

# Interim Operational Considerations for Implementing the Shielding Approach to Prevent COVID-19 Infections in Humanitarian Settings

Accessible version: <https://www.cdc.gov/coronavirus/2019-ncov/global-covid-19/shielding-approach-humanitarian.html>

This document presents considerations from the perspective of the U.S. Centers for Disease Control & Prevention (CDC) for implementing the shielding approach in humanitarian settings as outlined in guidance documents focused on camps, displaced populations and low-resource settings.<sup>1,2</sup> This approach has never been documented and has raised questions and concerns among humanitarian partners who support response activities in these settings. The purpose of this document is to highlight potential implementation challenges of the shielding approach from CDC's perspective and guide thinking around implementation in the absence of empirical data. Considerations are based on current evidence known about the transmission and severity of coronavirus disease 2019 (COVID-19) and may need to be revised as more information becomes available. Please check the following CDC website periodically for updates: <https://www.cdc.gov/coronavirus/2019-ncov/global-covid-19/index.html>

## What is the Shielding Approach<sup>1</sup>?

The shielding approach aims to reduce the number of severe COVID-19 cases by limiting contact between individuals at higher risk of developing severe disease ("high-risk") and the general population ("low-risk"). High-risk individuals would be temporarily relocated to safe or "green zones" established at the household, neighborhood, camp/sector or community level depending on the context and setting.<sup>1,2</sup> They would have minimal contact with family members and other low-risk residents.

Current evidence indicates that older adults and people of any age who have serious underlying medical conditions are at higher risk for severe illness from COVID-19.<sup>3</sup> In most humanitarian settings, older population groups make up a small percentage of the total population.<sup>4,5</sup> For this reason, the shielding approach suggests physically separating high-risk individuals from the general population to prioritize the use of the limited available resources and avoid implementing long-term containment measures among the general population.

In theory, shielding may serve its objective to protect high-risk populations from disease and death. However, implementation of the approach necessitates strict adherence<sup>1,6,7</sup> to protocol. Inadvertent introduction of the virus into a green zone may result in rapid transmission among the most vulnerable populations the approach is trying to protect.

A summary of the shielding approach described by Favas is shown in Table 1. See *Guidance for the prevention of COVID-19 infections among high-risk individuals in low-resource, displaced and camp and camp-like settings*<sup>1,2</sup> for full details.



**Table 1: Summary of the Shielding Approach<sup>1</sup>**

Level	Movement/ Interactions
<p><b>Household (HH) Level:</b> A specific room/area designated for high-risk individuals who are physically isolated from other HH members.</p>	<p>Low-risk HH members should not enter the green zone. If entry is necessary, it should be done only by healthy individuals after washing hands and using face coverings. Interactions should be at a safe distance (approx. 2 meters). Minimum movement of high-risk individuals outside the green zone. Low-risk HH members continue to follow social distancing and hygiene practices outside the house.</p>
<p><b>Neighborhood Level:</b> A designated shelter/group of shelters (max 5-10 households), within a small camp or area where high-risk members are grouped together. Neighbors “swap” households to accommodate high-risk individuals.</p>	<p>Same as above</p>
<p><b>Camp/Sector Level:</b> A group of shelters such as schools, community buildings within a camp/sector (max 50 high-risk individuals per single green zone) where high-risk individuals are physically isolated together.</p>	<p>One entry point is used for exchange of food, supplies, etc. A meeting area is used for residents and visitors to interact while practicing physical distancing (2 meters). No movement into or outside the green zone.</p>

## Operational Considerations

The shielding approach requires several prerequisites for effective implementation. Several are addressed, including access to healthcare and provision of food. However, there are several prerequisites which require additional considerations. Table 2 presents the prerequisites or suggestions as stated in the shielding guidance document (column 1) and CDC presents additional questions and considerations alongside these prerequisites (column 2).

**Table 2: Suggested Prerequisites per the shielding documents and CDC’s Operational Considerations for Implementation**

<p align="center"><b>Suggested Prerequisites</b> <b>*As stated in the shielding document*</b></p>	<p align="center"><b>Considerations as suggested by CDC</b></p>
<ul style="list-style-type: none"> <li>• Each green zone has a dedicated latrine/bathing facility for high-risk individuals</li> </ul>	<ul style="list-style-type: none"> <li>• The shielding approach advises against any new facility construction to establish green zones; however, few settings will have existing shelters or communal facilities with designated latrines/ bathing facilities to accommodate high-risk individuals. In these settings, most latrines used by HHs are located outside the home and often shared by multiple HHs.</li> <li>• If dedicated facilities are available, ensure safety measures such as proper lighting, handwashing/ hygiene infrastructure, maintenance and disinfection of latrines.</li> <li>• Ensure facilities can accommodate high-risk individuals with disabilities, children and separate genders at the neighborhood/camp-level.</li> </ul>
<ul style="list-style-type: none"> <li>• To minimize external contact, each green zone should include able-bodied high-risk individuals capable of caring for residents who have disabilities or are less mobile. Otherwise, designate low-risk individuals for these tasks, preferably who have recovered from confirmed COVID-19 and are assumed to be immune.</li> </ul>	<ul style="list-style-type: none"> <li>• This may be difficult to sustain, especially if the caregivers are also high risk. As caregivers may often will be family members, ensure that this strategy is socially or culturally acceptable.</li> <li>• Currently, we do not know if prior infection confers immunity.</li> </ul>
<ul style="list-style-type: none"> <li>• The green zone and living areas for high-risk residents should be aligned with minimum humanitarian (SPHERE) standards.<sup>6</sup></li> </ul>	<ul style="list-style-type: none"> <li>• The shielding approach requires strict adherence to infection, prevention and control (IPC) measures. They require, uninterrupted availability of soap, water, hygiene/cleaning supplies, masks or cloth face coverings, etc. for all individuals in green zones. Thus, it is necessary to ensure minimum public health standards<sup>6</sup> are maintained and possibly supplemented to decrease the risk of other outbreaks outside of COVID-19. Attaining and maintaining minimum SPHERE<sup>6</sup> standards is difficult in these settings for the general population.<sup>8,9,10</sup> Users should consider that provision of services and supplies to high risk individuals could be at the expense of low-risk residents, putting them at increased risk for other outbreaks.</li> </ul>

<ul style="list-style-type: none"> <li>• Monitor and evaluate the implementation of the shielding approach.</li> </ul>	<ul style="list-style-type: none"> <li>• Monitoring protocols will need to be developed for each type of green zone.</li> <li>• Dedicated staff need to be identified to monitor each green zone. Monitoring includes both adherence to protocols and potential adverse effects or outcomes due to isolation and stigma. It may be necessary to assign someone within the green zone, if feasible, to minimize movement in/out of green zones.</li> </ul>
<ul style="list-style-type: none"> <li>• Men and women, and individuals with tuberculosis (TB), severe immunodeficiencies, or dementia should be isolated separately</li> </ul>	<ul style="list-style-type: none"> <li>• Multiple green zones would be needed to achieve this level of separation, each requiring additional inputs/resources. Further considerations include challenges of accommodating different ethnicities, socio-cultural groups, or religions within one setting.</li> </ul>
<ul style="list-style-type: none"> <li>• Community acceptance and involvement in the design and implementation</li> </ul>	<ul style="list-style-type: none"> <li>• Even with community involvement, there may be a risk of stigmatization.<sup>11,12</sup> Isolation/separation from family members, loss of freedom and personal interactions may require additional psychosocial support structures/systems. See section on additional considerations below.</li> </ul>
<ul style="list-style-type: none"> <li>• High-risk minors should be accompanied into isolation by a single caregiver who will also be considered a green zone resident in terms of movements and contacts with those outside the green zone.</li> </ul>	<ul style="list-style-type: none"> <li>• Protection measures are critical to implementation. Ensure there is appropriate, adequate, and acceptable care of other minors or individuals with disabilities or mental health conditions who remain in the HH if separated from their primary caregiver.</li> </ul>
<ul style="list-style-type: none"> <li>• Green zone shelters should always be kept clean. Residents should be provided with the necessary cleaning products and materials to clean their living spaces.</li> </ul>	<ul style="list-style-type: none"> <li>• High-risk individuals will be responsible for cleaning and maintaining their own living space and facilities. This may not be feasible for persons with disabilities or decreased mobility.<sup>11</sup> Maintaining hygiene conditions in communal facilities is difficult during non-outbreak settings.<sup>7,8,9</sup> consequently it may be necessary to provide additional human resource support.</li> </ul>
<ul style="list-style-type: none"> <li>• Green zones should be more spacious in terms of shelter area per capita than the surrounding camp/sector, even at the cost of greater crowding of low-risk people.</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure that targeting high-risk individuals does not negate mitigation measures among low-risk individuals (physical distancing in markets or water points, where feasible, etc.). Differences in space based on risk status may increase the potential risk of exposure among the rest of the low-risk residents and may be unacceptable or impracticable, considering space limitations and overcrowding in many settings.</li> </ul>

## Additional Considerations

The shielding approach outlines the general “logistics” of implementation –who, what, where, how. However, there may be additional logistical challenges to implementing these strategies as a result of unavailable commodities, transport restrictions, limited staff capacity and availability to meet the increased needs. The approach does not address the potential emotional, social/cultural, psychological impact for separated individuals nor for the households with separated members. Additional considerations to address these challenges are presented below.

### *Population characteristics and demographics*

**Consideration:** The number of green zones required may be greater than anticipated, as they are based on the total number of high-risk individuals, disease categories, and the socio-demographics of the area and not just the proportion of elderly population.

**Explanation:** Older adults represent a small percentage of the population in many camps in humanitarian settings (approximately 3-5%<sup>4,5</sup>), however in some humanitarian settings more than one quarter of the population may fall under high risk categories<sup>13,14,15</sup> based on underlying medical conditions which may increase a person’s risk for severe COVID-19 illness which include chronic kidney disease, obesity, serious heart conditions, sickle cell disease, and type 2 diabetes. Additionally, many camps and settlements host multiple nationalities which may require additional separation, for example, Kakuma Refugee Camp in Kenya accommodates refugees from 19 countries.<sup>16</sup>

### *Timeline considerations*

**Consideration:** Plan for an extended duration of implementation time, at least 6 months.

**Explanation:** The shielding approach proposes that green zones be maintained until one of the following circumstances arises: (i) sufficient hospitalization capacity is established; (ii) effective vaccine or therapeutic options become widely available; or (iii) the COVID-19 epidemic affecting the population subsides.

Given the limited resources and healthcare available to populations in humanitarian settings prior to the pandemic, it is unlikely sufficient hospitalization capacity (beds, personal protective equipment, ventilators, and staff) will be achievable during widespread transmission. The national capacity in many of the countries where these settings are located (e.g., Chad, Myanmar, and Syria) is limited. Resources may become quickly overwhelmed during the peak of transmission and may not be accessible to the emergency affected populations.

Vaccine trials are underway, but with no definite timeline. Reaching the suppression phase where the epidemic subsides can take several months and cases may resurge in a second or even third wave. Herd immunity (the depletion of susceptible people) for COVID-19 has not been demonstrated to date. It is also unclear if an infected person develops immunity and the duration of potential immunity is unknown. Thus, contingency plans to account for a possibly extended operational timeline are critical.

### *Other logistical considerations*

**Consideration:** Plan to identify additional resources and outline supply chain mechanisms to support green zones.

**Explanation:** The implementation and operation of green zones requires strong coordination among several sectors which may require substantial additional resources: supplies and staff to maintain these spaces – shelters, IPC, water, sanitation, and hygiene (WASH), non-food items (NFIs) (beds, linens, dishes/utensils, water containers), psychosocial support, monitors/supervisors, caretakers/attendants, risk communication and community engagement, security, etc. Considering global reductions in commodity shortages,<sup>17</sup> movement restrictions, border closures, and decreased trucking and flights, it is important to outline what additional resources will be needed and how they will be procured.

### *Protection*

**Consideration:** Ensure safe and protective environments for all individuals, including minors and individuals who require additional care whether they are in the green zone or remain in a household after the primary caregiver or income provider has moved to the green zone.

**Explanation:** Separating families and disrupting and deconstructing multigenerational households may have long-term negative consequences. Shielding strategies need to consider sociocultural gender norms in order to adequately assess and address risks to individuals, particularly women and girls.<sup>18,19,20</sup> Restrictive gender norms may be exacerbated by isolation strategies such as shielding. At the household level, isolating individuals and limiting their interaction, compounded with social and economic disruption has raised concerns of potential increased risk of partner violence. Households participating in house swaps or sector-wide cohorting are at particular risk for gender-based violence, harassment, abuse, and exploitation as remaining household members may not be decision-makers or responsible for households needs.<sup>18,19,20</sup>

## Social/Cultural/Religious Practices

Consideration: Plan for potential disruption of social networks.

Explanation: Community celebrations (religious holidays), bereavement (funerals) and other rites of passage are cornerstones of many societies. Proactive planning ahead of time, including strong community engagement and risk communication is needed to better understand the issues and concerns of restricting individuals from participating in communal practices because they are being shielded. Failure to do so could lead to both interpersonal and communal violence.<sup>21,22</sup>

## Mental Health

Consideration: Ensure mental health and psychosocial support<sup>\*,23</sup> structures are in place to address increased stress and anxiety.

Explanation: Additional stress and worry are common during any epidemic and may be more pronounced with COVID-19 due to the novelty of the disease and increased fear of infection, increased childcare responsibilities due to school closures, and loss of livelihoods.

Thus, in addition to the risk of stigmatization and feeling of isolation, this shielding approach may have an important psychological impact and may lead to significant emotional distress, exacerbate existing mental illness or contribute to anxiety, depression, helplessness, grief, substance abuse, or thoughts of suicide among those who are separated or have been left behind. Shielded individuals with concurrent severe mental health conditions should not be left alone. There must be a caregiver allocated to them to prevent further protection risks such as neglect and abuse.

## Summary

The shielding approach is an ambitious undertaking, which may prove effective in preventing COVID-19 infection among high-risk populations if well managed. While the premise is based on mitigation strategies used in the United Kingdom,<sup>24,25</sup> there is no empirical evidence whether this approach will increase, decrease or have no effect on morbidity and mortality during the COVID-19 epidemic in various humanitarian settings. This document highlights a) risks and challenges of implementing this approach, b) need for additional resources in areas with limited or reduced capacity, c) indefinite timeline, and d) possible short-term and long-term adverse consequences.

Public health not only focuses on the eradication of disease but addresses the entire spectrum of health and wellbeing. Populations displaced, due to natural disasters or war and, conflict are already fragile and have experienced increased mental, physical and/or emotional trauma. While the shielding approach is not meant to be coercive, it may appear forced or be misunderstood in humanitarian settings. As with many community interventions meant to decrease COVID-19 morbidity and mortality, compliance and behavior change are the primary rate-limiting steps and may be driven by social and emotional factors. These changes are difficult in developed, stable settings; thus, they may be particularly challenging in humanitarian settings which bring their own set of multi-faceted challenges that need to be taken into account.

Household-level shielding seems to be the most feasible and dignified as it allows for the least disruption to family structure and lifestyle, critical components to maintaining compliance. However, it is most susceptible to the introduction of a virus due to necessary movement or interaction outside the green zone, less oversight, and often large household sizes. It may be less feasible in settings where family shelters are small and do not have multiple compartments. In humanitarian settings, small village, sector/block, or camp-level shielding may allow for greater adherence to proposed protocol, but at the expense of longer-term social impacts triggered by separation from friends and family, feelings of isolation, and stigmatization. Most importantly, accidental introduction of the virus into a green zone may result in rapid transmission and increased morbidity and mortality as observed in assisted care facilities in the US.<sup>26</sup>

The shielding approach is intended to alleviate stress on the healthcare system and circumvent the negative economic consequences of long-term containment measures and lockdowns by protecting the most vulnerable.<sup>1,24,25</sup> Implementation of this approach will involve careful planning, additional resources, strict adherence and strong multi-sector coordination, requiring agencies to consider the potential repercussion among populations that have collectively experienced physical and psychological trauma which makes them more vulnerable to adverse psychosocial consequences. In addition, thoughtful consideration of the potential benefit versus the social and financial cost of implementation will be needed in humanitarian settings.

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\*Specific psychosocial support guidance during COVID-19 as specific subject areas are beyond the scope of this document.

## Reference

1. Favas, C. Guidance for the prevention of COVID-19 infections among high-risk individuals in camps and camp-like settings. London School of Hygiene and Tropical Medicine, 31 March 2020. <https://www.lshtm.ac.uk/sites/default/files/2020-04/Guidance%20for%20the%20prevention%20of%20COVID-19%20infections%20among%20high-risk%20individuals%20in%20camps%20and%20camp-like%20settings.pdf>
2. Mayssoon, D, Zandvoort K, Flasche S, et al. COVID-19 control in low-income settings and displaced populations: what can realistically be done?. 2020. London School of Hygiene and Tropical Medicine. <https://www.lshtm.ac.uk/newsevents/news/2020/covid-19-control-low-income-settings-and-displaced-populations-what-can>
3. Centers for Disease Control and Prevention. Groups at Higher Risk for Severe Illness. Content source: National Center for Immunization and Respiratory Diseases (NCIRD), Division of Viral Diseases. Last content review 14 May 2020. <https://www.cdc.gov/coronavirus/2019-ncov/need-extra-precautions/groups-at-higher-risk.html>
4. UNHCR Statistical Yearbook 2016. <https://www.unhcr.org/en-us/statistics/country/5a8ee0387/unhcr-statistical-yearbook-2016-16th-edition.html>
5. UNHCR -Rohingya Refugee Response/Bangladesh-Joint Government of Bangladesh-UNHCR, Population Factsheet. Annex I and II. March 31,2020. Sent by email.
6. The Sphere Handbook. Humanitarian Charter and Minimum Standards in Humanitarian Response, 2018 edition. <https://handbook.spherestandards.org/en/sphere/#ch001>
7. Butler, N., Tulloch. O. Anthrologica, 2020. Social Sciences in Humanitarian Action. <https://opendocs.ids.ac.uk/opendocs/bitstream/handle/20.500.12413/15286/SSHAP%20COVID-19%20Brief%20Shielding.pdf?sequence=1&isAllowed=y>
8. Blum, L.S., Yemweni, A., Trinius, V. et al. Programmatic implications for promotion of handwashing behavior in an internally displaced persons camp in North Kivu, Democratic Republic of Congo. *Confl Health* 13, 54 (2019). <https://doi.org/10.1186/s13031-019-0225-x>
9. Cronin AA, Shrestha D, Cornier N, Abdalla F, Ezard N, Aramburu C. A review of water and sanitation provision in refugee camps in association with selected health and nutrition indicators--the need for integrated service provision. *J Water Health*. 2008;6(1):1-13. doi:10.2166/wh.2007.019. <https://pubmed.ncbi.nlm.nih.gov/17998603>
10. Nyoka R, Foote AM, Woods E, et al. Sanitation practices and perceptions in Kakuma refugee camp, Kenya: Comparing the status quo with a novel service-based approach [published correction appears in *PLoS One*. 2017 Dec 19;12 (12 ):e0190129]. *PLoS One*. 2017;12(7):e0180864. Published 2017 Jul 13. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5509214/>
11. UNHCR. Working with Persons with Disabilities in Forced Displacement: Need to Know Guidance 1. 2019. <https://www.unhcr.org/4ec3c81c9.pdf>
12. IFRC, UNICEF and WHO. Social Stigma Associated with COVID-19: A guide to preventing and addressing social stigma associated with COVID-19. [https://www.who.int/publications/m/item/a-guide-to-preventing-and-addressing-social-stigma-associated-with-covid-19?gclid=CjwKCAjwr7X4BRA4EiwAUXjbtys2osYzSUm7H4O1AiaKNcr0PPwOqc9Z382D-9rYLv3ZNQYZoAapBoCjxMQAvD\\_BwE](https://www.who.int/publications/m/item/a-guide-to-preventing-and-addressing-social-stigma-associated-with-covid-19?gclid=CjwKCAjwr7X4BRA4EiwAUXjbtys2osYzSUm7H4O1AiaKNcr0PPwOqc9Z382D-9rYLv3ZNQYZoAapBoCjxMQAvD_BwE)
13. Sethi S, Jonsson R, Skaff R, Tyler F. Community-Based Noncommunicable Disease Care for Syrian Refugees in Lebanon. *Glob Health Sci Pract*. 2017;5(3):495-506. Published 2017 Sep 28. doi:10.9745/GHSP-D-17-00043. <https://doi.org/10.9745/GHSP-D-17-00043>
14. Akik C, Ghattas H, Mesmar S, Rabkin M, El-Sadr WM, Fouad FM. Host country responses to non-communicable diseases amongst Syrian refugees: a review. *Confl Health*. 2019;13:8. Published 2019 Mar 22. doi:10.1186/s13031-019-0192-2. <https://doi.org/10.1186/s13031-019-0192-2>
15. Rehr M, Shoaib M, Ellithy S, et al. Prevalence of non-communicable diseases and access to care among non-camp Syrian refugees in northern Jordan. *Confl Health*. 2018;12:33. Published 2018 Jul 11. doi:10.1186/s13031-018-0168-7. <https://conflictandhealth.biomedcentral.com/articles/10.1186/s13031-018-0168-7>
16. UNHCR, Kakuma camp and Kalobeyi Settlement Visitors Guide. <https://www.unhcr.org/ke/wp-content/uploads/sites/2/2018/02/UNHCR-Sub-Office-Kakuma-Visitors-Guide.pdf>
17. World Health Organization. COVID-19 Supply Chain System, Requesting and Receiving Supplies. [https://webcache.googleusercontent.com/search?q=cache:D\\_ZSJ6qjJCMJ:https://www.who.int/docs/default-source/coronaviruse/covid-19-supply-chain-system-requesting-and-receiving-supplies.pdf%3Fsfvrsn%3Dcd25bbbc\\_6%26download%3Dtrue+%&cd=2&hl=en&ct=clnk&gl=us](https://webcache.googleusercontent.com/search?q=cache:D_ZSJ6qjJCMJ:https://www.who.int/docs/default-source/coronaviruse/covid-19-supply-chain-system-requesting-and-receiving-supplies.pdf%3Fsfvrsn%3Dcd25bbbc_6%26download%3Dtrue+%&cd=2&hl=en&ct=clnk&gl=us)
18. UNFPA: COVID-19, A Gender Lens: Protecting sexual and reproductive health and rights and promoting gender equality. <https://www.unfpa.org/resources/covid-19-gender-lens#>
19. IFRC, Prevention and Response to Sexual and Gender-Based Violence in COVID-19, A protection, Gender and Inclusion PGI Technical guidance note. [https://reliefweb.int/sites/reliefweb.int/files/resources/IFRC-SGBV-COVID-19-Technical-Guidance-Note-FINAL\\_14May.pdf](https://reliefweb.int/sites/reliefweb.int/files/resources/IFRC-SGBV-COVID-19-Technical-Guidance-Note-FINAL_14May.pdf)

20. Inter-agency Standing Committee Interim guidance -Technical note. Protection from sexual exploitation and abuse (PSEA) during COVID-19 response. Version 1. <https://interagencystandingcommittee.org/system/files/2020-04/IASC%20Interim%20Guidance%20on%20COVID-19%20-%20Protection%20from%20Sexual%20Exploitation%20and%20Abuse.pdf>
21. Rashad, M, Farrell, S. April 24, 2020. Reuters, Islam's holiest sites emptied by coronavirus crisis as Ramadhan begins. <https://www.reuters.com/article/us-health-coronavirus-ramadan/islams-holiest-sites-emptied-by-coronavirus-crisis-as-ramadan-begins-idUSKCN22611R>
22. ABP News Bureau, April 24, 2020. Pakistani Imams Overrule Lockdown for Ramadan, 253 Healthcare Workers get Infected with COVID-19. <https://news.abplive.com/news/world/ramadan-2020-pakistan-lockdown-253-healthcare-workers-infected-with-coronavirus-1205538>
23. Operational considerations for multisectoral mental health and psychosocial support programmes during the COVID-19 pandemic, Version 1.1 [https://interagencystandingcommittee.org/system/files/2020-06/Operational%20considerations%20for%20multisectoral%20mental%20health%20and%20psychosocial%20support%20programmes%20during%20the%20COVID-19%20pandemic\\_version%201.1.pdf](https://interagencystandingcommittee.org/system/files/2020-06/Operational%20considerations%20for%20multisectoral%20mental%20health%20and%20psychosocial%20support%20programmes%20during%20the%20COVID-19%20pandemic_version%201.1.pdf)
24. Public Health England: Guidance on Shielding and Protecting People Who are Clinically Extremely Vulnerable from COVID-19. <https://www.gov.uk/government/publications/guidance-on-shielding-and-protecting-extremely-vulnerable-persons-from-covid-19/guidance-on-shielding-and-protecting-extremely-vulnerable-persons-from-covid-19>
25. Van Bunnik, Bram A.D., Morgan, L.K., et al. Segmentation and shielding of the most vulnerable members elements of an exit strategy from COVID-19. University of Edinburgh. <https://www.wiki.ed.ac.uk/display/Epigroup/COVID-19+project?preview=/442891806/447360858/van%20Bunnik%20et%20al.%20SS%20manuscript%20050520.pdf>
26. Michael TM, Clark S, Pogojans S, et al. COVID-19 in a Long-Term Care Facility — King County, Washington, February 27–March 9, 2020. MMWR Morb Mortal Wkly Rep 2020; 69:339-342. DOI: <http://dx.doi.org/10.15585/mmwr.mm6912e1>