




Rapid Review Update 2: What strategies mitigate risk of COVID-19 outbreaks and mortality in long-term care facilities?



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Date: March 9, 2021

Suggested Citation:

National Collaborating Centre for Methods and Tools. (2021, March 9). *What strategies mitigate risk of COVID-19 outbreaks and mortality in long-term care facilities? Update 2*. <https://www.nccmt.ca/knowledge-repositories/covid-19-rapid-evidence-service>

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The National Collaborating Centre for Methods and Tools (NCCMT) is hosted by McMaster University and funded by the Public Health Agency of Canada. The views expressed herein do not necessarily represent the views of the Public Health Agency of Canada. This review was supported by funding from nib Health. The funder had no role in collection or interpretation of data.

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The authors declare they have no conflicts of interest to report.

Executive Summary

Background

Older adults have the highest rates of mortality due to the coronavirus disease 2019 (COVID-19) and long-term care (LTC) facilities were particularly affected by high rates of infection and mortality in the first waves of the pandemic. To date, strategies used by certain facilities and jurisdictions have shown preliminary evidence of efficacy at reducing risk of infections and outbreaks. Understanding which strategies work at the resident, facility and community level will facilitate the development of interventions to help mitigate this risk.

This rapid review was produced to support public health decision makers' response to the COVID-19 pandemic. This review seeks to identify, appraise, and summarize emerging research evidence to support evidence-informed decision making.

This rapid review is based on the most recent research evidence available at the time of release. A previous version was completed on December 10, 2020. This updated version includes evidence available up to February 1, 2021 to answer the question: **What strategies mitigate risk of COVID-19 outbreaks and mortality in LTC facilities?**

What Has Changed in this Version?

- Previous versions of this review included two unique questions: what risk factors are associated with COVID-19 outbreaks and mortality in LTC facilities and what strategies mitigate risk. The majority of risk factors identified were non-modifiable. In order to inform actionable strategies to mitigate risk in LTC settings, in this update we have focused exclusively on strategies to mitigate risk of outbreaks and reduce mortality. A previous archived version containing information on risk factors can be found [here](#).

Key Points

- Most guideline and guidance document recommendations include comprehensive surveillance, monitoring and evaluation of staff, resident, and visitor symptoms, limiting movement into and between LTC facilities, physical distancing, proper ventilation, and proper provision and use of personal protective equipment (PPE) to reduce transmission amongst residents and staff within LTC facilities. The included guidelines were of moderate quality when assessed using the AGREE II tool.
- Several studies found that implementation of a comprehensive COVID-19 plan (with strategies to: prevent introduction of COVID-19 into LTC facilities; quickly identify and isolate cases; decrease likelihood of transmission amongst staff and residents; and provide high-quality medical care to residents) may be effective to reduce both COVID-19 transmission and mortality within LTC. The certainty of the evidence is very low (GRADE) and may change as more data become available. Due to the heterogeneity in measures put in place, and limitations in study design, it is not possible to identify the most important components of these multifaceted interventions.
- The studies included in this review do not provide evidence for the experiences of populations who live with social and structural inequities, such as Indigenous or racialized communities. Further research is required to ensure representation of these populations for decision making.

Overview of Evidence and Knowledge Gaps

- Most of the included studies were conducted during the first or second waves of the pandemic. The applicability of this evidence to LTC facilities that have had access to vaccinations is not known. The question remains as what measures need to be kept in place following resident and staff vaccinations, given the current uncertainty about the role of vaccines in preventing transmission, as well as the role that variants of concern may play .
- Findings from low and high quality syntheses report a variety of interventions to decrease infection transmission in LTC. Common interventions across syntheses were promotion of hand hygiene and regular/enhanced environmental cleaning. Two syntheses included studies conducted in the context of COVID-19, as well as other respiratory infections. Notably, the quality of included evidence in syntheses was very low or not reported.
- Single studies consisted primarily of case series, cohort or quasi-experimental designs. Most studies did not address potential confounding factors at the resident, organizational, or community level that may influence measured outcomes of implemented infection control interventions. Limitations in methodological quality of single studies limit our ability to draw conclusions as to the most effective interventions
- A number of interventions were described with the potential to decrease COVID-19 transmission:
 - Proactive facility-wide asymptomatic screening and routine testing of residents and staff and/or point-of-care testing
 - Infection control audits
 - Compliance with proper use of masks and other personal protective equipment
 - Cohorting
 - Technological tools (i.e., digital contact tracing, COVID-19 app tool)
 - Social distancing
 - Enforcement of maximum occupancy in small areas
 - Voluntary staff self-confinement in facilities (i.e., spending ≥ 7 days a week and 24 hours a day in the facility; sleeping in unused areas)
 - Oral thromboembolism prophylaxis
 - Evacuation from LTC facilities
 - Creation of negative pressure isolation wards
 - Policies to limit staff mobility between facilities
- While several case reports describe implementing visitor restriction policies, no studies that include a comparator group were identified to explore the efficacy of this measure.
- One study used GPS mobility data to evaluate the effect of a government policy to restrict movement of staff between multiple LTC facilities. While the policy did appear effective at limiting movement, its effect on transmission and mortality is not clear.
- Technological platforms and tools (e.g., digital contact tracing, apps, heat maps) are being developed and show potential for decreased transmission through efficient case and/or contact identification that further informs infection control planning strategies.
- A number of in-progress studies were identified to examine the effect of telemonitoring, pharmaceutical and behavioural interventions on COVID-19 transmission and mortality with results not yet reported.

Methods

Research Question

What strategies mitigate risk of COVID-19 outbreaks and mortality in LTC facilities?

Search

On February 1, 2021, the following databases were searched using key terms “long term care”, “long-term care”, “nursing home*”, “aged care cent*”, “aged care facilit*”, and “extended care facilit*”. This search builds upon the previous search conducted in the first version of this rapid review, with no date limits applied:

- Pubmed’s curated COVID-19 literature hub: [LitCovid](#)
- [Trip Medical Database](#)
- World Health Organization’s [Global literature on coronavirus disease](#)
- [COVID-19 Evidence Alerts](#) from McMaster PLUS™
- [COVID-19 Living Overview of the Evidence \(L·OVE\)](#)
- [McMaster Health Forum](#)
- [Prospero Registry of Systematic Reviews](#)
- NCCMT [COVID-19 Rapid Evidence Reviews](#)
- [MedRxiv preprint server](#)
- NCCDH [Equity-informed Responses to COVID-19](#)
- NCCEH [Environmental Health Resources for the COVID-19 Pandemic](#)
- NCCHPP [Public Health Ethics and COVID-19](#)
- NCCID [Public Health Quick Links](#)
- NCCID [Disease Debrief](#)
- NCCIH [Updates on COVID-19](#)
- [Uncover \(USHER Network for COVID-19 Evidence Reviews\)](#)
- [Morbidity and Mortality Weekly Report \(MMWR\)](#)
- [Institute national d’excellence en santé et en services sociaux \(INESSS\)](#)
- [Institut national de santé publique du Québec \(INSPQ\)](#)
- [Guidelines International Network \(GIN\) Library](#)
- [BC Centre for Disease Control \(BCCDC\)](#)
- [Public Health England](#)

A copy of the search strategy is available at this [link](#).

Study Selection Criteria

The search results were first screened for recent guidelines and syntheses. Single studies were included if no syntheses were available, or if single studies were published after the search was conducted in the included syntheses. English-language, peer-reviewed sources and sources published ahead-of-print before peer review were included. Surveillance sources were excluded. When available, findings from syntheses and clinical practice guidelines are presented first, as these take into account the available body of evidence and, therefore, can be applied broadly to populations and settings.

| | Inclusion Criteria | Exclusion Criteria |
|--------------|--|----------------------------------|
| Population | Residents and staff in LTC facilities (defined as a non-hospital setting where care is provided to assist with activities of daily living) | Hospital or rehabilitation wards |
| Intervention | Strategies to reduce introduction of infection, transmission of infection, and mortality | Non-COVID-19 related |
| Comparisons | - | |
| Outcomes | Outbreaks / cases | |

Data Extraction and Synthesis

Data relevant to the research question, such as study design, setting, location, population characteristics, interventions or exposure and outcomes were extracted when reported. We synthesized the results narratively due to the variation in methodology and outcomes for the included studies.

Appraisal of Evidence Quality

We evaluated the quality of included evidence using critical appraisal tools as indicated by the study design below. Quality assessment was completed by one reviewer and verified by a second reviewer. Conflicts were resolved through discussion.

| Study Design | Critical Appraisal Tool |
|--------------------|---|
| Synthesis | Assessing the Methodological Quality of Systematic Reviews (AMSTAR) AMSTAR 1 Tool |
| Guideline | Appraisal of Guidelines for Research & Evaluation (AGREE) AGREE II Tool |
| Cross-sectional | Joanna Briggs Institute (JBI) Checklist for Cross-Sectional Studies |
| Quasi-experimental | Joanna Briggs Institute (JBI) Checklist for Quasi-Experimental Studies |
| Case Report | Joanna Briggs Institute (JBI) Checklist for Case Reports |
| Case Series | Joanna Briggs Institute (JBI) Checklist for Case Series |
| Qualitative | Joanna Briggs Institute (JBI) Checklist for Qualitative Research |

Completed quality assessments for each included study are available on request.

The Grading of Recommendations, Assessment, Development and Evaluations ([GRADE](#)) approach was used to assess the certainty in the findings based on eight key domains. In the GRADE approach to quality of evidence, **observational studies**, as included in this review, provide **low quality** evidence, and this assessment can be further reduced based on other domains:

- High risk of bias
- Inconsistency in effects
- Indirectness of interventions/outcomes
- Imprecision in effect estimate
- Publication bias

and can be upgraded based on:

- Large effect
- Dose-response relationship
- Accounting for confounding.

The overall certainty in the evidence for each outcome was determined taking into account the characteristics of the available evidence (observational studies, some not peer-reviewed, unaccounted-for potential confounding factors, different tests and testing protocols, lack of valid comparison groups). A judgement of 'overall certainty is very low' means that the findings are very likely to change as more evidence accumulates.

Findings

Summary of Evidence Quality

This update adds 1 new synthesis, 1 in-progress syntheses, 8 new single studies, 1 update to a previously included study, and 11 new in-progress single studies. In total, 42 publications are included in this review. The quality of the evidence included in this review is as follows:

| Question | Evidence included | | Overall certainty in evidence |
|--|----------------------------|----|-------------------------------|
| What strategies can prevent introduction of and transmission within LTC? | Completed syntheses | 6 | Very low |
| | In progress syntheses | 3 | |
| | Single studies | 22 | |
| | In progress single studies | 11 | |

Warning

Given the need to make emerging COVID-19 evidence quickly available, many emerging studies have not been peer reviewed. As such, we advise caution when using and interpreting the evidence included in this rapid review. We have provided a summary of overall certainty of the evidence to support the process of decision making. Where possible, make decisions using the highest quality evidence available.

A number of mathematical modelling studies are emerging related to COVID-19. While these studies may provide important estimates, their ultimate usefulness depends on the quality of the data that is entered into the model. Given the constantly evolving nature and changing understanding of COVID-19 around the world, a high degree of caution is warranted when interpreting these studies, and when presented, include the range of confidence intervals rather than single effect estimates.

Important to this question, we did not assess the methodological quality of the included modelling study. Due to the highly technical nature of these studies, we highly recommend consulting a content-area expert to inform decision making.

Table 1: Syntheses

| Reference | Date Released | Description of Included Studies | Summary of Findings | Quality Rating: Synthesis | Quality Rating: Included Studies |
|---|---|--|---|---|----------------------------------|
| New Evidence Reported March 9, 2021 | | | | | |
| <p>World Health Organization (2021). <i>Infection prevention and control guidance for long-term care facilities in the context of COVID-19.</i></p> | <p>Jan 8, 2021 (Search date not reported)</p> | <p>This guideline was based on:</p> <ul style="list-style-type: none"> • 6 observational studies • 10 clinical guidelines <p>Guideline informed by systematic review from Rios et al (see below)</p> | <p>In all LTC settings:</p> <ul style="list-style-type: none"> • Create an IPAC program and team • Implement standard IPAC measures, especially hand hygiene and cleaning • Universal masking of staff, visitors, suppliers and residents in areas of known or suspected community transmission; targeted masking of staff in areas with sporadic transmission • Physical distancing • Adequate ventilation • Vaccination of staff and residents (influenza and COVID-19) • Implement IPAC policies for visitors • Ensure appropriate staffing levels, staff organization and working hours to protect staff • Syndromic surveillance and/or laboratory testing of staff and residents • Test residents on admission or readmission in areas with community transmission if resources permit <p>Following a suspected or positive case:</p> <ul style="list-style-type: none"> • Universal testing of residents and staff • Implement contact, droplet and/or airborne precautions • Follow procedures for cleaning, disinfection, waste and laundry • Isolate suspected or confirmed cases, or cohort if isolation not possible • Careful clinical assessment of patients, especially those with additional risk factors • Quarantine all contacts for 14 days • Safe procedures for managing a dead body if a patient death occurs | <p>Moderate</p> <p>NOT PEER REVIEWED</p> | <p>Not reported</p> |

| Previously Reported Evidence | | | | | |
|--|---|---|---|--|---------------------|
| <p>Frazer, K., Lachlan, M., Stokes, D., Crowley, E., & Kelleher, C.C. (2020). A rapid systematic review of measures to protect older people in long term care facilities from COVID-19. <i>Preprint</i>.</p> | <p>Nov 3, 2020 (Search completed Jul 27, 2020)</p> | <p>This rapid review included 38 studies:</p> <ul style="list-style-type: none"> • 8 cohort • 28 cross-sectional • 1 case study • 1 ecological study | <p>Strategies used in LTC facilities included a combination of:</p> <ul style="list-style-type: none"> • Mass testing (n=22) • Use of PPE (n=10) • Screening of residents, staff, visitors (n=8) • Visitor restrictions (n=10) • Hand hygiene and droplet precautions (n=6) • Cohorting and isolation (n=11 studies) <p>Most studies were cross-sectional with no comparator group. Due to heterogeneity in the combination of strategies used, and infection prevalence across settings, no conclusions about the most effective strategies can be drawn.</p> | <p>High PREPRINT</p> | <p>Low</p> |
| <p>Public Health England (2020). Factors associated with COVID-19 in care homes and domiciliary care, and effectiveness of interventions: A rapid review.</p> | <p>Oct 28, 2020 (Search completed Aug 31, 2020)</p> | <p>This rapid review included 9 studies (3 preprints) that focused on the research question:</p> <ul style="list-style-type: none"> • 3 cohort • 1 cross-sectional • 2 outbreak investigations • 2 descriptive • 1 modelling | <p>There is limited evidence on the impact of specific interventions on the transmission or prevalence of COVID-19 in care homes.</p> <p>Based on weak quality evidence, interventions associated with significantly lower levels of COVID-19 included:</p> <ul style="list-style-type: none"> • Routine facility wide testing followed by isolation of cases • Voluntary staff confinement in care homes <p>One modelling study reported that symptom-based detection and screening was least effective in reducing transmission of COVID-19 and digital contact tracing was more effective than non-digital approaches.</p> | <p>Moderate NOT PEER REVIEWED</p> | <p>Not reported</p> |

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|---|---|--|--|--|---------------------|
| <p>Gmehlin, C., & Munoz-Price, L.S. (2020). COVID-19 in Long Term Care Facilities: A Review of Epidemiology, Clinical Presentations, and Containment Interventions. <i>Infection Control & Hospital Epidemiology</i>. Epub ahead of print.</p> | <p>Oct 26, 2020 (Search date not reported)</p> | <p>This review included: 12 studies, set in United States and European facilities (study designs not reported)</p> | <p>Containment interventions used by LTC facilities before an outbreak occurred included:</p> <ul style="list-style-type: none"> • Surveillance and social distancing • Cancelled group activities • Daily screening / symptom assessment (residents, staff, visitors) • Symptom-based testing (residents) • Infection control training (staff) • Visitation restrictions • Admission suspension • Use of metered inhalers vs. nebulizers <p>Once an outbreak occurred, additional strategies included:</p> <ul style="list-style-type: none"> • Cohorting with universal / point prevalence testing • Universal use of personal protective equipment <p>This study is limited in the quality of its review methods.</p> | <p>Low</p> | <p>Not reported</p> |
| <p>Rios, P., Radhakrishnan, A., Williams, C., Ramkissoon, N., Pham, B., Cormack, G.V., ... Tricco, A.C. (2020). Preventing the transmission of COVID-19 and other coronaviruses in older adults aged 60 years and above living in long-term care: a rapid review. <i>Systematic Reviews</i>, 9(1), 1-8.</p> | <p>Sep 25, 2020 (Search completed Jul 31, 2020)</p> | <p>This rapid review included 9 clinical practice guidelines (CPG) from:</p> <ul style="list-style-type: none"> • Government agencies (n=3) • Medical associations (n=3) • Non-profit research trusts (n=2) • International health organizations (n=1) | <p>The most common recommendations among CPGs were:</p> <ul style="list-style-type: none"> • Surveillance, monitoring, and evaluation of symptoms in staff and residents • Mandated personal protective equipment (PPE) use • Social distancing/isolation or cohorting among residents • Enhanced cleaning • Promotion of hand and respiratory hygiene measures • Sick leave policies <p>Further evidence needed on impact of restricting staff movement between multiple facilities.</p> | <p>Moderate</p> | <p>Very low</p> |
| <p>Koshkouei, M., Abel, L., & Pilbeam, C. (2020, April 24). How can pandemic spreads be contained in care homes?</p> | <p>Apr 14, 2020 (Search date not reported)</p> | <p>This rapid review included: 30 studies (study designs and countries not reported)</p> | <p>Measures such as hand hygiene, regular cleaning, and limiting staff movement between facilities may reduce infection spread.</p> <p>Further evidence is needed regarding restrictions on visitors and testing of staff.</p> | <p>Low</p> <p>NOT PEER REVIEWED</p> | <p>Not reported</p> |

Table 2: In-progress Syntheses

| Title | Anticipated Release Date | Description of Document |
|--|---|--|
| New Evidence Reported March 9, 2021 | | |
| Su, Z., Meyer, K., Li, Y., McDonnell, D., Joseph, N. M., Li, X., ... Wang, J. (2020). Technology-based interventions for nursing home residents: Implications for nursing home practice amid and beyond the influence of COVID-19: A systematic review protocol . <i>Preprint</i> . | Unclear (noted to be Sept 2020, but search conducted in Dec 2020) | This review will investigate technology-based interventions designed to support the delivery of health care to LTC residents before and amid the COVID-19 pandemic, describing the interventions' effects in relation to the characteristics of the LTC residents and facilities. This review will also outline how technology-based interventions can be used during and following the COVID-19 pandemic. |
| Previously Reported Evidence | | |
| Cardot, T., Josseran, L., Herr, M., & Delarocque-Astagneau, E. (2020). Resilience of nursing homes in Europe during the first wave of COVID-19: a systematic review of control measures implemented according to the magnitude of the outbreak and national guidelines . <i>PROSPERO, CRD42020223089</i> . | Dec 30, 2020 | This review will explore the COVID-19 control measures that were implemented in LTC facilities in Western Europe during the first wave of the pandemic including room ventilation, hygiene management, access to and use of personal protective equipment, testing, physical restrictions on movement, isolation and cohorting of staff. |
| Durao, C., Rafael Henriques, H., Costa, A., Sousa, D., Pinto, J., Faria, J., & Henriques, A. (2020). Measures to minimize the risk of COVID-19 infection in nursing homes: a systematic review . <i>PROSPERO, CRD42020214566</i> . | Apr 12, 2021 | This systematic review will examine the effect of the organizational, individual and environmental measures to prevent and manage the spread of COVID-19 in LTC facilities. |

Table 3: Single Studies

| Reference | Date Released | Study Design | Population | Setting | Summary of findings | Quality Rating: |
|---|---------------|--------------------|-----------------------------|-----------------|---|-----------------|
| New Evidence Reported March 9, 2021 | | | | | | |
| Jones, A., Watts, A. G., Khan, S. U., Forsyth, J., Brown, K., Costa, A. P., ... Stall, N. M. (2021). Impact of a Public Policy Restricting Staff Mobility Between Nursing Homes in Ontario, Canada During the COVID-19 Pandemic . <i>Journal of Post-Acute and Long-Term Care Medicine</i> . Epub ahead of print. | Jan 25, 2021 | Quasi experimental | Staff in 623 LTC facilities | Ontario, Canada | <p>Mobile device GPS location data were analyzed 7 weeks before and after an emergency order restricting staff to work in a single LTC facility in a 14-day period.</p> <p>After the order was implemented the:</p> <ul style="list-style-type: none"> • Number of LTCs with ≥ 1 staff connection decreased from 42.7-12.7% ($p < 0.001$) • Mean number of connected staff per LTC decreased from 3.90 to 0.77 ($p < 0.001$) • Number of LTCs in outbreak increased from 23.9-46.9% (statistical significance not reported). <p>LTCs with more connections:</p> <ul style="list-style-type: none"> • Were located in larger communities • Had more beds • Were part of for-profit LTC chains <p>Data limitations prevented time trend analyses, and user consent for data sharing may underestimate staff mobility.</p> | High |

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|--|--------------------|---------------------------|----------------------------|--|--|-------------|
| <p>Vijh, R., Prairie, J., Otterstatter, M. C., Hu, Y., Hayden, A. S., Yau, B., ... Schwandt, M. (2021). Evaluation of a multisectoral intervention to mitigate the risk of severe acute respiratory coronavirus virus 2 (SARS-CoV-2) transmission in long-term care facilities. <i>Infection Control & Hospital Epidemiology</i>. Epub ahead of print.</p> | <p>Jan 5, 2021</p> | <p>Quasi experimental</p> | <p>Residents and staff</p> | <p>18 LTC facilities, British Columbia, Canada</p> | <p>Time series data from Feb 28-May 30, 2020 was used to evaluate the impact of bundled outbreak control interventions including:</p> <ul style="list-style-type: none"> • Case and contact management. • Proactive case detection through screening and monitoring • Infection control practices i.e., universal personal protective equipment, cohorting of residents and staff, activity restrictions, facility closures, cleaning. • Resource prioritization and stewardship. • Multisectoral collaboration <p>14 days post-intervention there was 27% decrease in COVID-19 incidence every 2 days (RR=0.73; 95% CI=0.67, 0.80) vs. pre-intervention.</p> <p>Difference in average COVID-19 rate was reduced more in staff vs. residents (RR=0.30; 95% CI=0.10, 0.88).</p> <p>Bundling of measures limit ability to determine essential components to reduce risk. No comparator group was available, and cases may have been underestimated due to lack of asymptomatic testing.</p> | <p>High</p> |
|--|--------------------|---------------------------|----------------------------|--|--|-------------|

| | | | | | | |
|--|---------------------|------------------------|------------------|--|---|-----------------|
| <p>Telford, C. T., Bystrom, C., Fox, T., Holland, D. P., Wiggins-Benn, S., Mandani, A., ... Shah, S. (2020). COVID-19 Infection Prevention and Control Adherence in Long-Term Care Facilities, Atlanta, Georgia. <i>Journal of the American Geriatrics Society</i>. Epub ahead of print.</p> | <p>Dec 28, 2020</p> | <p>Cross-sectional</p> | <p>Residents</p> | <p>24 LTC facilities, Georgia, United States</p> | <p>LTC facilities with ≥ 1 COVID-19 cases were visited to assess adherence to IPAC measures (hand hygiene, disinfection, social distancing, PPE, screening).</p> <p>Compared to high prevalence facilities, low prevalence facilities were more likely to:</p> <ul style="list-style-type: none"> • Limit occupancy in small areas (64 vs. 10%, $p=0.01$) • Post droplet precaution (77 vs. 27%, $p=0.02$) • Have bathrooms and sinks inside rooms (100 vs. 73%, $p=0.04$) • Train and audit mask use (85 vs. 36%, $p=0.02$) • Ensure proper mask usage inside COVID unit (100 vs. 45%, $p=0.01$) • Train and audit donning and doffing of PPE (92 v. 55%, $p=0.03$) • Report never having a shortage of PPE (85 vs. 18%, $p<0.01$) <p>Trend toward differences in:</p> <ul style="list-style-type: none"> • Availability of hand sanitizer (54 vs. 18%, $p=0.07$) • Social distancing in staff rooms (75 vs. 45%, $p=0.15$) • Mask use outside of COVID unit (92 vs. 64%, $p=0.09$) • Staff, resident and visitor screening logs (62 vs. 27%, $p=0.09$) <p>One-time assessment by site assessors who were not blinded to COVID-19 infection loads, and small sample size limits findings.</p> | <p>Moderate</p> |
|--|---------------------|------------------------|------------------|--|---|-----------------|

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|---|--------------------|------------------|--------------------------------------|--|--|--|
| <p>Vilches, T. N., Nourbakhsh, S., Zhang, K., Juden-Kelly, L., Cipriano, L. E., Langley, J. M., ... Moghadas, S. M. (2020). Multifaceted strategies for the control of COVID-19 outbreaks in long-term care facilities in Ontario, Canada. <i>Preprint.</i></p> | <p>Dec 7, 2020</p> | <p>Modelling</p> | <p>Simulated residents and staff</p> | <p>Simulated LTC facility, Ontario, Canada</p> | <p>Staff testing and vaccination were modelled in a simulated LTC facility based on data from Jan-Jun 2020. Baseline prevention measures included case isolation, mask wearing and cohorting.</p> <p>Weekly staff testing:</p> <ul style="list-style-type: none"> • Decreased attack rate in residents by 34.4% (95% CI=32.9, 36.0) and staff by 21.9% (95% CI=20.9, 23.0) • Decreased resident hospitalizations by 33.7% (95% CI=31.6, 35.8) • Decreased resident mortality by 34.8% (95% CI=33.0, 36.5) • Did not reduce staff deaths (data not shown) <p>Reductions were greatest when using nasopharangeal tests with a 1-day turnaround.</p> <p>Adding vaccination of residents and staff reduced:</p> <ul style="list-style-type: none"> • Attack rate in residents by 72.3% (95% CI=71.6, 72.9) and in staff by 76.7% (95% CI=76.4 77.1) • Hospitalization of residents by 81.4% (95% CI=80.6, 82.2) and staff by 71.8% (95% CI=69.3-74.0) • Reduced mortality in residents by 82.1% (95% CI=81.5, 82.7) and staff by 69.8% (95% CI=58.0, 79.7) <p>The model did not include visitors and did not account for noncompliance or aerosol transmission.</p> | <p>Not appraised</p> <p><i>PREPRINT</i></p> |
|---|--------------------|------------------|--------------------------------------|--|--|--|

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|---|--------------------|---------------------------|------------------------|---|--|------------|
| <p>Dolveck, F., Strazzulla, A., Noel, C., Aufaure, S., Tarteret, P., de Pontfarcy, A., ... Diamantis, S. (2020). COVID-19 among nursing home residents: results of an urgent pre-hospital intervention by a multidisciplinary task force. <i>The Brazilian Journal of Infectious Diseases</i>. Epub ahead of print.</p> | <p>Dec 5, 2020</p> | <p>Quasi experimental</p> | <p>n=770 residents</p> | <p>8 LTC facilities, Île-de-France region, France</p> | <p>From Apr 9-11, 2020 a task force that included nurses, infectious diseases, public health, emergency and geriatrics specialists, was implemented. Implemented steps included:</p> <ul style="list-style-type: none"> • Daily death notification to health authority • Audit by infectious diseases and public health focused on health care staffing, medical supplies, 24h presence of nurses, suspected case tracking, patient cohorting, preventive and protective measures, quarantine and isolation rooms, resident health status (hydration, thromboembolism, pneumonia and inflammatory syndrome risk) • Emergency team for urgent procedures • Coordination of care with geriatric team <p>One month following implementation</p> <ul style="list-style-type: none"> • Prevalence of COVID-19 amongst residents decreased to 123/422 (29%) from 348/770 (45%) before (p<0.001) • All-cause mortality decreased to 36/676 (5%) compared to 94/770 (12%) before (p<0.001) | <p>Low</p> |
|---|--------------------|---------------------------|------------------------|---|--|------------|

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|--|--------------------|---------------------------|---------------------------------------|--|--|--|
| <p>Micocci, M., Gordon, A. L., Seo, M. K., Allen, A. J., Davies, K., Lasserson, D., ... Buckle, P. (2020). Is Point-of-Care testing feasible and safe in care homes in England? An exploratory usability and accuracy evaluation of Point-of-Care Polymerase Chain Reaction test for SARS-COV-2. Preprint.</p> | <p>Dec 3, 2020</p> | <p>Diagnostic</p> | <p>n=189 staff n=89 residents</p> | <p>2 LTC facilities, England</p> | <p>Feasibility (usability and accuracy) of the POCKIT™ Central Nucleic Acid Analyzer point-of-care test was evaluated.</p> <p>User experience with testing equipment was positive. Users highlighted usefulness in testing symptomatic staff or residents, but the extra staff required to routinely test all residents and staff may not be feasible.</p> <p>Minor sources of error for included:</p> <ul style="list-style-type: none"> • Damaged equipment • Improper storage or use • User forgets sequence steps • User's inability to troubleshoot • Improper response from interface • Misinterpretation of test results <p>Sensitivity and specificity were high for:</p> <ul style="list-style-type: none"> • Asymptomatic tests (Sensitivity: 83.3%, 95% CI=35.9,99.6; Specificity: 98.7%, 95% CI=96.2,99.7) • Symptomatic tests (Sensitivity: 100%, 95% CI=2.5,100; Specificity: 100%, 95% CI=85.5,100) <p>Data on reductions in cases or mortality not yet reported.</p> | <p>Moderate <i>PREPRINT</i></p> |
| <p>Miller, S. L., Mukherjee, D., Wilson, J., Clements, N., & Steiner, C. (2020). Implementing a negative pressure isolation space within a skilled nursing facility to control SARS-CoV-2 transmission. <i>American Journal of Infection Control</i>. Epub ahead of print.</p> | <p>Oct 2, 2020</p> | <p>Quasi experimental</p> | <p>Residents</p> | <p>1 LTC facility, Pennsylvania, United States</p> | <p>HVAC changes and plastic barriers were used to create a negative pressure isolation space in a single ward, consistent with CDC guidelines. Efficacy was confirmed through onsite measurements and modelling simulations. Staff cohorting and education on proper use of PPE was also provided.</p> <p>From May 4-Jun 23, 2-6 cases were cared for on the ward at any given time (imported from local hospitals). No transmission of COVID-19 occurred amongst staff or residents within the facility.</p> | <p>Moderate</p> |

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| <p>Fischer, R. J. (2020). Impact of evacuating skilled nursing home residents testing positive for COVID-19 to an inpatient acute care setting. <i>The Journal of Nursing Home Research</i>, 6, 69-72.</p> | <p>Sep 10, 2020</p> | <p>Case series</p> | <p>n=38 residents with COVID-19</p> | <p>1 LTC facility, Washington, United States</p> | <p>All LTC residents with COVID-19 regardless of symptoms or health status were evacuated to an acute care setting during a 17-day outbreak Apr 24-Jun 2, 2020.</p> <p>Evacuation appeared to halt facility transmission. Mortality in the evacuated cohort was 13.2% compared to 21.7% for the outbreak overall. No statistical analyses were performed.</p> | <p>Moderate</p> |
| <p>Brouns, S. H., Brüggemann, R., Linkens, A. E. M. J. H, Magdelijns, F. J., Joosten, H., Heijnen, R., ... Spaetgens, B. (2020). Mortality and the Use of Antithrombotic Therapies Among Nursing Home Residents with COVID-19. <i>Journal of the American Geriatrics Society</i>, 68(8), 1647-1652.</p> | <p>Jul 7, 2020</p> | <p>Case series</p> | <p>n=101 residents with COVID-19</p> | <p>14 LTC facilities, Maastricht, Netherlands</p> | <p>This study compared all-cause mortality between residents with COVID-19 who did and did not receive oral antithrombotic therapies to prevent cardiovascular or venous thromboembolic.</p> <p>Oral antithrombotic therapies did not decrease the risk of mortality for residents with COVID-19 (OR=0.89, 95% CI=0.41,1.95) after adjusting for age, sex, and several clinical variables.</p> <p>Limitations of this study include likelihood of uncontrolled confounding between groups, and limited sample size.</p> | <p>High</p> |
| <p>Previously Reported Evidence</p> | | | | | | |

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| <p>Shimotsu, S. T., Johnson, A. R. L., Berke, E. M., & Griffin, D. O. (2021). COVID-19 Infection Control Measures in Long-Term Care Facility, Pennsylvania, USA. <i>Emerging Infectious Diseases</i>, 27(2).</p> | <p>Nov 20, 2020</p> | <p>Case report</p> | <p>Residents, staff and visitors of a LTC facility</p> | <p>Pennsylvania, United States</p> | <p>From Jun 23 to Oct 1, 2020, 5,625 nasal swabs (collected twice per week) and daily symptom checks were performed on residents, staff, and visitors. In addition, the following control measures were implemented:</p> <ul style="list-style-type: none"> • PPE required for all staff and visitors including masks anywhere in the facility, and N95 respirators in isolation and quarantine areas • Strict hygiene practices for the staff and twice-daily cleaning. • Only full-time staff; no per-diem staff • New residents admitted were required to quarantine for 14 days or until 2 negative tests • Family visits and group activities were not allowed <p>Based on data obtained Sep 28–Oct 9, 2020, this facility’s case number was 17 times lower than neighboring facilities.</p> | <p>Low</p> |
| <p>Pseudos, G., Papamanoli, A., Barrett, N., Bailey, L., Thorne, M., Ford, F., & Lobo, Z. (2020). Halting a SARS-CoV-2 Outbreak in a U.S. Veterans Affairs Nursing Home. <i>American Journal of Infection Control</i>, 49(1), 115-119.</p> | <p>Nov 2, 2020</p> | <p>Case report</p> | <p>Residents and staff</p> | <p>Veterans Affairs LTC facility, New York, United States</p> | <p>An outbreak was declared from Mar 24 to Apr 18, 2020. After an initial case was in the facility a variety of measures were implemented including:</p> <ul style="list-style-type: none"> • Social distancing isolation practices • Resident activities were stopped • Staff cohorting was introduced • New admissions were stopped • Hand hygiene was enforced <p>PPE use was also enforced, and stock quickly became depleted. As such, Ebola PPE stockpile was used including whole body suits, head and neck coverings, booties/shoe coverings, and N95 respirators.</p> <p>Additional measures including the creation of a dedicated COVID unit, the use of rapid RT-PCR test, and universal testing were implemented.</p> <p>Infection control measures lead to a decline in cases and full resolution of the outbreak by Apr 18, 2020.</p> | <p>High</p> |

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| <p>Sizoo, E. M., Monnier, A. A., Bloemen, M., Hertogh, C. M. P. M., & Smalbrugge, M. (2020). Dilemmas with restrictive visiting policies in Dutch nursing homes during the COVID-19 pandemic: A qualitative analysis of an open-ended questionnaire with elderly care physicians. <i>Journal of the American Medical Directors Association</i>, 21(12), 1774-1781.E2.</p> | <p>Oct 23, 2020</p> | <p>Qualitative</p> | <p>n=76 elderly care physicians</p> | <p>LTC facilities in Netherlands</p> | <p>This study explored the dilemmas experienced by physicians because of the implementation of COVID-19 visitor restrictions in LTC facilities in the Netherlands.</p> <p>The visitor restriction policy contributed to limiting the further spread of COVID-19. The need for balancing safety for all through infection prevention measures vs. quality of life of the individual residents and their loved ones is a core dilemma in LTC facilities.</p> | <p>High</p> |
| <p>Annweiler, C., Hanotte, B., de l'Eprevier, C. G., Sabatier, J.-M., Lafaie, L., & Célarier, T. (2020). Vitamin D and survival in COVID-19 patients: A quasi-experimental study. <i>The Journal of Steroid Biochemistry and Molecular Biology</i>, 204, 105771.</p> | <p>Oct 13, 2020</p> | <p>Quasi experimental</p> | <p>n=66 residents</p> | <p>1 facility, France</p> | <p>Residents who were administered oral vitamin D3 supplementation in the week prior or following a COVID-19 diagnosis (n=57) were compared to those who did not receive Vitamin D3 as part of routine supplementation (n=9).</p> <p>Vitamin D3 was associated with less severe COVID-19 symptoms ($\beta=-3.84$, 95%CI=6.07, -1.62, $p=0.001$) and lower mortality (HR=0.11, 95%CI=0.03, 0.48, $p=0.003$).</p> <p>Limitations of this study include its small sample size and quasi-experimental design. Reasons for declining standard Vitamin D3 supplementation were not reported.</p> | <p>Moderate</p> |

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| <p>Montoya, A., Jenq, G., Mills, J. P., Beal, J., Diviney Chun, E., Newton, D., ... Mody, L. (2020). Partnering with Local Hospitals and Public Health to Manage COVID-19 Outbreaks in Nursing Homes. <i>Journal of the American Geriatrics Society</i>, 69(1), 30-36.</p> | <p>Oct 9, 2020</p> | <p>Case report</p> | <p>n=215 residents</p> | <p>3 facilities, Michigan, United States</p> | <p>Upon identification of an outbreak, a number of measures were put in place:</p> <ul style="list-style-type: none"> • Cohorting positive residents to a dedicated COVID unit within 48 hours of initial testing • Providing in person, email, and phone communication to residents and health care workers, including testing results and potential exposures • Re-educating staff on PPE use and monitoring of use; gowns, gloves, eye protection and N95 respirators were used in COVID-19 areas • Allocating dedicated COVID unit staffing, with incentive pay • Following patient care processes, including residents remaining in assigned rooms, not sharing equipment, and reducing staff exposure • Point prevalence testing occurred three times, with decreasing prevalence <p>A limitation of this study is that interventions were only described; it was not possible to determine which were actually effective, or more effective.</p> | <p>High</p> |
| <p>Telford, C., Onwubiko, U., Holland, D., Turner, K., Prieto, J., Smith, S., ... Shah, S. (2020). Preventing COVID-19 Outbreaks in Long-Term Care Facilities Through Preemptive Testing of Residents and Staff Members – Fulton County, Georgia, March–May 2020. <i>Morbidity and Mortality Weekly Report</i>, 69(37), 1296–1299.</p> | <p>Sep 18, 2020</p> | <p>Quasi experimental</p> | <p>28 facilities</p> | <p>Georgia, United States</p> | <p>Facility-wide COVID-19 testing for residents and staff was conducted:</p> <ul style="list-style-type: none"> • As a response measure in 15 facilities after a confirmed case was identified (testing based on previous symptomatic screening) • As a prevention measure in 13 facilities with no confirmed cases <p>Prevalence of cases was significantly higher among ‘response’ facilities (28.0% residents; 7.4% staff) compared to ‘preventive’ facilities (0.5% residents; 1.0% staff).</p> <p>After 4 weeks of follow-up screening, overall prevalence was significantly lower in the “preventive” facilities (1.5% residents; 1.7% staff) compared to “response” facilities (42.4% residents; 11.8% and staff).</p> | <p>Low</p> |

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| <p>Lipsitz, L.A., Lujan, A.M., Dufour, A., Abrahams, G., Magliozi, H., Herndon, L., & Dar, M. (2020). Stemming the Tide of COVID-19 Infections in Massachusetts Nursing Homes. <i>Journal of the American Geriatrics Society</i>, 68(11), 2447-2453.</p> | <p>Sep 15, 2020</p> | <p>Quasi experimental</p> | <p>360 facilities</p> | <p>Massachusetts, United States</p> | <p>All facilities completed an infection control checklist at baseline. Payment incentives were attached to passing unannounced monthly or more infection control audits, COVID-19 testing of >90% of residents and staff, provision of key data and providing residents with technology for virtual visits with family and friends.</p> <p>Sites that had previous infection control deficiencies or failed an initial audit received additional support through onsite and virtual infection control consultations. All sites had access to weekly webinars and continuous Q&A communication, as well as PPE, staffing and testing resources.</p> <p>For every 1-point increase in the infection control checklist score, there was a decrease in weekly infection rate (8%, p=.0007) and decrease in weekly mortality rate (3%, p=0.179).</p> <p>Greater compliance with PPE and cohorting was associated with large reductions in infections.</p> | <p>Low</p> |
| <p>Wilmerk, G., Summer, I., Marsyla, D., Sukhu, S., Grote, J., Zobel, G., ... & Movva, S. (2020). Real-Time Digital Contact Tracing: Development of a System to Control COVID-19 Outbreaks in Nursing Homes and Long-Term Care Facilities. <i>JMIR Public Health and Surveillance</i>, 6(3), e20828.</p> | <p>Aug 25, 2020</p> | <p>Simulated model</p> | <p>n=120 individuals (80 residents; 40 staff)</p> | <p>Simulated model</p> | <p>A simulation model was developed to compare the effectiveness of a digital contact tracing system to other transmission control approaches (e.g., symptom mapping, manual contact tracing, polymerase chain reaction testing) in LTC facilities.</p> <p>The digital contact tracing system was more effective in reducing COVID-19 transmission, with a lower number of new cases and lower mortality rate, compared to other approaches, likely due to its speed and efficiency in identifying cases. Symptom-based screening alone was the least effective method resulting in the highest number of new cases and mortality in the simulation model.</p> | <p>Not appraised</p> |

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| <p>Belmin, J., Um-Din, N., Donadio, C., Magri, M., Nghiem, Q., Oquendo, B., Pariel, S., & Lafuente-Lafuente, C. (2020). Coronavirus Disease 2019 Outcomes in French Nursing Homes That Implemented Staff Confinement with Residents. <i>The Journal of the American Medical Association Network Open</i>, 3(8), e2017533.</p> | <p>Aug 13, 2020</p> | <p>Quasi experimental</p> | <p>17 facilities (n=1250 residents; n=94 staff) 9513 facilities (n=695,060 residents; n=385,290 staff)</p> | <p>France</p> | <p>Facilities that implemented voluntary staff self-confinement with residents (≥ 7 days) were compared to facilities which did not.</p> <p>Only 1 (5.8%) facility in which self-confinement occurred reported cases of COVID-19, compared with 4,599 (48.3%) facilities with no self-confinement ($p < 0.001$).</p> <p>Lower rates among residents were found in facilities with staff self-confinement compared to those without for:</p> <ul style="list-style-type: none"> • Confirmed cases (0.4 vs. 4.4%) • Possible cases (0 vs. 4.6%) • Mortality (0.4 vs. 1.8%; OR: 0.22, 95%CI 0.09, 0.53) <p>A lower rate of confirmed or possible cases among staff was also found in facilities with staff self-confinement compared to those without (1.6 vs. 7.6%).</p> | <p>Low</p> |
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| <p>Escobar, D. J., Lanzi, M., Saberi, P., Love, R., Linkin, D. R., Kelly, J. J., ... Doyon, J. B. (2020). Mitigation of a Coronavirus Disease 2019 Outbreak in a Nursing Home Through Serial Testing of Residents and Staff. <i>Clinical Infectious Diseases</i>. Epub ahead of print.</p> | <p>Jul 20, 2020</p> | <p>Case report</p> | <p>n=84 residents</p> | <p>1 facility, Pennsylvania, United States</p> | <p>This case study described an outbreak investigation at one LTC facility and the strategies used to contain it.</p> <p>Interventions to control the outbreak included:</p> <ul style="list-style-type: none"> • Serial rapid testing to identify, isolate, and cohort asymptomatic infectious residents every 3-5 days • Establishment of a COVID isolation ward • Daily meeting of multidisciplinary team of experts (infection prevention, quality improvement, geriatrics) • Universal staff testing • Universal masking for residents and staff • Quality management staff as dedicated observers to prevent lapses in control practice and re-educate on appropriate personal protective equipment use <p>A limitation of this study is that interventions were only described; it was not possible to determine which were actually effective, or more effective. No subsequent outbreaks occurred in the facility as of Jul 1.</p> | <p>High</p> |
| <p>Echeverría, P., Mas Bergas, M., Puig, J., Isnard, M., Massot, M., Vedia, C., ... & Negredo, E. (2020). COVIDApp as an Innovative Strategy for the Management and Follow-Up of COVID-19 Cases in Long-Term Care Facilities in Catalonia: Implementation Study. <i>JMIR Public Health and Surveillance</i>, 6(3), e21163.</p> | <p>Jul 17, 2020</p> | <p>Quasi experimental</p> | <p>196 facilities (169 long terms care facilities and 27 facilities for people with a physical or mental disability)</p> | <p>Catalonia, Spain</p> | <p>Care facilities collaborated with 64 primary care teams in the use of a COVID-19 App tool aimed at monitoring residents' clinical symptoms for early detection of suspected cases, managing care, and monitoring potential transmission within facilities.</p> <p>In the month following commencement of app use, there was an increase in suspected cases in week 1, but a decrease in weeks 3 and 4. Confirmed cases increased up until the end of week 3, then remained stable. Total deaths and deaths among suspected/confirmed cases increased over the first half of the month, then decreased.</p> <p>There was also a decrease in the number of facilities classified as "high-risk" for COVID-19 over the month.</p> | <p>Moderate</p> |

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| <p>Dora, A.V., Winnett, A., Jatt L.P., Davar, K., Watanabe, M., Sohn, L., ... Goetz, M.B. (2020). Universal and Serial Laboratory Testing for SARS-CoV-2 at a Long-Term Care Skilled Nursing Facility for Veterans – Los Angeles, California, 2020. <i>Morbidity and Mortality Weekly Report</i>, 69(21), 651-655.</p> | <p>May 29, 2020</p> | <p>Case report</p> | <p>Residents and staff (n=NR)</p> | <p>120-bed facility, Florida, United States</p> | <p>Published recommendations were put into place including training with infection prevention and control practitioners for hand hygiene, PPE use, and HVAC optimization. Twice daily screening for residents and staff, cessation of group activities, visitor bans, reducing staff working in multiple facilities and using telemedicine where possible.</p> <p>Following a second resident testing positive, routine universal testing occurred every 14 days for 6 weeks, and exposed residents were cohorted in a dedicated area and a universal masking policy was applied for all staff and patients when outside their room. Over 6 weeks, prevalence decreased from 5.4 to 3.6 to 0.41%.</p> | <p>High</p> |
| <p>Caspi, G., Chen, J., Liverant-Taub, S., Shina, A., & Caspi, O. (2020). Heat Maps for Surveillance and Prevention of COVID-19 Spread in Nursing Homes and Assisted Living Facilities. <i>The Journal of Post-Acute and Long-Term Care Medicine</i>, 21(7), 986-988.</p> | <p>May 25, 2020</p> | <p>Quasi experimental</p> | <p>Not reported</p> | <p>Israel</p> | <p>Authors have developed a real-time heat mapping website which captures data regarding the number of confirmed cases (residents and/or staff) in facilities within a specified time period, as well as the rate of growth in cases in a facility.</p> <p>This tool could be used by officials to monitor trends in facility transmission and determine whether transmission may be occurring across facilities within a specific geographic area, allowing further investigation.</p> | <p>Low</p> |

Table 4: In-progress Single Studies

| Title | Anticipated Release Date | Population | Setting | Description of Study |
|---|--------------------------|--|---------------|--|
| New Evidence Reported March 9, 2021 | | | | |
| Tchalla, A. (2020). <i>Gerontological Telemonitoring of Older Adults Living in Nursing Homes With COVID-19 Disease (COVIDeHPAD).</i> | Sep 2020 | LTC residents | France | This study will explore the impact of gerontological telemonitoring on health outcomes of probable or confirmed resident cases of COVID-19 in LTC facilities. |
| McGeer, A. J., & Golan, Y. (2020). <i>Control of COVID-19 Outbreaks in Long Term Care.</i> | Mar 2021 | LTC facility residents and staff | Canada | This randomized control trial will examine the effects of Favipiravir (Avigan) chemoprophylaxis vs. placebo on COVID-19 outbreak control in LTC facilities. Effects of the drug on mortality, incidence rates among residents and staff, hospitalizations, occurrence of new cases in new units and medication discontinuation due to adverse events will also be examined. |
| Morales-Asencio, J. M., Gómez-Huelgas, R., & Morilla-Herrera, J. C. (2020). <i>Prevention of COVID19 Infection in Nursing Homes by Chemoprophylaxis With Hydroxychloroquine (PREVICHARM) (PREVICHARM).</i> | Apr 1, 2021 | LTC residents and staff | Spain | This triple-blind randomized control trial will test the effectiveness of hydroxychloroquine for the prevention of COVID-19 infection in residents and staff. Mortality, compliance with treatment, occurrence of new cases, hospitalizations and adverse events will also be examined. |
| Berry, S. D., & Mor, V. (2021). <i>Improving COVID-19 Vaccine Uptake in Nursing Homes.</i> | Apr 19, 2021 | LTC staff and residents | United States | This cluster randomized controlled trial will examine the effects of a multi-pronged behavioral intervention on COVID-19 vaccine uptake among staff and residents of a LTC facility. |
| Eli Lilly and Company (2021). <i>A Study of LY3819253 (LY-CoV555) and LY3832479 (LY-CoV016) in Preventing SARS-CoV-2 Infection and COVID-19 in Nursing Home Residents and Staff (BLAZE-2).</i> | Jun 29, 2021 | Staff and residents in contracted LTC facilities | United States | This randomized control trial will evaluate whether LY3819253 given alone and with LY3832479 prevents COVID-19 infection. |
| Bardin, M. (2021). <i>Trial to Evaluate the Efficacy and Safety of Nitazoxanide (NTZ) for Post-Exposure Prophylaxis of COVID-19 and Other Viral Respiratory Illnesses in Elderly Residents of Long-Term Care Facilities (LTCF).</i> | Jun 30, 2021 | LTC facility residents | United States | This randomized controlled trial will evaluate the efficacy and safety of Nitazoxanide for post-exposure prophylaxis of COVID-19 and other viral respiratory infections in elderly LTC residents. |

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| Carlson, B. W., & Sturdevant, D. L. (2020). <i>Training the Innate Immune System Against SARS-CoV-2 (COVID-19) Using the Shingrix Vaccine in Nursing Home Residents (NH-Shingrix).</i> | Sep 1, 2021 | LTC facility residents | United States | This randomized pilot trial will measure the effect of Shingrix vaccine on the immune system and whether that has any effect on the body's ability to fight off other infections such as COVID-19. |
| Murray, M. (2020). <i>BCG Against Covid-19 for Prevention and Amelioration of Severity Trial (BAC to the PAST).</i> | Nov 30, 2021 | Residents of LTC facilities | United States | This randomized controlled trial will assess the efficacy of Bacille Calmette-Guérin vaccination compared to placebo in reducing severe COVID-19 disease among elderly residents of LTC facilities. |
| Kraschnewski, J., & Francis, E. (2020). <i>COVID-19 Project ECHO in Nursing Homes.</i> | Jul 2022 | LTC facilities | United States | This randomized controlled trial will explore how an intervention using an evidence-based telehealth model can be implemented effectively in LTC facilities. Effectiveness and implementation outcomes will be evaluated including infection rate, hospitalization, and death. |
| Luque, G. (2020). <i>Prevention of COVID19 infection with hydroxychloroquine in institutionalized older people and nursing home staff. An open, randomized controlled stepped-wedge clinical trial by clusters. PREVICHARM study.</i> | NR | Staff in institutions | Spain | This randomized control trial will evaluate the effectiveness of prophylactic administration of hydroxychloroquine to prevent COVID-19 infection in direct care staff in institutions. Mortality, hospital admission, incidence and drug safety will also be evaluated. The interaction of additional measures (i.e., IPAC knowledge, cross-infection) and hydroxychloroquine chemoprophylaxis will also be evaluated. |
| Odense University Hospital (2020). <i>COVID-19 Prophylaxis with hydroxychloroquine, Vitamin D, and Zinc supplementation in Danish nursing home residents – a randomized controlled trial.</i> | Prematurely ended | NR | Denmark | Study prematurely ended, no data reported |

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