

COVID-19: prevention and future initiative within nursing homes

Marysia Wrona

Laboratory for Geriatric Medicine, Department and Chair of Palliative Medicine, Poznan University of Medical Sciences, Poland

 <https://orcid.org/0000-0003-4482-3511>

Corresponding author: marysia.b.wrona@gmail.com

Sławomir Tobis

Laboratory for Geriatric Medicine, Department and Chair of Palliative Medicine, Poznan University of Medical Sciences, Poland

 <https://orcid.org/0000-0002-0764-3258>

Katarzyna Wieczorowska-Tobis


Laboratory for Geriatric Medicine, Department and Chair of Palliative Medicine, Poznan University of Medical Sciences, Poland

 <https://orcid.org/0000-0003-4017-3013>

Agnieszka Neumann-Podczaska

Laboratory for Geriatric Medicine, Department and Chair of Palliative Medicine, Poznan University of Medical Sciences, Poland

 <https://orcid.org/0000-0002-0060-7430>

 DOI: <https://doi.org/10.20883/medical.e451>

Keywords: long term living facilities, elderly, older individuals, SARS-CoV-2

Published: 2020-09-30

How to cite: Wrona M, Tobis S, Wieczorowska-Tobis K, Neumann-Podczaska A. COVID-19: prevention and future initiative within nursing homes. JMS [Internet]. 2020 Sep 30;89(3):e451. doi:10.20883/medical.e451



© 2020 by the author(s). This is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY-NC) licence. Published by Poznan University of Medical Sciences

ABSTRACT

The high COVID-19 mortality rate in nursing homes in the United States and internationally prompted a comprehensive mini literature review concerning the prevalence, preventative protocol, and proactive initiatives against the highly infectious COVID-19. PubMed articles published between January and June 2020 and data sourced from government ministries of health concerning COVID-19 in nursing homes were used for this review. The prevalence and mortality rate in seven countries were compared. The underlying theme of the articles reviewed addressed four focus areas for the prevention of infectious disease spread: diagnostics, protection of residents in nursing facilities, administration and staff protection, and legislative advocacy. Adaptations and solutions may reduce the current transmission of COVID-19 within nursing homes, as well as in the future.

Introduction

An unexpected demographic group that has been significantly impacted by the coronavirus disease 2019 (COVID-19) pandemic are the elderly in nursing homes and long-term facilities. The rapid spread within a long-term skilled facility was highlighted by the first report published on 28th February 2020 in King County, Washington [1]. For the most part, COVID-19 cases in nursing homes are related to the facility location and

size, not quality metrics [2]. The illness caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) affects the elderly far more severely due to the multiple comorbidities, cognitive and behavioural issues, and living situations [3]. The focus of this literature review is to highlight the prevalence and mortality rate of COVID-19 within nursing facilities, and in turn, review which preventative measures could lower the transmission of an infectious outbreak in the future.

Material and Methods

Prevalence and mortality rates within nursing homes were collected from countries' government health ministry COVID-19 data pages. The selected countries had data on COVID-19 cases within nursing facilities.

A literature review was performed using the PubMed database, focusing on preventative measures against COVID-19 within nursing homes. The search criteria were limited to articles and data published between January 2020 to June 2020 using the following keyword(s): nursing home(s), long-term living facility, elderly, older individual(s), COVID-19, SARS-CoV-2, prevalence, mortality rate. An article was excluded if it had no substantial pro-

ocol for infection prevention or failed to address the nursing facility population. Articles were selected for review if they identified an issue regarding infection spread or proposed a protocol to preserve the health of residents and the workforce.

Results

Table 1 summarises data collected from seven countries: Belgium, Spain, Germany, Singapore, Australia, Canada, and the United States. The data comprised of the number of cases and deaths in affected long-term care facilities (LTCF) and showed that the population within care facilities in these countries had been significantly affected by COVID-19, with deaths among residents

Table 1. COVID-19 cases and deaths in affected facilities that include residential care centres, long-term care facilities, and nursing homes around the world

Country	Report date	Affected facilities	Total number of COVID-19 cases	Confirmed COVID-19 cases in LTCF	COVID-19 related deaths in LTCF	Total number of COVID-19 deaths	% of LTCF deaths
Belgium [4]	15 th June 2020	Residential care centres	60,100	N/A	4,472	9,661	46%
Spain [5]	15 th June 2020	Residential care centres	246,272	N/A	19,549	28,323	69%
Germany [6]	15 th June 2020	Facilities for the care of older, dabled, or other persons in need of care, homeless shelters, community facilities for asylum	186,461	17,300	3,439	8,791	39%
Singapore [7]	3 rd May 2020	LTCF run by governments, non-profit organisations, and the private sector	18,205	N/A	2	18	11%
Australia [8]	21 st June 2020	Australian government subsidised residential aged care facilities	7,461	71	29	102	28%
Canada [9]	22 nd April 2020	Long-term care or other residential care settings (including retirement homes and assisted living facilities)	40,179	6,519	1,240	1,974	62%
United States [10]	14 th May 2020	Medicare skilled nursing facility/Medicaid nursing facility	1,480,873	107,389	29,497	89,219	33%

* official data on COVID-19 related deaths among home care residents is not available for all countries due to discrepancies among testing availability and polices in documenting deaths

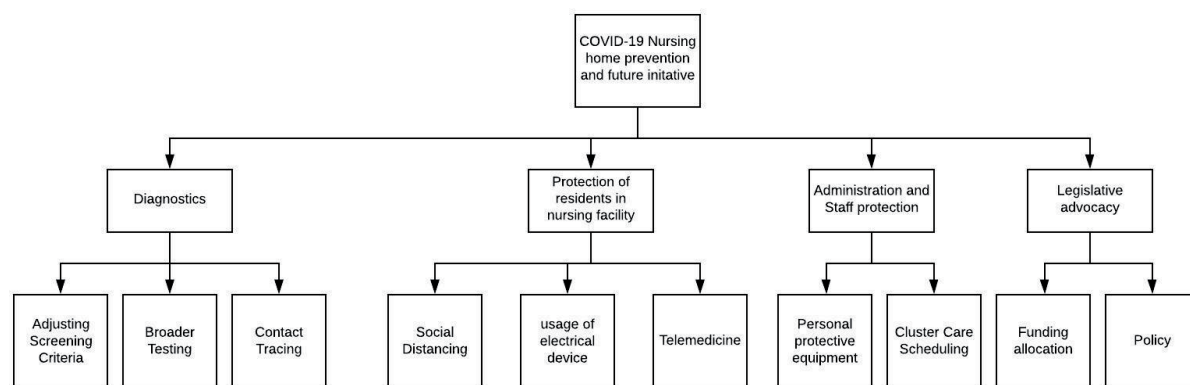


Figure 1. Summary of the nursing home preventative actions against COVID-19 based on the available studies

Table 2. Studies associated with COVID-19 in nursing homes found through PubMed

Study	Objective	Method	Preventative Action	Results	Summary
McMichael et al [1]	Investigation of confirmed cases of COVID-19 in a skilled nursing facility in King County, Washington on 28 th February 2020	Public Health-Seattle and King County, aided by the CDC launched an investigation; contact tracing initiated where COVID-19 positive individuals were interviewed to collect information regarding symptoms, severity, other chronic illnesses, travel history, and close contacts; diagnostic testing; survey to assess clusters of influenza-like illness among residents, staff, transfers, and other facilities in the area; survey assessed issues that may have contributed to infection spread	Diagnostic broad testing and adjusting screening criteria; administration and staffing cluster scheduling, personal protective equipment	4 cases confirmed at Facility A within King County with 45 residents and staff displaying symptoms on 28 th February 2020 As of 18 th March, 167 persons positive for COVID-19 linked to Facility A; most individuals had a range of symptoms besides 7 cases; the mortality rate was 33.7%; most individuals had underlying chronic illnesses; 3 other facilities were epidemiologically linked to Facility A Survey identified that vulnerability of facilities, staff who worked while symptomatic, staff working in multiple facilities, issues with PPE, and delayed recognition of cases	COVID-19 rapidly spreads once introduced into a skilled nursing facility, which has many negative consequences Steps against infection spread need to be implemented quickly Broad testing, staff management, PPE supply should be practised
Kimball et al [11]	Investigation of asymptomatic, presymptomatic SARS-CoV-2 cases in long-term care skilled nursing facility	1st case with a long-term care skilled nursing facility occurred on 28 th February 2020 On 13 th March, CDC performed system assessments and SARS-CoV-2 testing to assess utilisation of symptoms screen as a clinical assessment of COVID-19; residents categorised as asymptomatic or symptomatic at the time of testing and preceding 14 days	Diagnostic broad testing and adjusting screening criteria	76 of 82 residents tested positive; among 23 (30%) residents with positive results, 10 (43%) had symptoms and 13 (57%) were asymptomatic	Symptom-based screening misses the identification of all COVID-19 cases, even a person who is asymptomatic or presymptomatic can have a high quantity of viral RNA
Dora et al [12]	Investigation of confirmed cases of COVID-19 On 28 th March 2020, two residents in a long-term care skilled nursing facility at Veterans Affairs Greater Los Angeles Healthcare System had positive test results for COVID-19	During 29 th March 29–23 rd April, all staff and residents were tested every week by reverse transcription-polymerase chain reaction (RT-PCR) testing of nasopharyngeal specimens	Diagnostics broad testing and contact tracing	99 residents (19%) and eight of 136 (6%) staff members tested positive; isolation protocol implemented; additional testing on 13 th , 22 nd & 23 rd April showed no new positive cases	Broad testing of residents and staff members of a long-term care skilled nursing facility aided in the rapid identification of hotspots Isolation and grouping of these residents lead to a reduction in transmission within the facility Serial testing of residents performed until all were negative

Table 2. Continued

Study	Objective	Method	Preventative Action	Results	Summary
Banskota et al [13]	Show benefits of using mobile technology such as application to better quality of life during isolation of older adults	Apps review categorised as: social networking, medical, health and fitness, food and drinks, and visual and hearing Apps needed a rating of 4.5 or higher and at least 3000 reviews in the Apple Store Further screened based on function, cost, and ranking based on reviews	Protection of residents within the nursing facility through the use of electrical devices	Top apps social networking: Facetime and Skype medical: telemedicine (Teladoc, K Health Primary Care, Doctor on Demand), prescription management (GoodRx, Medisafe medication management) health and fitness: calm, headspace, MyFitnessPal, and Yoga: down dog food and drinks: Doordash and Instacart visual and hearing: Be my eyes- helping blind and Glide-live video messenger	Many apps available on many mobile device platforms can help older adults handle isolation by staying connected with others and maintain autonomy
Tan et al [14]	In Singapore, deaths of LTCF residents due to COVID-19 accounted for 14% of total fatalities as of 14 th April 2020	Following preventative strategies implemented rapidly across all LTCF: early management of LTCF residents with respiratory symptoms, transfer protocols between hospital and LTCF, increased temperature screening, restriction of visitors, social distancing, and segregation of staff and residents	Administration and staffing cluster scheduling, personal protective equipment	After a month, COVID-19 found in 6 nursing homes in Singapore; an increase in LTCF correlated with exponential community transmission meaning staff were at risk of catching the virus and spreading it to the residents	Staff management is very important in preventing the spread of infection
Quigley et al [15]	Preparedness of Nursing Homes across the nation	Emailed a 30-item survey to NH drawn from national surveys conducted in 2013 and 2015 (N=942); first email sent on 30 th March 2020 and reminder on 5 th April 2020	Administration and staff personal protective equipment and legislative allocation of funds	Fifty-six NH responded nationwide, representing 29 states within the United States Guidance and Preparedness: NH used 2–5 guidance documents by CDC, WHO, local government Greatest COVID-19 preparedness concern: lack of supplies (43%), especially PPE, staff shortages (34%), and resident health and safety (14%) Financial effects: most indicated increased costs for supplies (58%) and employee hours (38%), or fewer admissions (27%)	Results indicate further need for NHS to continue preparedness, with a particular focus on the lack of supplies, especially PPE

accounting for 11–69% of all COVID-19 related deaths (**Table 1**). Of the seven countries, Spain had the highest percentage of LTCF deaths, with the percentage of deaths in LTCF in Belgium, Germany, Australia, and the United States between 28–45%, highlighting the vulnerability of LTCF communities. Examples of effective preventative measures can be drawn from Singapore, where the percentage of deaths in LTCF was 11%.

Sixty-two articles matched keywords, but only six articles are summarised in **Table 2**, and **Figure 1** quantitatively addresses COVID-19 issues within nursing homes and provides preventative guidelines.

Discussion

The purpose of this literature review was to comprehensively address the high number of cases and deaths within nursing homes, the issue of infection prevention, and future mitigation of infectious spread. The underlying theme of the articles addressed four areas: diagnostics, protection of residents in nursing facilities, administration and staff protection, and legislative advocacy.

Diagnostics

The initial screening for COVID-19 is usually based on clinical presentation, with the most common symptoms being fever, cough, and shortness of breath [11]. Many elderly individuals present with atypical symptoms of satiety or altered mental status that can be confused as a symptom of age or a chronic illness [16]. Adjusting the screening criteria for COVID-19 to include these atypical symptoms needs to be implemented for the timely identification of cases. Furthermore, asymptomatic individuals can also have a high viral load [11]. Broad facility testing and serial testing of residents and staff should be implemented to identify clusters of infection [12], as the early identification of hotspots and initiation of infection protocols can significantly reduce the transmission within facilities [12]. Furthermore, an investigation of positive individuals can help identify weaknesses in the prevention protocol.

Protection of residents in nursing facilities

COVID-19 can rapidly spread among residents and staff once introduced into a skilled nursing facility, which may have many negative con-

sequences. Hence, many facilities implemented social distancing to slow down the communicable spread of COVID-19, with residents isolated from each other, restricted family visitation, and limited interaction with staff [12]. Though isolation reduces the spread of infection, it has some negative ramifications. The loss of communication with others, especially loved ones, lack of information, and loss of autonomy can psychologically impact a resident in a nursing home leading to depression [13]. However, the use of devices can help address this issue, as various apps that focus on social networking, telemedicine, prescription management, health and fitness, and food and drink can be utilised to improve the residents' quality of life [13]. Many residents of nursing homes are considered vulnerable COVID-19 due to their underlying health conditions, so telemedicine can be used to provide continuity of care by limiting the cross interaction with health care providers that may have been exposed to COVID-19 [16].

Administration and Staff Protection

Staff management is essential in preventing the spread of infection, as there is the potential for staff to acquire the virus through community transmission, then spread it to the facility residents [14]. To minimise cross interaction between residents and their multidisciplinary care team, cluster care scheduling of staff should be implemented whereby the staff are assigned to specific patients for the duration of their shift [17]. To protect the staff members who are putting themselves at risk, an adequate supply of personal protective equipment and additional resources need to be accessible. In addition, if the supply chain is limited, staff need to be educated on how to reuse resources throughout their shift in a safe manner [15].

Legislative advocacy

Unfortunately, often the elderly demographic is forgotten during a health crisis, therefore, emphasis needs to be placed on public health planning by collaborating with geriatric health experts, nursing home leadership, and government [18]. Reform and policies focusing on funding allocation need to be made so that resources, like personal protective gear, testing supplies, wages for increased staff, and smart device purchases, can be used within a nursing home to minimise the negative outcomes of an infectious outbreak.

If implemented, the above solutions can reduce the transmission of COVID-19 and help prepare facilities for future outbreaks.

Acknowledgements

Conflict of interest statement

The authors declare no conflict of interest.

Funding sources

There are no sources of funding to declare.

References

1. McMichael TM, Currie DW, Clark S, Pogojans S, Kay M, Schwartz NG, Lewis J, Baer A, Kawakami V, Lukoff MD, Ferro J, Brostrom-Smith C, Rea TD, Sayre MR, Riedo FX, Russell D, Hiatt B, Montgomery P, Rao AK, Chow EJ, Tobolowsky F, Hughes MJ, Bardossy AC, Oakley LP, Jacobs JR, Stone ND, Reddy SC, Jernigan JA, Honein MA, Clark TA, Duchin JS. Epidemiology of Covid-19 in a Long-Term Care Facility in King County, Washington. *New England Journal of Medicine*. 2020 May 21;382(21):2005-2011. <https://doi.org/10.1056/nejmoa2005412>
2. Abrams HR, Loomer L, Gandhi A, Grabowski DC. Characteristics of U.S. Nursing Homes with COVID-19 Cases. *Journal of the American Geriatrics Society*. 2020 Jul 7;68(8):1653-1656. <https://doi.org/10.1111/jgs.16661>
3. Cohen MA, Tavares J. Who are the Most At-Risk Older Adults in the COVID-19 Era? It's Not Just Those in Nursing Homes. *Journal of Aging & Social Policy*. 2020 May 17;32(4-5):380-386. <https://doi.org/10.1080/08959420.2020.1764310>
4. 19 - Epidemiologische situatie: Coronavirus COVID-19. <https://covid-19.sciensano.be/nl/covid-19-epidemiologische-situatie>. Accessed 2020 June 22.
5. Radiografía del coronavirus en residencias de ancianos en España. <https://www.rtve.es/noticias/20200624/radiografia-del-coronavirus-residencias-ancianos-espana/2011609.shtml>. Accessed 2020 June 22.
6. Coronavirus Disease 2019 (COVID-19) Daily situation report of the Robert Koch Institute. https://www.rki.de/DE/Content/InfAZ/N/Neuartiges_Coronavirus/Situationsberichte/2020-06-15-en.pdf?__blob=publicationFile. Accessed 2020 June 15.
7. Tan L, Seetharaman S. COVID-19 outbreak in nursing homes in Singapore. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7219412>. Accessed 2020 June 15.
8. Coronavirus (COVID-19) current situation and case numbers. <https://www.health.gov.au/news/health-alerts/novel-coronavirus-2019-ncov-health-alert/coronavirus-covid-19-current-situation-and-case-numbers>. Accessed 2020 June 15.
9. Hsu A, Lane N. Impact of COVID-19 on residents of Canada's long-term care homes - ongoing challenges and policy response. <https://ltccovid.org/2020/04/15/impact-of-covid-19-on-residents-of-canadas-long-term-care-homes-ongoing-challenges-and-policy-response>. Accessed 2020 June 15.
10. COVID-19 Nursing Home Data. <https://data.cms.gov/stories/s/COVID-19-Nursing-Home-Data/bkwz-xpvg>. Accessed 2020 June 15.
11. Kimball A, Hatfield KM, Arons M, James A, Taylor J, Spicer K, Bardossy AC, Oakley LP, Tanwar S, Chisty Z, Bell JM, Methner M, Harney J, Jacobs JR, Carlson CM, McLaughlin HP, Stone N, Clark S, Brostrom-Smith C, Page LC, Kay M, Lewis J, Russell D, Hiatt B, Gant J, Duchin JS, Clark TA, Honein MA, Reddy SC, Jernigan JA, Baer A, Barnard LM, Benoliel E, Fagalde MS, Ferro J, Smith HG, Gonzales E, Hatley N, Hatt G, Hope M, Huntington-Frazier M, Kawakami V, Lenahan JL, Lukoff MD, Maier EB, McKeirnan S, Montgomery P, Morgan JL, Mummert LA, Pogojans S, Riedo FX, Schwarcz L, Smith D, Stearns S, Sykes KJ, Whitney H, Ali H, Banks M, Balajee A, Chow EJ, Cooper B, Currie DW, Dyal J, Healy J, Hughes M, McMichael TM, Nolen L, Olson C, Rao AK, Schmit K, Schwartz NG, Tobolowsky F, Zacks R, Zane S. Asymptomatic and Pre-symptomatic SARS-CoV-2 Infections in Residents of a Long-Term Care Skilled Nursing Facility – King County, Washington, March 2020. *MMWR. Morbidity and Mortality Weekly Report*. 2020 Apr 3;69(13):377-381. <https://doi.org/10.15585/mmwr.mm6913e1>
12. Dora AV, Winnett A, Jatt LP, Davar K, Watanabe M, Sohn L, Kern HS, Graber CJ, Goetz MB. Universal and Serial Laboratory Testing for SARS-CoV-2 at a Long-Term Care Skilled Nursing Facility for Veterans – Los Angeles, California, 2020. *MMWR. Morbidity and Mortality Weekly Report*. 2020 May 29;69(21):651-655. <https://doi.org/10.15585/mmwr.mm6921e1>
13. Banskota S, Healy M, Goldberg E. 15 Smartphone Apps for Older Adults to Use While in Isolation During the COVID-19 Pandemic. *WestJEM* 21.3 May Issue. 2020 Apr 14;21(3). <https://doi.org/10.5811/westjem.2020.4.47372>
14. Tan LF, Seetharaman SK. COVID-19 outbreak in nursing homes in Singapore. *Journal of Microbiology, Immunology and Infection*. 2020 May;. <https://doi.org/10.1016/j.jmii.2020.04.018>
15. Quigley DD, Dick A, Agarwal M, Jones KM, Mody L, Stone PW. COVID-19 Preparedness in Nursing Homes in the Midst of the Pandemic. *Journal of the American Geriatrics Society*. 2020 May 12;68(6):1164-1166. <https://doi.org/10.1111/jgs.16520>
16. Munanga A. Critical Infection Control Adaptations to Survive COVID-19 in Retirement Communities. *Journal of Gerontological Nursing*. 2020 Jun 1;46(6):3-5. <https://doi.org/10.3928/00989134-20200511-03>
17. Cormi C, Chrusciel J, Laplanche D, Dramé M, Sanchez S. Telemedicine in nursing homes during the COVID-19 outbreak: A star is born (again). *Geriatrics & Gerontology International*. 2020 May 27;20(6):646-647. <https://doi.org/10.1111/ggi.13934>
18. American Geriatrics Society Policy Brief: COVID-19 and Nursing Homes. *Journal of the American Geriatrics Society*. 2020 Apr 29;68(5):908-911. <https://doi.org/10.1111/jgs.16477>