

Favorable outcome of geriatric telemedicine for frail older adults with COVID-19 staying at home during the omicron tsunami in Hong Kong

Tak-kwan Kong^{1,2} 

¹Division of Geriatric Medicine, Department of Medicine, The University of Hong Kong Li Ka Shing Faculty of Medicine, Hong Kong SAR, China

²Division of Geriatrics, Department of Medicine & Therapeutics, Prince of Wales Hospital, The Chinese University of Hong Kong, Hong Kong SAR, China

Correspondence

Tak-kwan Kong, Division of Geriatric Medicine, Department of Medicine, The University of Hong Kong Li Ka Shing Faculty of Medicine, Room 405B, 4/F, Professorial Block, Queen Mary Hospital, 102 Pok Fu Lam Road, Hong Kong SAR, China.

Email: tkkong@hku.hk

Abstract

Hong Kong was hit by a tsunami of COVID-19 in mid-February 2022, impacting on frail older adults with high COVID-19 mortality. Two older adults with COVID-19 managed by geriatric telemedicine at home were reported with favorable outcome despite severe frailty (Clinical Frailty Score 7). Stressed by COVID-19, both presented with the geriatric giants or frailty syndromes of brain failure (delirium) and balance failure (falls). Their successful outcome resulted not from COVID-19 antiviral treatment, but individualized holistic person-centered care attending to the frailty syndromes: optimized treatment of comorbid conditions by medication review, medication reduction on recognition of drug-induced hypotension and hypoglycaemia, appropriate use of medication to reduce iatrogenesis, caregivers' replenishment of fluid and nutrition deficit, oxygen support during critical hypoxic period, and recognition and early treatment of superimposed infections (bacterial respiratory tract superinfection, herpes zoster). Their social support was good. Family members and helpers became invaluable resources in providing the much-needed personal care, nutrition, hydration, comfort, and health monitoring to keep the geriatrician informed of their condition and to draw up an individualized management plan. Home environment and human presence were therapeutic in delirium care, avoiding damage from separation and isolation commonly practiced in this COVID-19 pandemic.

KEYWORDS

COVID-19, frailty syndrome, geriatric telemedicine

1 | INTRODUCTION

Hong Kong was hit by a tsunami of COVID-19 in mid-February 2022, cumulating to 1 million cases out of its 7.4 million population by mid-March, overwhelming its capacities on test-and-trace, quarantine, isolation, and treatment. Public hospitals could not admit all new cases,¹ while private hospitals had neither isolation infrastructure

nor COVID-19 antivirals to shoulder responsibility. The daily new cases peaked at 77,000 on March 3, 2022 and there were 1.2 million cases by June 22, 2022.² The onslaught impacted on frail older adults with high COVID-19 mortality.³ The case fatality rate in the fifth wave of COVID-19 in Hong Kong for patients aged ≥ 80 years was 10.38% (1.25%–16.42% depending on vaccination status).⁴ Here, I report two older adults managed by geriatric telemedicine in

This is an open access article under the terms of the [Creative Commons Attribution-NonCommercial-NoDerivs](https://creativecommons.org/licenses/by-nc-nd/4.0/) License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.

© 2022 The Author. *Aging Medicine* published by Beijing Hospital and John Wiley & Sons Australia, Ltd.

March 2022, via WhatsApp messages and videocall, at homes with favorable outcome despite severe frailty.

2 | CASE REPORT

2.1 | Case 1

A 76-year-old man presented with delirium on February 28, 2022. He had multiple system atrophy-parkinsonism (MSA-P) with autonomic dysfunction on 11 drugs. He was living with and cared for by his wife and two helpers. His baseline fitness-frailty by the 9-point Clinical Frailty Scale⁵ (CFS) was 7, indicating severe frailty.

His wife noted he was confused the morning of February 28, 2022, after a sleepless night of coughing, with ear temperature

37.1°C higher than baseline. He was unvaccinated for COVID-19. One helper had cough and chilliness 4 days before. COVID-19 rapid antigen tests (RAT) for this helper and the man were positive on February 28, 2022 (Figure 1A). He complained of itchy throat, fatigue, sleepiness, and myalgia. Purulent sputum (Figure 1B) was observed and oxygen desaturation down to 90% noted on day 2. His blood pressure fluctuated 68/49–150/97 mmHg, pulse 55–90 beats/min. His delirium had multiple causes: hypoxia, bacterial respiratory tract superinfection, cerebral hypoperfusion from hypotension, predisposed by MSA with autonomic dysfunction and precipitated by fluid deficit (from reduced fluid intake because of sleepiness, and increased fluid loss from fever). With hydration, frequent small meals to minimize postprandial hypotension, midodrine for orthostatic hypotension, 1 week of Augmentin 1 g bd, and 5 days of intermittent 0.5–1 L nasal oxygen, his sputum cleared up (Figure 1B), oxygen

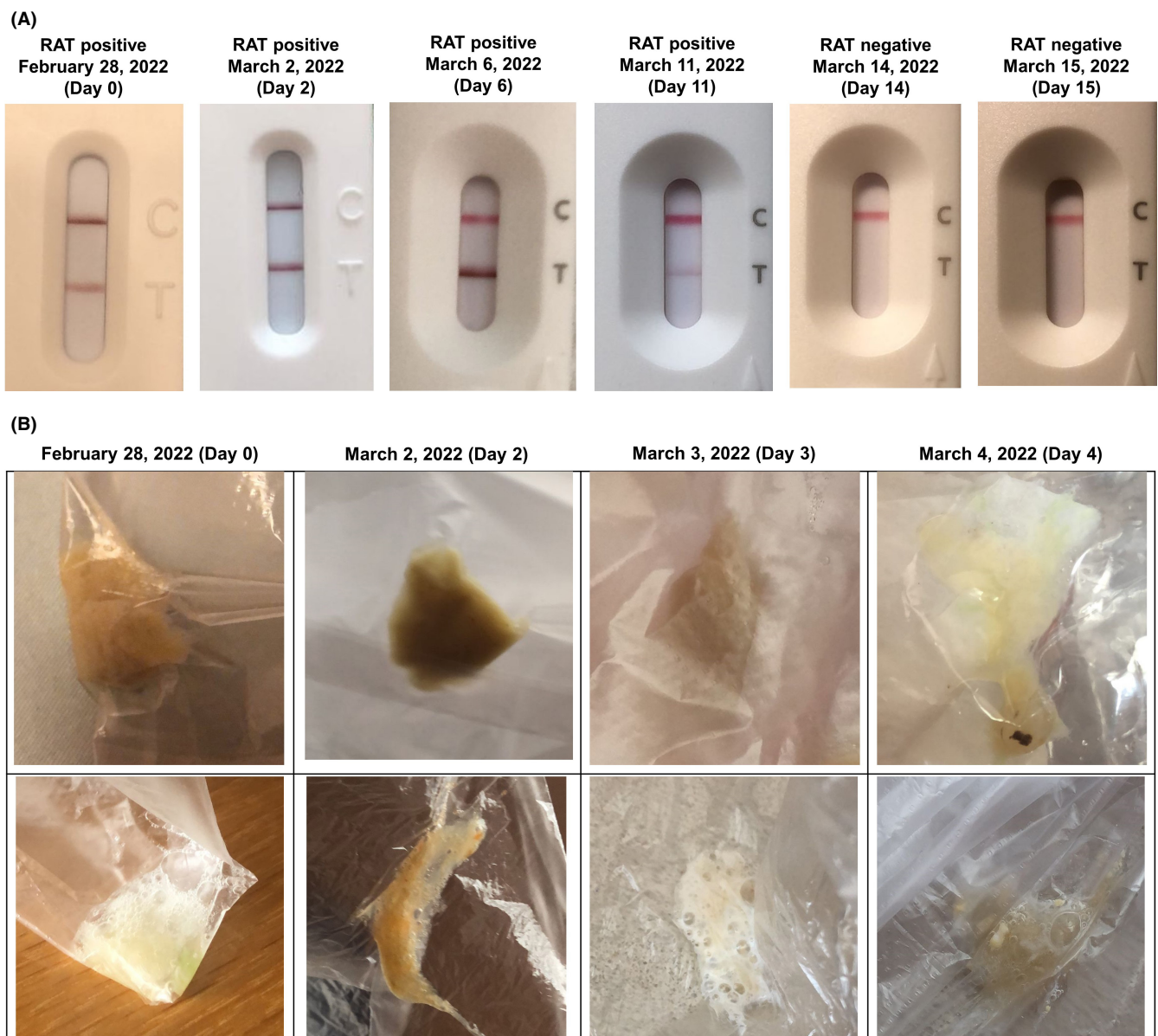


FIGURE 1 Clinical photos of Case 1. (A) Serial COVID-19 rapid antigen tests (RAT). Date of COVID-19 diagnosed taken as date of first RAT positivity (day 0). (B) Serial sputum samples.

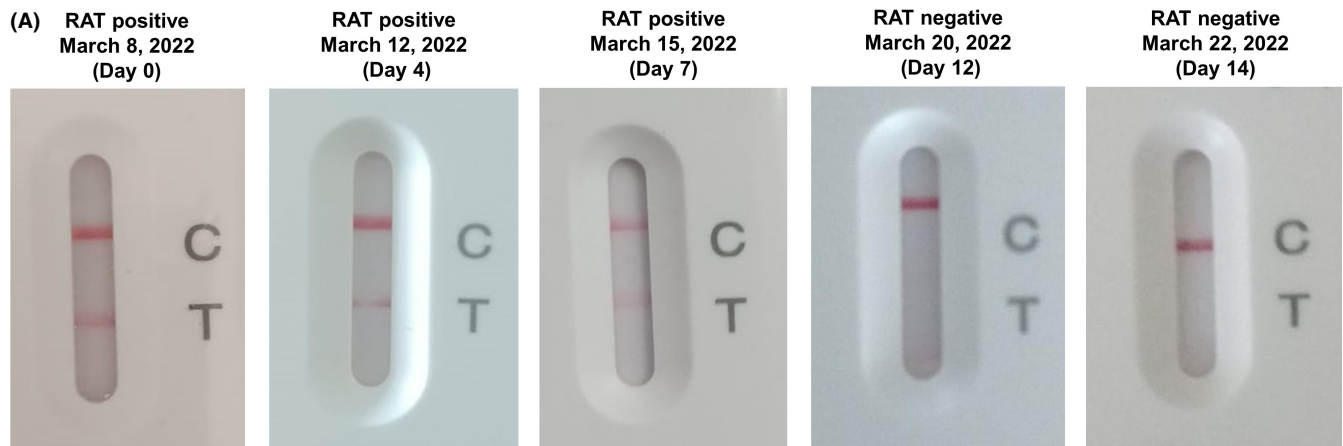
saturation improved, and RAT was negative by day 14 (Figure 1A). He returned to his baseline fitness-frailty within 3 weeks. The other helper and his wife subsequently were COVID-19 positive but had mild symptoms.

2.2 | Case 2

An 84-year-old woman presented with near-fall and delirium on March 12, 2022. She had hypertension, diabetes mellitus,

hyperlipidaemia, ischaemic heart disease, atrial fibrillation, old stroke, and was on nine drugs. She was living with and cared for by two helpers and was regularly visited by her son. Her baseline CFS score was 7.

She was COVID-19- positive on March 8, 2022 (Figure 2A), acquired from one helper. She had one COVID-19 vaccination. On the morning of March 12, 2022 before breakfast, her helpers noted she was unsteady and nearly fell after bathing. They lay her on the bed and gave her 4 L of oxygen. She recovered within an hour with a lying blood pressure of 134/76 mmHg. For 3 days, she had dizziness,



(B)



FIGURE 2 Clinical photos of Case 2. (A) Serial COVID-19 rapid antigen tests (RAT). Date of COVID-19 diagnosed taken as date of first RAT positivity (day 0). (B) Face and forehead on day 11 of COVID-19, showing vesicular rash distributed over the dermatome innervated by the right trigeminal nerve ophthalmic division.

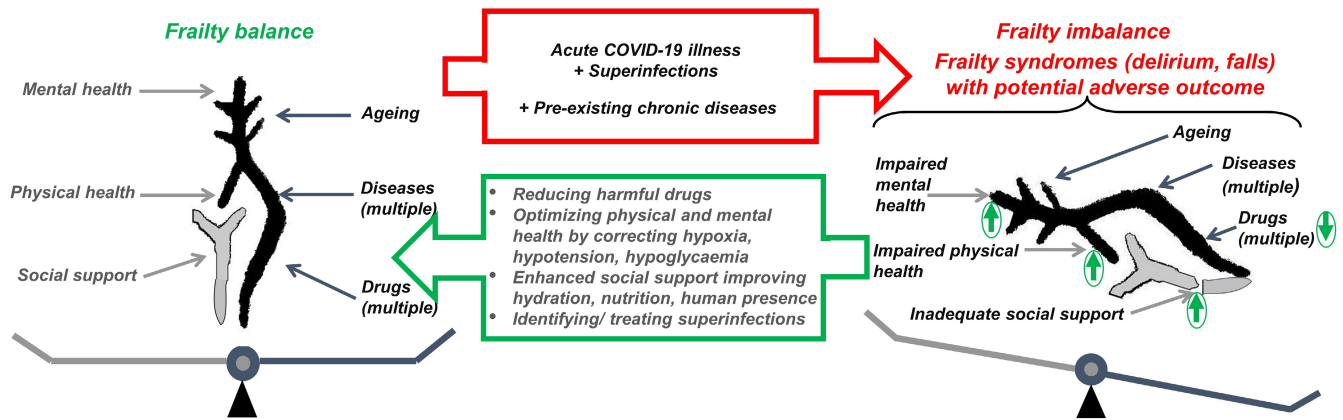


FIGURE 3 The frailty imbalance triggered by COVID-19 leading to frailty syndromes (delirium, falls) was restored by reducing harmful drugs; optimizing physical and mental health by correcting hypoxia, hypotension, and hypoglycemia; enhanced social support improving hydration, nutrition, and human presence; and identifying/treating superinfections (bacterial respiratory tract superinfection, herpes zoster).

fatigue, sleepiness, reduced appetite, cough, mobility decline, and confusion episodes. She took over-the-counter Maxigesic (paracetamol, ibuprofen) for fever (up to 38.2°C) and myalgia. Her daytime sitting systolic blood pressure was low, down to 99 mmHg. Fluid deficit was evidenced by deep yellow urine and 3 kg weight loss in 1 day. No tarry stool was passed. Her near-fall and delirium were due to postural hypotension, cerebral hypoperfusion, and hypoglycemia predisposed by medication (anti-hypertensives, diuretics, hypoglycemics) and precipitated by reduced fluid and food intake (from reduced appetite, sleepiness, delirium) and increased fluid loss (from fever). She improved following advice on medication reduction, frequent small meals, milk supplements, and increased fluid intake. She was advised to use paracetamol instead of Maxigesic to avoid the nephrotoxic and bleeding potential of ibuprofen. On day 11, herpes zoster ophthalmicus was diagnosed (Figure 2B) and treated with 1 week of Valacyclovir in renal dose. Her RAT was negative by day 12, and she recovered to her baseline frailty level within 3 weeks. Her other helper subsequently was COVID-19 positive with mild symptoms.

3 | DISCUSSION

These two patients, severely frail with chronic diseases and incompletely vaccinated, were expected to have unfavorable outcome.^{3,4} International guidelines suggested CFS score ≥ 5 as triage criteria for excluding COVID-19 patients from intensive care.⁶ However, provision of geriatric telemedicine and wellness care allowed both COVID-19 patients to be treated at home with full recovery. Stressed by COVID-19, both presented with Isaacs' geriatric giants of intellectual impairment (delirium) and instability (falls)⁷ and frailty syndromes of high order system failure of brain and balance.^{8,9} These reflect the multiple, interacting medical and social deficits raising the risk of adverse outcomes. Geriatric medicine embraces frailty and directs attention away from organ-specific diagnoses towards holistic management.^{8,9}

Their successful outcome resulted not from COVID-19 antiviral treatment, but from individualized person-centered care attending to the frailty syndromes triggered by COVID-19 (Figure 3). These include optimized treatment of comorbid conditions by medication review (of current drugs as informed by family members and recorded in Electronic Health Record Sharing System), medication reduction on recognition of drug-induced hypotension (hypertension and ischaemic heart disease overtreated with eplerenone and furosemide) and hypoglycaemia (diabetes mellitus overtreated with Linagliptin), appropriate use of medication to reduce iatrogenesis, caregivers' replenishment of fluid and nutrition deficit (hydration status as guided by urine color and body weight changes, fasting hemoglucostix to watch out for hypoglycaemia from inadequate dietary intake), oxygen support during critical hypoxic period, and recognition and early treatment of superimposed infections. A review highlighted the importance of appropriate antibiotic use in reducing COVID-19 mortality,¹⁰ and the first patient did improve after Augmentin prescribed for bacterial respiratory tract superinfection. Herpes zoster associated with COVID-19 had been reported,¹¹ and awareness of this association prompted its early diagnosis in the second patient and treatment with valacyclovir.

Home care by geriatric telemedicine was wanted by these two frail older adults amidst an overburdened hospital system. Their social support was good. Family members and helpers of the same household, though COVID-19 infected, had mild symptoms only and became invaluable resources in providing the much-needed personal care, nutrition, hydration, comfort, and health monitoring to keep the geriatrician informed of their condition and to draw up an individualized management plan. Others in their social network helped in collecting drug prescriptions and oxygen concentration machine and purchasing finger-tip pulse oximeters and RATs. Home environment and human presence were therapeutic in delirium care, avoiding damage from separation and isolation^{12,13} commonly practiced in this COVID-19 pandemic.¹⁴

Telemedicine has been pioneered to care for nursing home residents and stroke patients for post-acute and rehabilitative care since

the 2000s in Hong Kong.¹⁵ COVID-19 has accelerated the adoption of telemedicine and hospital-at-home internationally.^{16,17} In the light of the COVID-19 Omicron tsunami and the increase in the demand for medical support by the public in March 2022, the Government of the Hong Kong Special Administrative Region has encouraged more private hospitals to provide telemedicine services to members of the public, including COVID-19 patients.¹⁸ Besides shouldering health care when hospital capacity is overwhelmed, geriatric telemedicine to frail older adults at home can have the added advantages of treatment in elder-friendly environment and reduced iatrogenesis as demonstrated in the two patients described here and is a good alternative care model to consider when family and social support is good.

AUTHOR CONTRIBUTIONS

The author is the sole contributor.

ACKNOWLEDGEMENTS

I acknowledge the contribution to the care of the patients reported here from their family and helpers.

FUNDING INFORMATION

Not Applicable.

CONFLICT OF INTEREST

Nothing to disclose.

INFORMED CONSENT

Consent from the patients in reporting the cases are obtained.

ORCID

Tak-kwan Kong  <https://orcid.org/0000-0003-4340-7479>

REFERENCES

- The Government of the Hong Kong Special Administrative Region Press Releases. Government announces arrangements for persons pending admission to hospitals or isolation facilities. 2022. <https://www.info.gov.hk/gia/general/202202/15/P2022021500524.htm>. Accessed 26 Apr 2022.
- The Government of the Hong Kong Special Administrative Region COVID-19 Thematic Website. Archive of statistics on 5th wave of COVID-19. <https://www.coronavirus.gov.hk/eng/5th-wave-statistics.html>. Accessed 23 June 2022.
- Geriatric Medicine Research Collaborative. Age and frailty are independently associated with increased COVID-19 mortality and increased care needs in survivors: results of an international multi-Centre study. *Age Ageing*. 2021;50(3):617-630. doi:10.1093/ageing/afab026
- The Government of the Hong Kong Special Administrative Region COVID-19 Thematic Website. Provisional data analysis on COVID-19 reported death cases (from 31 Dec 2021 up till 15 June 2022 00:00). 16 June 2022. https://www.covidvaccine.gov.hk/pdf/death_analysis.pdf. Accessed 23 June 2022.
- Theou O, Pérez-Zepeda MU, van der Valk AM, Searle SD, Howlett SE, Rockwood K. A classification tree to assist with routine scoring of the clinical frailty scale. *Age Ageing*. 2021;50(4):1406-1411. doi:10.1093/ageing/afab006
- Rockwood K, Theou O. Using the clinical frailty scale in allocating scarce health care resources. *Can Geriatr J*. 2020;23(3):210-215. doi:10.5770/cgj.23.463
- Kong TK. In memory of Professor Bernard Isaacs. *J Hong Kong Geriatr Soc*. 1996;7(1):31-32. https://scholar.google.com/citations?view_op=view_citation&hl=en&user=tDwNYpcAAA&AJ&scstart=20&pagesize=80&sortby=pubdate&citation_for_view=tDwNYpcAAA&R3hNpxXUuUC. Accessed April 26 2022.
- Rockwood K, Shi J, Yu P, Song X. Translating Isaacs: the "geriatric giants in China". *Chin J Geriatr*. 2016;35(10):1027-1029. doi:10.3760/cma.j.issn.0254-9026.2016.10.001
- Clegg A, Young J, Iliffe S, Rikkert MO, Rockwood K. Frailty in elderly people. *Lancet*. 2013;381(9868):752-762. doi:10.1016/S0140-6736(12)62167-9
- Ginsburg AS, Klugman KP. COVID-19 pneumonia and the appropriate use of antibiotics. *Lancet Glob Health*. 2020;8(12):e1453-e1454. doi:10.1016/S2214-109X(20)30444-7
- Algaadi SA. Herpes zoster and COVID-19 infection: a coincidence or a causal relationship? *Infection*. 2022;50(2):289-293. doi:10.1007/s15010-021-01714-6
- Abad C, Fearday A, Safdar N. Adverse effects of isolation in hospitalised patients: a systematic review. *J Hosp Infect*. 2010;76(2):97-102. doi:10.1016/j.jhin.2010.04.027
- Purcell E, Gould D, Chudleigh J. Impact of isolation on hospitalised patients who are infectious: systematic review with meta-analysis. *BMJ Open*. 2020;10(2):e030371. doi:10.1136/bmjopen-2019-030371
- Diamantis S, Noel C, Tarteret P, Vignier N, Gallien S. Groupe de Recherche et d'Etude des maladies Infectieuses - Paris S-E. severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)-related deaths in French long-term care facilities: the "confinement disease" is probably more deleterious than the coronavirus Disease-2019 (COVID-19) itself. *J Am Med Dir Assoc*. 2020;21(7):989-990. doi:10.1016/j.jamda.2020.04.023
- Yu TKK. Telemedicine. In: Kong T-K, ed. *The Hong Kong Geriatrics Society Curriculum in Geriatric Medicine*. 2nd ed. Hong Kong Academy of Medicine Press; 2017:71-76. <http://www.hkgs.org/image/files/HKGS-2nd-Curriculum-ebook-HKGS%20copy.pdf>. Accessed April 26 2022.
- Ahmed S, Sanghvi K, Yeo D. Telemedicine takes Centre stage during COVID-19 pandemic. *BMJ Innov*. 2020;6(4):252-254. doi:10.1136/bmjinnov-2020-000440
- Lasserson D. Older people with multiple long term conditions part 1 - can we really bring the hospital into the home? Royal College of Physicians of Edinburgh Symposium on Medicine of Older People. 2022, 11 March 2022. <https://events.rcpe.ac.uk/medicine-older-people>
- The Government of the Hong Kong Special Administrative Region Press Releases. Government responds to media reports on telemedicine services and medical and health sector's support to fight against epidemic. 16 March 2022. <https://www.info.gov.hk/gia/general/202203/16/P2022031600695.htm>. Accessed 13 June 2022.

How to cite this article: Kong T-k. Favorable outcome of geriatric telemedicine for frail older adults with COVID-19 staying at home during the omicron tsunami in Hong Kong. *Aging Med*. 2022;5:232-236. doi: [10.1002/agem2.12218](https://doi.org/10.1002/agem2.12218)