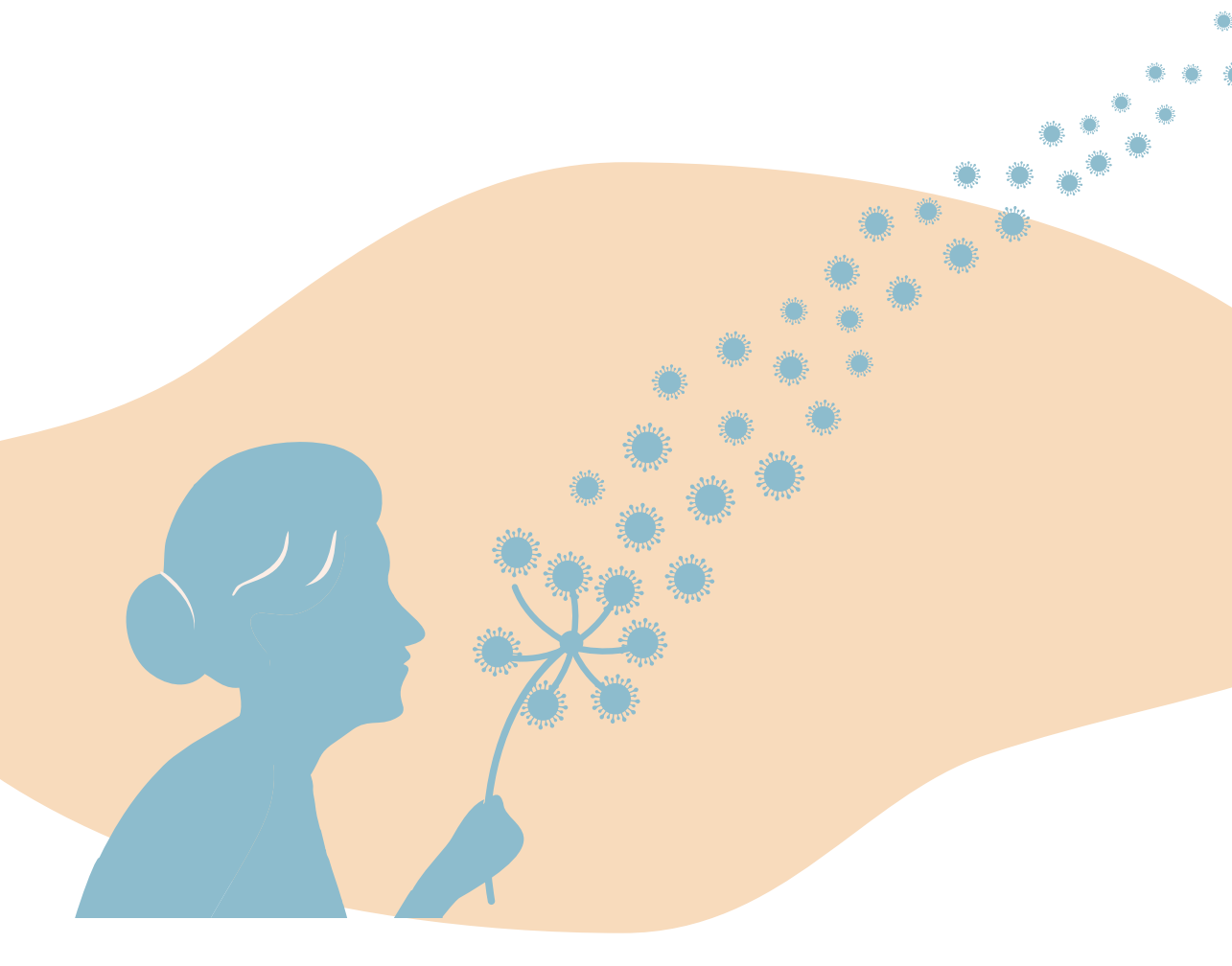
The COVID-19 pandemic and vulnerable older persons: impact of a public health emergency on nursing homes and geriatric rehabilitation

Tol, L.S. van



1

General introduction

SITUATION OUTLINE: DUTCH NEWS ARTICLES PUBLISHED MARCH AND APRIL 2020

On March 12, 2020, a press conference and subsequent news reports announced "*corona measures: stay at home with mild complaints, mass cancellation of events* " (1). Dutch citizens with mild symptoms of COVID-19 were advised to avoid social contacts and stay home, to cancel events with more than 100 people, and to limit visits to older persons. In addition, older persons were advised to avoid public transport and large groups of people.

March 15, 2020 was labelled as "*The day the Netherlands went into further lockdown*" (2). All schools, childcare centres, cafes, restaurants and sports clubs in the Netherlands had to close down. These measures would last for at least three weeks until April 6.

A headline on Thursday March 19, 2020: *"Visits to nursing homes are no longer possible due to coronavirus"* (3). It was announced that as of March 20, nursing homes had to close their doors to visitors and others "*who are not necessary for basic care needs*", until at least April 6. Occasionally, an exception could be made for residents in the dying phase. The Minister of Health, Welfare and Sport said at a press conference: "…*We did not take this decision lightly. But we must protect the people we love*".

On Friday April 10, 2020, a news article appeared entitled: "*Silent disaster at nursing homes: 'Older persons dying here one by one'*" (4). The article described the situation in a nursing home in the south of the country, where entire floors were in total isolation. A nurse who works there sees the residents she is taking care of die one by one. In some departments more than half of the residents died.

On April 19, 2020 the article "*Locked up in the nursing home but no corona: 'She is dying of loneliness'*" was published (5), and on April 21 an article describing that more and more nursing home residents "*would rather have corona than go through this long crisis alone.*" (6).

A NEW DISEASE WITH FAR-REACHING CONSEQUENCES

From new disease to pandemic

Coronavirus disease 2019 (COVID-19), caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), was discovered in Wuhan, China, in early December 2019 (7). In January 2020, the virus started to spread rapidly across the world (8). It soon became

clear that this new disease would pose a serious threat to global public health, especially to vulnerable populations. On January 30, 2020, the World Health Organization (WHO) declared the COVID-19 pandemic a public health emergency of international concern – the highest level of alarm under international law (9, 10).

COVID-19 reached Europe at the end of January 2020 (8). In the Netherlands, the first official COVID-19 diagnosis was confirmed on February 27, 2020 (11), and the first death occurred on March 6, 2020 (12). The first large COVID-19 outbreak in Europe occurred in Lombardy, Italy, starting early March 2020 (13). By mid-March Europe had become the epicentre of the global pandemic (14).

Fear of the unknown

There was a great lack of knowledge about this new disease. Before the COVID-19 pandemic, leading international healthcare institutes such as the WHO and the European Centre for Disease prevention and Control (ECDC) had warned of the risks of global pandemics and published recommendations for pandemic preparedness and response (15, 16). However, when the COVID-19 pandemic began, many of these recommendations could not be implemented due to the lack of diagnostic tests, a cure, and vaccines (17). When the first deaths occurred, there was still uncertainty about how to clinically diagnose COVID-19 and how to distinguish COVID-19 from influenza and other infectious diseases that cause similar symptoms (18). Among the few tools available to prevent further spread of the virus were containment and mitigation strategies (17, 19, 20), referred to in this thesis as infection prevention measures.

SARS-CoV-2 infection was suspected in anyone who developed a cough, a sore throat, shortness of breath (dyspnoea), loss or change of smell or taste, a congested nose, runny nose (rhinorrhoea), headache, fatigue and weakness, fever, and myalgia (21, 22). These symptoms made people fear for their own health, worry about illness and death of their loved ones, and infecting others (23). In addition, it was still unknown how quickly the virus would spread, how many people would die from infection, and how long the pandemic would last. The high level of media attention given to the threats that COVID-19 posed to societies only increased people's fears (23).

Impact on the healthcare sector

The COVID-19 pandemic put pressure on healthcare systems. Healthcare facilities worldwide were inundated with a large influx of COVID-19 patients. By the end of March 2020, Dutch Intensive Care Units (ICUs) were almost full, with more than 1,100 COVID-19 patients in (24). With this limited ICU capacity, ethical dilemmas arose, such as deciding who to treat and who not to treat (25). Older persons braced themselves for possible

decision that there would be no place for them in the ICU (26), and were prompted to have conversations about advance care planning (24, 27). Healthcare workers saw many patients dying, they became ill, and often worked overtime (28). Regular healthcare services were frequently disrupted, cancelled, or postponed (29).

In order to provide care to as many incoming patients as possible, and to isolate COVID-19 patients from other patients, hospitals often reorganized their departments (30). Other healthcare facilities, such as nursing homes, played an important role in reducing the pressure on hospitals by creating COVID-19 units to care for COVID-19 patients who did not require intensive hospital care, thus enabling early hospital discharge of COVID-19 patients (31, 32). Nevertheless, the nursing home care sector itself was also hit hard by SARS-CoV-2 infections, as the news headlines above illustrate.

DUTCH NURSING HOMES

Dutch nursing home organizations provide a wide range of care and support services to the most vulnerable groups in our society: persons that require care or supervision 24 hours a day and suffer from long-term, complex health problems. The services provided to these residents include, but are not limited to, support in daily living, social care, palliative care, and other types of (medical) treatment (33, 34). In addition, many Dutch nursing homes provide more temporary inpatient or ambulatory geriatric rehabilitation (33). These services are provided by multidisciplinary teams that only in the Netherlands include specially trained elderly care physicians (33). To persons that do not require care or supervision 24 hours a day, nursing home care organizations often provide long-term care at home, in nursing home day-care, and in other types of residential long-term care facilities, such as care homes (33). Since most care homes in the Netherlands have been closed (35), residential long-term care facilities are referred to in this dissertation as 'nursing homes'.

Susceptibility to outbreaks of infectious diseases

Nursing home residents are susceptible to infection for several reasons. First, close contact between persons is often inherent in the setting of these care facilities. Residents live in clusters and often share common areas such as living rooms and sometimes also sanitary facilities with other residents, and they meet during communal meals and activities (36, 37). In addition, older residents are dependent on daily care that involves close contact with staff members, who move between multiple residents and may transfer the virus throughout the care facility (36, 38). The second reason for the high infection rates in nursing homes is that common characteristics of nursing home residents, including

advanced age, vulnerability, and comorbidities, are also risk factors for many infectious diseases (39, 40). More than 80 percent of residents suffer from multimorbidity, and a quarter have five or more chronic conditions (35). Third, many of the residents who suffer from cognitive impairment are unable to understand, remember, or physically comply with general hygiene rules and imposed infection prevention measures (37, 38). It has been estimated that about three-quarters of nursing home residents suffer from cognitive impairments (35).

ORGANIZATION OF INFECTION PREVENTION AND CONTROL IN NURSING HOMES

Before to the COVID-19 pandemic, nursing homes regularly dealt with outbreaks of infectious diseases, such as influenza, norovirus disease, and methicillin-resistant Staphylococcus aureus (MRSA) infection (41). Therefore, nursing home organizations have an internal structure for hygiene, infection prevention, and control. As recommended by the WHO, an infection prevention and control committee is usually responsible for maintaining hygiene standards, monitoring infection rates, implementing and lifting infection prevention measures, and educating staff about infection prevention (42). During severe infectious disease outbreaks, infection prevention committees convert to or establish outbreak teams (43). These outbreak teams are responsible for implementing and lifting infection prevention measures based on the organization's protocols, and for internal communication (43).

In the early stages of the COVID-19 pandemic, no COVID-19-specific guidelines had been developed yet. However, infection prevention committees and outbreak teams could draw inspiration from infection prevention measures described in existing guidelines for other infectious diseases. For the common infectious diseases mentioned above, guidelines have been published by the Infection Prevention Working Group (de Werkgroep Infectie Preventie, WIP) (44), Partnership Guidelines Infection Prevention (Samenwerkingsverband Richtlijnen Infectiepreventie, SRI) (45), and Centers for Disease Control and Prevention (46). These guidelines recommend, for example, various types of isolation measures and imposing cohorts, personal hygiene, hand hygiene, and the use of personal protective equipment (PPE) by staff and visitors.

Despite these guidelines for other diseases, it was difficult to make ad hoc national and local policy decisions while COVID-19-specific knowledge was still lacking. The Ministry of Public Health, Welfare, and Sport needed insight into what was happening in the sector. Nursing home organizations expressed the need to share and learn from the

experiences gained so far. To accommodate both these needs, the academic University Network for the Care sector Zuid-Holland (UNC-ZH), together with the University Network of Elderly Care Organizations of the University Medical Center Groningen (UNO-UMCG), quickly started the 'COVID-19 management in nursing homes by outbreak teams' (MINUTES) study.

GERIATRIC REHABILITATION AND COVID-19

Not only nursing home residents, but also vulnerable older persons living at home were severely affected by COVID-19. Older COVID-19 patients living at home require hospitalization and admission to an ICU more often than younger patients. By the end of March 2020, half of the COVID-19 patients admitted to Dutch hospitals were 71 years and older (47). This group of older persons is at risk of serious health deterioration (48). Offering support in their recovery may optimize their health outcomes (49). Especially given the large numbers of COVID-19 patients and the pressure to quickly make room for new patients, older patients should be supported in their continuing recovery process after discharge from acute care hospital departments. Recovery support for older persons is usually provided in the form of geriatric rehabilitation.

Geriatric rehabilitation involves "*a multidimensional approach of diagnostic and therapeutic interventions, the purpose of which is to optimise functional capacity, promote activity and preserve functional reserve and social participation in older people with disabling impairments.*" (50). These older people with disabling impairments are more likely than younger patient groups to have a complex health status, including multimorbidity, chronic conditions, cognitive impairments, and frailty (51). Geriatric rehabilitation is tailored to their specific needs (51). In addition, the focus of geriatric rehabilitation is usually not on complete medical recovery, but on regaining independence in daily functioning, preserving functional reserve, promoting activity, social participation, overall well-being, and person-centred goals (50). Throughout Europe, there has been a growing awareness of the importance of geriatric rehabilitation in recent years. However, there are differences across the continent in the formal recognition, national policies and reimbursements, and organization of geriatric rehabilitation care (51, 52).

Early COVID-19 studies indicated that the rehabilitation process after COVID-19 can be unpredictable (48, 53, 54). It was important to know the extent to which older persons recovered after a COVID-19 infection. In addition, it was unknown which geriatric rehabilitation care services best supported COVID-19 recovery. Therefore, in September 2020, the UNC-ZH and members of the EuGMS special interest group for geriatric reha-

bilitation joined forces to set up the European Cooperation in Geriatric Rehabilitation (EU-COGER) after the COVID-19 study. Their aim was to gain insight into the recovery process of persons receiving geriatric rehabilitation because of a SARS-CoV-2 infection (55).

RESEARCH QUESTIONS

This thesis has two main aims regarding nursing home care and geriatric rehabilitation for vulnerable older persons during the COVID-19 pandemic:

1. To describe the impact of, challenges presented by, and policy responses of Dutch nursing home organizations to the COVID-19 pandemic (Part 1).
2. To describe the recovery trajectories of post-acute COVID-19 patients admitted to geriatric rehabilitation and the geriatric rehabilitation care provided to these patients across Europe (Part 2).

Part 1 of this thesis consists of chapters 2 to 6 and presents results of the MINUTES study. In this study we analysed the content of the minutes of the COVID-19 outbreak teams to provide insight into the decisions made by these outbreak teams. In addition, experiences with these decisions were discussed with panels of nursing home staff and resident representatives in a Nominal Group Technique (NGT) study.

Chapter 2 provides insight into the impact of, challenges presented by, and responses to the COVID-19 pandemic, by describing the COVID-19 outbreak teams that were set up by nursing home organizations and by presenting the topics that required the most attention from these teams. In addition, this chapter outlines the design of the MINUTES study. **Chapter 3** provides an overview of the physical distancing measures that were discussed and imposed in nursing homes, and of the challenges that were encountered as a result of these measures. **Chapter 4** shows which activities for residents were cancelled, continued, or started in nursing homes during different periods of the pandemic and what considerations these decisions were based on. In **Chapter 5**, nursing home staff and resident representatives prioritize what they consider to be the most important measures for either preventing infections or maintaining the well-being of nursing home residents during COVID-19 outbreaks. In addition, this chapter describes how nursing home staff and resident representatives experience decision-making processes regarding COVID-19 measures in nursing homes. **Chapter 6** identifies strategies that are used and considered to be important to increase the willingness of nursing home staff to be vaccinated against COVID-19.

Part 2 of this thesis consists of chapters 7 and 8 and presents the results of the EU-COGER study. In this longitudinal observational cohort study, data were collected on the regular care of persons admitted to geriatric rehabilitation for recovery from COVID-19 in various European countries. **Chapter 7** provides insight into the recovery trajectory of COVID-19 patients in geriatric rehabilitation by modeling their daily functioning and quality of life over time. In addition, this chapter examines whether the level of frailty of these patients at admission to geriatric rehabilitation is associated with the recovery trajectory. **Chapter 8** describes differences between the participating countries in the selection criteria for referral to geriatric rehabilitation, the geriatric rehabilitation care provided, and the recovery observed.

Chapter 9 presents a general discussion of the main findings, a broader perspective on these findings, and methodological considerations of the studies described in this thesis. Recommendations regarding COVID-19 and the care of vulnerable older persons are outlined for practice, policy, and education in nursing home and geriatric rehabilitation care, as well as for future research.

REFERENCES

1. Corona-maatregelen: thuisblijven bij milde klachten, evenementen massaal afgelast: NOS; 2020 [updated March 12 2020. Available from: https://nos.nl/artikel/2326868-corona-maatregelen-thuisblijven-bij-milde-klachten-evenementen-massaal-afgelast.
2. Corona-overzicht 15 maart: de dag dat Nederland verder op slot ging: NOS; 2020 Available from: https://nos.nl/artikel/2327219-corona-overzicht-15-maart-de-dag-dat-nederland-verder-op-slot-ging.
3. Bezoek aan verpleeghuizen niet langer mogelijk vanwege coronavirus: Rijksoverheid; 2020. Available from: https://www.rijksoverheid.nl/actueel/nieuws/2020/03/19/bezoek-aan-verpleeghuizen-niet-langer-mogelijk-vanwege-corona#:~:text=Bezoek%20aan%20verpleeghuizen%20niet%20langer%20mogelijk%20vanwege%20coronavirus,-Nieuwsbericht%20%7C%2019%2D03&text=Verpleeghuizen%20en%20kleinschalige%20woonvormen%20in,vandaag%20bekend%20namens%20het%20kabinet.
4. Stille ramp in verpleeghuis: 'De ouderen gaan hier één-voor-één dood': Nieuwsuur; 2020. Available from: https://nos.nl/nieuwsuur/artikel/2330102-stille-ramp-in-verpleeghuis-de-ouderen-gaan-hier-een-voor-een-dood.
5. Opgesloten in het verpleeghuis maar geen corona: 'Ze sterft aan eenzaamheid': NOS; 2024 Available from: https://nos.nl/artikel/2331028-opgesloten-in-het-verpleeghuis-maar-geen-corona-ze-sterft-aan-eenzaamheid.
6. Liever corona dan eenzaam deze lange crisis door, pleidooi voor bezoek in verzorgingstehuizen: Omroep Brabant; 2020]. Available from: https://www.omroepbrabant.nl/nieuws/3191502/liever-corona-dan-eenzaam-deze-lange-crisis-door-pleidooi-voor-bezoek-in-verzorgingstehuizen.
7. Allam Z. The first 50 days of COVID-19: A detailed chronological timeline and extensive review of literature documenting the pandemic. Surveying the Covid-19 Pandemic and Its Implications. ScienceDirect: Elsevier; 2020. p. 1 - 7.
8. Stoecklin SB, Rolland P, Silue Y, Mailles A, Campese C, Simondon A, et al. First cases of coronavirus disease 2019 (COVID-19) in France: surveillance, investigations and control measures, January 2020. Eurosurveillance. 2020;25(6):20-6.
9. Statement on the fifteenth meeting of the IHR (2005) Emergency Committee on the COVID-19 pandemic: World Health Organization (WHO); 2023. Available from: https://www.who.int/news/item/05-05-2023-statement-on-the-fifteenth-meeting-of-the-international-health-regulations-(2005)-emergency-committee-regarding-the-coronavirus-disease-(covid-19)-pandemic.
10. WHO chief declares end to COVID-19 as a global health emergency https://news.un.org United Nations (UN); 2023. Available from: https://news.un.org/en/story/2023/0
11. Man diagnosed with coronavirus (COVID-19) in the Netherlands government.nl/latest/news: Government of the Netherlands; 2020. Available from: https://www.government.nl/latest/news/2020/02/27/man-diagnosed-with-coronavirus-covid-19-in-the-netherlands.
12. Patiënt met nieuw coronavirus overleden: Rijksinstituut voor Volksgezondheid en Milieu (RIVM); 2020. Available from: https://www.rivm.nl/nieuws/patient-met-nieuw-coronavirus-overleden.
13. Saglietto A, D'Ascenzo F, Zoccai GB, De Ferrari GM. COVID-19 in Europe: the Italian lesson. Lancet. 2020;395(10230):1110-1.
14. WHO Director-General's opening remarkts at the media briefing on COVID-19 - 13 March 2020 https://www.who.int/director-general/speeches/detail: World Health Organization (WHO); 2020. Available from: https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-mission-briefing-on-covid-19---13-march-2020.

15. WHO. Strengthening response to pandemics and other public-health emergencies. Report of the Review Committee on the Functioning of the International Health Regulations (2005) and on Pandemic Influenza (H1N1) 2009. World Health Organization (WHO); 2011 Jan 1.
16. ECDC. Guide to revision of national pandemic influenza preparedness plans. Lessons learned from the 2009 A (H1N1) pandemic. Stockholm: European Centre for Disease prevention and Control (ECDC); 2017 Nov.
17. OECD. Flattening the COVID-19 peak: Containment and mitigation policies. https://www.oecd.org/coronavirus/en/policy-responses: OECD; 2020 Update 24 March 2020.
18. Zayet S, Kadiane-Oussou NJ, Lepiller Q, Zahra H, Royer PY, Toko L, et al. Clinical features of COVID-19 and influenza: a comparative study on Nord Franche-Comte cluster. Microbes Infect. 2020;22(9):481-8.
19. WHO. Module 1: Planning for respiratory pathogen pandemics. Version 1.0. https://www.who.int/publications/: World Health Organization (WHO) April 2023.
20. Mujica G, Sternberg Z, Solis J, Wand T, Carrasco P, Henao-Martinez AF, et al. Defusing COVID-19: Lessons Learned from a Century of Pandemics. Trop Med Infect Dis. 2020;5(4).
21. Long B, Carius BM, Chavez S, Liang SY, Brady WJ, Koyfman A, et al. Clinical update on COVID-19 for the emergency clinician: Presentation and evaluation. Am J Emerg Med. 2022;54:46-57.
22. Lechien JR, Chiesa-Estomba CM, Place S, Van Laethem Y, Cabaraux P, Mat Q, et al. Clinical and epidemiological characteristics of 1420 European patients with mild-to-moderate coronavirus disease 2019. J Intern Med. 2020;288(3):335-44.
23. Mertens G, Gerritsen L, Duijndam S, Salemink E, Engelhard IM. Fear of the coronavirus (COVID-19): Predictors in an online study conducted in March 2020. J Anxiety Disord. 2020;74:102258.
24. Waarom de ic's nu al vollopen, maar de echte piek pas over een tijd volgt: NU.nl; 2020. Available from: https://www.nu.nl/uitleg-over-het-coronavirus/6041684/waarom-de-ics-nu-al-vollopen-maar-de-echte-piek-pas-over-een-tijd-volgt.html.
25. Jaziri R, Alnahdi S. Choosing which COVID-19 patient to save? The ethical triage and rationing dilemma. Ethics Med Public Health. 2020;15:100570.
26. Verweij M, van de Vathorst S, Schermer M, Willems D, de Vries M. Ethical Advice for an Intensive Care Triage Protocol in the COVID-19 Pandemic: Lessons Learned from The Netherlands. Public Health Ethics. 2020;13(2):157-65.
27. Gordon AL, Goodman C, Achterberg W, Barker RO, Burns E, Hanratty B, et al. Commentary: COVID in care homes-challenges and dilemmas in healthcare delivery. Age and Ageing. 2020;49(5):701-5.
28. Ranney ML, Griffeth V, Jha AK. Critical Supply Shortages - The Need for Ventilators and Personal Protective Equipment during the Covid-19 Pandemic. N Engl J Med. 2020;382(18):e41.
29. Chang AY, Cullen MR, Harrington RA, Barry M. The impact of novel coronavirus COVID-19 on non-communicable disease patients and health systems: a review. J Intern Med. 2021;289(4):450-62.
30. Winkelmann J, Webb E, Williams GA, Hernandez-Quevedo C, Maier CB, Panteli D. European countries' responses in ensuring sufficient physical infrastructure and workforce capacity during the first COVID-19 wave. Health Policy. 2022;126(5):362-72.
31. Ministerie van Volksgezondheid WeSV. Feitenreconstructie. Thema: Extra bedden buiten het ziekenhuis. Periode: februari 2020 tot en met juli 2020. Ministerie van Volksgezondheid, Welzijn en Sport (VWS); 2023 Aug.
32. Bosch AL, S. Verpleeg- en verzorgingshuizen in regio klaar voor opname herstellende coronapatiënten uit Isala. de Stentor. 2020 Mar.

33. Achterberg WP, Caljouw MAA, Husebo BS. Towards academic nursing home medicine: a Dutch example for Norway? Omsorg. 2025;1:70-5.
34. Healthcare in the Netherlands. Ministry of Public Health, Welfare and Sport; 2016 31 January 2016.
35. Verbeek-Oudijk D, Koper I. Het leven in een verpleeghuis. Landelijk overzicht van de leefsituatie, ervaren kwaliteit van leven en zorg van oudere verpleeghuisbewoners in 2019. Sociaal en Cultureel Planbureau (SCP); February 2021.
36. Ayalon L, Zisberg A, Cohn-Schwartz E, Cohen-Mansfield J, Perel-Levin S, Bar-Asher Siegal E. Long-term care settings in the times of COVID-19: challenges and future directions. Int Psychogeriatr. 2020;32(10):1239-43.
37. Gardner W, States D, Bagley N. The Coronavirus and the Risks to the Elderly in Long-Term Care. J Aging Soc Policy. 2020;32(4-5):310-5.
38. Dichter MN, Sander M, Seismann-Petersen S, Köpke S. COVID-19: it is time to balance infection management and person-centered care to maintain mental health of people living in German nursing homes. International Psychogeriatrics. 2020;32(10):1157-60.
39. Gavazzi G, Krause KH. Ageing and infection. Lancet Infect Dis. 2002;2(11):659-66.
40. Fulop T, Larbi A, Witkowski JM, McElhaney J, Loeb M, Mitnitski A, et al. Aging, frailty and age-related diseases. Biogerontology. 2010;11(5):547-63.
41. Bloch N, Manner J, Gardiol C, Kohler P, Kuhn J, Munzer T, et al. Effective infection prevention and control measures in long-term care facilities in non-outbreak and outbreak settings: a systematic literature review. Antimicrob Resist Infect Control. 2023;12(1):113.
42. WHO. Minumum requirements for infection prevention and control programmes. World Health Organization (WHO); 2019.
43. Verenso. Handreiking Uitbraakmanagement. Verenso; 2023 September 21 2023.
44. WIP. Norovirus. Verpleeghuizen, woonzorgcentra en voorzieningen voor kleinschalig wonen voor ouderen. Rijksinstituut voor Volksgezondheid en Milieu (RIVM); 2016 Jun 30.
45. Alle richtlijnen: Samenwerkingsverband Richtlijnen Infectiepreventie (SRI); [cited 2024 April 11]. Available from: https://www.sri-richtlijnen.nl/alle-richtlijnen.
46. Guideline Library: Centers for Disease Control and Prevention (CDC); [updated September 2 2020. Available from: https://www.cdc.gov/infectioncontrol/guidelines/index.html.
47. RIVM. Epidemiologische situatie COVID-19 in Nederland 28 maart 2020. Bilthoven: Rijksinstituut voor Volksgezondheid en Milieu; 2020 Mar 28.
48. Laher N, Bocchinfuso S, Chidiac M, Doherty C, Persson A, Warren E. The Biopsychosocial Impact of COVID-19 on Older Adults. Gerontol Geriatr Med. 2021;7:23337214211034274.
49. Bachmann S, Finger C, Huss A, Egger M, Stuck AE, Clough-Gorr KM. Inpatient rehabilitation specifically designed for geriatric patients: systematic review and meta-analysis of randomised controlled trials. BMJ. 2010;340:c1718.
50. Grund S, Gordon AL, van Balen R, Bachmann S, Cherubini A, Landi F, et al. European consensus on core principles and future priorities for geriatric rehabilitation: consensus statement. Eur Geriatr Med. 2020;11(2):233-8.
51. Achterberg WP, Cameron ID, Bauer JM, Schols JM. Geriatric Rehabilitation-State of the Art and Future Priorities. J Am Med Dir Assoc. 2019;20(4):396-8.
52. Grund S, van Wijngaarden JP, Gordon AL, Schols J, Bauer JM. EuGMS survey on structures of geriatric rehabilitation across Europe. Eur Geriatr Med. 2020;11(2):217-32.

53. Ramos JGR, Laporte LR, de Souza FR, de Andrade LF. Functional Outcomes of Severe COVID-19 Patients After a Post-Acute Care Hospitalization. Journal of the American Medical Directors Association. 2021;22(11):2265-6.
54. Piquet V, Luczak C, Seiler F, Monaury J, Martini A, Ward AB, et al. Do Patients With COVID-19 Benefit from Rehabilitation? Functional Outcomes of the First 100 Patients in a COVID-19 Rehabilitation Unit. Arch Phys Med Rehab. 2021;102(6):1067-74.
55. Grund S, Caljouw MAA, Haaksma ML, Gordon AL, van Balen R, Bauer JM, et al. Pan-European Study on Functional and Medical Recovery and Geriatric Rehabilitation Services of Post-COVID-19 Patients: Protocol of the EU-COGER Study. J Nutr Health Aging. 2021;25(5):668-74.