC approval. The white-listed senior care centers were at about 50 percent utilization. The staff-to-client ratio was reduced as a result, with one center going from six to seven clients per member of staff to two to three.

As with nursing homes, MOH and AIC continued to provide support to centers in the form of temporary subventions, based on the number of subsidized clients and the level of subsidy clients received. Daycare operators have also been receiving COVID-19 nationwide financial support schemes, such as the Jobs Support Scheme, which has been extended to March 2021 to help providers defray wage costs.

In lieu of center-based services, most homecare services remained open for families who required support, with the exception of a suspension of home personal care services and home therapy on April 11. However, home personal care was still available to those with no alternative arrangements, and for those who required home therapy services, these were delivered primarily by teleconsultation. With more seniors receiving homecare during COVID-19, temporary exceptions have been made to existing financial coverage by MOH and AIC, such as time-limited extension of the Community Health Assistance Scheme (CHAS) and MediSave to pay for teleconsultation services for those who need regular follow-ups for chronic conditions.[67]

Stage 4: Careful resumption of services
June 19 to October 16 (final date of this report's development) — Phase 2 of Singapore's reopening post-circuit breaker
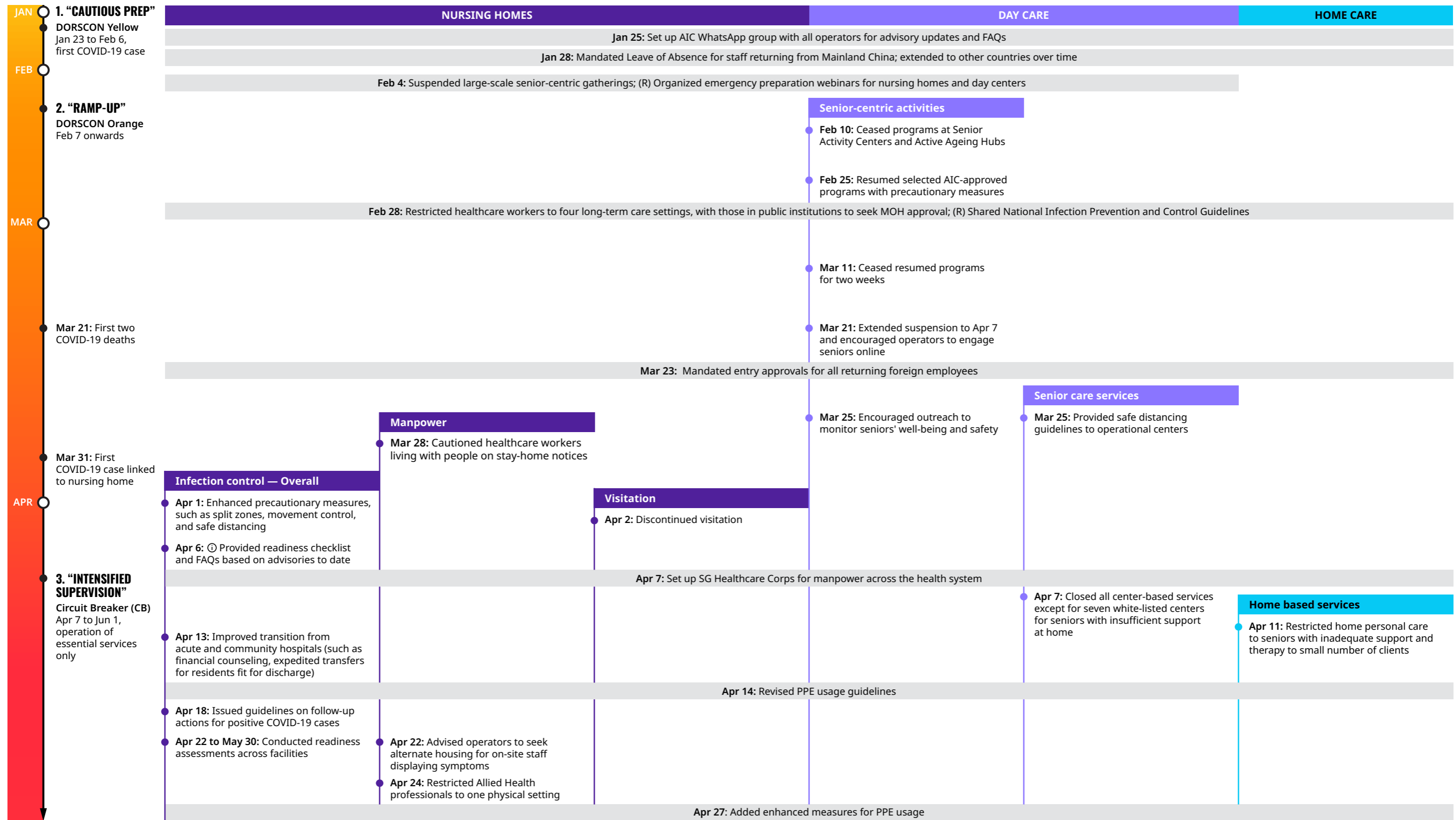
As the number of COVID-19 cases in migrant worker dormitories and in the community has declined, Singapore entered Phase 2 of reopening. MOH and AIC gradually loosened previous advisories, such as nursing home visitor restrictions: Visits have resumed, with the number of visitors per resident increased over time.

As all types of homecare services resumed on June 19 and daycare centers reopened on June 29, all staff in senior-facing roles were tested for COVID-19 in early June. Readiness checklists were also provided to daycare centers before reopening in Phase 2, including 43 items in the following categories:

- Visitor management (symptoms for screening, maintenance of visitor records, mask usage).
- Vendor management (designated drop-off point, deferring non-essential deliveries).
- Client management (no outings, one-meter safe distancing, activities to have no more than five people per table including staff, minimal sharing of equipment, temperatures and respiratory symptoms recorded twice daily).
- Staff management (temperatures and respiratory symptoms recorded twice daily, no cross-deployment of staff between centers, staggered lunch hours).
- Split zones for centers co-located with nursing homes and polyclinics.
- Hygiene and infection control (hand hygiene, PPE usage and supply, cleaning of centers and equipment).
- Maintaining infection control operating procedures and workflows for pandemic preparedness.

Exhibit 3: Summary of MOH and AIC COVID-19 response
ⓘ Represents resources, from end January to early July

	NURSING HOMES	DAY CARE	HOME CARE
	Jan 25: Set up AIC WhatsApp group with all operators for advisory updates and FAQs		
	Jan 28: Mandated Leave of Absence for staff returning from Mainland China; extended to other countries over time		
	Feb 4: Suspended large-scale senior-centric gatherings; (R) Organized emergency preparation webinars for nursing homes and day centers		

JAN
1. "CAUTIOUS PREP"
DORSCON Yellow
Jan 23 to Feb 6, first COVID-19 case

FEB

2. "RAMP-UP"
DORSCON Orange
Feb 7 onwards

Senior-centric activities

Feb 10: Ceased programs at Senior Activity Centers and Active Ageing Hubs

Feb 25: Resumed selected AIC-approved programs with precautionary measures

Feb 28: Restricted healthcare workers to four long-term care settings, with those in public institutions to seek MOH approval; (R) Shared National Infection Prevention and Control Guidelines

MAR

Mar 11: Ceased resumed programs for two weeks

Mar 21: First two COVID-19 deaths

Mar 21: Extended suspension to Apr 7 and encouraged operators to engage seniors online

Mar 23: Mandated entry approvals for all returning foreign employees

Senior care services

Manpower

Mar 25: Encouraged outreach to monitor seniors' well-being and safety

Mar 25: Provided safe distancing guidelines to operational centers

Mar 28: Cautioned healthcare workers living with people on stay-home notices

Mar 31: First COVID-19 case linked to nursing home

Infection control — Overall

Visitation

Apr 1: Enhanced precautionary measures, such as split zones, movement control, and safe distancing

Apr 2: Discontinued visitation

APR

Apr 6: ⓘ Provided readiness checklist and FAQs based on advisories to date

Apr 7: Set up SG Healthcare Corps for manpower across the health system

3. "INTENSIFIED SUPERVISION"
Circuit Breaker (CB)
Apr 7 to Jun 1, operation of essential services only

Apr 7: Closed all center-based services except for seven white-listed centers for seniors with insufficient support at home

Home based services

Apr 11: Restricted home personal care to seniors with inadequate support and therapy to small number of clients

Apr 13: Improved transition from acute and community hospitals (such as financial counseling, expedited transfers for residents fit for discharge)

Apr 14: Revised PPE usage guidelines

Apr 18: Issued guidelines on follow-up actions for positive COVID-19 cases

Apr 22 to May 30: Conducted readiness assessments across facilities

Apr 22: Advised operators to seek alternate housing for on-site staff displaying symptoms

Apr 24: Restricted Allied Health professionals to one physical setting

Apr 27: Added enhanced measures for PPE usage

	NURSING HOMES	DAY CARE	HOME CARE

MAY

May 4: Four weeks' extension

May 3: Extended split zones to accommodations. Staff to move on-site or to hotels

May 6: Allowed fifteen clients per week for each home therapy provider

May 25: Funded infrastructure for video consultation and selected vital sign equipment

May 29: New guidelines for staff accommodation to be met by Jul 31

May 29: Extended suspension of visitors

JUN

Phase 1
Jun 2 to Jun 18, gradual re-opening

Jun 2: Re-opened some AIC-approved Senior Activity Centers

Jun 3: Commenced testing for on-site day care staff and home care staff with people-facing roles

Jun 5: Provided funding, such as infection control solutions for day care and staff appreciation fund for frontline healthcare workers

Jun 6: ⓘ Provided readiness checklist to re-opening centers

Jun 8: Re-opened day hospices

Jun 15: Organized webinar to share infection control best practice

Jun 15: Re-opened community rehabilitation centers

4. "CAREFUL RESUMPTION"

Phase 2
Jun 19 onwards, resumption of most services with safe distancing

Jun 19: Lifted visitor ban (two visitors per resident, maximum of 15 percent capacity)

Jun 19: Resumed all home-based services, with restrictions lifted

Jun 24: ⓘ Provided readiness checklist with FAQs to other re-opening centers

Jun 26: Set up Staff Transport Fund for VWO operators (extended to private nursing homes on Jul 3), and provided contactless temperature scanners

Jun 29: Re-opened all Senior Activity Centers

Jun 29: Re-opened all day care centers with precautionary measures and volunteer activities suspended

Jun 30: Set up referral workflow by IMH for urgent mental health tele-consults

Jun 31: Allowed four designated visitors per resident, maximum of 20 percent capacity

JUL

Jul 1: Updated PPE usage guidelines for staff, volunteers, visitors and seniors

Source: Interviews with MOH and AIC, Oliver Wyman analysis

Furthermore, temporary subventions and nationwide financial support schemes[68] continued, to make up for reduced capacity in these centers. MOH and AIC also continued to provide more resources to help operators adjust, including the Sayang Sayang Staff Appreciation Fund for staff welfare and continued funding for video-consultation infrastructure.

The sector received training and information on infection control before COVID-19, and MOH and AIC coordinated and provided resources on the ground throughout the crisis. However, given the rate at which COVID-19 was unfolding, along with the lack of an early consensus over information about the virus, advisories were largely reactionary in nature and released in rapid succession, with short turnaround times. This has been a contrast to the routine and stability that normally characterize the sector. There are two considerations for the future. The first is a nationwide effort to develop a more granular, methodological framework — beyond DORSCON — so that it consists of anticipatory guidelines and can become more actionable especially for stabilizing settings that serve vulnerable populations. Second, which is more focused on the LTC sector, is to identify other longer-term solutions to make the sector more resilient to pandemics. A starting point can be a compilation of protocols and resources as a "pandemic playbook" — as well as a revamped training with this — for the future. For example, some US states have begun to roll out pandemic lessons and guidelines in the form of toolkits for the long-term care sector. Reflecting on COVID-19 challenges and lessons to date will help Singapore's long-term care prepare for an eventual Phase 3 of reopening and even greater unknowns beyond COVID-19.

Key takeaways

- MOH and AIC's COVID-19 response in long-term care consists of: Advisories, which include guidelines for infection control; checklists, which are self-assessment tools that summarize guidelines from advisories with detailed instructions; and resources, which offer support to operators in the forms of funding, technology, non-technological solutions, and knowledge sharing.

- Given the enormity of risks and the fast-developing situation, operators found the government's support to be positive over the past six months of the crisis. However, some confusion emerged on the ground when navigating the government's advisories, with operators finding some advisories to be reactive at times. They struggled with the large volume of advisories, with many incremental changes, and the short turnaround time given to implement changes. This has all been a contrast to the routine and stability that normally characterize the sector.

- MOH and AIC's actions have also been largely responsive to the overall development of COVID-19 cases and in sync with the broader government response nationwide. The response can be broadly categorized into four stages: Cautious preparation (Jan to early-Feb), ramp up of advisories (Feb to Mar), intensified supervision (Apr to mid-Jun), and careful resumption of services (after mid-Jun).

3. FIRST SIX MONTHS OF THE PANDEMIC

Challenges and lessons for long-term care operators

In Chapter 3, we dive into the challenges faced by Singapore's long-term care operators — nursing homes, daycare, and homecare — throughout the first six months of the COVID-19 pandemic. These challenges have broader, longer-term implications for the sector moving forward. We focus on five areas: Continuity of care, physical space, manpower, seniors' wellbeing, and primary caregivers.

The greatest impact [has been] on the physical and mental wellbeing of seniors due to social distancing measures... going forward, the key is to balance protection from infection with their overall wellbeing.

— *Mary Ann Tsao, Chairman, Tsao Foundation*

The pandemic and its effects have disrupted long-term care models in different ways, depending on their setting and care delivery model. In Singapore, nursing homes and daycare centers bore the brunt of the impact, with many potential cross-infection risks to control. The facilities are shared by numerous seniors, and other people — such as staff and visitors — also move around them. Nursing homes faced challenges from stopgap measures, while daycare operators had difficulty navigating the closure of their centers. In comparison, homecare operators saw an inflection point, with the utilization of their medical and nursing services increasing over the past six months. Ultimately, the impact borne by people — seniors, staff, and primary caregivers — has been considerable, in ways unique to this sector.

Broadly, operators faced five areas of challenge. For each model, we dive into the areas that saw the greatest impact from COVID-19 or for which the pandemic has long-term implications (these are discussed further in Chapter 4).

Area of challenge	Description
Continuity of care	Disruptions in where and how care and services are delivered
Physical space	Immediate need for safe distancing for infection prevention and control within existing infrastructure and design
Manpower	Additional burden and day-to-day disruptions to working and staff living environments, impacting wellbeing and morale
Seniors' wellbeing	Shifts in environments, impacting quality of life and wellbeing
Primary caregivers	Stress from adjusting to changes and uncertainties of the "new normal," while taking care of seniors

3.1 NURSING HOMES

Stopgap measures severely impacted staff and residents

In the long run, infectious diseases will always be with us, so this needs to be taken into consideration when planning and designing nursing homes, since seniors are more vulnerable and more likely to be immuno-compromised.

— Dr Loke Wai Chiong, Clinical Director of Programs and Head of Integrated Health Promotion, MOH Office for Healthcare Transformation

Context

In Singapore, nursing homes are the dominant form of residential long-term care: There are 80 nursing homes and 16,059 beds.[69] Rooms with six to 10 beds are still commonplace today in nursing homes[70], and only three assisted-living facilities exist in the country.[71] Residents usually stay between three to 15 years, with a few residents staying for 30 to 40 years.[72] This is a contrast to other developed countries, where single and double occupancy rooms are more commonplace and seniors stay in nursing homes for much less time.

At the time of this report's publication, four[73] out of 28 COVID-19 deaths were nursing home residents — out of estimated 16,000 residents[74] — a smaller proportion than in many other developed countries, though some countries have even smaller proportions, such as Taiwan (see Appendix for more detail). Given that the pandemic's threat to nursing homes lingers in Singapore — with the possibility that fewer recorded outbreaks might mean that homes have not been fully "put to the test" — it is urgent to synthesize the challenges. It will then be possible to come up with more sustainable further steps, rather than just stopgap measures, in order to better navigate the uncertain future.

Nursing homes had anticipated challenges from COVID-19 as early as end-January, but by April, the pandemic's unprecedented magnitude was more clear. Government advisories intensified over time, first starting with health sector guidelines in February, such as movement restrictions for workers and travel history checks. The guidelines became more specific to nursing homes by April, including visitor bans and alternative housing for long-term care staff (see Exhibit 3 for a timeline of key advisories).

Clear protocols were set up by AIC for managing potential COVID-19 cases. Residents showing any possible symptoms are isolated, and MOH-funded swabbing tests are then performed. The turnaround has been quick, with results released within 24 hours of submission. If a test is positive, the resident is transferred to a hospital by a dedicated ambulance. Furthermore, the COVID-19 Incident Response Team was set up, consisting of public health, hospital, infectious disease experts, and representatives from the nursing home and MOH.

After a case is discovered, the next steps include putting tests into operation, assisting with contact tracing, supporting communications to family members and public, and evaluating existing infection control measures such as split-zone arrangements. Designated staff were also prepared to step in if an outbreak occurred and a home required additional manpower. This was prepared in case a nursing home would be short of staff from illness or quarantine orders. Five operators were identified to provide this assistance, and they received AIC support to hire additional manpower in advance (new hires and volunteers from SG Healthcare Corps).

Nursing homes that have gone through the process said the protocols were streamlined and timely. In one home, when a positive case[75] emerged, a tele-conference with government officials was set up within two hours to devise a plan. By the afternoon, residents in the same zone as the case were swabbed and segregated from other residents. The test results were swiftly returned by the next day, with safety measures (including re-swabbing) maintained for the subsequent two weeks.

During the first six months of the COVID-19 crisis, operators remained at nearly full capacity (most beyond 90 percent[76]), with discharges from acute hospitals to nursing homes in the early stages of the pandemic, when hospital capacity was freed up in anticipation of COVID-19 patients. One home had a 5 percent increase in utilization because of a partner hospital's discharge volume, and another home saw the number of MOH-subsidized beds increase by 15 percent. There was no discernible decline in the number of existing residents.[77]

CHALLENGES AND LESSONS

A. Continuity of care
Care disrupted, emergence of telehealth

The pandemic reshaped how care is delivered in nursing homes. Traditionally, many homes have a shared-services model, in which doctors and specialists rotate across several facilities and care settings. However, due to COVID-19 risks, healthcare workers were limited to rotating across a maximum of four long-term care facilities as of February 28. Allied health professionals (AHPs) working in nursing homes were limited to conducting physical consultations in only one nursing home as of April 24.[78] These measures were prudent for minimizing cross-infection risks but presented challenges for operators. One major nursing home could no longer have its resident doctor and dieticians visit. While healthcare workers, from outside of long-term care, could step in to provide support, those from public healthcare institutions (which were on the front line for COVID-19 in the broader community) needed approval from MOH[79], making this a difficult alternative.

Despite the use of teleconsultation — which leveraged donated mobile tablets repurposed by AIC — other methods were also required to continue care for residents. One home continued regular physician visits, but on any one day, the doctor physically called upon residents in one zone and attended to residents in the other zones via videoconferencing. Another operator continued regular therapist visits, but productivity was impacted, with therapists allowed to see just one resident at a time and unable to finish seeing all residents on a given day. These disruptions exposed the weaknesses of nursing homes' current care models, highlighting the importance of telehealth alternatives and the need to rethink the staffing model for clinical support.

B. Physical space
Existing spaces upended for safe distancing

Infection control affected every aspect of nursing home life. Almost all spaces within nursing homes are shared, either with other residents or with staff and visitors. According to operators, the spaces most impacted were communal areas, split zones, and staff living quarters.

- **Communal areas:** Operators initially compartmentalized communal areas, such as dining spaces, and staggered foot traffic. All group activities were halted, though they have since resumed with one-meter distancing, no more than five participants per group, shorter activities, and minimal equipment sharing.[80] The transformation of communal areas was easier for homes that already had decentralized social spaces within each ward or household. In other cases, more staff were allocated to monitor safe distancing in areas such as corridors and visitor areas.

- **Split zones:** Split zones are self-contained areas set up to reduce infection risks: Staff and residents are not to enter other zones[81] or interact with people from other zones. The zones are designated by either floor or wing, and the number depends on the nursing home setup and size. Each zone has no more than 100 residents. As of July, about half of the care facilities reorganized themselves such that there were 26 to 50 residents in each zone.[82] Implementing split zones was harder for some operators than others and depended on each home's layout. One home with an existing household structure — self-contained areas of 12 to 16 residents — transitioned to split zones with minimal design changes. However, one home had multiple bedrooms with shared common areas on one floor, thereby needing to create two separate split zones in the same floor. Another key implication was setting up split staff teams and practices, with staff unable to mix within the facility or in living spaces.

- **Staff living quarters:** According to operators interviewed in the study, at least 80 percent of direct care staff in some nursing homes are foreign, mostly from Southeast and South Asia.[83] Some nursing homes provide staff accommodation on-site, and such dormitories are in shared-room format, with typically six, but sometimes up to 10 people per room. With COVID-19, these on-site dormitories required drastic changes to minimize cross-infection risks among staff. For example, in one dorm, a staff member — who was later confirmed to have the virus — was living with another staff member from a different split zone. Over time, bedrooms were converted to accommodate just two to three staff, and bunk beds were replaced with single beds. In some homes, spare rooms were converted to temporary staff living quarters.

From end-May, on-site dormitories needed to improve standards to meet split zoning, safe distancing, and ventilation requirements as mandated by AIC; otherwise, an alternative housing arrangement was required. The agency provided various funding packages to support staff and operators during this transition period (see Chapter 2). These were interim solutions, however, and permanent changes will be required, such as renovating existing or upcoming staff living quarters, as well as changing the guidelines for future dormitories. Off-site accommodations have implications for both operations (such as ensuring living based on split zones) and costs (such as higher rents for centrally located facilities).

There were other changes made to the physical space, such as maintaining safe distance between beds — 1.2 meter, according to one operator — and setting up isolation rooms. By September, MOH set up a centralized isolation facility to help nursing homes that may not have enough isolation capacity; incoming residents can be isolated here before being transferred to nursing home. Many operators said these practices were fortunately not too difficult to implement, compared to the aforementioned measures. One operator moved residents to different rooms to vacate some areas for isolation purposes. Another similarly removed a total of 15 beds to create two-meter safe distances between beds for additional safety.

The activity area (left) has been converted to designated visitor's area (right), in preparation for gradual resumption of visitors in June. Photos courtesy: Sree Narayana.

Free space on level 1 of the facility (left) has been converted to a separate staff dining area (right). Photos courtesy: Sree Narayana.

Residents are organized by households at Peacehaven (left), which eased the process of implementing split zones for the nursing home. Now, each split zone is marked with color to help residents adhere to their zones. Safe distancing measures were set up within each household (right). Photos courtesy: Peacehaven.

The facility's rehabilitation space (left) was converted to a temporary staff living quarters (right) when daycare center was closed from April to June. Since then, the space has been converted back to its original use. Photos courtesy: Sree Narayana.

The facility's daycare center was converted to temporary staff living quarters, when the daycare center was closed from April to June. Since then, the space has been converted back to its original use. Photo courtesy of Sree Narayana.

C. Manpower

As frontline workers in a high-risk environment, nursing home staff made many sacrifices, both in their professional and personal lives. They understood their duties as care workers and were obliged to do so, but these were often difficult decisions and challenging for their mental wellbeing.

Existing manpower shortage further exacerbated

Insufficient manpower was a problem in Singapore's nursing homes before the COVID-19 pandemic and has been further amplified by it. There is high dependence on foreign workers with challenges around hiring local talent, low salaries, and limited career advancement opportunities, to name a few.[84]

Given the high dependence on foreign talent, there were key challenges in manpower throughout COVID-19. Travel restrictions effectively put foreign worker recruitment on pause, and some foreign workers, who were back in their home countries, were unable to re-enter Singapore. Moreover, some operators expected a few foreign workers may leave Singapore once the travel ban is fully lifted. Meanwhile, it became even more challenging to hire locals, potentially given that many do not want to work in a nursing home for fear of being infected or, worse, unknowingly infecting seniors themselves — on top of existing challenges associated with being a nursing home staff.

Volunteers are a critical source of manpower for nursing homes, with one home's volunteers running up to 20 percent of its activities. With volunteers not allowed on-site however, recreational activities like board games and arts and crafts were either drastically scaled back or operators had to rely on their full-time staff.

Singapore Healthcare Corps, a MOH-led initiative to support the healthcare workforce throughout the COVID-19 crisis, provided a stopgap solution. The government recruited both healthcare and non-healthcare professionals, provided training, and matched them to paid or volunteer opportunities across the health system. Applicants indicate their preference, if any, for hospital or long-term care settings. This initiative launched on April 7 and saw about 3,000 sign-ups by the end of April. From our conversations with operators, however, the uptake of manpower from the initiative has not been high in the long-term care sector. In addition, there was re-deployment of daycare staff and recruitment through channels such as the Yellow Ribbon Project.[85] More recently, many furloughed crew members from Singapore Airlines joined nursing homes as care ambassadors, supporting residents with their daily activities.

However, many operators said these initiatives could only partially mitigate the overstretching of existing staff. For example, many of the Healthcare Corps volunteers are not clinically trained, so they could not enter and help in wards. Furthermore, they are interim in nature — one nursing home hired 10 Healthcare Corps members but noted that most would not likely stay permanently. The pause on foreign recruitment and limited local recruitment sheds a light on the need for sustainable local recruitment going forward.

To overcome manpower constraints, Peacehaven employed new staff from the SG Healthcare Corps and deployed them for both clinical and non-clinical duties. Photo courtesy of Peacehaven.

Shifts extended for coverage and compliance

Operators transformed existing processes to meet the spate of evolving infection control advisories. Some homes migrated from a three-shift to a two-shift model, with 12-hour working days, to ensure they had enough staff assigned to each split zone at a time. The extension of shifts from eight hours to 12 is not sustainable, however, and one home said even before COVID-19, it had seen a higher rate of medical leave by staff working 12-hour shifts than those working eight-hour shifts. Some homes also added more night-shift staff to cope with any potential rise in evening emergencies. Staff were obliged to adopt these operational shifts quickly.

Challenges with overstretched staff and the limitations of split zones during COVID-19 have made homes more eager to test digital and tech-enabled solutions. These include centralized electronic medical record systems, remote monitoring across bedrooms, and assistive robots for tasks like cleaning and meal delivery.

Mass relocations and isolation from friends and family

In March, MOH encouraged healthcare workers living with staff from other institutions, as is common for foreign workers, to take precautionary measures, such as not reporting to work if unwell. This became more stringent in May, when MOH and AIC advised all nursing home staff to relocate to on-site living quarters, hotels, or other off-site residences. Some operators had preempted this advisory and moved staff on-site beforehand, given the logistics required to move a large number of people. For example, nearly 60 percent of one home's staff lived off-site and needed alternative accommodation. In all, 3,600 resident-facing staff were relocated to designated on-site accommodation facilities or at hotels. Many local staff had to live away from their families for an extended period.

The transition of staff to hotels was well-coordinated by AIC, with meals and transport provided to relocated staff. AIC also helped source housing for staff from Malaysia, who could no longer make the daily commute home after the mid-March movement control order. Operators said they had some difficulty sourcing off-site residences — one operator noted that he had requested MOH for support from the Housing Development Board (HDB) to locate available housing, but that this did not materialize. In some extreme cases, nursing home workers were evicted by their landlords because they were considered a high risk for spreading infection. As a result, operators provided counselling for these affected staff.

Staff morale fluctuated in the first half of 2020. AIC recognized this and organized care[86] and financial packages. Many homes also organized wellbeing initiatives for staff, funding Grab (a ride-hailing app) accounts for commutes, on-site entertainment programs, and volunteer-made care packages. At times, some operators supplemented government grants out-of-pocket to provide additional benefits and initiatives to maintain staff morale. However, this approach is not enough for long-term sustainability, and changes need to be more operational, such as job redesign or automation, or structural, such as policy changes.

D. Seniors' wellbeing
Socially isolated, routines disrupted

The suspension of visits, which has been gradually lifted since mid-June, from family and loved ones had the most dramatic impact on seniors. While it is too early to quantitatively capture the full impact[87], anecdotes abound, and it has been widely observed that social isolation is a key risk factor for loneliness, with potential for harmful consequences such as increased risks of depression, anxiety, and cognitive decline.[88]

- **Seniors with dementia:** Suspension of visits has been especially difficult for residents with more-severe illnesses, such as dementia. To help one senior resident with severe dementia, one home recorded a video from their daughter and played it to them every day. Another home tried to continue tailoring cognitive exercises for residents with dementia based on the severity of their condition, but this was difficult given manpower constraints.

- **Low level of engagement:** Many residents struggled with boredom and staying meaningfully engaged, as volunteer-run recreational activities were paused and their typical routines, such as going outside or cooking, were discontinued. Not all operators were able to set up online volunteer-run activities in time, and many residents resorted to watching television all day.

- **Increased stress levels due to changes in environment and routines:** Staff in masks or full PPE caused stress for some residents with dementia. Furthermore, residents initially had a difficult time understanding safe distancing, even as staff tried to communicate the rationale for the measures as much as possible and monitored residents' reactions. Residents also had to make sacrifices in their personal spaces and privacy. One nursing home had to pre-package diapers and place them in residents' bedside cabinets, rather than staff traveling across wards to deliver them. Staff temporarily moved residents' personal items, such as gifts from previous holidays, from the cabinets and stored them centrally. These items have since been returned to family members, though the episode was upsetting to residents, highlighting the importance of maintaining a sense of connection to loved ones as a source of comfort.

- **Physical deterioration:** Physical wellbeing was impacted, too. One home noted a slight deterioration among residents as therapists could only conduct sessions at a lower frequency. Hence, more therapy aides were hired to help. Some saw weight loss among residents, as they were eating at their beds, rather than in communal areas, which may have impacted their appetite.

To ensure seniors remain connected with their loved ones during circuit breaker, staff at NTUC Health's nursing homes help seniors make video calls. Photo courtesy: NTUC Health.

Best practice #1

United States: "Compulsive communications" to keep seniors and families connected

As of publication, the United States has the highest number of COVID-19 cases worldwide, at more than eight million.[89] Up to June, at least 40 percent of COVID-19 deaths were linked to senior care facilities.[90] With visitor bans implemented following the recommendation of the Centers for Medicare and Medicaid Services in March, Thrive Seniors — an operator of assisted- and independent-living communities — saw the importance of securing a steady flow of communication between family members and residents.

Thrive Seniors adopted a policy of "compulsive communications" with families, in which they made daily phone calls, sent weekly letters, maintained 24/7 helplines directly linked to the COVID-19 response teams, and shared information around any COVID-19 cases or deaths in its facilities. In a bid to "shine the light on COVID-19", they also regularly uploaded videos on their website, showing how residents and staff, including those who had tested positive, were coping and steps the care home was taking with regard to infection control. This transparency helped to reassure family members. According to Tammy Marshall, the organization's Chief Experience Officer, "Customer satisfaction scores, even in COVID-19-positive settings, saw upward trends and we credit [this] to our compulsive communications. In times of ambiguity, as people were seeking certainty, the only thing we could do is to give them the information we had."

In addition, Thrive Seniors quickly developed and deployed "Clear Connection," a movable clear glass panel with phones on both sides that replaced the front doors of their care facilities. Despite the ban on visitors, family members were able to book visitation slots to see and talk to seniors through these panels without having to enter the facility. One family member expressed how "seeing the look on [her father's] face when she reads to him is the best part of her day."

As an organization, Thrive Seniors prioritized communications with families and was very nimble in designing and implementing creative solutions to address them. In Singapore, operators can take this lesson forward, not only to adopt the philosophy of comprehensive communications, but also to take a similarly agile approach in rolling out solutions.

Best practice #2

Belgium: Tech partnerships for social isolation in nursing homes

Around 90 percent of nursing homes in Belgium had been severely affected by COVID-19 as of April 17[91], and the government imposed visitor bans. Some operators leveraged partnerships with private companies to help residents deal with the resulting isolation from family members. One example was with Zorabots, a Belgian robotics company that loaned robots to nursing homes during lockdown. "James," a 1.2-meter tall robot butler, can navigate space autonomously and connect residents to family members, as each robot is connected to Facebook Messenger. Rather than staying put in one place with a tablet or other device, residents can walk around with the robot while still conversing with loved ones. The initial plan was for Zorabots to lend 60 robots to nursing homes, but the company announced plans to loan hundreds more to nursing homes in need.

As demonstrated in this example, Singapore's operators can further leverage private partnership to adopt digital solutions with applicable use cases for long-term care. Solutions designed for other sectors with applicability for long-term care can also be explored by broadening the scope of partnerships. Some robotic solutions have already been developed in Singapore (see Chapter 4, Tech case study #3). Long-term care facilities can further embrace these solutions, given the momentum created by COVID-19 for digital adoption throughout the sector.

The first six months of the crisis had a clear impact on all aspects of nursing homes, highlighting the necessity to evaluate the likely impact if second and third waves of COVID-19 hit Singapore. Measures to minimize infection risks did ultimately worsen the quality of life for many residents, so it is urgent and critical to find more-sustainable, longer-term solutions.

3.2 DAYCARE CENTERS
Offline model ground to a halt

Daycare centers should be designed with infection control measures in mind and be more "pandemic-proof." The key question will be how to accommodate smaller group activities and safe distancing measures, while [remaining] financially sustainable and not compromising on service quality.

— *Dr Kenny Tan, CEO, St. Luke's ElderCare*

Context

In Singapore, center-based facilities for seniors span different types, such as daycare, dementia daycare, and community rehabilitation. The number of such facilities has grown significantly over the past decade, with capacity increasing fourfold to 7,600 available placements across 143 facilities[92], making aging-in-place more feasible for seniors. Daycare provides full-day programs to engage seniors while their caregivers are at home, serving as both a place to maintain and improve general physical and mental wellbeing and to encourage socialization.

Over the six months from February to July, the daycare experience was defined by closure and reopening, which created confusion on the ground. Senior care centers remained open in February and March[93], while a variety of senior-centric activities — such as those in senior activity centers — were suspended — to ensure that the operators had appropriate safeguards in place — restarted, and then suspended again. Then, from April 7, all daycare centers, including senior care centers, were closed until June 29, except for centers that were specifically white-listed and remained open for seniors with insufficient support at home.

The three-month closure brought unfamiliar challenges. Seniors suddenly found themselves spending most of their time at home, while caregivers frantically searched for alternative options and operators scrambled to arrange check-in phone calls and online activities for their clients.

As centers reopened, attendance — based on centers interviewed — hovered around 50 to 80 percent[94], depending on the space available to accommodate safe distancing measures (see next section on physical space). Attendance also depended on caregivers' willingness to send seniors back to the centers, whether they were frail from isolation or feared COVID-19 transmission risk. Another key point for daycare centers will be financial viability, even with temporary subventions to help cover for lower attendance for subsidized clients and the Job Support Scheme (see Chapter 2 for more detail). For centers that continue to serve fewer clients, as well as non- or low-subsidy clients, maintaining the overhead cost could become unsustainable.

CHALLENGES AND LESSONS

A. Continuity of care
Forced migration to online, gaps in adoption

Prior to the circuit breaker, some daycare operators were already experiencing a slight dip in attendance, as seniors and their families became more cautious. Eventually, daycare centers were ordered to close on April 7 — with such closure common in other nations during lockdowns — with three days' notice. Operators scrambled to respond. "We had very little time to react and were scrambling to put together activity packs to keep seniors occupied at home," said Jason Foo, CEO of the Alzheimer's Disease Association. Almost immediately, centers had to establish regular contact with seniors and their caregivers through phone calls, primarily to check on their safety and remind them of daily routines. Operators have said it has been difficult to enforce habits, especially medication adherence, during center closure.

Operators recognized the importance of migrating to services beyond phone calls to improve the quality of social engagement with seniors online. "[Seniors] come to these centers not only for the interventions, but also to have a social network and sense of community," said Sairam Azad, Deputy Director of Health and Senior Care at the Asian Women's Welfare Association (AWWA). While some operators got a head start by preparing online content, such as pre-recorded videos, most only pivoted to online activities a few weeks into closure, when it became clear that closure would be extended.

The online migration was not easy, as only about 58 percent of Singapore's seniors are Internet users. Of this group, only 33 percent are computer users and 13 percent do not own any portable device — that is a laptop, tablet, smartphone, or mobile phone.[95] Many operators had not done much digital preparation, and not all seniors were engaged or had sufficient tools, Internet connectivity or support from caregivers and family members at home to participate. As a result, the uptake of online activities was not a full migration. From the operators interviewed, engagement among healthier daycare clients varied from 20 to 50 percent, with only 10 to 20 percent of rehab clients engaged via tele-therapy during center closure.

Daycare operators provided their perspectives on how the adoption of virtual activities varied among clients, from more advanced online transition among less-frail or younger clients, to basic check-ins via calls and messages for frailer or older clients. The presence of a caregiver at home played a key role in promoting adoption.

Exhibit 4: Daycare centers' mixed results — observations from operators

Range of client characteristics

← →

Less frailty, younger, and/or tech equiped

More frailty, older, and/or no tech/connectivity

Overall success of virtual engagement	More advanced online transition	Online activities fine, but increasingly disengaged	Some successes with personalized delivery	Baseline communications for check-in
Overview	Slightly younger, more-active clients, well engaged via diverse selection of exercises and social activities (Zumba, Bingo, skill-focused classes)	Some seniors growing disengaged over a prolonged time at home; difficult to recreate center's environment through virtual means	Difficult to engage clients with physical or cognitive impairments; important to be familiar with clients' strengths and weaknesses to customize modules (with favorite activities and familiar staff)	Operators relied on phone calls or WhatsApp messages where possible; checking in more for safety than deeper engagement
Key takeaways	• Quick digital adoption triggered by COVID-19 "finally saw the need for digital" • Potential to further "IT-ify" seniors and increase online services • Benefits of more-frequent engagement	• Need to meaningfully strengthen a sense of community • Simple video chat platforms have limits; need greater variety and more creative activities	• More human capital required for one-on-one, personalized engagement • Equip staff with skills to be care ambassadors, providing more-holistic, individualized check-ins	• Lack of tech devices and connectivity main barrier • Clients with severe dementia difficult to engage meaningfully

Having an engaged caregiver (with technical and emotional support in-person) can make a difference, particularly for this segment of clients

Source: Operator interviews, Oliver Wyman analysis

GoodLife!, which is under Montfort Care (a voluntary welfare organization), is a program that promotes and improves the overall wellbeing of seniors. Through GoodLife! programs, Montfort Care supports a wide range of seniors, through senior-centric activities for healthier seniors and casework and befriending for lower-income and frailer seniors. During the COVID-19 crisis, especially during center closure from April to June, Montfort Care developed different outreach strategies.

For more-active seniors, Montfort Care organized virtual activities, which started as Facebook Live programs, on a "virtual Senior Activity Center." This uses social media and video conferencing platforms to provide curated activities such as exercise, cooking, and arts and craft. It has also focused on taking volunteer-run activities online. In one example, it engaged student volunteers to log on after school to do an online inter-generational exchange program. Students shared tech-related content with seniors, while seniors taught them different dialects and shared their life experiences growing up in a kampung — the name of traditional villages.

The next frontier is an "E-Seniors" program, mainly targeting people in their 60s. Here, someone can learn basic tech skills, such as how to use common social media platforms, and be recognized as an "E-Senior,"

one who is better equipped to interact with the digital world. The digital journey that the seniors embarked on is the beginning of a lifelong learning expedition. The virtual senior-centric activities pioneered by Montfort Care will help seniors stayed engaged and entertained. Essentially, the digital platforms provided an avenue for continual engagement with seniors even when center-based programs had to be suspended due to the pandemic. Staff received new training to better engage with seniors during these classes.

For lower income seniors who do not own a smartphone or have Wi-Fi and for older seniors who are not so IT-savvy, the key barrier has been tech infrastructure. For this group, Montfort Care leveraged three key channels of engagement: In-person meal deliveries, home visits to provide basic health checks, and phone calls from staff and volunteer befrienders, who are often seniors themselves. The volunteer befrienders were actively engaged, making more than 1,000 calls to 84 isolated seniors from April to June.

The next frontier is strengthening the volunteer befriending program. Montfort Care recognizes that volunteer management is critical in reaching out to the larger community, so support for the volunteers is important through regular volunteer engagement and appreciation initiatives.

B. Physical space
Reduced capacity, reconfigured space

Operators reduced their maximum capacities to adhere to safe-distancing guidelines, and as of end-July, about 50 to 80 percent[96] of the pre-COVID-19 client base had returned to the reopened daycare centers. This reduction was especially pressing for smaller centers that operate in the void decks of Housing and Development Board (HDB) buildings but less so in larger facilities that are standalone or part of integrated hubs or nursing homes. In addition to being cramped, some of these void-deck facilities are not built for infection control: They often have only one place to enter and leave, and many have pillars in the middle or other layout peculiarities, which complicate the segregation of groups and the implementation of self-contained activity areas. AIC provided best practices for safe distancing and infection control — including specific protocols and PPE usage — to reduce any infection risks. However, in the future, these space constraints call for a review of how daycare spaces are created.

NTUC Health's 23 daycare centers have all been adjusted to implement various safety measures. For example, seats are now spaced out at least one seat apart during group exercises, and table-top activities are limited to two or three clients at a time. Photos courtesy: NTUC Health.

Peacehaven's Changi Day Center has resumed group activities with safe-distancing measures in place.
Photo courtesy: Peacehaven.

C. Manpower
Additional responsibilities with the same staffing levels[97]

Prior to the circuit breaker, daycare centers had to implement safe distancing measures and screen visitors and staff as early as February, when DORSCON Orange was activated. When the majority of daycare centers reopened on June 29, infection prevention and control practices were continued. Cleaning time and frequency had increased — one center built in 15 minutes between every activity to wipe down equipment. According to operators interviewed in the study, fewer clients could travel in the same vehicle[98], resulting in at least twice as many rounds of transportation were needed as before, requiring more work from staff. Reminding clients to keep their masks on and maintaining safe distance was also difficult. Clients were required to use designated toilets, but seniors — especially those with dementia — have had a hard time understanding the rationale. Furthermore, activities now happened in smaller groups, and while good for engaging clients, they demanded more manpower. As a result, many operators discontinued virtual engagement when physical centers reopened. For some new tasks specific to COVID-19 — such as temperature screening, visitor management, and disinfecting facilities and equipment — operators saw great potential for automation eventually.

As of early August, volunteers were not allowed to return to daycare centers, and operators were continuing some volunteer-run activities virtually where possible. For instance, one center engaged corporate volunteers to run online activities such as singing and dancing, and another recently organized a virtual Singapore National Day celebration in partnership with schools. Most of these activities, however, would require staff on-site to help engage clients in the center while volunteers facilitate activities online.

Clients are assigned to groups, and toilets and tables are designated for each group. At one center in NTUC Health, clients are in flower-themed groups. Photo courtesy: NTUC Health.

Best practice #3

Taiwan: The role of volunteers and digital technology

Overall, Taiwan, which has a population of nearly 24 million, has been very successful in keeping its COVID-19 numbers low — at around 530 cases and seven deaths as of mid-October. The country exercised comprehensive border controls early, and its citizens have a high awareness of public safety following SARS. To protect seniors from potential infection, Taiwan also temporarily discontinued community-based activities to promote health and prevent disability and dementia.

Taiwan has a robust network of volunteers across over 3,000 hubs, with both formal and informal volunteers. Under the Volunteer Service Act, Taiwan outlines the rights of volunteers, and organizations must have a concrete volunteer service plan. About 40 percent of volunteers are formal, and undergo training, which includes general modules such as ethics, as well as specialized modules such as senior care and drug abuse prevention (depending on the volunteer's area of interest). Formal volunteers receive benefits such as government commendation after a certain number of hours, organization-funded stipends for transport and food, and free entrance to places like national parks. Informal volunteers are often community members in different cities and villages, and they too have access to opportunities like formal volunteers. During the closure, Taiwan actively engaged this network of volunteers. The country has no centralized national organization looking after all senior needs, so the government saw volunteers as the frontline for senior outreach. Throughout the lockdown, volunteers delivered meals and care packages, including information booklets and dry goods, to seniors and called them to check in.

Digital tools also played an important role. Nearly 95 percent of seniors in Taiwan own smartphones, which are the most common way for them to access the Internet. LINE, a prevalent online messaging platform, has been a key channel for seniors to share news and keep in touch with family members and volunteers. Going forward, senior-focused organizations are exploring more digital opportunities. For example, the Federation for the Welfare of the Elderly noted that Taiwan should develop an online platform like Age UK, which centralizes services available to seniors, a hotline, and different resources spanning money, legal issues, workplace rights, and wellbeing. "Such a platform for Taiwan does not exist yet. This would make resources and information even more accessible for seniors in Taiwan," said Carol Chang, Secretary General of the Federation.

Unlike Taiwan, Singapore's volunteers are largely managed by operators, and they often provide ad hoc support in community care. To better mobilize volunteers, Singapore could scale existing training initiatives and programs by the National Council of Social Service to formalize and provide even-more-specialized training for volunteers. A volunteer network that has a deeper level of expertise could then provide stronger support for existing community-based initiatives such as the Community Resource Engagement and Support Teams (CREST). At the same time, the volunteers could be more actively used to enhance support for digital-clinic initiatives for seniors. This would not only help create a more digitally-savvy senior population, but also drive uptake of online platforms like the LifeSG (formerly Moments of Life) mobile application. During COVID-19, Singapore was able to quickly mobilize and train volunteers through initiatives like SG Healthcare Corps. This momentum can lend itself to a more widespread upskilling and formalization of the volunteer network to support the long-term care sector.

D. Seniors' wellbeing
Acute risks from sustained social isolation

Operators noted the impact of prolonged social isolation on seniors' physical and mental wellbeing. Since the reopening of daycare centers, staff have focused on countering this impact through professional assessment and interventions. There is already evidence of the broader health impact that isolation has had on daycare seniors:

- **Mental deterioration:** The mental condition of many clients, particularly those with dementia, had deteriorated severely. One center said: "Some of our dementia clients have forgotten that they used to come to the center. We organized photo album activities to help them remember what they used to do here." Another example is a senior who ran away from home and showed up at a center during the circuit breaker.

- **Increased falls and physical deterioration:** According to geriatric experts and daycare operators, more incidences of falls leading to hospitalizations emerged during the circuit breaker.[99] At the same time, one geriatric expert noted more behavioral problems and falls amongst seniors with dementia. Homecare was available to seniors during the closure of daycare centers, but closure still may have played a part: "Daycare is important for a few reasons. Staff can keep a lookout for early signs of disease and worsening frailty to prevent health and care crises such as falls. For example, they can screen for sarcopenia — the progressive loss of skeletal muscle mass and strength — and triggers for falls and other health crises, such as acute illness, medication, decreased appetite, rising temperature, or changes in respiratory rate and other vital signs. Closure can also mean there will be no rehabilitation, exercise, social engagement, and group meals for many, which may contribute to further decline in health and wellbeing," said Dr Ng Wai Chong, Founder and CEO of NWC Longevity Practice.

  Some seniors were unable to return to the centers immediately, as they had become physically frail during the circuit breaker. Some operators noted other kinds of physical deterioration, such as worsened skin conditions, reduced tolerance for sitting or standing, and greater difficulties in activities of daily living due to muscle weakness. An operator working with seniors with dementia raised the point that returning to the centers was yet another disruption to the routines these seniors had developed during the circuit breaker. As such, these seniors required closer staff supervision and took longer to adjust back to being in the centers again.

- **Disengagement:** Caregivers noted that many seniors had become disengaged because they were away from their usual social circles. Many also had a limited focus during virtual activities. After being inside for a prolonged time period, some seniors lost any sense of urgency to get out of bed. Once the centers reopened, seniors have had to make changes, such as making appointments rather than dropping in and not being able to eat group meals with friends, which may continue to disengage them. Meanwhile, because group activities were limited to five people or fewer and equipment could not be shared[100], one center discontinued activities such as mahjong, leading to a significant reduction in the variety of activities.

E. Primary caregivers
Overwhelming demands on primary caregivers

Primary caregivers, typically family members, faced overwhelming challenges at home while centers were closed. In many cases, family members were adjusting to significant life changes themselves, including remote working, financial worries or layoffs, and a sudden absence of alternatives for child and senior care. Essential workers also bore health risks, fatigue, and anxiety, as they applied for a place in one of the white-listed daycare centers. Many were not well trained to take care of a senior at home, especially without the support of other siblings and relatives, who were not allowed to visit during the circuit breaker, and with restrictions on home personal care from April to mid-June. "While we did not see a significant spike in calls to the helpline, we noticed more calls from caregivers asking for help, rather than to ask for general information," said Jason Foo. The challenge was amplified for caregivers of clients with dementia, as they lacked the specialized expertise to deal with behavioral outbursts during an extended time at home.

Staff members at AWWA's Senior Care Centers have been evaluating the impact of center closure on the physical condition of their clients through re-assessments. Photo courtesy: AWWA.

COVID-19 has presented pressing questions for some daycare centers that depend on an offline model. They may need to further embrace a model that will become more omnichannel over time. That is, this model will use both online and offline programs and interventions, including physical centers that serve multiple purposes, leverage community members, and are more embedded into neighborhoods or integrated settings with other medical and social care options. This transition will be the next test for daycare centers. If they are unable to pass, they may become less relevant for seniors.

3.3 HOMECARE

A new inflection point and a catalyst for further adoption

COVID-19 is making people think more about homecare...people are increasingly seeing homes as the "safest place." Perceptions have changed, and we expect this to be sustained.

— Kavin Seow, Senior Director, Elderly Group at TOUCH Community Services

Context

In Singapore, homecare has been a nascent part of the country's long-term care landscape. The number of homecare operators has nearly trebled since 2010 and counted 24 operators[101] and 10,300 placements in 2019. One driver of this has been the government's directive to push towards aging-in-place.[102] However, utilization of these services has remained low and was just 54 percent of total capacity in 2019.[103] Compared to other LTC types, homecare operators faced fewer challenges during COVID-19; instead, they saw an inflection point, with the utilization of home medical and nursing services growing during the circuit breaker. The focus now is to sustain this momentum.

Across the homecare segment, demand for home nursing and medical care increased, primarily driven by patients who were discharged from hospitals. On the other hand, home personal care demand declined because of the restrictions, as family members were at home during the circuit breaker and able to support seniors. Home therapy demand, too, declined.[104] Operators included in this study saw over 20 percent growth in home nursing and medical care — up to 20 percent growth in home nursing and between 25 and 50 percent growth in home medical care. Home personal care demand fell between 10 and 30 percent, but demand has since returned to its pre COVID-19 level.[105]

The segment saw a promising foray into telehealth, with some operators rolling out the service for the first time during COVID-19. One operator saw 90 percent growth in telehealth adoption, which was stronger among seniors supported by family members or caregivers at home. Operators broadly see stronger use cases for teleconsultations in non-urgent medical care, such as rehabilitation and post-discharge check-ups.

Driven by this momentum, some operators seized the opportunity to introduce new homecare services designed to address unmet needs. Homage, a tech start-up that provides on-demand nursing, caregiving, and rehabilitation services, launched "Homage Health," a suite of medical services with teleconsultations. The new virtual service allowed diagnosis of common conditions, follow-up consultations for those with chronic conditions, prescription refills, and medication delivery.

Homecare operators were much less impacted by government advisories on infection control than were the other two types. This is primarily because the advisories have contained specific rules on facility setup and the movement of people — seniors, staff, visitors, and vendors — which are less relevant to homecare. Nonetheless, homecare still faced operational challenges, while its existing challenge of financing was amplified during the pandemic.

International perspective

Homecare demand in the United States and Australia

While Singapore saw an overall sustained demand for home-medical and home-nursing care throughout COVID-19, other countries such as the US and Australia had varying experiences. In harder-hit US cities, including New York and Baltimore, the high number of hospital discharges increased the use of homecare services during the COVID-19 crisis. In less-affected states, however, demand for homecare fell, as some families became unwilling to allow strangers into their homes. Homecare in the US was hit by manpower constraints, as some care workers were reluctant to work and instead claimed unemployment benefits.

In Australia, the non-medical needs of seniors make up 85 percent of homecare demand, and many families took over these roles after the outbreak of COVID-19. That led to an immediate fall of 50 percent in the use of homecare services. Demand picked up again, however, and averaged about 20 percent below pre-crisis level over the first three months.

Note: These insights were gathered from expert interviews in June 2020.

CHALLENGES AND LESSONS

A. Continuity of care
Operator-driven approach to risk assessment

Homecare providers updated their risk criteria and assessment methodologies for client visits, using the government advisories[106] as a basis and then independently adopting their own guidelines. Making the right decision before each visit is imperative, as homecare workers have minimal control over a home once they have entered the environment. They evaluated the risk profile of each visit in advance by calling clients to ask questions or by using a mobile app, if available. They could then prepare for the visit — for example, by bringing the appropriate PPE. However, there were inevitable unknowns, as staff had no way of verifying clients' disclosure of information.

Implications from PPE usage

Homecare workers experienced some challenges with PPE usage. Their efficiency was reduced by wearing PPE[107], and some staff commutes to client homes became cumbersome with PPE. Moreover, the equipment had to be changed for each PPE-mandatory visit, requiring some workers to return to headquarters to prepare for their next visit. At HCA Hospice Care, nursing staff visits were reduced from five or six patients a day to two or three. Furthermore, some patients were uncomfortable with the use of full PPE, worrying that neighbors might stare — so they preferred to go to the hospital instead.

A consideration is that operators have taken on additional training and costs to navigate the new reality, though for most operators, the cost increase will not be a significant burden moving forward. Nevertheless, despite the impact on efficiency, these operators have recognized the need for such measures to minimize the risk of transmission.

Homecare workers have been on the ground to keep foreign migrant workers safe and healthy throughout the pandemic. Photo courtesy: Jaga-Me.

Gaps in care and service coordination

The pandemic has tested the importance of coordination across the health system, and care coordination — or even integration — will become increasingly important for homecare. Hospital discharges in favor of homecare increased during the pandemic. During this time, existing difficulties in interpreting different discharge metrics were amplified. Operators noted that while the existing referral system[108] worked, data sharing was still very one-directional (from the hospital to LTC operator), and hospitals maintained their own discharge metrics and standard operating procedures. Some of the hospitals' detailed metrics may not be consistently captured in the current system, which tended to use information in the form of free text. The process for seniors transitioning from one care setting to another was far from seamless.

Another challenge was around the sporadic closures of providers. One operator explained that physiotherapy was initially suspended but then resumed, creating challenges in referring patients and in ensuring the seamless continuity of care. Furthermore, there are opportunities to cooperate more across the broader care and service continuum: By joining forces amid the crisis, operators may be able to provide a consistent quality of care for seniors in different settings. "There is a large range of social agencies and private providers that operate across the care continuum, but we need operators to be more integrated to provide a combined solution to fight the pandemic," said Gillian Tee, CEO and Co-Founder of Homage.

Renewed focus on financing required

With greater demand for homecare, there is renewed focus on financial coverage for its services. Some operators are still concerned about the adequacy of financial coverage to sustain the momentum for homecare over the long run. One private operator noted that middle-income households still spend up to 40 percent of household income on long-term care in normal times; in comparison, higher-income households only spend about 10 to 20 percent of household income.[109] The subsidy ceiling has been recently raised to $2,800 per capita monthly household income[110] for homecare, but this increase may still exclude some middle-income families. Furthermore, according to Lien Foundation's Care Where You Are (2018), Integrated Home and Day Care (IHDC) can cost $3,100, including transport and consumables, before subsidies, compared to $2,400 for the same person to receive care in VWO-run[111] nursing home. Means-testing also does not sufficiently account for households that may be asset-rich but cash-poor or multi-generational households that are still unable to cover the cost together. Even when subsidies exist for lower-income households, there is limited awareness among these households of how they can access such funding.

Another existing challenge is that homecare is currently underfunded. In the same 2018 report, it was found that norm costs (MOH's observed average cost of operating services) are lower than the real operating cost of delivering homecare, according to VWOs. One operator in the report said charity dollars still offset 29 to 41 percent of full costs for lower-income families, even after government subsidies are taken into account. Hence, donations are critical to their operations. These existing issues must be addressed if the increase in homecare utilization is to be sustained going forward.

Best practice #4

US: Visiting Nurse Service of New York, bringing COVID-19 patients home

Visiting Nurse Service of New York (VNSNY) is the largest and one of the oldest non-profit home- and community-based care providers in the US. Its staff of 13,000 serve about 44,300 patients daily and provide a wide range of homecare services, including nursing, rehabilitation therapy, hospice and palliative care, and personal care.

In April, New York accounted for almost half of all COVID-19 deaths in the country. During that peak, on April 1, VNSNY began accepting COVID-19 patients for homecare and home hospice services, so that patients — regardless of age — could recover more comfortably in familiar settings. By discharging patients with less severe symptoms, VNSNY was also able to free up hospital beds for those in more serious condition. In April and May, VNSNY supported more than 2,000 COVID-19 patients.

As VNSNY provided care to COVID-19 patients, key steps were required to ensure both patient and staff safety. First, they deployed more telehealth solutions to enable remote patient visits and spent $200,000 to procure tablets and equipment to facilitate remote monitoring. Second, they prioritized sourcing PPE early, as well as additional supplies such as disposable thermometers, stethoscopes, and blood-pressure cuffs. More recently, in late July, VNSNY launched a new contact tracing tool, "VisitContactTrace," for home- and community-based providers. This is a free, open-source code that can be applied to typical healthcare data that providers collect. It offers insights into scenarios if appropriate precautions are not in place and into the identification of potential exposure to COVID-19 through direct contact.

VNSNY was able to flexibly redirect its resources to support New York's COVID-19 response. Similarly, some homecare operators in Singapore were tapped to provide critical support, such as training swab assistants and caring for COVID-19 patients with less-severe conditions at Community Care Facilities (CCF). For other providers looking to do the same, nimbleness and agility are key to quickly deploying resources to address pressing needs.

C. Manpower
Navigating additional responsibilities

Homecare workers had additional responsibilities during the first wave of the crisis. There was an increased need to separate teams for different tasks, such as calling clients in advance for risk assessment, visiting more clients than before, and running more-frequent training such as in PPE use. In some cases, care workers ate their meals in HDB void decks between client visits, when dining in was not allowed during the circuit breaker and Phase 1.

Broadly, most operators said they had sufficient manpower to keep up with the increased demand over the past few months. One key point has been nurses. There has been increased demand for nurses throughout the healthcare sector, and nurses were deployed more in homecare too — one or two more visits per day at one operator. In other cases, operators have sought creative solutions to plug manpower gaps. One example is Homage's partnership with MOH to train and mobilize people who lost their jobs to become care responders, such as swab assistants, and potentially join the Homage team in future.[112] The key challenge will be to prepare for larger future manpower needs beyond the interim COVID-19 solutions.

COVID-19 has given momentum to homecare, highlighting its value as a supplement and, in some cases, an alternative to hospital and other institutional care. Going forward, operators should consider how to seize this momentum. This can be a combination of offering more services at home that are currently provided in acute settings and other long-term care settings and enhancing the current patient journey with steps like medication delivery. Ultimately, these moves can help lead towards easier, more-holistic care at home for seniors.

Key takeaways

Long-term care operators have navigated challenges from COVID-19 across five areas:

- Continuity of care, manpower, physical space, seniors' wellbeing, and primary caregivers.

- Nursing homes and daycare operators were hardest hit by COVID-19, while homecare providers saw an inflection point with greater utilization of its services.

- Nursing homes faced a wide range of challenges, while navigating stopgap measures for infection prevention and control. They had to adapt operationally to continue care in the light of restrictions on care workers' movements and make numerous infrastructural changes, such as communal areas, split zones, and staff living quarters. Staff also sacrificed a lot as they bear more responsibilities, and some had to relocate. The wellbeing of residents was at risk amid the changes and a no-visitation period, with increased stress, disengagement, and physical deterioration.

- Daycare's offline model came to a halt during center closure, with many services forced to migrate online with mixed success. Centers reopened in an unfamiliar environment three months later, with reduced capacity of 50 to 80 percent. Spaces were reconfigured and manpower was stretched to adhere to infection control measures. Ultimately, the challenges greatly impacted seniors and primary caregivers. The prolonged isolation led to the mental and physical deterioration of seniors, and centers are now focused on deconditioning the effects. Meanwhile, caregivers were overwhelmed at home by caring for seniors, while juggling other new responsibilities and difficulties from COVID-19.

- In the homecare segment, COVID-19 catalyzed further adoption of home medical and nursing care. Homecare also saw a promising foray into telehealth, with some operators rolling out these services for the first time during COVID-19. Operators faced challenges around the continuity of care, such as risk assessment and care coordination, as well as additional demands on manpower. The key next step is to sustain the perception shift towards homecare, by expanding service offerings and addressing structural gaps such as the financing of coverage.

4. OPPORTUNITIES AND TECH INNOVATIONS
Preparing for long-term care's new reality

In Chapter 4, we discuss key opportunities that require renewed focus in the light of COVID-19 challenges. These opportunities, if executed well, may represent a means to better future-proof the sector against COVID-19 and other future pandemics. We explore the role of technology to help operators realize these opportunities.

There are many lingering questions for the immediate future: When will the next wave of COVID-19 or the next pandemic arise? How can we keep up with needs that have changed at an unprecedented pace amid the crisis? How can we turn the inevitable "new normal" into a new reality — a pandemic-resilient future — for long-term care?

COVID-19 has brought many disruptions, but some may also have silver linings. Not only did the crisis bring concerns over the senior population to the forefront of policymaking, it has also demonstrated the importance of digital technologies and the public's willingness to use them. The next step is to identify which opportunities have been amplified by the structural and operational challenges of COVID-19. These opportunities will help fortify long-term care against the uncertainties of the future.

We have identified 12 opportunities that require a renewed focus in the light of COVID-19 challenges. Some of these themes have been raised for years — envisioned in studies such as Silver Hope, Safe but Soulless, LTC Manpower Study, and Care Where You Are, from Lien Foundation, Khoo Chee Neo Foundation, and others — yet progress has been slow. COVID-19 has now presented a revitalized case for bringing these opportunities to fruition and re-evaluating the sector's direction. In this report, we focus on six areas, referred to as "key priorities", that are immediately actionable and present strong cases for applying technology.

The opportunities will require a combination of technology and enablers to take root. We introduce technologies and example use cases, as well as enablers such as policy and financing (see Exhibit 6 for types of technology and enablers). These examples of technology are existing solutions that must be reconsidered given the exigent use cases from COVID-19, and we feature a few examples through case studies (see Appendix for a comprehensive list of tech solutions considered, which has been developed from a global tech scan of digital health and technology applicable for long-term care).

Exhibit 5: Opportunities from COVID-19 lessons for the "better new normal"

Area of challenges		Longlist of opportunities (highlighted are "key priorities" for deep dive)
Continuity of care	A	Greater focus on digital-led models, integrated closely with offline models (such as telehealth and virtual daycare)
	B	Continuation of preventive health and wellness, with patient empowerment as core focus, to fortify against future disruptions in care provision
		Mindset shift towards homecare is sustained, with next step to focus on enablers such as broadened financing coverage and more care options shifted to home, to solidify home as a preferred site of care
		More integration of care and services around the senior, with streamlined roles (such as long-term care providers, social care agencies, RHS) across different organizations to reduce duplication of services and clarify ownership
Physical spaces	C	Retrofitting of existing space to minimize risks of infection, with design and operational changes to nursing home and daycare facilities
		All new nursing homes to be purpose-built with fewer residents per bedroom (such as no more than four residents per room), decentralized communal areas (such as for meals, socialization, and care provision), and flexibility for nimble isolation; new standards required, with changes in KPIs
		All new daycare centers to be built with ample space that can be compartmentalized into smaller social areas; daycare centers in void-deck spaces to be repurposed, for example as spaces that cater to multi-generational visitors (beyond seniors) and serve as a multi-functional community space in every HDB
Manpower	D	Empowerment of the workforce for the future, with COVID-19 lessons reflected in job re-designs, reorganization of teams, upskilling, and engagement of volunteers
		More local workforce from a wider pool of candidates, through new career paths, rotations, and leadership roles
		Sustainable foreign worker recruitment, with permanent solutions to structural barriers, such as higher pay and longer-term stay options
Seniors' wellbeing	E	Greater emphasis on mental health and wellbeing to be included in care planning; focus on social connectivity
Primary caregivers	F	Support for caregivers via upskilling and wellbeing initiatives, to better prepare for navigating uncertainties

Source: Oliver Wyman analysis

DEEP DIVE: KEY PRIORITIES

A. Greater focus on digital-led models

COVID-19 severely limited in-person visits and care worker movements, giving rise to the mass adoption of telehealth solutions in Singapore and countries such as South Korea, the US, and Australia. In Singapore, the trend was supported by the temporary extension of Community Health Assist Scheme (CHAS) and MediSave for telehealth usage.

While some providers and seniors will revert to in-person care, most providers expect telehealth to remain as permanent options, given the operational upsides (such as reduced waiting for remaining in-person visits, eliminating commuting time for patients, and increasing capacity). Telehealth can extend to more use cases, such as home or remote monitoring, and to more-holistic platforms with other offerings, such as chatbots and information for preventive health and post-care management. For example, MOH Office for Healthcare Transformation has piloted home blood pressure monitoring for hypertension, together with an automated bot that provides reminders and tips. Beyond the greater number of use cases, the next frontier is to close the loop in the system. This entails coaching to encourage continued adherence, whether it is to lifestyle or medication, rather than one-off consultations.

In daycare, virtual activities must find a way to co-exist with in-person delivery: "A combination of online and in-center care must continue even after daycare centers are reopened. Some seniors are still worried about COVID-19 and may want to continue staying at home; others are not able to attend as frequently as before due to the impact of safe distancing on center capacity. Online channels are necessary to help everyone feel more included in center activities," said Chan Su Yee, CEO of NTUC Health.

There are three areas of focus. First, there must be a comprehensive onboarding process for seniors and families before they use any tech solution at home. Successful onboarding ensures that seniors and families can be assessed and coached to instill confidence and that the right tools can be recommended to them. Second, operators can — in the interim — repurpose physical centers to serve other needs (see Opportunity C: Retrofitting of existing space). One opportunity is to use the centers as spaces for in-person digital training for seniors. Finally, seniors need a better blended program of offline and virtual services, so that they can be persuaded that this is the way forward. This entails a wider range of activities, as well as partnerships to help seniors feel engaged in their community, such as with local community partners including schools, corporations, and museums.

The initial stage of integration between digital and offline care will be carried out by care workers and other staff, so the workforce will need new skills to enable them to act as a bridge. Otherwise, these solutions will not reach their full potential, since issues such as connectivity and scheduling will take up the time of doctors, nurses, and supporting staff (see Opportunity D: Empowerment of the workforce).

For telehealth, tech-nascent players should focus on familiarizing care staff, patients, and family caregivers with teleconsultation via phone and video. More advanced players that seek to permanently adopt telehealth should view this more holistically — that is, set up cloud-based computing for cost and operational flexibility; pilot sensor-based technology (see Tech deep dive #1) to support remote monitoring (start with care staff, then expand to patients); and connect

the analytics back-end with the operator's care management platform. This opportunity will require enablers, including the following: financing, such as temporary measures from COVID-19 (like CHAS and MediSave extension and videoconferencing infrastructure for operators), as well as existing schemes such as the Assistive Technology Fund; training and education for doctors and nurses to deliver telehealth more efficiently without compromising quality; and process redesign to standardize the patient assessment process so it can be easily carried out with telehealth solutions.

For virtual daycare, operators must explore online platforms beyond standard videoconferencing for a diverse range of activities and social connectivity (see Tech deep dive #4). This opportunity will need enablers, including: Training seniors and caregivers to adopt new platforms and tools; process redesign to incorporate these activities into clients' activity planning; and sufficient IT infrastructure in seniors' homes (such as Internet coverage and mobile devices) to ensure the optimization of services.

Tech case study #1

Remote monitoring solutions to enable aging-in-place and alleviate manpower strain in nursing homes

Examples of remote monitoring solutions include ambient sensors, AI-enabled video surveillance, and wearables. They can be applied to the home setting, to monitor activity levels and unusual movements of seniors at home without caregiver support, and to track vital signs such as body temperature. These use cases are relevant in nursing homes as well. Data privacy, however, would be a concern, as collected data has the potential for misuse. Data management frameworks and robust data protection systems hence need to be in place to minimize this risk.

Singapore-based Lifecare's non-intrusive motion sensors in seniors' homes, which was piloted few years ago in Singapore's Yuhua estate, helped care responders monitor the activity levels of live-alone seniors during the circuit breaker. Care responders could confirm that there was a healthy amount of movement within a home and reach out to seniors

if any anomalies were detected. Wearables such as Singapore's PouchPASS can also be utilized to track temperature changes through an app and facilitate the contact tracing of seniors — many operators in the study expressed interests in solutions like this for continued COVID-19 use cases. Outside COVID-19, these solutions provide additional safety to enable seniors to age-in-place more independently and detect any potential onset of medical conditions by collecting vital sign data for back-end analytics.

Malaysia-based SmartPeep is an AI-enabled enhancement software for existing closed circuit television (CCTV) systems that has been trialed at nursing homes including Peacehaven. Additional features such as route tracing and fall detection can be added to remotely monitor seniors in split zones, and facial recognition technology can help keep out non-designated visitors. Additional responsibilities created by infection control measures can be alleviated by centrally ensuring residents' and visitors' adherence to safe distancing measures. However, significant capital investment will need to be considered for homes to set up a centralized remote monitoring unit.

B. Continuation of preventive health and wellness

Nearly all "non-essential" care was paused during the initial crisis, including nutrition monitoring, health screening, counselling, and rehabilitation. However, following the first wave of the COVID-19 crisis, there is now a renewed focus on preventive health and wellness — for infectious diseases, but also for broader chronic conditions. Close collaboration throughout the health and social system will be needed to create touchpoints for preventive health beyond current channels.

Among the different channels, patient empowerment will increasingly become important as a first line of defense for preventive health, in part because of expectations that care provision will be disrupted again. This requires focus on health education for seniors, who have become more health literate during COVID-19: The fundamentals need to be emphasized again, such as pneumonia vaccination, healthy eating, and physical exercise. There could also be an opportunity for greater use of existing solutions such as home screening, which have previously seen lukewarm uptake but could be reintroduced.

For preventive health, similar technology to that identified for Opportunity A: Digital-led models can be considered. Examples could include sensor-based technology (consumer-facing examples like wearables), remote medication adherence (see Tech deep dive #2), and online platforms geared towards preventive health and wellness (using video-based platforms for overall service delivery, content creation platforms like Physiotools, and off-the-shelf wellness apps). This opportunity will need enablers, including: Financing, to make preventive health a larger part of insurance, and funding to roll out more wellness solutions; health promotion, to renew focus on senior outreach on wellness topics, including people who are at-risk or already ill; and process re design to embed preventive health as part of personalized care planning at various touchpoints.

Tech case study #2

Medication adherence solutions to empower patients in preventive care

Automated pill sorters and dispensers and smart pillboxes can simplify the medication process and help seniors better adhere to medication schedules. These tools can be used at home, to remind seniors to take pills and allow family members to monitor adherence, and in nursing homes, to sort and dispense accurate dosages at set times. Seniors are thus empowered to manage their chronic conditions with medication, while allowing some form of remote supervision by family members or caregivers. However, there is limited enforcement for seniors who refuse to take their pills.

In Singapore, Pillpresso is utilized by some long-term care organizations such as Yong-En Care Center and TOUCH Home Care. It minimizes the need to handle pills manually by automatically sorting medication, while also dispensing up to 30 days' worth of medication. The solution is accompanied by a mobile application that facilitates remote adjustment of medication schedules and reminders and the tracking of pill consumption and that can be used without Wi-fi. More simple and affordable pillbox solutions, such as LiveFine and GMS, are available too. They require pills to be sorted manually but also offer reminders and automatically dispense medication. Going forward, medication adherence solutions could be distributed at the point of dispensation to encourage uptake.

C. Retrofitting of existing space

Before longer-term changes, care facilities need to be retrofitted to embed infection control measures. This consists of changes to existing layouts, such as the continued implementation of split zones in nursing homes. The living spaces of nursing home staff also require urgent upgrades. This will help reduce cross-infection risks and also enhance the quality of living for foreign talent in residential-based care. Furthermore, operators must leverage available technologies to automate infection control practices and to alleviate their shortage of manpower. Practical solutions, such as automated guided vehicles and remote monitoring sensors, could become standard in all homes. New homes would be smart buildings — with automated doors, sensors linked to a centralized monitoring room and other features — and would be developed with these technologies at their core. Staff will then be able to focus more on delivering personalized, light-touch care.

Another consideration is to create more-engaging spaces in daycare centers. These would go beyond a large, multi-purpose hall with limited choice of activities. Rather, partitions could create self-contained areas with a diverse range of activities in each area, and staff could continue to engage smaller groups of clients. Small-space centers could be repurposed now as a headquarters for virtual activities, and over the longer-term they could be repurposed (see Opportunity A: Digital-led models).

Examples of tech solutions for nursing homes include robot-driven technologies (see Tech deep dive #3) for various tasks, such as disinfection and meal delivery; and AI-based solutions, such as software for existing CCTV systems, for facial recognition, and for temperature screening (see Tech deep dive #1: SmartPeep). For daycare, solutions could include wearables for contactless measurement of vital signs (see Tech deep dive #1: PouchPASS) and online activity platforms to provide a wider range of activities in self-contained zones or to facilitate virtual activities across zones (see Tech deep dive #4: SilverActivities). This opportunity will need enablers, including: Funding support for technology deployment and other facility modifications; and policy changes to update facility and operational standards for nursing homes and daycare, such as standards for communal living and disinfection requirements.

Tech case study #3

Assistive robots to free up staff capacity and disinfect facilities

Assistive robots — including Automated Guided Vehicles (AGVs) and disinfection robots — can automate time-consuming tasks. They can deliver meals, transport supplies across split zones in nursing homes, and clean and disinfect both nursing homes and daycare centers. These solutions can help free up staff capacity to focus primarily on senior needs, while maintaining high service and infection-control standards in the facilities. While significant investments may be required, deployment of these solutions could be done in partnership with relevant organizations. Furthermore, the upfront investments could lead to savings in operational expenses in the longer term.

Peacehaven was the first nursing home in Singapore to introduce remote-controlled AGVs. The vehicles distributed meals to residents four times a day and transported logistical supplies. They helped the organization save about SG$12,000 per month on salaries alone, as it could reduce outsourced kitchen labor. Nanyang Technological University's (NTU) Robotics Research Center in Singapore also developed the eXtreme Disinfection roBOT (XDBOT) during COVID-19 — a semi-autonomous, remote-controlled robot with an electrostatically-charged nozzle to disinfect large surfaces. As of April, the solution was being piloted at the university, and there were plans to use it to support cleaning in hospitals and public spaces. Local operators can build partnerships with organizations such as NTU's Robotics Research Center to pilot the use of robot solutions to automate disinfection and other COVID-19-related responsibilities.

D. Empowerment of the workforce

Redesign: Disruptions throughout the pandemic have been addressed by redesigning certain roles. One example is daycare staff being repositioned as "care ambassadors" during center closures and frequently engaging with seniors and their caregivers through messaging and phone calls. Another is an existing role at Allium Care Suite — a dedicated "care manager" assigned to about eight residents. This allowed the home to prioritize the overall resident experience during the crisis, paying more attention to seniors' individual requests and shifting around manpower to meet these needs. For homecare, there is an untapped opportunity to bring different profiles of workers into the segment, such as non-care workers who were trained during COVID-19, to further expand homecare going forward.

Reorganization: Nursing homes should reconsider how to organize the shared services model, as well as whether to hire in-house allied health professionals. Strategic partnerships can be formed between nursing homes and their respective RHS to ensure timely manpower support when needed. Another example is the cross-deployment of staff, with homecare staff working with daycare clients during center closure and daycare staff stepping into fill nursing home manpower gaps (during center closure). This was a common interim solution for operators that provide more than one long-term care service, and while these solutions must be carefully managed during times of infectious diseases (to manage cross-infection risks), they illuminated the value of having one integrated operator run multiple service offerings. Furthermore, workers from outside the sector also into long-term care to provide support, such as Singapore Airlines cabin crew joining nursing homes as care ambassadors, providing a good starting point for exploring similar recruitment from outside of long-term care.

Upskilling: MOH and AIC recognized that a priority for the future will be to have providers be able to step up to new challenges — and they saw that this will require upskilling. Some suggested areas, based on operator interviews, include: Recreation and activity design; remote client management and communications (how to effectively engage clients and their caregivers using online tools); a customer-first focus (such as a concierge model with a hospitality mindset); operational efficiencies (how to streamline existing processes); and design thinking (how to apply a structured, creative process to better understand end users and their environments). Continued upskilling in tech and digital skills will remain crucial as well — for example, training doctors and nurses in telehealth operations. As AIC noted, many providers have actively shared information and best practices with one another throughout the crisis, and this can be further leveraged to share training curriculum across the sector, as applicable.

Some operators have already begun new training over the past few months. For example, NTUC Health began teaching staff to work more with lean methodologies to optimize their existing processes. The course focuses on a basic knowledge of Lean 6 Sigma (method of collaborative and productive teamwork by improving existing processes), covering tools, such as Pareto Chart and Fish Bone diagram, to help teams identify the root causes of problems and prioritize areas for improvement within existing processes. Another example is Asian Women's Welfare Association (AWWA), which is exploring a wide range of topics related to online platforms, from broader communication skills to better understand seniors' needs, to specialized intervention program design. Allium Care Suite introduced hospitality training prior to COVID-19 (how better to take care of clients' non-clinical needs) and saw the benefits come to fruition during nursing home lockdown. Volunteer initiatives will require more-creative training as well, to help staff stay engaged on in-person visits during restrictions and to help them upskill in virtual befriending services so that they can continue to provide social and psycho-emotional support through different channels.

We have seen global examples of manpower innovations. In the US, Iora Health, for example, quickly switched to lean, multidisciplinary teams during the COVID-19 crisis (see Best practice #5). To encourage volunteering, Taiwan long ago introduced a system of "time dollars," under which hours worked as a volunteer can be reclaimed in later years in the form of other services.[113] This is one of many volunteer-focused schemes available in Taiwan (see Case study #2). Singapore has seen emerging player in the "time dollars" space, such as Hourvillage, though there is no wide-scale uptake to date.

Operators should consider tech solutions that can free up staff resources to focus on new roles and upskilling. Examples include sensor-based technology for remote monitoring (see Tech deep dive #1), the Internet of Things (IoT, such as new administrative systems), and robotics (disinfection, meal delivery, and other tasks — see Tech deep dive #3). This opportunity will need enablers, including the following: Redesigned training and education for upskilling (rolled out at operator level or across sectors) and process redesigns, such as recruitment processes reconfigured for new roles and skills.

Best practice #5

US: Iora Health delivers virtual care with both tech solutions and workforce reorganization

Iora Health is a US-based primary care network with about 50 locations. Iora Health has a population-based payment model, rather than a pay-per-visit setup, and primarily serves those eligible for Medicare.[114] This means that the organization mostly serves an older, frailer population, who required continued care throughout the COVID-19 lockdown, especially because of chronic conditions and acute needs.

In March, within a week of the COVID-19 outbreak in the US, Iora Health quickly pivoted to non-visit-based care, fulfilling 92 percent of patient encounters through email, text, phone, and video. It also had providers on call 24/7 for after-hours inquiries. When it realized that virtual care would continue, it focused more on video engagement and started to deliver pre-configured tablets to patients. It made other adjustments, such as shifting services to Saturday, so that seniors could have caregiving support at home during the virtual visits.

Iora Health recognized that technology alone could not provide holistic virtual care, and that it needed to adjust its teams and processes — a key lesson for any organization making a similar transition to virtual care. As part of the COVID-19 response, it restructured teams around smaller, fixed groups of patients, rather than overseeing bigger groups in physical practices. It now operates with smaller teams of a doctor or a nurse plus two health coaches, centered around fixed population groupings. These organizational shifts will serve as a key foundation, as the network plans to continue online visits and to maintain only about 20 to 30 percent of in-person visits.

Some operators in Singapore have already started exploring multi-disciplinary teams. The next step is to strategically segment their clientele based on their health status and needs, after which this multifaceted skill set can be deployed. However, good virtual care delivery will not happen just through team changes or tech solutions. They must be carried out in parallel to unlock a better future of digital-led models.

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E. Greater emphasis on mental health and wellbeing

Prolonged social isolation has led to a rise in loneliness, boredom, disengagement, and mental deterioration among seniors. Given the potential for recurring shutdowns, assessment and solutions for mental health and wellbeing need to be included in overall care planning. There should be regular checkpoints for assessment, but also personalized prescribing of physical and social activities and consistent measurement of outcomes (see Opportunity B: Preventive health, for potential linkage). COVID-19 may be a trigger to get rid of stigmas traditionally associated with mental health problems, as there has been widespread recognition of the mental strain and impact of this crisis on all segments of the population. Ultimately, a greater focus on mental health and wellbeing will re-center the dialogue to balance seniors' quality of life with safety measures, for COVID-19 and for future pandemics and other disruptions.

Examples of tech solutions include both software-based solutions such as platforms for social connectivity (see Tech deep dive #4) and mental health assessment (based on digital phenotyping, such mindline.sg[115]) and hardware-based solutions such as virtual-reality programs (using VR headsets and VR-based interventions) for rehabilitation and entertainment in nursing homes and daycare. This opportunity will need enablers, including the following: Expanding financing to provide wider access to mental health and wellness services; increased health promotion via in-community campaigns and programs to further de-stigmatize mental health issues; renewed training and education in mental health for all stakeholders (seniors, staff, caregivers); and a review of existing care planning pathways to embed mental wellness assessments and solutions.

Tech case study #4

Social connectivity solutions to meaningfully engage seniors

Social connectivity solutions such as online activity platforms and tablets designed for seniors can be deployed to help seniors maintain connections with friends and family and to keep them entertained when isolated at home or in facilities. These solutions facilitate online group activities and can also offer individualized activities for seniors to do alone. Together, they offer a suite of tools to facilitate online connection in addition to offline channels.

In Singapore, SilverActivities has been in active use among residents at Sree Narayana over the past six months. The platform curates videos and activities including guessing games, drawing, and sorting and matching activities — to keep seniors engaged and improve their coordination and problem-solving ability.

Operators in Australia have also rolled out similar solutions to reduce social isolation during COVID-19 lockdowns. ECH, an integrated elderly care operator, introduced Mint Social to their clients free of charge. This social media platform, designed for seniors, has simple, personalized interfaces that allow seniors to share what they are doing with family and friends. Another homecare provider, Feros Care, developed the Virtual Social Center, a web-based platform that offers a diverse range of activities such as book clubs, guided tours, and exercise programs. One Feros Care client said the technology had helped her cope with loneliness and given her a reason to get out of bed during this period.

Best practice #6

United Kingdom: Wellbeing Teams practice holistic care, self-management, and tech-enabled experience

Wellbeing Teams deliver person-centric, relationship-based care to seniors and adults with disabilities, delivering traditional care services, such as washing and medication, and community connections. The teams — either partnering with local authorities or being directly commissioned by patients — co-produce holistic care plans with their clients, including detailed profiles on what matters in the clients' lives and what good support looks like to them. The teams also regularly check what is working well and not well for the client, so that the care plans can be adjusted. During COVID-19, the teams leveraged these holistic care plans to tailor activities and keep clients meaningfully engaged amid the lockdown.

The organization has self-managing, neighborhood-based teams, modeled after the Netherlands' Buurtzorg model, which consists of a small team of nurses in a designated neighborhood. Wellbeing Teams operate without a manager; instead, all team members take on leadership roles and decision-making responsibilities. COVID-19 has re-emphasized the importance of distributing decision-making power among teams and their members, as staff needed to make quick decisions on their own as the pandemic unfolded.

COVID-19 amplified the Wellbeing Teams' focus on technology as a key enabler for both users and staff. Helen Sanderson, the Founder, believes there are plenty of use cases from existing technology. For example, wearables are used to detect patterns such as sleeping and walking; VR is used for pain relief; and off-the-shelf apps are used for mindfulness practice. In addition to existing technology, during COVID-19, the organization loaned tablets so that clients could access online community events through Facebook. Their care platform application has enabled continued care throughout COVID-19, as well as communications between clients and caregivers. When a client had a skin tag (a non-cancerous growth on the skin), staff could upload a photo to the care platform app during a home visit and notify the client's daughter about next steps.

The organization firmly believes that tech solutions must be centered around what a senior wants to get out of them and that COVID-19 re-emphasized this point. Hence, staff members will continue to trial different tech devices and senior-oriented apps to ensure they fully understand these tools before recommending them to their clients. They believe that these ways of working with people and technology are applicable beyond homecare, for example to hospitals and to mental health teams.

As Singapore's operators transition to a digital-led model, senior-centricity should remain a fundamental tenet to guide not only the deployment of technologies, but also the reorganization of the workforce.

F. Support for caregivers

Caregivers play a fundamental role in long-term care, and they have faced unprecedented stress while navigating the various phases of the COVID-19 crisis. Since 2019, there have been increased sector-wide efforts to support caregivers, primarily via the Caregiver Support Action Plan.[116] In combination with ongoing policy directives, operators must customize and deliver support to caregivers from the ground-up, and technology is a key channel. One example is the forming of digital communities of caregivers, who collaborate with different community partners to share best practices. They also collaborate on training, where they pool resources

for caregiving support and work towards the online migration of caregiving training. They focus training on the mental wellbeing of caregivers, as well as how caregivers can adopt new skills for the new reality, such as digital communications with seniors and recreational activities at home. These efforts will ultimately strengthen the support system for caregivers and prevent their burnout, especially during these challenging times.

Examples of tech solutions include leveraging platforms to deliver virtual caregiver training (a US-based example is CareAcademy, with tailored, in-app videos) and extending existing tools such as videoconferencing and social media further into the caregiver community. This opportunity will need enablers, including: Policy review for ongoing caregiver initiatives; financing hardship allowances for relevant caregivers (such as those who lost their jobs); and process redesign so that daycare and homecare operators engage caregivers better and more regularly, during both care planning and ongoing interactions.

Exhibit 6: Summary — Types of technology and enablers

Technology	Examples of use cases
Artificial Intelligence (AI) enabled	Software for facial recognition and temperature screening
Sensor-based	Remote monitoring**: Environmental sensors, wearables, camera analytics software; smart home (smart pill boxes**)
Virtual/augmented reality	VR headsets; VR-based rehabilitation and entertainment
Internet of Things	Care management system; cloud-based computing and data analytics platform (for remote monitoring)
Robotics-powered	Assistive robots** (disinfection, automated guided vehicles)
Platforms	Social connectivity solutions**, preventive health and wellness programs

Enablers	Examples of enablers
Policy/regulatory framework	Policy changes for any long-term care facility requirements/standards
Financing	Continued telehealth funding
Health promotion	In-community campaigns and programs (such as to de-stigmatize mental health issues)
Training and education	New training curriculum for workforce; digital empowerment of seniors
Process/operations re-design	New team setups; staff schedules; operator protocols
IT infrastructure	Widespread Internet coverage and access; mobile devices

** Examples featured in as tech deep dives.
Note: See Appendix for a detailed list of category definitions and longlist of solutions.

Source: Oliver Wyman analysis

Key takeaways

- The pandemic has created acute awareness of structural and operational challenges in long-term care and highlighted key opportunities to tackle them.

- Many of these were conceptualized or piloted before COVID-19 but can now be further prioritized and accelerated to address emerging needs from COVID-19 and to future-proof the sector against infectious diseases. Priorities for the next one or two years to address this new reality include:

  – Greater focus on digital-led models, with the pandemic disrupting in-person visits and care worker movements — to drive further integration between digital and offline care.

  – Continuation of preventive health and wellness, by creating more touchpoints and with patient empowerment as a core focus — to fortify against potential disruptions in care provision.

  – Retrofitting of existing spaces to minimize risks of infection, with design changes and tech adoption — to uphold key infection control measures until longer-term solutions can be implemented.

  – Empowerment of the workforce with COVID-19 lessons reflected across job re-designs, reorganization of teams, upskilling, and engagement of volunteers — to deliver care and services both offline and online, efficiently and effectively.

  – Greater emphasis on mental health and wellbeing in care planning and greater focus on social connectivity — to balance seniors' wellbeing and quality of life with safety measures.

  – Support for caregivers via upskilling and wellbeing initiatives using digital platforms — to strengthen the support system for caregivers and prevent burnout.

- COVID-19 not only brought the senior population to the forefront of policymaking, but also demonstrated the importance of digital and technologies and the public's willingness to use them. Now there is an opportunity to re-evaluate tech solutions, such as remote monitoring and assistive robots, and how they can bring these opportunities to fruition.

5. LONG-TERM CARE 3.0
Vision and guiding principles

In Chapter 5, we calibrate where the sector has been (LTC 1.0), where it is today (LTC 2.0), and where it is headed (LTC 3.0). COVID-19 has accelerated the need for the sector to move from 2.0 to 3.0, and we envision the future of long-term care — LTC 3.0 — in Singapore and explore how opportunities from COVID-19 amplify this vision. We present key principles from transformations in other industries to guide and inspire the LTC sector's journey towards a more integrated, tech-enabled, and omni-channel future.

Long-term care has been continuously evolving over the past decade, with new solutions and services emerging in response to growing demand and to seniors' changing needs and preferences. However, the pandemic has accelerated the sector's need to further evolve and has highlighted two key insights. Chapter 4 explored the first insight: Confronted by the blunt reality of the pandemic, technology may be the key to becoming more pandemic-resilient. The second insight is that opportunities from COVID-19 will set the groundwork to amplify the overall transformation of the sector. Singapore's journey shows how this transformation can continue.

From LTC 1.0 to 2.0

Just a decade ago, Singapore's formal long-term care sector was characterized by two features — dormitory-style nursing homes and care that was largely medicalized. This first generation, LTC 1.0, prioritized safety over dignity: Practices such as physical restraint were not uncommon and perhaps overused in some care settings — one study found that around one in four nursing home residents were on physical restraints.[117] Seniors found themselves in custodial care for many years[118], and there was a binary division between seniors who were formally supported and those that were not, with neither receiving ideal care: Residents in facilities were confined until their end of lives, while those in the community had to make do with nonexistent or limited social support service.

Singapore has since sought a more balanced middle ground between these extremes. Over the past five years, the government has embraced an aging-in-place philosophy, signaling a new generation of long-term care — LTC 2.0. AIC led many of these reforms, such as Integrated Home and Daycare, which was launched in 2016.[119] Other cross-sector initiatives were also launched, such as Kampung Admiralty, a project by the Housing and Development Board, in partnership with multiple agencies, including MOH, the Yishun Health Campus, National Environment Agency, and the Land Transport Authority. It integrates HDB housing for the elderly with various health, social, community, and retail offerings. Innovative newcomers have entered the sector as well. Nursing homes have also seen a gradual shift from open wards — sleeping up to 30 people — to newer, smaller bed "clusters," with four to eight residents in a room. Homecare tech platforms such as Jaga-Me and Homage provide care for seniors in their own homes, while purpose-built homes such as Allium Care Suite[120] reject the dormitory-style designs of the past in favor of homelike spaces with more privacy. They are harbingers of LTC 3.0.

LTC 3.0 on the horizon

LTC 3.0 is a new generation of care with an emphasis on technology, which allows seniors to move seamlessly between various care and service settings, whether online or offline, and to receive lighter-touch care as needed. COVID-19 brought these elements to the forefront, as it led the sector to prioritize:

- **Better access —** making both medical and social care more widely available to seniors through a variety of channels. In the future, this could consist of centralized, integrated hubs with primary care, daycare, homecare, and social care in communities, while these providers are coordinated to streamline the services. These services must be available both online and offline to minimize any future disruptions. Seeking care should be seamless and intuitive:
  No one should feel lost amid the options and next steps.

- **Better quality of life —** ensuring that while safety is assured, seniors also receive care and services that meet their diverse needs and evolving preferences. In the future, this could mean more assisted-living facilities that provide required services, while prioritizing seniors' autonomy and preferences. Rather than 24/7 care focusing on safety and removing individualization, an emphasis on quality of life will minimize the need for cookie-cutter treatment.

Exhibit 7: Evolution of Singapore's long-term care sector

	Today	Tomorrow
LTC 1.0 (pre-2015)	**LTC 2.0 (2015-2023)**	**LTC 3.0 (after 2023)**
Largely institutionalized	Aging-in-place	Integrated
Medicalized and standardized	Holistic and personalized	Care as needed
Primarily offline	Multichannel	Omnichannel
Tech-nascent	Tech growth	Tech-enabled

Source: Oliver Wyman analysis

The shift to LTC 3.0 — the integrated, tech-enabled model of the future — is imperative, and COVID-19 has made the case for change all the more urgent. We paint a picture of what the future senior journey could look like under LTC 3.0 and highlight where the opportunities and tech solutions (discussed in Chapter 4) fit into this overall transformation (see Exhibit 8).

As the long-term care sector thinks about the road to LTC 3.0, it can draw inspiration from other industries that have also fundamentally transformed their value propositions and operating models with technology. These shifts have not only fortified the industries against the COVID-19 pandemic and other major disruptions, but also share the mission of meeting the underserved needs of different populations. Their journeys suggest guiding principles for the long-term care sector.

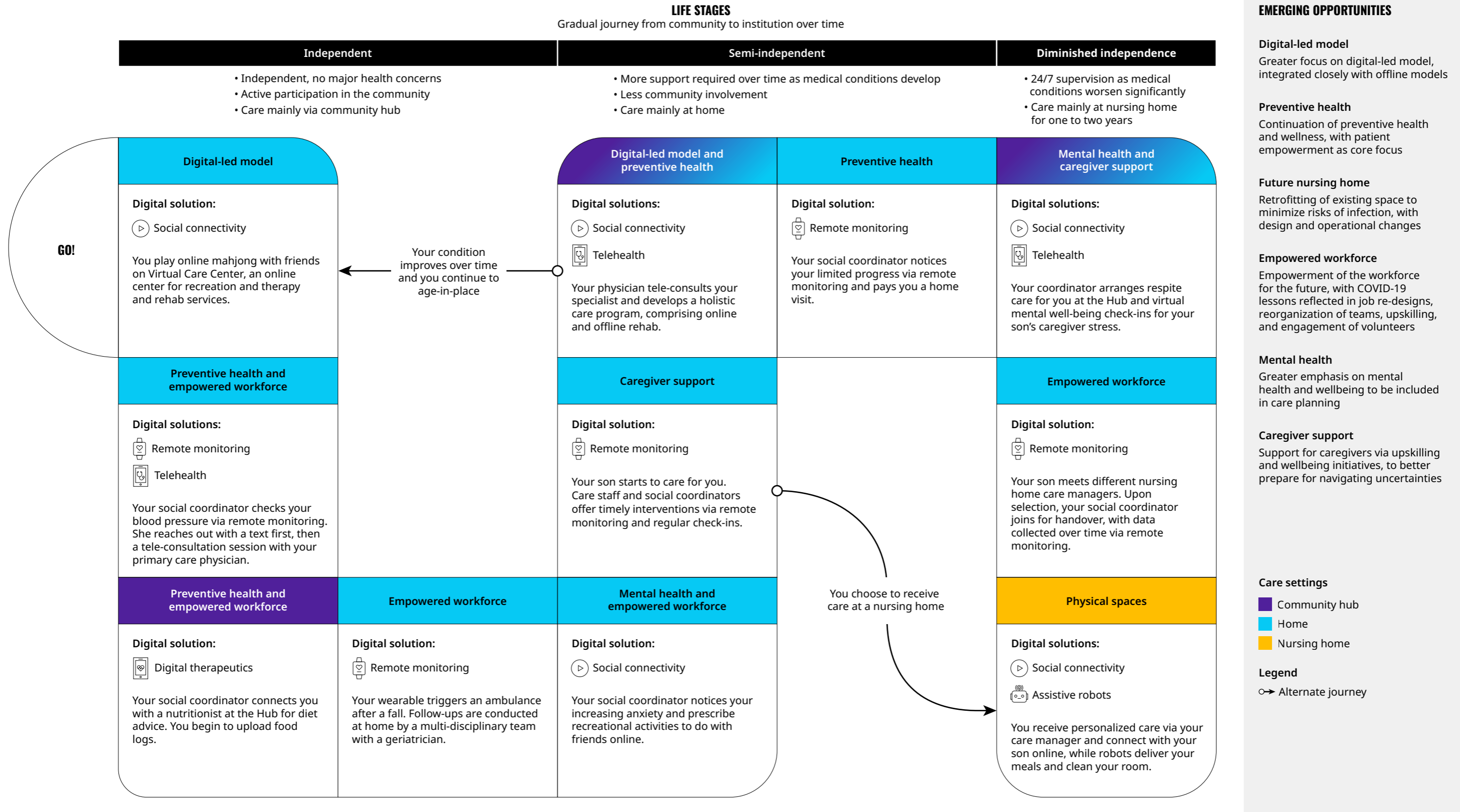## 1. Challenge the status quo

To drive transformation, sector incumbents need to take a step back and redraw their boxes — that is, challenge their business and operational models in an open-minded, unconstrained manner. Several financial services industries have embraced this approach. The insurance industry, for instance, has expanded its value proposition from healthcare to health by shifting its focus from sick care to preventive care. Digital technology has underpinned this transformation, with examples such as Prudential's Pulse, an AI-powered mobile app launched during COVID-19. Similarly, digital-only banks have been springing up around the world to serve underbanked populations with a faster, lower-cost channel — fundamentally challenging the brick-and-mortar branches and ATMs that for decades were the hallmark of the banking industry.

COVID-19 has challenged many fundamental aspects of long-term care, and these require bold rethinking. In the ideal future state, the vast majority of seniors would live out their last years at home and only enlist professional care when needed. This means the sector must become less fragmented and less "all-or-none." It should provide opportunity for both one-stop shops and scope for smaller interactions for care needs — both online and offline — in every neighborhood. Seniors would benefit from a community hub where they can go for a range of holistic solutions to their needs. For those who still require residential-based support, that must be an empowering choice rather than a default with a point of no return. Nursing homes must give equal weight to non-clinical needs and medical care and become truly habilitative, with more options such as assisted-living facilities and nursing home staff trained in a "care concierge" model, in which staff are clinically qualified but are also trained in hospitality-focused skills — this means the staff can oversee a small group of seniors and provide more empathetic and dignified support. To drive this vision, the sector must redefine KPIs (such as including metrics focused on happiness of residents) and modify job descriptions and processes to drive toward these reoriented aims.

As the long-term care sector thinks about the road to LTC 3.0, it can draw inspiration from other industries that have also fundamentally transformed their value propositions and operating models with technology. These shifts have not only fortified the industries against the COVID-19 pandemic and other major disruptions, but also share the mission of meeting the underserved needs of different populations. Their journeys suggest guiding principles for the long-term care sector.

Exhibit 8: The senior journey in LTC 3.0

LIFE STAGES
Gradual journey from community to institution over time

Independent	Semi-independent	Diminished independence
• Independent, no major health concerns • Active participation in the community • Care mainly via community hub	• More support required over time as medical conditions develop • Less community involvement • Care mainly at home	• 24/7 supervision as medical conditions worsen significantly • Care mainly at nursing home for one to two years

GO!

Your condition improves over time and you continue to age-in-place

Digital-led model

Digital solution:

▷ Social connectivity

You play online mahjong with friends on Virtual Care Center, an online center for recreation and therapy and rehab services.

Preventive health and empowered workforce

Digital solutions:

☐ Remote monitoring

☐ Telehealth

Your social coordinator checks your blood pressure via remote monitoring. She reaches out with a text first, then a tele-consultation session with your primary care physician.

Preventive health and empowered workforce

Digital solution:

☐ Digital therapeutics

Your social coordinator connects you with a nutritionist at the Hub for diet advice. You begin to upload food logs.

Empowered workforce

Digital solution:

☐ Remote monitoring

Your wearable triggers an ambulance after a fall. Follow-ups are conducted at home by a multi-disciplinary team with a geriatrician.

Digital-led model and preventive health

Digital solutions:

▷ Social connectivity

☐ Telehealth

Your physician tele-consults your specialist and develops a holistic care program, comprising online and offline rehab.

Caregiver support

Digital solution:

☐ Remote monitoring

Your son starts to care for you. Care staff and social coordinators offer timely interventions via remote monitoring and regular check-ins.

Mental health and empowered workforce

Digital solution:

▷ Social connectivity

Your social coordinator notices your increasing anxiety and prescribe recreational activities to do with friends online.

Preventive health

Digital solution:

☐ Remote monitoring

Your social coordinator notices your limited progress via remote monitoring and pays you a home visit.

You choose to receive care at a nursing home

Mental health and caregiver support

Digital solutions:

▷ Social connectivity

☐ Telehealth

Your coordinator arranges respite care for you at the Hub and virtual mental well-being check-ins for your son's caregiver stress.

Empowered workforce

Digital solution:

☐ Remote monitoring

Your son meets different nursing home care managers. Upon selection, your social coordinator joins for handover, with data collected over time via remote monitoring.

Physical spaces

Digital solutions:

▷ Social connectivity

🤖 Assistive robots

You receive personalized care via your care manager and connect with your son online, while robots deliver your meals and clean your room.

EMERGING OPPORTUNITIES

Digital-led model
Greater focus on digital-led model, integrated closely with offline models

Preventive health
Continuation of preventive health and wellness, with patient empowerment as core focus

Future nursing home
Retrofitting of existing space to minimize risks of infection, with design and operational changes

Empowered workforce
Empowerment of the workforce for the future, with COVID-19 lessons reflected in job re-designs, reorganization of teams, upskilling, and engagement of volunteers

Mental health
Greater emphasis on mental health and wellbeing to be included in care planning

Caregiver support
Support for caregivers via upskilling and wellbeing initiatives, to better prepare for navigating uncertainties

Care settings
■ Community hub
■ Home
■ Nursing home

Legend
○→ Alternate journey

Source: Oliver Wyman analysis

2. Seek rapid, incremental innovation

Change does not require a big-bang, overnight transformation. The healthcare industry was laying the foundations for telemedicine over the years before COVID-19, positioning itself well to augment the use of virtual care during the pandemic. Other industries, such as consumer-to-consumer retail, have started from a baseline and made incremental, yet cumulatively powerful actions over time: From offline classified ads, to online platforms such as Craigslist, to tech-enabled platforms like Carousell that have added features such as premium listings, seller payments, and payment escrow.

Throughout COVID-19, care providers have begun to put this approach to the test, for example homecare providers introducing new services. Going forward, it will remain important to make rapid, incremental changes. Providers should plan a roadmap of key changes, and test and iterate those changes accordingly. For example, centers can trial virtual tools or modules iteratively and measure outcomes before scaling to bigger, more-permanent programs. This will require an operating model around fast pilots and decision making, underpinned by diligence and drive for innovation and improvement.

3. View seniors as consumers, not patients

Long-term care has focused on designing care to be "person-centric," yet the progress has been slow. The process can be accelerated by a broader view beyond the clinical nature of the seniors in their care — positioned as consumers rather than just patients. Leading hospitality operators have made devotion to their customer experience one of their key tenets, pioneered by Ritz-Carlton among others. Such companies have redesigned the end-to-end journey by dissecting and then addressing customers' preferences at every stage, including the booking process, check-out, and every interaction in between. They have also focused on embedding digital solutions at each touchpoint in a way that still emphasizes the consumer's experience, rather than "tech for tech's sake," and embedding the human interaction with as a key opportunity to cement the customer relationship and loyalty.

Such a mentality can help the LTC sector become more aligned with seniors' preferences as consumers. For instance, if certain virtual sessions have seen low uptake, staff could observe activities at homes of a sample of seniors directly and redesign digital programs and tech solutions mapped to existing activities. They will then be able to understand more deeply what the frictions are, rather than relying only on primary caregivers to decide what to provide to their parents or what is convenient to them.

4. Build partnerships

Not everything has to be built from scratch — instead, great synergies can come from leveraging partnerships and each player's strengths. Just this year, COVID-19 has catalyzed creative partnerships across the world. In May, French insurer AXA and hospitality leader Accor launched a global partnership to provide medical support to guests across more than 5,000 Accor hotels, including free access to medical teleconsultations and a hotel-to-medical referral system. In June, Oversea-Chinese Banking Corporation (OCBC) launched a proprietary healthcare app to provide its customers with telehealth services through a network of over 100 general practitioner and specialist partners and a wellness marketplace through CXA Group.

Throughout COVID-19, long-term care saw key partnerships emerge. RHS and private homecare providers stepped into train COVID-19 response capabilities, like swabbing, across care facilities. AIC partnered with GovTech to develop solutions such as self-service thermometer scanners. Going forward, the sector should seize more partnership opportunities in areas such as virtual programs design (leveraging community and corporate partners to build and facilitate new content) and training (tapping into corporate partners for courses in digital skills and other new ways of working). The LTC sector will then be able to leverage the comparative advantage of other sectors and partners.

Key takeaways

- Over the past five years, Singapore's long-term care sector has come a long way as the government embraced an aging-in-place philosophy, departing from the highly medicalized form of care of the past.
- The next step in this journey — LTC 3.0 — is an integrated, omnichannel, tech-enabled model, with care provided only as needed rather than as a default. The challenges that surfaced during COVID-19 also suggest where such a model can fill gaps, particularly around the need for better access and quality of care.
- To guide the path forward, we have laid out four guiding principles for long-term care, inspired by transformations in other industries: 1. Challenge the status quo; 2. Seek rapid, incremental innovation; 3. View seniors as consumers, not patients; and 4. Build partnerships.

6. CONCLUSION

Mobilizing long-term care for the future

In Chapter 6, we recommend ways in which the sector's stakeholders should embrace a whole-of-sector approach to transformation, so that they can take ownership of their roles and responsibilities.

The long-term care sector in Singapore is poised for change, with the COVID-19 pandemic being a catalyst for an ongoing, technology-driven shift. To make this happen, the sector must embrace a whole-of-sector approach, deepening on-the-ground relationships — such as AIC working closely with nursing home operators on-site throughout the pandemic — and cooperation and co-creation.

Multisectoral collaboration proved effective during the first wave of the pandemic, and continued ownership of roles will be a critical aspect of this shared responsibility. Operators fought hard to protect seniors. Staff made sacrifices both professionally and personally. Caregivers showed immense strength amid major changes. Government was on the ground, providing tangible infection-control support and recommendations to operators, and private players stepped in to share their resources and expertise. Most importantly, seniors were as resilient as they could be amid the physical and mental upheavals. Singapore's long-term care system showed its collective strength — and the basis for LTC 3.0 as a new reality.

Key takeaways

- A whole-of-sector approach, leveraging co-creation, has been critical throughout the pandemic and will continue to be important in transforming the sector toward LTC 3.0.
- This will require: Operators to review and modify their operations in light of the key priorities from COVID-19 — from digital-led models to mental health treatment; government to take ownership of key policymaking, payor, and coordination responsibilities; private players to provide support through innovative partnerships; and seniors and caregivers to drive the feedback loop.

Exhibit 9: Stakeholder journey to LTC 3.0

Key stakeholders		Roles and responsibilities
Operators		Develop a blended online and offline service delivery strategy and plan, individualized for different senior segments based on needs and preferences
		Embed mental wellness and preventive health into care planning; expand touchpoints where these care options are available
		Review the existing operating model and end-to-end processes to make key changes, including job re-designs and an upskilling curriculum
		Retrofit existing facilities, where possible, to accommodate safe-distancing measures and maintain seniors' engagement
		Collaborate with the broader healthcare sector to offer integrated services in different settings, including primary and acute care
		Provide more-holistic services in single settings, such as expanding care options available in homes, including preventive care, such as diabetes management
Government	Policymaking (MOH)	Review and update infrastructure policies for new nursing homes and daycare centers, as well as for existing facilities such as on-site dormitories; compare the cost benefits with cumulative infection-control costs
		Update the operator funding model to better reflect the cost of operations, considering the increased manpower needs throughout the COVID-19 pandemic
		Evaluate the impact of recent policies and resources for caregivers and identify new ways to support and engage them
		Collaborate with acute-care and homecare operators to shift more services to the home and set clear regulatory guidelines
	Payor coverage (MOH)	Review and update LTC financial schemes, including options in the private payor market, as unmet consumer needs emerge from or are accelerated by COVID-19
		Reassess financing options to cover telehealth and digital-health solutions
	Coordination and resource (AIC)	Ensure adequate funding is disbursed for key LTC innovations, such as digital solutions and infrastructure for aging-in-place
		Prioritize LTC human-resources propositions to recruit more workers (especially from the local pool), improve salaries, create career paths, and re-design jobs throughout the sector
		Provide advisory and resources to help operators update their infrastructure and operating models, including job re-designs and expanded mental health services; facilitate the sharing of best practices across the sector
Private players (corporations, universities, tech partners)		Deploy or fund technologies and other solutions for which LTC use cases have been amplified by COVID-19
		Co-develop, pilot, and scale the use of new solutions together with LTC operators
Seniors and caregivers		Stay open to the use of digital solutions and actively provide feedback to operators on their solutions
		Foster knowledge-sharing in the community, for example for seniors to teach each other digital skills

Source: Oliver Wyman analysis

APPENDIX

Appendix 1: COVID-19 impact on seniors vs. other age segments

Countries (Date, 2020)	COVID-19 cases by age segment (% of total cases)					
	<20 years	20-29 years	30-39 years	40-49 years	50-59 years	>60 years
Singapore (Mar25[1])	**3**	**25**	**19**	**15**	**17**	**20**
Japan (Jul29)	6	29	17	14	13	20
Korea (Jul24)	7	26	12	13	18	24
Taiwan (Aug19)	5	37	21	10	13	14
Australia (Aug18)	13	23	17	13	12	22
California (Aug17[2])	<34 years: 45			35-49: ~25	14	16

Countries (Date, 2020)	COVID-19 deaths by age segment (% of total deaths)					
	<20 years	20-29 years	30-39 years	40-49 years	50-59 years	>60 years
Singapore (Aug19)	—	—	—	4	7	**89**
Japan (Jul29)	—	0.1	0.4	1	3	**94**
Korea (Jul24)	—	—	1	1	5	**93**
Taiwan (Aug19)	—	—	—	29	14	**57**
Australia (Aug18)	—	—	0.5	0.5	2	**97**
US (Aug8[3])	0.2	1	2	5	12	**79**

■ High occurence of cases amongst age groups   ■ Disproportionately high mortality rates among seniors

Note: Data was last updated on August 19, 2020 across all countries. For Singapore's senior death figures, we confirmed again on October 16, 2020 with the Ministry of Health.

1. March 25 data was used to limit the impact of migrant worker cases on the percentage distribution of cases across age groups. Singapore stopped reporting case-by-case breakdowns since April 19.

2. Not all states provide a breakdown of COVID-19 cases by age groups. California was selected as it has the highest number of COVID-19 cases as of July 29. Age segments are reported as follows: <5 years, 5 to 17 years, 18 to 34 years, 35 to 49 years, 50 to 59 years and >60 years.

3. Age groups for US data on COVID-19 deaths are reported in the following segments: <25 years, 25 to 34 years, 35 to 44 years, 45 to 54 years, 55 to 65 years and >65 years.

Source: MOH, The Straits Times, Toyo Keizai, South Korea's Ministry of Health and Welfare, Taiwan Centers for Disease Control, Australian Department of Health, US Centers for Disease Control and Prevention, California Department of Public Health

Appendix 2: COVID-19 impact on long-term care facilities

Countries	% of seniors in population, >65 years, 2019[1]	% of senior population living in nursing homes and other long-term care facilities, 2017[2]	% of COVID-19 deaths linked to nursing homes and other long-term care facilities (resident and staff[3])
Singapore	14	2	14
Japan	28	3	10
South Korea	15	3	34
Taiwan	15	1	—
Australia	16	6	28
USA	16	2	45
Sweden	20	4	47
Spain	20	2	34
Canada	18	4	85

■ Example countries with large aging population and major nursing home outbreaks

Note: Data was last updated on August 19, 2020 across all countries.

1. Singapore data from Singapore's Department of Statistics. Data for Japan, Korea, Taiwan, Australia and the US obtained from Fitch Solutions. Data for Sweden and Spain from the Economist Intelligence Unit. Data for Canada from Statistics Canada.

2. Singapore data from Lien Foundation's Safe But Soulless (2016) report. Data for Australia, Japan, Korea, Sweden, Spain, Canada (all 2017) and the US (2016) obtained from OECD. Data for Taiwan obtained from Statistics of General Health & Welfare Report 2018 (i.e. total number of recipients for long-term care institutions and nursing facilities).

3. Singapore figure from Ministry of Health as of mid-October; Japan data from Reuters report, May 10, 2020; Korea, Australia, US, Sweden, Spain and Canada data from International Long-Term Care Policy Report, June 26, 2020; Taiwan figure from COVID-19 in Long-Term Care Facilities report, June 2020.

Source: Oliver Wyman analysis

Appendix 3: Singapore long-term care definition

Residential-based	**Nursing homes**	Long-term care settings for residents with no family support and who need medical care, nursing care, and rehabilitative services
	Chronic sick units	Maintenance, medical, and skilled nursing care for patients with advanced and complicated chronic medical conditions
	Inpatient Hospice Palliative Care Services	Place to serve end-of-life patients who cannot be cared for at home and require inpatient care; patients are admitted for terminal care or a trial of treatment
Center-based	**Daycare**	Maintenance of seniors' health and wellbeing during the day through socialization and assistance with activities of daily living
	Community rehabilitation	Provision of physiotherapy and occupational therapy for those with conditions such as stroke, fractures, and mental health issues
	Dementia daycare	Focus on cognitive stimulation and preservation of personal identity
	Day hospice	Medical, nursing, and psychosocial care for end-of-life patients
Home-based	**Home medical care**	Doctors visit homes to conduct care assessments and provide long-term management of chronic conditions
	Home nursing care	Nurses manage a care plan, consult with doctors, and provide caregiver training. Care includes wound dressing and injections
	Home palliative care	Medical and nursing care for end-of-life patients, including pain control and symptom relief
	Home personal care	Support with activities of daily living, including showering, housekeeping, and medication reminders
	Meals-on-wheels	Meal delivery program
	Medical escort and transport	In-person support for medical appointments

Source: Ministry of Health

Appendix 4: Singapore long-term care capacity

Types of LTC services	2011			2019		
	Nursing home	Daycare[2]	Homecare[3]	Nursing home	Daycare[2]	Homecare[3]
No of facilities or providers**	64[1]	35	9	77[1]	143	24
No. of beds/places	9,690[4]	2,100	3,800[5]	16,059[4]	7,600	10,300[5]
No. of seniors in resident population	352,400			579,774		
No. of facilities per 1,000	0.18	0.10	0.03	0.13	0.25	0.04
No. of beds/places per 1,000 seniors	27	6	11	28	13	18

** Number of providers for homecare.

1. MOH provides a breakdown of public, not-for-profit and private facilities only for nursing homes. In 2011, the number of public and not-for-profit nursing homes constituted 50 percent of all facilities, while in 2019, this proportion was 60 percent. In 2020, number of nursing homes grew to 80.

2. Daycare figures include centers that offer daycare, dementia daycare, community rehabilitation, the Singapore Program for Integrated Care of the Elder (SPICE) and/or Integrated Home and Day Care services, and are recipients of MOH subventions and/or referrals by AIC.

3. Homecare figures include home medical and home nursing services by providers who receive MOH subventions, but exclude home palliative care providers (four in 2011, nine in 2019). A provider that manages multiple branches is only counted once.

4. In 2011, public and not-for-profit nursing homes manage 66 percent of nursing home beds. In 2019, they manage 76 percent. Number of nursing home beds provided by MOH includes beds for chronic sick services.

5. Excludes home palliative care places (3,800 in 2011, 6,300 in 2019 based on total number of clients served per year).

Source: MOH, SingStat, Oliver Wyman analysis

Appendix 5: Longlist of technological solutions for long-term care

Prioritization across care models is based on four metrics. **Cost:** Relative with consideration of CAPEX, OPEX and end-consumer cost. **Context:** Fit for social and cultural context in Singapore. **Driver of integration:** Solution's ability to drive greater integration across other technologies and data. **Availability:** Solutions that have been piloted or are currently implemented in Singapore

Artificial intelligence-enabled (AI) solutions	Relevance to metrics	Cases applicable for COVID-19
CCTV/video analytics software Software incorporated into CCTV to enable features such as facial recognition, fall detection and temperature screening (SmartPeep, Innotec)	Cost Context Driver for integration Availability • Saving implementation costs by tapping into existing CCTV systems • Potential to create an integrated central unit to remotely monitor nursing homes and daycare centers across SG • Pilots available in SG (at Peacehaven)	• Oversee movements remotely — especially for larger nursing homes with split zones or manpower constraints • Allow daycare seniors to come and go, while they are screened remotely
Pain assessment app Facial recognition analytics via smartphone camera to calculate pain scores for seniors with communication difficulties (PainChek)	Cost Context Driver for integration Availability • Cost-effective tool, downloadable onto smartphones • Better-targeted care for a significant proportion of seniors with dementia in nursing homes and in the community • Integration of pain scores with medical records for doctor/specialist coaching • Tool in use in SG (at Allium)	• Provide better-targeted intervention programs for seniors with difficulties communicating (such as those with dementia) by tracking recurring pain points, which reduces need for specialist attention
Vital sign app Phone applications that use cameras to monitor vital signs, such as heart rate, oxygen saturation and blood pressure, as well as mental stress (Binah)	Cost Context Driver for integration *Availability* • Cost-effective tools used on smartphones carried by caregivers or seniors • Fast and contactless solution that may be well-accepted by seniors • Promotion of preventive health efforts via fuss-free method of monitoring vital signs • Nascent technology — no pilots yet in SG	• Monitor seniors' vital signs without direct contact when they visit daycare centers • Use caregivers' smartphones to quickly monitor vital signs at home without direct contact with seniors • Promote self-care amongst seniors living alone, when caregivers are unable to visit
Online cognitive assessment tools Real-time digital assessment of cognitive impairments to track progress of seniors' mental states (Neurocern, Neurotrack)	Cost *Context* Driver for integration *Availability* • Cost-effective tools, downloadable onto smartphones • Not tailored to local languages in SG; primarily in English • Integration of cognitive health data with mental wellness programs • Nascent technology — no pilots yet in SG	• Monitor impact of changing nursing home environments on mental health of seniors • Conduct home-based cognitive assessment for seniors who are reluctant to return to daycare centers • Self-assess cognitive health at home and share results with specialists for coaching to limit unnecessary home visits
Digital therapeutics Behavior modification tools to manage chronic diseases such as diabetes, and to support mental health (Livongo, Holmusk's GlycoLeap, Omada Health)	Cost *Context* Driver for integration *Availability* • Cost-effective tools, downloadable onto smartphones • Not tailored to local languages in SG; primarily in English • Use of behavioral data to incorporate preventive programs into care planning • Lack of other senior-specific solutions in SG	• Administer online therapy programs for seniors who prefer to stay at home to minimize physical and mental deterioration • Help caregivers to better manage seniors' chronic diseases at home and to work with doctors and specialists online so they can receive coaching in spite of movement restrictions

Sensor-based solutions	Relevance to metrics	Cases applicable for COVID-19
Ambient sensors Non-intrusive devices that use electro-magnetic waves (such as infra-red and radio waves) to detect and convert physical features into readable signals (Ascom's location beacons, Walabot, Red Cross's HoME+, AstraLink's LifeCare)	**Cost** **Context** **Driver for integration** **Availability** • Inexpensive subscription bundles for end users, but higher OPEX for operators • Better senior receptiveness, as privacy is not breached • Driver of integrated, community-based units for remote monitoring • Pilots available in SG (such as Shine Seniors)	• Oversee movements remotely — especially for larger nursing homes with split zones or manpower constraints • Monitor seniors' movements at home or during non-center hours or after caregiving hours via a centralized 24/7 remote monitoring unit
Smart home devices Smart everyday appliances that can be controlled remotely or that detect bodily signals and physical movement (CareValidate's SafeLight, 100 Plus's and Hinounou's weight scales, Nanyang Polytechnic's Smart Mat)	**Cost** **Context** **Driver for integration** **Availability** • Inexpensive solutions that can be incorporated into current Housing & Development Board (HDB) home layouts • Limited maintenance required by seniors • Integration with other sensor-based solutions to better understand seniors' routines for care planning • Pilots available in SG (such as Smart Mat)	• Detect any movement of seniors at night remotely to reduce need for patrols — especially for larger nursing homes • Monitor seniors' movements in their homes remotely; send alerts in case of deviations from routine to trigger timely intervention
Wearables Portable devices such as watches and pendants that can detect and analyze bodily signals and vital signs, such as temperature, and trigger emergency responses or conduct geo-tracking (PouchPass, D Free, Lifeline 24's Vibby Pendant, KaHa)	**Cost** Context **Driver for integration** **Availability** • Inexpensive devices widely available in Singapore (for example through government initiatives) • Difficulty in ensuring seniors' adherence to use and maintenance of wearables • Data analysis (of metrics such as heartrate and blood glucose) to detect health conditions early and promote preventive self-care	• Build predictive models using data from wearables to predict onset of COVID-19 symptoms or worsening conditions • Contact trace seniors who leave nursing homes for family activities • Track location of daycare and homecare seniors and use wearables to monitor vital signs; trigger emergency response if needed
Medication management devices Automated pill boxes and dispensers that can provide reminders and track adherence to medication schedules (Pillpresso, MedMinder)	**Cost** **Context** Driver for integration **Availability** • Inexpensive solutions, especially simple pill boxes • Limited potential for data collected on seniors' medication adherence • Homegrown solutions (such as Pillpresso) and local pilots (such as Shine Seniors)	• Automate sorting and dispense of medication for nursing home staff, minimizing physical handling of pills • Remotely supervise medication adherence of daycare and homecare seniors, without having to pay a home visit
Point-of-care diagnostics Testing kits or machines that use bio-sensors to analyze blood samples and provide on-demand medical examinations (TytoCare, Xip Diagnostics, Tisenc)	Cost Context **Driver for integration** Availability • High CAPEX, and OPEX for one-time use solutions • Driver for buildup of primary care capabilities in long-term care providers • Nascent technology — no pilots yet in SG	• Trained caregivers and staff to conduct in-house medical examinations in seniors' homes or in nursing homes, reducing the need for hospital visits

Virtual/augmented reality solutions	Relevance to metrics	Cases applicable for COVID-19
Mixed reality therapy Physical and mental wellbeing therapy programs, administered using virtual- or augmented-reality tools (Rendever, Hololens, XR Health, Mind Palace)	(Cost) **Context** (Driver for integration) **Availability** • High CAPEX, but lower OPEX for therapy programs • Programs can be tailored to senior needs and preferences • Standalone solution • Piloted in local nursing homes (such as Sree Narayana, although technology is not in use now)	• Organize virtual outings for nursing home and daycare seniors to minimize big group or outdoor activities

Internet of Things (IOT) solutions	Relevance to metrics	Cases applicable for COVID-19
Back-end care management systems Integrated administrative systems that store seniors' care records and automate operational processes such as billing and inventory management (NHELP, InGot, Napier, Ascom)	(Cost) **Context** **Driver for integration** **Availability** • High CAPEX • Systems can be tailored to current processes • Foundational system that can be scaled up across operators for data sharing • Usage of homegrown solutions in local nursing homes (such as MOH's NHELP system and InGot in Lee Ah Mooi)	• Promote data sharing to seamlessly transition seniors between different types of operator (such as from nursing home to homecare), to minimize contact points and waiting times • Automate administrative processes to free up staff capacity for additional COVID-19 responsibilities
Data analytics systems Platforms that store and analyze data from sensors and wearables to derive trends in seniors' activities and health (Biofourmis, Care Predict)	(Cost) **Context** **Driver for integration** **Availability** • Expensive proprietary tools for advanced analytics • Increasingly-relevant for SG with growing tech adoption by younger seniors • Foundation for use of analytics for early detection (such as tracking blood glucose to detect potential onset of diabetes), preventive self-care, and personalized care planning (for long-term and primary care) • Solutions available in Singapore (such as Biofourmis)	• Share data with primary care providers to guide tele-diagnosis and tele-treatment • Analyze seniors' preferences and needs so they can be incorporated into overall care planning • Predict emerging health conditions and develop in-facility or in-home preventive programs to minimize hospital visits

Robotics-based solutions	Relevance to metrics				Cases applicable for COVID-19
Companion robots Animal-like robots that keep seniors company and can respond to touch and sound (Paro, Hasbro's Joy For All)	**Cost**	**Context**	Driver for integration	**Availability**	• Provide companionship for nursing home seniors with Alzheimer's and dementia, given that fewer visitors are allowed • Serve as an alternative form of therapy for seniors with dementia attending daycare to partly replace in-person therapy • Provide companionship for seniors living alone at home
	• Inexpensive compared to other robotics-based solutions • No language barrier • Standalone solution • Usage in local nursing homes (such as Ling Kwang Home for seniors with dementia)				
Assistance robots Robots that can assist staff in physically demanding or time-consuming tasks such as lifting seniors and delivering meals (Robear, providers of automated guided vehicles (AGV) such as Ferrotec, and Nanyang Technological University (NTU)'s extreme disinfection robot)	Cost	**Context**	Driver for integration	**Availability**	• Deliver meals and medication to nursing home residents across split zones and minimize physical contact • Automate and enhance cleaning processes for better infection control in nursing homes and daycare centers
	• High CAPEX, but may reduce OPEX in the long run • Standalone solution aimed at increasing efficiency • Pilots available in SG (such as AGVs at Peacehaven, disinfection robots at NTU)				
Robotic butlers Personal robotic butlers that can offer reminders and entertainment to seniors and connect family members via video calls (Buddy, Zorabots)	Cost	Context	**Driver for integration**	Availability	• Connect seniors with family members to minimize social isolation • Check in with caregivers by remote daycare and homecare staff to provide advice and support when needed
	• High CAPEX, with limited OPEX savings • Language barrier for non-English-speaking seniors • Empowerment of caregivers and seniors via greater collaboration with operators • No pilots yet in SG				
Rehabilitative devices Exoskeletons that support rehabilitation of physical functions such as hand movement and walking (ReWalk, Rehab Robotics)	Cost	Context	Driver for integration	**Availability**	• Use to conduct tele-rehabilitation sessions online in nursing homes with specialists (though staff support is required) • Use to conduct online rehabilitative programs with seniors in daycare centers or in their homes, under caregiver supervision
	• High CAPEX, with limited OPEX savings as the devices still require human support • Lack of personal touch may limit seniors' receptiveness • Standalone solution • Some pilots exist in Singapore, but not widely adopted at this time				
Assistive apparel Powered apparel (like body suit and shoes) that provide physical support for daily activities and fall prevention (Seismic, B-Shoe)	Cost	Context	Driver for integration	Availability	• Support specific movements (such as sitting to standing) for seniors living alone at home outside caregiving hours
	• High CAPEX • Available option (body suit) less-suited for SG's climate • Standalone solution • Nascent technology — no pilots yet in SG				

Platforms	Relevance to metrics	Cases applicable for COVID-19
Social platforms for seniors Social media and content-aggregation websites that cater to seniors, with simple interfaces and larger fonts (Silver Activities, Mint Social, Billy, Family Ties)	**Cost** · **Context** · **Driver for integration** · **Availability** • Inexpensive solutions, some free • Available solution in SG tailored to local languages • Driver of collaboration between LTC operators and solution providers to offer online services and activities • Usage in local nursing homes (such as Sree Narayana)	• Provide entertainment for seniors in nursing homes or living alone at home and maintain connections with family members online to overcome social isolation • Use to offer physical and cognitive exercises to engage seniors at home by daycare and homecare staff
Tele-consultation Platforms connecting seniors and caregivers to doctors (Homage Health, White Coat, My Doc) and doctors to physicians (RubiconMD, AristaMD)	**Cost** · **Context** · **Driver for integration** · **Availability** • Inexpensive apps for tele-consultations, but may raise OPEX for payors due to more-frequent usage • Usage by SG operators, with broader acceptance by seniors during COVID-19 • Driver of greater integration between primary and long-term care providers	• Conduct tele-consultations in-facility or at home to minimize hospital visits and overcome restrictions on healthcare workers • Allow resident doctors in nursing homes to consult specialists online for greater efficiency
Volunteer/caregiver matching apps for seniors Smart matching of seniors with caregivers and volunteers based on several factors, such as personality, interests, and experience (Five Good Friends, The Helper Bees)	**Cost** · Context · **Driver for integration** · **Availability** • Inexpensive tools, downloadable on smartphones • Greater collaboration between operators and volunteers to deliver care services to seniors • Pilots available in SG (through government initiatives), though less-targeted at seniors	• Use by daycare and homecare staff to match volunteers to seniors for online recreational activities to minimize social isolation
Senior-tailored tablets Devices designed specifically for seniors, with large buttons and text (SilverPad, GrandPad, GreatCall, Claris Companion)	Cost · **Context** · **Driver for integration** · **Availability** • May be seen as less value-for-money than regular tablets due to limited functions • Available solution in SG tailored to local languages • Medium to drive coordination and digital delivery of care services • Usage of SilverPad by solution provider to facilitate activities in Senior Activity Centers	• Provide entertainment for seniors and maintain connections with family members online to overcome social isolation • Administer tele-consultations through tablets with caregiver supervision in seniors' homes
Smart transportation for seniors On-demand, non-emergency transport for seniors, with specialized drivers trained to care for and work with seniors (Veyo, Uber Health)	**Cost** · Context · **Driver for integration** · Availability • Cost saving through corporate partnerships (with Grab), but significant capital investment needed to build out platform • Seniors may prefer cheaper, existing ride-hailing platforms, as transport is not subsidized • Analytics using data collected on seniors' movements to better understand their preferences and needs over time • No pilots yet in SG	• Arrange transport for seniors from home to daycare centers to minimize contact with other seniors • Provide credits to seniors and caregivers to minimize use of public transport

Care concierge apps

Online platforms that coordinate care-related services for caregivers and offer emotional support; also identify at-risk caregivers via questionnaires (Wellthy, Care Right, HomeThrive, TCare)

Cost	Context	**Driver for integration**	Availability

- Expensive subscription bundles (around US$300/month)
- Driver of greater coordination by providing a single platform for various service providers
- No pilots yet in SG, and limited contextualization to SG's long-term care

- Identify caregivers at-risk of burnout and coordinate respite care in daycare centers or at their homes
- Support first-time caregivers in navigating options online and coordinate services of different providers

Digital caregiver console and apps

Two types of solutions: a smartphone app that acts as a digital caregiver and engages in conversation (Elovee); and interactive consoles with virtual caregivers that provide medication reminders, monitor activity levels and vital signs, and engage in conversations (Addison Care)

Cost	Context	**Driver for integration**	Availability

- High CAPEX
- Potential language barrier with non-English speaking seniors
- Medium to drive coordination and digital delivery of various care services
- Nascent technology — no pilots yet in SG

- Provide sense of familiarity for seniors with dementia in nursing homes or in their own homes through conversations with digital versions of caregivers
- Perform basic caregiving tasks (such as medication reminders, monitoring vital signs) virtually in place of physical home visits

Source: Oliver Wyman analysis

ENDNOTES

1   WHO Coronavirus Disease (COVID-19) Dashboard.

2   Comas-Herrera A, Zalakaín J, Lemmon E, Henderson D, Litwin C, Hsu AT, Schmidt AE, Arling G and Fernández J-L (2020) Mortality associated with COVID-19 in care homes: international evidence. Article in LTCcovid.org, International Long-Term Care Policy Network, CPEC-LSE, 14 October.

3   Defined as those over the age of 60 for this report.

4   Based on data from Worldometer, as of October 16, 2020.

5   Based on data from Worldometer, as of May 14, 2020.

6   Comas-Herrera A, Zalakaín J, Lemmon E, Henderson D, Litwin C, Hsu AT, Schmidt AE, Arling G and Fernández J-L (2020) Mortality associated with COVID-19 in care homes: international evidence. Article in LTCcovid.org, International Long-Term Care Policy Network, CPEC-LSE, October 14, 2020.

7   Ministry of Health, October 16, 2020.

8   As of October 16, 2020.

9   John Hopkins University of Medicine: Mortality Analyses.

10 While MOH tracked the number of COVID-19 cases by age at the start, the ministry transitioned to reporting cases based on migrant worker dormitory, in-community, and imported cases.

11 The latest data on death figures are confirmed by the Ministry of Health's Ageing Planning Office, October 16, 2020.

12 Ministry of Health, May 8, 2020.

13 SingStat, Population.sg. Resident population only (Singapore citizens and permanent residents).

14 Ministry of Health.

15 Parliament Singapore, Breakdown of Government Expenditure on Long-Term Care Services in FY2017 and FY2018.

16 Channel News Asia: "COVID-19 testing started for 16,000 nursing home residents, 9,000 staff already tested with 1 positive case", May 8, 2020.

17 Latest figures confirmed by the Ministry of Health's Ageing Planning Office, October 16, 2020. We also confirmed with Lee Ah Mooi Old Age Home that there was a sixth nursing home staff from Singapore who was tested COVID-19 positive once she returned home to the Philippines in August. Source: Channel News Asia, September 1, 2020.

18 Latest figures confirmed by the Ministry of Health's Ageing Planning Office, October 16, 2020.

19 All 14 cases were linked to Lee Ah Mooi Old Age Home. The data have been confirmed by the operator.

20 Ministry of Health, October 16, 2020.

21 The Washington Post, August 29, 2020.

22 Ministry of Health, October 16, 2020.

23 Reuters: "Anatomy of Singapore's Outbreak."

24 NPR: "Singapore Sees Surge In COVID-19 Cases, Now Has Highest Number in Southeast Asia."; Nikkei Asian Review: "Indonesia tops Singapore as Southeast Asia's COVID-19 hot spot".

25 These figures are based on the "Summary of Advisories and Resources" dating between end-January and end-June, provided by AIC. Updates are defined as advisories, notices, and announcements on resources. Not all updates were relevant to every long-term care provider, hence not requiring implementation.

26 Information from Ministry of Health, Singapore.

27 Based on data from Worldometer, as of October 16, 2020.

28 Seniors defined in this data as 60 years or older. Based on data from Worldometer, as of May 14, 2020.

29 BBC: "Coronavirus: The world in lockdown in maps and charts", April 7, 2020.

30 International Monetary Fund: "World Economic Outlook Update", June 2020.

31 US Centers for Disease Control and Prevention and United Nations: Seniors are more likely to contract COVID-19, suffer from it more severely, and experience a tougher recovery. The Lancet Infectious Diseases: Seniors (defined in this data as those who are 60 years of age or older) are more likely to be hospitalized, between 12 to 18 percent amongst seniors compared to 1 to 8 percent for those below the age of 60.

32 According to a 2019 study by the Center for Ageing Research and Education, the proportion of seniors with three or more chronic diseases has increased from 20 percent in 2009 to 37 percent in 2017. Top five chronic diseases include high blood pressure, high blood cholesterol, cataract, arthritis and diabetes.

33 Comas-Herrera A, Zalakaín J, Lemmon E, Henderson D, Litwin C, Hsu AT, Schmidt AE, Arling G and Fernández J-L, 2020. Mortality associated with COVID-19 in care homes: international evidence. Article in LTCcovid.org, International Long-Term Care Policy Network, CPEC-LSE, October 14, 2020.

34 SingStat, Population.sg. Resident population only (Singapore citizens and permanent residents).

35 Department of Statistics Singapore: Population Trends 2020.

36 According to the United Nations' World Population Ageing 2019 report, Singapore is expected to experience the second largest increase in the proportion of seniors above 65, between 2019 and 2050, with an increase of 21 percent. This is preceded only by South Korea's increase of 23 percent.

37 To support the aging population, the Singapore government has increased capacity and introduced reforms in its long-term care sector in residential-, center-, and home-based services over the past decade. The government has focused increasingly on a principle of "aging in place," strengthening the ability of seniors to live independently and safely and grow old at home and in the community.

38 Parliment Singapore: Breakdown of Government Expenditure on Long-Term Care Services in FY2017 and FY2018.

39 Ministry of Health, October 16, 2020.

40 Data confirmed by Lee Ah Mooi Old Age Home.

41 Latest figures confirmed by the Ministry of Health's Ageing Planning Office, October 16, 2020. We also confirmed with Lee Ah Mooi Old Age Home that there was a sixth nursing home staff from Singapore who was tested COVID-19 positive once she returned home to the Philippines in August. Source: Channel News Asia, September 1, 2020.

42 Latest figures confirmed by the Ministry of Health's Ageing Planning Office, October 16, 2020.

43 Ministry of Health, October 16, 2020.

44 The Washington Post, August 29, 2020.

45 Doores et al "Longitudinal evaluation and decline of antibody responses in SARS-CoV-2 infection", July 11, 2020; and US Centers for Disease Control and Prevention: The new normal has been inextricably complex, with new evidence suggesting that COVID-19 immunity for re-infection is not granted and estimating 40 percent of COVID-19 infected people to be asymptomatic, with their chance of transmission being as high as 75 percent. This looming threat of the unknowns will continue to challenge how Singapore keeps its population safe.

46 Reuters: "Anatomy of Singapore's Outbreak."

47 As of October 16, 2020.

48 As of August 20, 2020.

49 John Hopkins University of Medicine: Mortality Analyses.

50 Examples of committees formed during SARS include the Inter-Ministerial Committee and the Inter-Ministry SARS Operations Committee. These committees put in place decision-making frameworks and a consolidated organizational structure to reduce bureaucracy and response times.

51 Singapore government website: There are four colors in the DORSCON framework — green, yellow, orange, and red. Green — disease is mild, or disease is severe but does not spread easily from person to person (such as Middle East respiratory syndrome). Yellow — disease is severe and spreads easily but is occurring outside of Singapore, or disease is spreading in Singapore but is typically mild or being contained (such as H1N1). Orange — disease is severe and spreads easily from person to person, but disease has not spread widely in Singapore and is being contained (such as SARS). Red — disease is severe and is spreading widely. The framework considers various factors, such as the current disease situation overseas, the transmissibility of the disease, the likelihood of the disease arriving in Singapore, and the impact it may have on Singapore.

52 SingStat: In 2003, Singapore's senior population was only 7.4 percent (~250,000) of its resident population.

53 Ministry of Health: Based on comparison between 2011 and 2019 figures. Dataset excludes operators that do not receive Ministry of Health subventions. It also excludes home palliative care providers.

54 AIC website: AIC was originally Care Liaison Services (CLS) under the MOH. Since its inception in 1992, CLS evolved to Integrated Care Services, then renamed to AIC in 2008. A year later, AIC became a separate corporate entity under MOH Holdings. AIC now acts as the main coordinator of aged care services, both for delivery and for improving services and capacity.

55 In 2017, the Ministry of Health spent approximately SGD$580 million in operating expenditure for long-term care services, with 60 percent on residential long-term care. The latest figures on Singapore's long-term care expenditure were not available from MOH and AIC upon request.

56 These figures are based on the "Summary of Advisories and Resources" dating between end-January and end-June, provided by AIC. In addition to advisories, updates include notices and and announcements on resources. Not all updates were relevant to every long-term care provider, hence not requiring implementation.

57 Knowledge sharing includes informational posters (such as staff hygiene) for care facilities and workshops (such as mask-fitting.)

58 The number of PPE and swab tests funded by MOH and AIC were not available upon request. The number of PPE sets distributed is based on caseloads submitted by operators (dependent on staff size and level of precaution required for specific services) while swab tests are made available for both mass testing exercises and for residents displaying ARI symptoms.

59 All financial figures provided in this report are denominated in Singapore dollars (SGD), unless stated otherwise.

60 WhatsApp, Telegram, and other channels like webinars were used to share information among operators on recommended infection control practices and emergency preparations throughout COVID-19. These channels were available to both voluntary welfare organizations and private operators.

61 Ministry of Health website, 2019: Across the sector, there are 244 nursing homes, daycare centers (senior daycare, dementia daycare, community rehabilitation, the Singapore Program for Integrated Care of the Elder (SPICE) and Integrated Home and Day Care) and home medical and nursing service providers. Figures for daycare and homecare only include operators receiving MOH subventions.

62 AIC — "Apart But Not Alone — How SGO Helped Seniors During COVID-19", July 27, 2020: During the circuit breaker, volunteers also provided support through activities like grocery shopping and meal delivery, made referrals to medical and social services, and pivoted to tele-engagements. If seniors were uncontactable, volunteers paid short visits to their homes.

63 More information on the circuit breaker is available on the government website: What you can and cannot do during the circuit breaker period.

64 Outside of COVID-19, AIC conducts regular facility visits to understand on-the-ground challenges, from manpower to clinical needs.

65 For homes that need to test more than five residents in one day.

66 As of October 2020, MOH and AIC were unable to provide a detailed breakdown of how many tests and PPE had been subsidized.

67 Ministry of Health: Time-limited extension of CHAS and MediSave available for seven chronic conditions: diabetes (including pre-diabetes), hypertension, lipid disorder, schizophrenia, major depression, bipolar disorder, and anxiety.

68 The Jobs Support Scheme was extended to March 2021, with daycare operators expected to receive support equivalent to 10 percent of wages. One daycare operator mentioned that appeals have been made to receive greater support for wages, given the significant reduction in his center's capacity.

69 Comas-Herrera A, Zalakaín J, Lemmon E, Henderson D, Litwin C, Hsu AT, Schmidt AE, Arling G and Fernández J-L (2020) Mortality associated with COVID-19 in care homes: international evidence. Article in LTCcovid.org, International Long-Term Care Policy Network, CPEC-LSE, 14 October. Data as of 2020. According to Ministry of Health, in 2011, there were 64 facilities with 9,690 beds.

70 Extrapolated from interviews with operators.

71 Assisted-living facilities provide care for seniors who only require some assistance with daily living and are largely independent. According to the Straits Times, Singapore's third assisted-living facility opened in March 2020.

72 Extrapolated from interviews with operators.

73 Ministry of Health: The four residents were three women and one man, all in their 80s or older.

74 Channel News Asia: "COVID-19 testing started for 16,000 nursing home residents, 9,000 staff already tested with 1 positive case", May 8, 2020.

75 This case eventually turned out to be a false positive.

76 Extrapolated from interviews with operators.

77 Some operators noted several cases in which families wanted residents to move out. However, in these cases, primary caregivers often did not have enough training or resources to care for seniors at home.

78 Based on April 23 MOH advisory titled "Additional movement restrictions for Allied Health Professionals in Nursing Homes".

79 According to MOH Circular: "Updated guidance on movement of healthcare workers, patients, and visitors in healthcare institutions at DORSCON orange", February 28, 2020.

80 All are still in place as of October 16, 2020.

81 If medical personnel must move between zones, these physicians and therapists are to follow strict, enhanced infection-prevention and control measures, with all their movements recorded for contact tracing.

82 Graham, WCK, Wong, CH. (2020) Responding to COVID-19 in Residential Care: The Singapore Experience. LTCcovid country report, International Long-Term Care Policy Network, CPEC-LSE, 27 July 2020.

83 Extrapolated from interviews with operators.

84 For more insights into Singapore's long-term care manpower, see Lien Foundation's Long-Term Care Manpower Study, July 2018.

85 The Yellow Ribbon Singapore is a statutory board that aims to equip prison inmates and ex-offenders with employable skills and to support them in long-term career development following their release.

86 With the support of corporate partners, AIC organized corporate and in-kind donations. AIC also collaborated with the Ministry of Culture, Community, and Youth to distribute 10,000 care packages across all nursing homes.

87 Every quarter, nursing home operators report Basic Safety Quality indicators to AIC. These indicators include falls and use of physical restraint, pressure injuries, medication incidents, and infection control. At the time of the report, data from the first quarter of 2020 were not available, as operators were given extensions for submissions. However, all operators that were interviewed said that they have not seen anomalies in the metrics from this period.

88 Joyce Simard and Ladislav Volicer: "Loneliness and Isolation in Long-term Care and the COVID-19 Pandemic."

89 Data from Worldometer, as of October 19, 2020.

90 University of Minnesota's Center for Infectious Disease Research and Policy: "Nursing homes site of 40% of US COVID-19 deaths", June 2, 2020.

91 Euro News: "Coronavirus: Care homes could be where over half of Europe's COVID-19 deaths occur, says new study", April 17, 2020.

92 Data as of 2019. Figure includes those that receive MOH subventions and/or referrals by AC. In 2011, there were 35 facilities with 2,100 places.

93 Senior-centric activities organized by Senior Activity Centers and Active Aging Hubs were suspended on February 10, and selected programs were permitted to resume two weeks after, only to close again by March 11. Daycare centers remained open until April 7, and were then closed for three months, except for 13 white-listed centers (ranging from senior care, psychiatric daycare, and hospice daycare centers) that remained open to serve seniors with inadequate family support and intensive care needs. See Exhibit 3 for more details on the advisory timeline.

94 As of end-July.

95 IMDA 2019: Annual survey on Infocomm usage in households and by individuals. In this data, seniors are 60 years of age or older.

96 Extrapolated from interviews with operators.

97 Daycare centers use fewer foreign workers than other care settings (about 10-30 percent of the total workforce — extrapolated from interviews with operators), as there may be language barriers with clients. Hence, daycare providers did not face major challenges with COVID-19 travel restrictions.

98 This guideline around client transportation has since been lifted.

99 Comprehensive data is not yet available. The information shared by geriatric experts and daycare operators were based on their own observations and discussions with caregivers.

100 Measures still in place as of October 16, 2020.

101 Data from Ministry of Health. Figure excludes operators that do not receive MOH subventions and home palliative care providers.

102 Data as of 2019. The figures include operators that receive MOH subventions and exclude home palliative care providers/placements. In 2011, there were nine operators with 3,800 places.

103 Ministry of Health, Utilization of Long-Term Care Services, November 5, 2019.

104 During COVID-19, home personal care (except for those with inadequate family support) and home therapy (except through teleconsultation) were deemed non-essential and restricted from early April to mid-June.

105 Extrapolated from interviews with operators.

106 Given the smaller number of relevant advisories, AIC did not provide a readiness checklist for homecare.

107 PPE was primarily required for aerosol-generating procedures, such as feeding tube insertion and suctioning; for other procedures like wound dressing, full PPE was not necessary.

108 The sector currently uses the ILTC Referral Management System (IRMS).

109 Extrapolated from an operator interview.

110 Health Hub: Intermediate and Long-Term Care Services Subsidies.

111 VWO: Voluntary Welfare Organization.

112 If the newly trained care responders want to join Homage's core pool of caregivers, they would need to undergo the organization's regular manpower screening and training process.

113 HonDao Senior Citizens Welfare Foundation's Time Dollar Mutual Support.

114 Medicare is a US federal government health insurance that covers people over 65 years of age, younger people who meet disability criteria, and people with specific conditions such as end-stage renal disease and amyotrophic lateral sclerosis (ALS).

115 Mindline.sg is an interactive website for wellbeing resources and help in Singapore. It was piloted during COVID-19 and developed by the MOH Office of Healthcare Transformation, the Ministry of Social and Family Development, the National Council for Social Services, and the Institute of Mental Health. It currently curates resources, such as helplines, employment support, and volunteering opportunities, and it will continue to expand with more use cases.

116 The Caregiver Support Action plan includes the ongoing development of: Health marketplace e-platform for caregivers to browse goods and services based on feedback and ratings; expansion of MediSave to cover sibling's healthcare expenses; and the launch of caregiver network in dementia-friendly communities.

117 Restraint practices are not banned to this day.

118 Radha Basu: "Safe But Soulless: Nursing homes need a new narrative." The report found that residents stay in nursing homes for an average of three to six years, some even for more than a decade.

119 Integrated Health and Daycare: Launched in 2016, this initiative consists of a multidisciplinary care team of doctors, nurses, therapists, and social workers liaising with seniors and caregivers to design a more integrated care package. Services may include dementia care, rehabilitation, caregiver support, home medical and nursing care, and transportation.

120 Allium Care Suite is a 129-bed nursing home that launched in 2019. Configured in a household structure, the home hosts 12 to 16 people per household, with more personal space and privacy for its residents. Allium provides single- and double-occupancy rooms, as well as executive suites.

Oliver Wyman is a global leader in management consulting that combines deep industry knowledge with specialized expertise in strategy, operations, risk management, and organization transformation.

The Lien Foundation is a private philanthropic organization that pioneers solutions to improve lives and tackle the root of problems in early childhood development and eldercare in Singapore. It also works to improve access to clean water, sanitation and palliative care among diverse communities in South and South East Asia. The Foundation's research publications, multimedia advocacy and design projects aim to seed public discourse in the hope that these can lead to better policies and practices in its various fields of work. For more information, please visit www.lienfoundation.org.

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