OLIVER WYMAN | LIEN foundation

NAVIGATING A NEW REALITY

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

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:

- 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 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

applicable.

Research was conducted over a three-month period from June to August 2020, and we conducted

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

lowest number of care home deaths as a percentage of total care home residents among the 21 countries — South Korea was the lowest.

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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]
diagnosed with COVID-19 had required intensive care in the hospital, compared to 0.2 percent of non-seniors. [12]
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

based care: Daycare capacity has grown nearly fourfold over the past decade and homecare capacity threefold. [14]
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 [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,

Chapter 2

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

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end-January to end-July.

Chapter 3

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

2Q WKH JURXQG ORQJ WHUP FDUH IDFHG FKDOOHQJHV LQ ‰YH DUHDV &R 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 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.

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.

along with new responsibilities to care for seniors with minimal support from other family

Chapter 5 and 6

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,

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] [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

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

disease. From an environmental perspective, some seniors are more likely than others to live

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]

system. The pandemic has not only posed direct health risks to seniors through potential

and social care, multiplying the impact on seniors’ physical and mental wellbeing, even for

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

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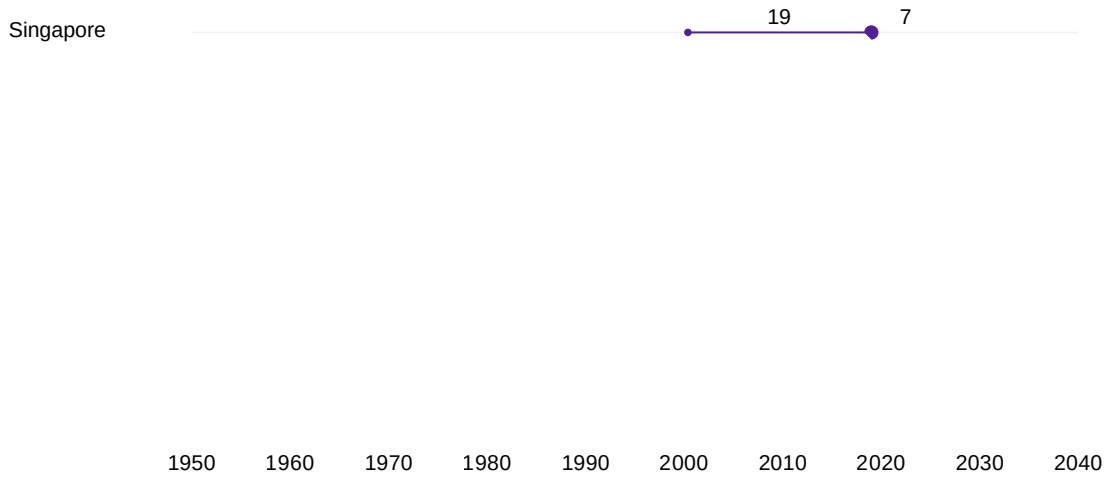
Source: MOH'V $JHLQJ 3ODQQLQJ 2±FH 0LQLVWU\ RI +HDOWK 7KH 6WUDLWV 7LPHV

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 [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] 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 [37] As of FY 2017, the latest period for which [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



As of October 16, Singapore had 57,901 COVID-19 cases. [39] At the time of this report's publication,

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 [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 [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 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,

2. SAFEGUARDING SENIORS

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.

  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

  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.

  the national stockpile), support from AIC, MOH, and hospitals, and in-kind support from

  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).
  -

    per month).

in May for temporary relocation, SG$6,000 transitional grant, and SG$4,400 additional housing member).

collaborated

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

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

to keep up with numerous advisories and frequently following up with AIC to clarify the details of incremental 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

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

gradually.

AIC recognized that the quickly evolving information about COVID-19's transmission and

being announced with short lead time." AIC added that the ongoing feedback channels with

[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

followed the shifts in the spread and transmission risk of COVID-19 in the community and the

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

virtual WhatsApp chat group [60] on January 25 with more than 200 long-term care operators [61]

call center in February to clarify policies and to pass on on-the-ground feedback to MOH.

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

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).
- that require access to resident areas).
- Resident management (number of people, length, area, and cleaning guidelines for group activities).
- healthcare organizations).
- 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

operational support, such as same-day swabs [65]; mass testing for nearly 25,000 nursing home [66]; and knowledge support, such as facilitating the sharing of best practices among facilities through webinars.

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

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

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

2021

to help providers defray wage costs.

In lieu of center-based services, most homecare services remained open for families who

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

teleconsultation services for those who need regular follow-ups for chronic conditions. [67]

Stage 4: Careful resumption of services

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.

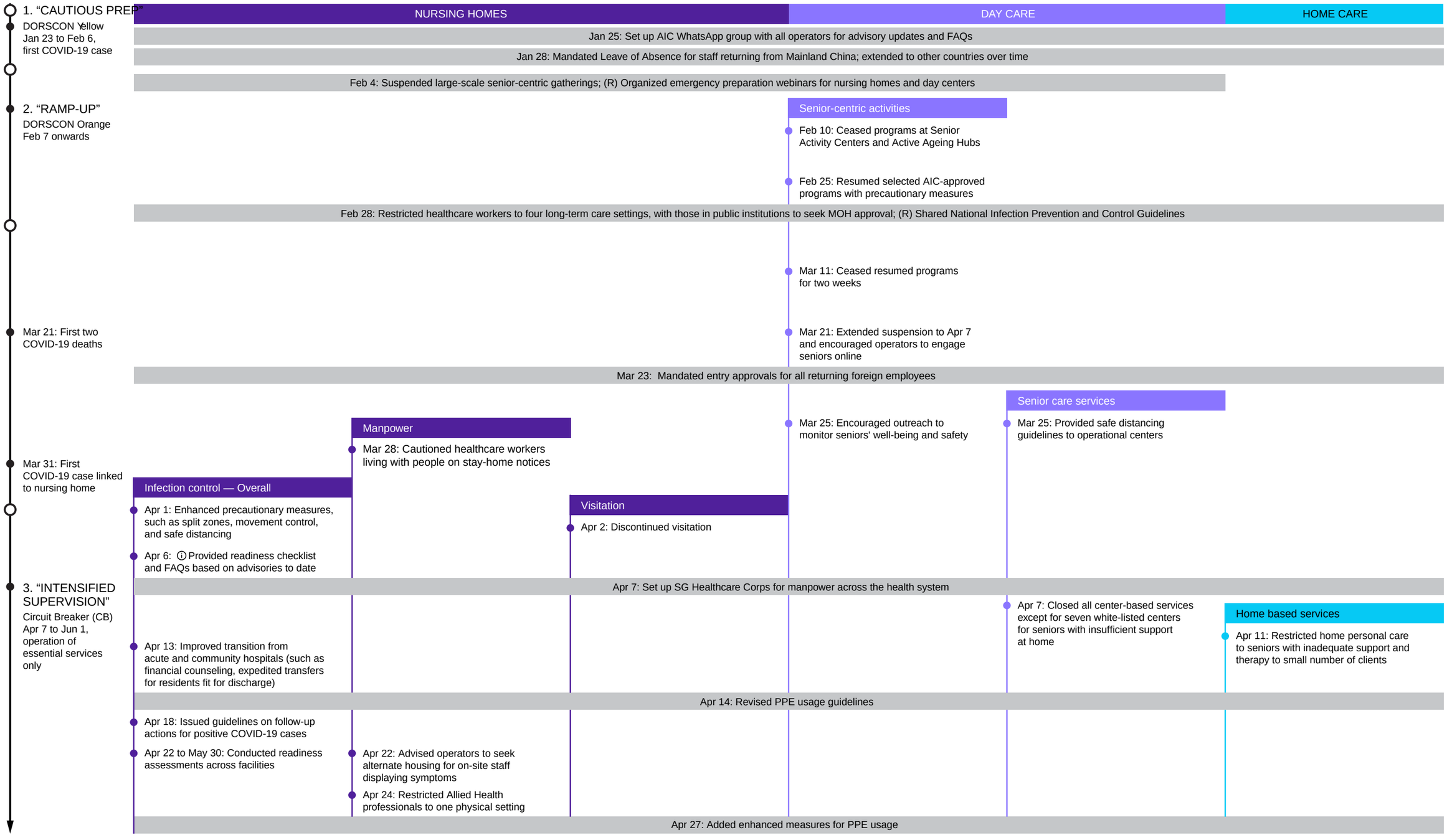
As all types of homecare services resumed on June 19 and daycare centers reopened on June

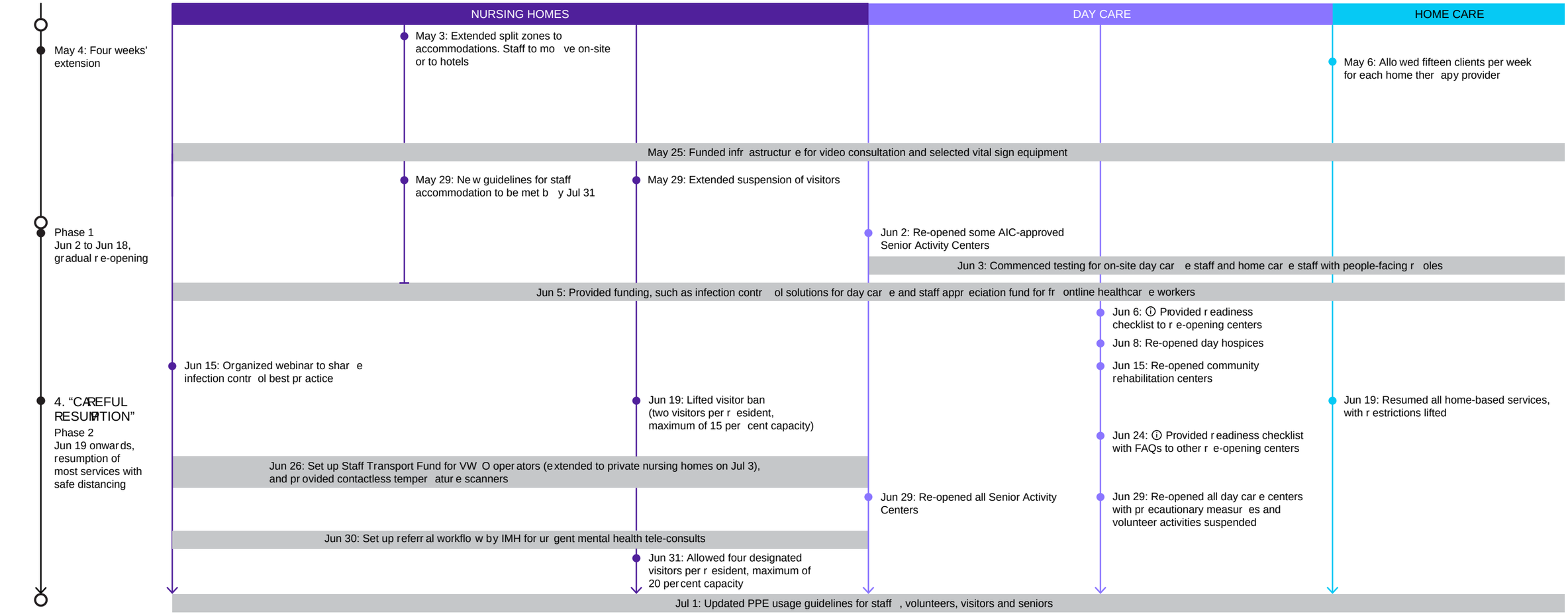
were also provided to daycare centers before reopening in Phase 2, including 43 items in the following categories:

- Visitor management (symptoms for screening, maintenance of visitor records, mask usage).
- deliveries).
- Client management (no outings, one-meter safe distancing, activities to have no more than

Exhibit 3: Summary of MOH and AIC COVID-19 response

ⓘ Represents resources, from end January to early July





Source: Interviews with MOH and AIC Oliver Wyman analysis

[68] continued, to make up for reduced capacity in these centers. MOH and AIC also continued to provide more 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

[redacted]

3. FIRST SIX MONTHS OF THE PANDEMIC

3.1 NURSING HOMES

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, 02+ 2„FH IRU +HDOWKFDUH 7UDQVIRUP

Context

In Singapore, nursing homes are the dominant form of residential long-term care: There are 80 nursing homes and 16,059 beds. [69]
nursing homes [70] [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

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,

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

MOH.

contact tracing, supporting communications to family members and public, and evaluating

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

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

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

implement, compared to the aforementioned measures. One operator moved residents to

C. Manpower

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FOLQLFDO DQG QRQ FOLQLFDO GXWLHV 3KRWR FRXUWHV\ RI 3HDFHKDYHQ

Shifts extended for coverage and compliance

advisories. Some homes migrated from a three-shift to a two-shift model, with 12-hour working

of shifts from eight hours to 12 is not sustainable, however, and one home said even before

shifts quickly.

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

common for foreign workers, to take precautionary measures, such as not reporting to work if

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

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

coping and steps the care home was taking with regard to infection control. This transparency helped to reassure family members. According to Tammy

“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

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 [91], and the government imposed visitor bans. Some operators leveraged partnerships with private companies to help residents deal with the resulting isolation from family

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

to nursing homes, but the company announced plans to loan hundreds more to nursing homes in need.

can further leverage private partnership to adopt digital solutions with applicable use cases for long-term care. Solutions designed for other sectors with applicability

the scope of partnerships. Some robotic solutions have already been developed in Singapore (see Chapter 4,

3.2 DAYCARE CENTERS

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 >UHPDLQLQJ@ ‰QDQFLDOO\ VXVWDLQDEOH DQG QRW FRPSUL

— Dr Kenny Tan, CEO, St. Luke’s ElderCare

Context

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.

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

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]
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.

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.

A. Continuity of care

Forced migration to online, gaps in adoption

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

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

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

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 ‰ Q H but increasingly disengaged	Some successes with S H U V R Q D O L]HG delivery	Baseline]HG communications for check-in
Overview	Slightly younger, more-active clients, well engaged via diverse selection social activities focused classes)	Some seniors growing disengaged over a prolonged time at home; center's environment through virtual means	engage clients with physical or cognitive impairments; important to be familiar with clients' strengths and weaknesses to customize modules (with favorite activities and familiar	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 need for digital" • Potential to further "IT-ify" seniors and increase online services • 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 • with skills to be care ambassadors, providing more-holistic, individualized check-ins	• Lack of tech devices and connectivity main barrier • Clients with severe dementia engage meaningfully

Having an engaged caregiver (with technical and emotional support in-person)

segment of clients

6RXUFH 2SHUDWRU LQWHUYLHZV 2OLYHU :\PDQ DQDO\VLV

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,

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

and arts and craft. It has also focused on taking

it engaged student volunteers to log on after

program. Students shared tech-related content with

kampung — the name of traditional villages.

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

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

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,

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.

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

5 H G X F H G F D S D F L W \ U H F R Q ‰ J X U H G space

end-July, about 50 to 80 percent [96]

C. Manpower

$GGLWLRQDO UHVSRQVLELOLWLHV ZLWK WKH VDPH VWD‡QJ OHYHOV

Prior to the circuit breaker, daycare centers had to implement safe distancing measures and

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

3.3 HOMECARE

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

The segment saw a promising foray into telehealth, with some operators rolling out the

A. Continuity of care

Operator-driven approach to risk assessment

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

[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

seniors transitioning from one care setting to another was far from seamless.

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,

"There is a large range of social agencies and private providers that operate across the care

the pandemic," said Gillian Tee, CEO and Co-Founder of Homage.

5 H Q H Z H G I R F X V R Q ‰ Q D Q F L Q J required

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]
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-

poor or multi-generational households that are still unable to cover the cost together. Even

households of how they can access such funding.

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

government subsidies are taken into account. Hence, donations are critical to their operations.

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

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

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,

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

contact.

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

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.

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

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

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

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 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,

4. OPPORTUNITIES AND TECHNNOVATIONS

Preparing for long-term care's new reality

In Chapter 4, we discuss key opportunities that require renewed focus in

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

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).

piloted home blood pressure monitoring for hypertension, together with an automated bot

close the loop in the system. This entails coaching to encourage continued adherence, whether consultations.

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

tools can be recommended to them. Second, operators can — in the interim — repurpose

One opportunity is to use the centers as spaces for in-person digital training for seniors.

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.

Otherwise, these solutions will not reach their full potential, since issues such as connectivity

D: Empowerment of the workforce).

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

the analytics back-end with the operator’s care management platform. This opportunity will

redesign to standardize the patient assessment process so it can be easily carried out with telehealth solutions.

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;

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

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-alon4 Td [(r)80048000yC00590047 Td [(ie, helpeh650048>)es Yu(espond-3was pilobles. The

B. Continuation of preventive health and wellness

Nearly all “non-essential” care was paused during the initial crisis, including nutrition monitoring,

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.

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

lukewarm uptake but could be reintroduced.

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

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

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

LiveFine and GMS, are available too. They require pills

automatically dispense medication. Going forward, medication adherence solutions could be distributed at the point of dispensation to encourage uptake.

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

Tech case study #3

$VVLVWLYH UREHWV WR IUHH XS VWDII FDSDFLW\ 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.

primarily on senior needs, while maintaining high service and infection-control standards in the facilities. While

of these solutions could be done in partnership with relevant organizations. Furthermore, the upfront investments could lead to savings in operational term.

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

closures and frequently engaging with seniors and their caregivers through messaging and

assigned to about eight residents. This allowed the home to prioritize the overall resident

around manpower to meet these needs. For homecare, there is an untapped opportunity 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

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

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 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

apply a structured, creative process to better understand end users and their environments).

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.

as Pareto Chart and Fish Bone diagram, to help teams identify the root causes of problems

online platforms, from broader communication skills to better understand seniors' needs, to specialized intervention program design. Allium Care Suite introduced hospitality training prior

Best practice #5

US: Iora Health delivers virtual care with both tech solutions and workforce U H R U J D Q L] D W L R Q

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

call 24/7 for after-hours inquiries. When it realized that virtual care would continue, it focused more on video

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

than overseeing bigger groups in physical practices. It now operates with smaller teams of a doctor or a

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

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.

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.

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.

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:

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,

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

individualized activities for seniors to do alone.

channels.

In Singapore, SilverActivities has been in active use among residents at Sree Narayana over the

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

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.

for the

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

  new reality include:
  - Greater focus on digital-led models, with the pandemic disrupting in-person visits and 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.
  - tech adoption — to uphold key infection control measures until longer-term solutions can be implemented.
  - reorganization of teams, upskilling, and engagement of volunteers — to deliver care and
  - 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

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

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

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

service.

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

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

receive lighter-touch care as needed. COVID-19 brought these elements to the forefront, as it led the sector to prioritize:

- % H W W H U D F F H V V 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

  and intuitive:

  steps.
- % H W W H U T X D O L W \ R I O L I H 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
/7& SUH	/7&	/7& DIWHU
Largely institutionalized	Aging-in-place	Integrated
Medicalized and standardized	Holistic and personalized	Care as needed
Primarily	Multichannel	Omnichannel
Tech-nascent	Tech growth	Tech-enabled

Source: 2OLYHU :\PDQ DQDO\VLV

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 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

the COVID-19 pandemic and other major disruptions, but also share the mission of meeting

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

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

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

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EMERGING OPPORTUNITIES

Digital-led model

Greater focus on digital-led model, integr ated closely with offline models

Preventive health

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

Futur e nursing home

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

Empo wer ed workfor ce

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

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

tech-enabled platforms like Carousell that have added features such as premium listings, seller payments, and payment escrow.

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

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

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.

ownership of roles will be a critical aspect of this shared responsibility. Operators fought hard

immense strength amid major changes. Government was on the ground, providing tangible infection-control support and recommendations to operators, and private players stepped in

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.

APPENDIX

Appendix 1:

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

Countries	% of seniors in population, >65 years, [1]	% of senior population living in nursing homes and other long-term care facilities, [2]	% of COVID-19 deaths linked to nursing homes and other long-term care facilities (resident and V W D)† [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

— outbreaks

Appendix 3: Singapore long-term care G H ¯ Q L W L R Q

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

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Appendix 4: Singapore long-term care capacity

	2011			2019		
Types of LTC services	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

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RU UHIHUUDOV E\ $,&

+RPHFDUH ¯JXUHV LQFOXGH KRPH PHGLFDO DQG KRPH QXUVLQJ VHUYLFHV E\ SURYLGHUV ZK
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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: 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

$ U W L ¯ F L D O L Q W H O O L J H Q F H 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 • 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 (PainChek)	Cost Context Driver for integration Availability • smartphones • 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 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 blood pressure, as well as mental stress (Binah)	Cost Context Driver for integration Availability • caregivers or seniors • Fast and contactless solution that may be well-accepted by seniors • 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 • 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 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 • smartphones • Not tailored to local languages in SG; primarily in English • Use of behavioral data to incorporate preventive programs into care planning • 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

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	• Promote data sharing to seamlessly transition seniors

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 • solutions • No language barrier • Standalone solution • Usage in local nursing homes (such as Ling Kwang Home for seniors with dementia)	• 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
Assistance robots 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 disinfection robot)	Cost · Context · Driver for integration · Availability • High CAPEX, but may reduce OPEX in the long run • Standalone solution aimed at increasing • Pilots available in SG (such as AGVs at Peacehaven, disinfection robots at NTU)	• 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
Robotic butlers Personal robotic butlers and entertainment to seniors and connect family members via video calls (Buddy,	Cost · Context · Driver for integration · Availability • 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	• Connect seniors with family members to minimize social isolation • Check in with caregivers by remote daycare and homecare support when needed
Rehabilitative devices rehabilitation of physical functions such as hand movement and walking (ReWalk, Rehab Robotics)	Cost · Context · Driver for integration · Availability • High CAPEX, with limited OPEX savings as the devices still require human support • Lack of personal touch may limit seniors' receptiveness • Standalone solution • this time	• Use to conduct tele-rehabilitation sessions online in nursing homes with specialists (though required) • Use to conduct online rehabilitative programs with seniors in daycare centers or in their homes, under caregiver supervision
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 • High CAPEX • Available option (body suit) less-suited for SG's climate • Standalone solution • Nascent technology — no pilots yet in SG	• (such as sitting to standing) for seniors living alone at home outside caregiving hours

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