Health in Humanitarian Crises Centre

LONDON SCHOOL of HYGIENE &TROPICAL MEDICINE

Guidance for the prevention of COVID-19 infections among high-risk individuals in urban settings

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List of abbreviations

COPD	Chronic obstructive pulmonary disease
COVID-19	Coronavirus disease 2019
IPC	Infection prevention and control
HIV/AIDS	Human immunodeficiency virus infection / acquired immune deficiency syndrome
LIC	Low-income countries
NCDs	Non-communicable diseases
NFIs	Non-food items
SARS-Cov-2	Severe acute respiratory syndrome coronavirus 2
TB	Tuberculosis
WASH	Water, sanitation and hygiene
WHO	World Health Organisation

1 Background

Populations residing in urban areas in low-income countries (LICs) may be particularly vulnerable to COVID-19 epidemics due to i) high-population density resulting in intense social mixing, ii) uncontrolled urbanisation and a high proportion of the population living in shanty towns and overcrowded slums iii) often poor access to safe water and sanitation (1–3).

There is no global consensus on what constitutes an 'urban area', and national definitions vary considerably (4). In this guidance, we used the following definition: "the population contained within the contours of a contiguous territory inhabited at urban density levels without regard to administrative boundaries" (4). This definition usually incorporates the population in a city or town plus that in the suburban areas lying outside of, but being adjacent to, the city boundaries, as well as people living in informal urban settlements or 'slums', defined as "a heavily populated urban area characterised by substandard housing and squalor" (5). In crisis-affected settings, a relative majority of forcibly displaced people live within the host community in urban areas (6).

Resource-intensive containment measures imposing severe movement and contact restrictions on the entire population, such as mass 'stay-at-home' orders or general 'lockdown' strategies, have substantially reduced contact levels in China and Europe, thereby suppressing the epidemic and gaining time for preparation of further measures (7). However, these measures might not be appropriate or sustainable for people living in urban areas in LICs, where such measures might be physically unfeasible or would severely disrupt the economy and threaten communities' livelihoods if applied over a long period (8). More generally, these population-wide measures would have to achieve very high levels of compliance in order to lower COVID-19 transmission to an appreciable extent: this is because the baseline transmissibility of the virus in urban areas in LICs, particularly in slums or informal urban settlements, is likely to be considerably higher than hitherto observed in high-resource settings. A more targeted approach of specifically preventing infections among groups at high risk of COVID-19 mortality may thus be a useful strategy to reduce mortality and pressure on health services: we refer to this approach as 'shielding' to denote it from more generic distancing measures.

This document provides guidance on the implementation of the shielding approach in urban areas in LICs and crisis-affected regions. It is intended for the community itself, national and local governance institutions, and humanitarian and development actors operating in the country.

2 General principles

The targeted shielding approach aims to protect those most vulnerable from SARS-CoV-2 infection by helping them to live in dignity, safely and separately from the general population for an extended period of time, until one of the following circumstances arises: (i) the number of cases in the community becomes manageable and allows for effective implementation of the optimal strategy of testing, contact tracing and isolation of positive cases as well as quarantine of exposed individuals; (ii) sufficient hospitalisation capacity at the appropriate level is established; (iii) effective vaccine or therapeutic options become widely available; or (iv) the COVID-19 epidemic affecting the population subsides due to control or depletion of susceptible people in the unshielded population. The ultimate goal of this approach is to reduce the excess mortality attributable to COVID-19 while relieving some of the pressure on an often-overstretched health system.

The main feature of this approach is to create 'green zones' – dedicated areas at either the household, extended family or neighbourhood level, in which high-risk individuals (the elderly and those with chronic, underlying conditions) are relocated temporarily, and have minimal contact with family members and other community members at lower risk of severe disease. The actual configuration of these green zones will depend on local cultural and physical urban settlement characteristics: broad options are outlined below. In its most basic design,

shielding mainly attempts to prevent introduction of infection within green zones; if locally possible, rapid testing and referral of shielded residents may be added as a desirable but not strictly necessary component.

In epidemiological terms, the approach attempts to limit, if not completely eliminate, contacts that may result in transmission ('effective contacts') between high-risk and low-risk people, as well as between high-risk people and food, water and fomites that are possibly contaminated by the virus. Its effect on mortality directly attributable to COVID-19 is linearly proportional to the fraction of shielded green zones that remain transmission-free during the COVID-19 epidemic: as such, the approach does not need to attain a specific threshold uptake to have any effectiveness. Despite this, modelling work to date suggests that shielding only achieves substantial effects if enough high-risk people are actually shielded (indicatively, > 60%), if their physical contact with low-risk people is minimised, and if within green zones that house more than one shielded individual, the degree of contact is at least no greater than at baseline (9).

Because high-risk individuals are a numerically small proportion of the population (particularly in low-income countries because of the population age distribution), the build-up of herd immunity (i.e. progression of the epidemic) is relatively unaffected by the intervention.

While the implementation of the approach is as yet undocumented, two key conditions are likely to be indispensable for its effectiveness:

i. Community acceptance and involvement. Essentially, this approach should be community-led. This will require appropriate communication of accurate and consistent information, as well as proactive community engagement and participation in the design and local implementation of the shielding approach (10). Conversely, it is likely that the approach will not be successful if it is perceived as coercive, misunderstood or used by authorities as a pretext for forms of oppression;

ii. Sufficient support to shielded residents as well as their families and caregivers. As outlined below, this will likely include nutrition, medical care and water and sanitation services at a minimum.

This preventive approach should not be seen as a stand-alone intervention to mitigate the COVID-19 epidemic, but rather as part of a holistic response strategy comprising key complementary interventions such as self-isolation of symptomatic people and general physical distancing (9), and requiring strong multisectoral coordination at all levels.

3 Who should be shielded?

The population targeted by the shielding approach consists of the individuals at high risk of death from SARS-CoV-2 infection, mainly defined by age or presence of co-morbidities. Table 1 suggests inclusion criteria for shielding. The criteria reflect current evidence and plausible risk-mitigating assumptions where evidence is yet unavailable. Criteria relating to presence of existing morbidities are to be applied only if disease status is known. A country-specific tool is now available to facilitate estimation of the proportion of the population requiring shielding (11).

COVID-19 fatalities can occur across all age groups, including in apparently previously healthy patients, and as such no set of shielding inclusion criteria can completely capture all attributable mortality risk. Rather, the suggested criteria represent a trade-off between coverage and feasibility: shielding a large proportion of the population would likely negate the approach's potential advantages. Nevertheless, as evidence accumulates on COVID-19 age-specific risk in LICs and crisis settings, criteria may need to change, e.g. lower age groups may also need to be considered for shielding.

There is no evidence available to date that acute malnutrition increases the risk of severe outcomes from COVID-19 (12). In addition, clinical manifestations of COVID-19 among children seem to be less severe than in adults,

and case-fatality ratio seems to increase with age (13–15). While severe acute malnutrition in children may worsen COVID-19 outcomes, shielding a potentially large population of malnourished children and their caregivers (who moreover would not be able to care for other children) is unlikely to be feasible. However, to minimise risk to this group, strengthening food security and early identification and treatment of severe acute malnutrition, along with proactive follow-up of children benefiting from nutritional therapy are warranted. Although acute malnutrition is associated with a higher risk of infections (16), screening adults would entail additional risks of transmission (inherent to the screening activity itself) for possibly limited benefits.

To date, there is no evidence available indicating a higher risk of severe COVID-19 illness in children who recently recovered from measles and shielding them would imply the same challenges as those aforementioned. However, it can be assumed that adults who recently recovered from measles might be at higher risk, due to the increased risk with older age combined with the profound immunosuppression induced by the measles virus (17).

Pregnancy seems not to be associated with an increased risk of severe outcomes from COVID-19, and there is no evidence of intrauterine infection caused by vertical transmission in women who develop COVID-19 illness in late pregnancy (12,18). However, until evidence becomes available, we suggest considering acutely malnourished pregnant women in the inclusion criteria for shielding (see Table 1 below), as their pregnancy status combined with acute malnutrition may make them particularly vulnerable to severe COVID-19 disease.

Identification of high-risk community members should be a community-led process, which supports and promotes community ownership of the approach. The purpose of the shielding approach and the inclusion criteria should be clearly communicated and explained to the community, so that each household can identify who among them is at risk and should be shielded, on a voluntary basis. The process can be facilitated by community health workers / Red Cross or Red Crescent volunteers, or by the social care committees established to support the implementation of the approach (see below).

Table 1: Recommended inclusion criteria for shielding.

Category	Inclusion criteria	Current evidence and risk-mitigating assumptions
Age	60 years old and above	Risk of death from COVID-19 seems to increase with age, particularly among people aged 70 years and above (14,19). We suggest extending the age criterion to 60 years and above (a more meaningful proxy of biological age in most low-income settings) until evidence becomes available.
NCDs	Hypertension; diabetes; cardiovascular disease; obesity Chronic respiratory diseases (e.g. COPD, asthma); chronic kidney disease; cancer (leukaemia, lymphoma, myeloma OR currently or recently on chemotherapy treatment for any cancer type)	Obesity, hypertension, diabetes and cardiovascular disease appear to be associated with a higher risk of severe COVID-19 disease and death (14,19,20). Current recommendations from high-income countries also include chronic respiratory diseases such as COPD and asthma, and chronic kidney disease, as well as people with specific cancers (leukaemia, lymphoma, myeloma) or those who have recently undergone or are currently undergoing chemotherapy treatment.
HIV/AIDS	Known HIV-positive status	There is no evidence suggesting a higher risk of COVID-19 among people living with HIV. However, HIV+ patients are at increased risk of infections (21,22). Until evidence becomes available, we suggest including all people with known HIV+ status (differentiating stages of HIV infection among people might be challenging for the community).
TB	Recent diagnosis of tuberculosis disease AND/OR currently undergoing treatment for tuberculosis	Active or latent tuberculosis may increase susceptibility to COVID-19 and disease severity (23). However, TB patients will need dedicated isolation arrangements (see below).
Measles	Adults who recently recovered from measles	Infection by the measles virus induces a profound and prolonged immunosuppression and general immune dysfunction, which might increase the risk of severe outcomes from COVID-19 (17).
Pregnancy	Pregnant women identified as acutely malnourished Pregnant women with any of the other conditions listed in this table	To date, there is no evidence that pregnancy increases the risk of severe outcomes from COVID-19 (12). However, pregnant women suffering from acute malnutrition may be particularly vulnerable to severe COVID-19 disease. Screening for acute malnutrition is included as part of the minimum package of services to be provided during antenatal care visits, thus should not imply additional workload. Therefore, we suggest considering for inclusion acutely malnourished pregnant women, until evidence becomes available.
Other immuno-deficiency conditions	Severe immuno-deficiency diseases Sickle cell disease (excluding sickle cell trait) On immunosuppressive treatment for any other reason	To date, there is no evidence of association between immuno-deficiency and severe outcomes from COVID-19. However, people having immuno-deficiency conditions or on immunosuppressive treatment (e.g. high dose steroids) are known to be more susceptible to infections. Therefore, we suggest including people having immune-deficiency conditions, until evidence becomes available.
Other chronic infections	Hepatitis B infection Hepatitis C infection	To date, there is no evidence of association between chronic infectious diseases such as hepatitis B or hepatitis C and severe outcomes from COVID-19. However, these diseases impair organ function and may thus complicate COVID-19 progression. Therefore, we suggest considering for inclusion people with Hepatitis B or Hepatitis C, until evidence becomes available.

4 Creating shielding green zones

Three broad typologies of shielded housing arrangements may be considered:

1. Household-level
2. Street- or extended family-level
3. Neighbourhood-level

Each of these options entails benefits and challenges/risks that need to be clearly and adequately presented to the community to enable them to take informed decisions about shielding arrangement(s) choices. Depending on the context and community preferences, a single shielding option or a combination can be implemented. Generally, the chosen arrangement(s) should be tailored by the community to the socio-cultural context, taking into consideration safety and security risks (for example, single-gender green zones or gender-segregated areas may be appropriate). Innovative shielding arrangements can also be developed by the community. However, any local adaptation should not compromise key infection control requirements (see below). An outline of the key characteristics of each option is summarised in Figure 1. Table 2 presents an options appraisal.

Below we refer to high-risk individuals and carers living in the green zones as 'residents' and any other community members as 'non-residents'.

Features common to each option are:

- Unless rapidly feasible, the approach does not require construction of new dwellings; rather, shielding arrangements should be implemented by communities swapping / vacating specific houses / rooms within houses;
- To avoid the perception and experience of enforced isolation as well as the risk of stigmatisation, green zones need not have physical barriers around them (such as fencing), other than existing walls and doors;
- The green zone and living areas for residents should be spacious enough to enable physical distancing as well as acceptable living conditions, allowing for separate sleeping corners and aiming to have the smallest feasible number of people living within a single green zone area. Furthermore, to the extent possible, dedicated latrines / toilets and shower facilities should be available for the residents;
- Residents should, as much as possible, be familiar with one another or come from the same extended family;
- Other than for household-level arrangements, each green zone should include some able-bodied high-risk individuals who are able to care for disabled or less mobile residents: in order to minimise contact with people from outside the green zone, it is essential that residents are supported to take care of themselves;
- If absolutely necessary, one or more low-risk 'carers' (e.g. 1 per 5-10 residents) can be isolated in the green zone with the high-risk residents. Carers should be family members or familiar, trusted individuals; if possible, they should already had confirmed COVID-19, as these individuals are more likely than others have at least temporary immunity.

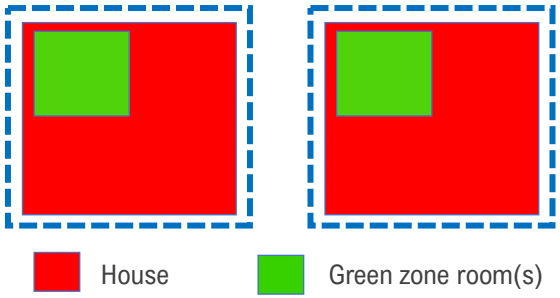
Option 1 : Household-level

Green zone: a specific area (a single or several rooms) within the household.

High-risk individuals are physically isolated from the other household members.

Other household members should not enter the green zone.

Movement outside the green zone should be minimised (shower/latrines; if needed, a short walk during quiet hours when children are sleeping), and social distancing measures should be applied during such movements.



Option 2: Street- or extended family-level

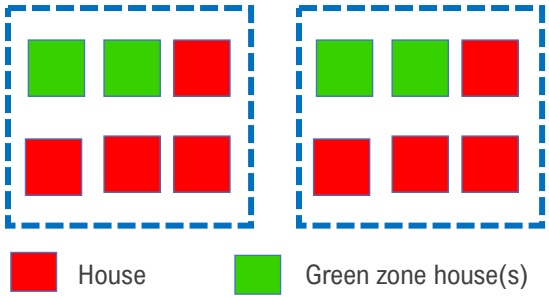
Green zone: a specific house/group of houses (with max 5-10 households), within a small area.

Neighbouring households voluntarily 'house swap' and group their high-risk member in the green zone.

High-risk individuals are physically isolated in the green zone.

Individuals not at high-risk should not enter the green zone.

Movements outside the green zone should be minimised (shower/latrines), and social distancing measures should be applied during such movements.



Option 3: Neighbourhood-level

Green zone: a specific group of houses within a neighbourhood sector (max 25-35 high-risk individuals per single green zone).

High-risk individuals are physically isolated in the green zone.

A single physical entry point is established: exchange of people, food and other provisions are exclusively done through this point.

A meeting area close to the entry point is established, where green zone residents and visitors can interact.

No movement outside the green zone.

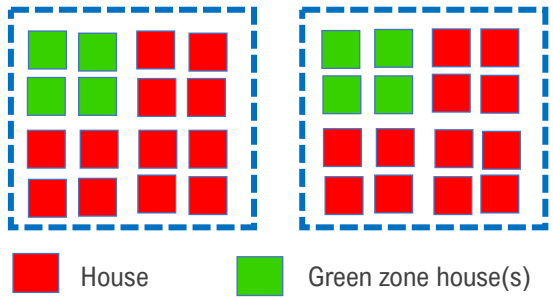


Figure 1: Representation of housing arrangements for each shielding option.

Table 2: Appraisal of shielding options.

Option	Applicability	Advantages / benefits	Challenges / risks
1. Household-level shielding	Urban areas with multi-room houses, or multi-house compound Enough living space available to create dedicated areas to accommodate high-risk individuals	Increased adherence due to proximity of family members who can provide basic necessities and emotional support Less stigma Less change to lifestyle Little need for extra resources	Monitoring of implementation and performance, especially in case of large cities or slums, due to the large number of green zones Implementation of infection prevention measures More likely to be 'leaky' (necessary movements outside the green zone, e.g. for access to shower / latrines)
2. Street- or extended family-level shielding	All urban settings Cultural appropriateness and community acceptance to move persons into grouped living conditions and swap houses	Less stigma Can rely on neighbourly or extended family trust networks; green zone residents likely to be relatives or familiar people Relatively flexible in terms of actual arrangements as long as infection control and social distancing measures can be enforced	Infection control and social distancing measures would have to be strictly observed within each green zone More likely to be leaky (necessary movements outside the green zone, e.g. if no designated showers / latrines in the green zone) Less proximity to family members
3. Neighbourhood-level isolation	Smaller-scale isolation (option 1 and/or 2) not feasible Cultural appropriateness and community acceptance to move persons in grouped living conditions Number of residents in green zones should not exceed 25-35 persons to limit risk of high-scale transmission	More controlled environment than options 1 and 2 Easier to monitor implementation and performance (as residents are concentrated in fewer green zones) Specific health services could be delivered on site (via mobile clinics for example). Potential better coverage	Needs stringent IPC and social distancing measures, which should be strictly observed within each green zone, due to high risk of high-scale transmission and severe disease if a case is introduced Risk of stigmatization Risk of poor adherence due to isolation and separation from family members

5 Implementation

5.1 Timing

Shielding high risk community members should be organised as early as possible in the epidemic progression in order to minimise the risk of introduction of a COVID-19 case into the green zones while establishing them. However, very early in the epidemic curve, or before cases occur locally, communities may not have enough information or perception of the threat to engage positively with such an approach. Conversely, once there is intense transmission within the community, the risk of introducing infectious people into green zones might be considered too high (see below). Although the timing of implementation depends on various context- and socio-cultural-specific factors, a reasonable timeline for rolling out this approach might be: (i) before incidence significantly increases locally, conduct risk communication and community engagement with people, and help them to co-design a shielding solution that works for them; (ii) move to support the implementation of shielding (or advise communities to adopt shielding) as soon as clusters of cases with local transmission occur.

Shielding is inherently restrictive of personal liberty and may carry a substantial psychosocial burden for both shielded individuals and their families. Therefore, the duration of shielding should be limited to the minimum needed to protect people during the majority of the epidemic curve. The exact period will be hard to determine without adequate local surveillance and/or mathematical modelling, and will vary as a function of baseline transmissibility and any general distancing measures implemented locally, since the latter will to a varying extent 'flatten' the curve, thereby resulting in a more protracted epidemic. Based on modelling predictions from representative African settings (9), shielding would probably need to be maintained over a 3-5 month period.

5.2 Community engagement and risk communication

Implementation of the selected shielding arrangements should be community-led: this includes deciding which household members meet the inclusion criteria for shielding, whom to allocate to each green zone, which houses to vacate / swap, and what provisions (e.g. beds, household supplies) to transfer across houses. As a requisite first step to be implemented in anticipation of local transmission or very early into an epidemic, communication and engagement with communities should be proactively carried out and will be fundamental to:

- Raise awareness of the likely level and urgency of risk (e.g. expected COVID-19 burden, time window for action, likely unavailability of treatment);
- Explain who are the most at risk of severe outcomes and death from COVID-19;
- Present the broad shielding options, while also communicating clearly the key infection prevention principles;
- Facilitate a sense of agency among community members: they can adopt *voluntary* changes and solutions to mitigate the risk. As long as the epidemiological foundation of shielding is maintained, they can design the most locally appropriate solution. They should be reassured that government services and civil society actors will then support them to implement it.

Social mobilisation and community engagement should be done through culturally appropriate and mediated risk communication (if useful providing experience from other settings) and in a coordinated manner to avoid confusion and diffusion of conflicting messages (see WHO guidance (24)).

In all cases, it should be made explicit to communities that their behaviour must change, perhaps drastically, if they are to lower the risk to all, and especially to the most vulnerable. Doing nothing should not be considered an option. Just as in Ebola control "no touch" and safe burial policies were warranted to curb transmission, so too with COVID-19 important alterations to religious practice, custom and tradition will be imperative. The social

desirability of honouring protecting the elderly and vulnerable family members should be emphasised, along with people's agency to make exceptional sacrifices to help these respected family members.

5.3 Community-based governance

A community-based governance mechanism might be helpful in facilitating and supporting the implementation of the shielding approach, enhancing adherence to the required infection control measures, and fostering a sense of community ownership of the approach. This governance mechanism can take various forms in its nature, structure and functions, depending on the existing social structure and context. A fundamental principle would be its social inclusiveness: specific categories of population should not be excluded, stigmatised or marginalised, whether they engage with the shielding approach or not. A few alternative / complementary options are listed as follows:

- Social care committees could be created, each covering a few green zones in a designated geographical area (e.g. a neighbourhood or a street). Their composition would vary according to context but should be representative of the families with high-risk individuals being shielded. The functions, ways of working and roles within the committee would be defined by its members;
- Community health workers or Red Cross/ Red Crescent volunteer networks could support shielding implementation, under the conditions that they are functioning well, the community workers / volunteers are well recognised in their communities and it does not represent an unmanageable additional workload. If these community care networks are well integrated into the health system, they could act as a valuable interface between the community and health facilities;
- Other well recognised community-based organisations or associations, including women's associations and faith-based institutions.

The governance body members should be supported and provided with adequate information and supplies (e.g. notebook, pen, phone credit) to perform their functions appropriately. Their main responsibilities could comprise:

- Helping households to identify high-risk community members;
- Facilitating a decision on which green zone arrangement works best for the community;
- Registration of high-risk individuals that are shielded in the green zones;
- Dissemination of culturally appropriate information on behaviour change, IPC measures and other relevant information;
- Enforcement of use of the single-entry point, hand washing on entry and exit of the meeting area or green zone, and maintenance of distance and disinfection of items in the meeting area;
- Coordination of provision of food and supplies from non-residents;
- Liaison with health facilities if a resident needs medical care or has symptoms consistent with COVID-19;
- Liaison with other supportive services provided by local authorities, local association and/or humanitarian actors;
- Collection of feedback and complaints.

5.4 Prior to setting up the green zones

Houses, latrines / toilets, showers and other fomites (e.g. beds, tables, household supplies etc.) assigned to a given green zone should be thoroughly cleaned.

Any high-risk individuals who are ill (fever and persistent cough), or whose household members are ill, should wait until they and their household members are all symptom-free before joining their allocated green zone.

Social care committees or other designated supporting bodies (e.g. Red Cross Red Crescent volunteers, NGOs) should inspect the green zones as they are being created, and provide constructive advice or material support whenever they do not comply with the essential criteria for infection control outlined below.

5.5 Registration of green zone residents

Registration of high-risk individuals isolated within the green zones as well as a mapping of the shielding housing arrangements should be done and continuously updated in order to:

- Identify the adequate level and type of supportive services to be delivered to them;
- Provide the residents with hygiene supplies as well as the water and sanitation facilities required to apply IPC measures (see below);
- Establish an appropriate alert mechanism to report and immediately isolate residents with symptoms consistent with COVID-19;
- Monitor and evaluate the implementation of the shielding approach.

Registration need not entail collection of confidential medical data, unless this is strictly relevant for provision of ongoing care for pre-existing conditions.

5.6 Specific considerations and risk mitigation

Any children identified as high-risk must 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.

Individuals with active TB should be isolated separately from other shielded individuals through either individual isolation (option 1) or a dedicated, separate green zone. The latter should be established with due attention to stigma and given sufficient protection (e.g. be placed under the stewardship of a health facility, NGO or religious institution).

Specific consideration should be given to the isolation arrangements of individuals with severe immuno-deficiency conditions, as well as elderly individuals with dementia or people with severe mental disorders. Individual shielding might be more appropriate in these specific cases.

People who report sexual, physical or other forms of abuse and discrimination by co-residents should be immediately offered alternative arrangements, e.g. individual isolation or residence in another green zone. Generally, *no one should be forced to remain within a green zone against his or her will*.

The main identified risks related to the implementation of the shielding approach, their consequences and mitigation measures are summarised in Table 3 below. Further detail is provided in the next section.

Table 3: Risk register and mitigation measures.

Risk description	Consequences	Specific mitigation measures
An infectious COVID-19 case is isolated within the green zones	High risk of transmission to other green zone residents Community mistrust Poor adherence	Limit the number of residents within each green zone Provide adequate space and hygiene within green zones to enable residents to maintain physical distancing from other residents Clear and appropriate risk communication to shielded residents If any high-risk individuals or their household members present symptoms consistent with COVID-19, they should wait until they (or their household members) are free of symptoms before being isolated within a green zone. If possible, systematically test people before isolating them in green zones.
Unshielded individuals transmit the infection to green zone residents	High risk of transmission to other green zone residents Community mistrust Poor adherence	Clear and appropriate risk communication Limit and preferably eliminate any physical entry of unshielded people into green zones Establish a single-entry point to the green zone, with stringent IPC (e.g. handwashing) Support residents to minimise their need for exiting the green zone (e.g. to procure food or medicine) Appoint community members to invigilate entry point Facilitate safe social interaction between shielded residents and their families and friends (e.g. meeting area in option 3)
Green zone residents develop symptoms consistent with COVID-19	High risk of transmission to other green zone residents Community mistrust Poor adherence	Limit the number of residents within each green zone Clear and appropriate risk communication to shielded residents Provide adequate space and hygiene within green zones to enable residents to maintain physical distancing from other residents Establish an effective alert mechanism for early identification, isolation and if appropriate referral of suspected cases
Transmission of other infectious diseases among shielded residents	Morbidity and mortality of shielded residents	Specific shielding arrangements for high-risk community members with infectious diseases such as TB (e.g. individual shielding)
Stigmatisation of green zone residents	Poor adherence Tensions between green zone residents and others as well as among green zone residents Worsened mental health and psychosocial functioning	Community engagement and risk communication Considering household shielding for high-risk individuals at risk of stigma Mental health and psychosocial support for shielded residents
Physical, sexual or other forms of abuse or discrimination among residents	Poor adherence Worsened mental health and psychosocial functioning	Communication and community engagement Gender-segregated green zones Community-based protection mechanisms Clear feedback and complaints mechanism (e.g. through governance body, set up of a dedicated phone line, etc…) Offer immediately other shielding arrangements Mental health and psychosocial support

6 Infection prevention and control

Stringent but realistic infection control measures should accompany any shielding arrangement chosen, as should some social distancing within the green zones. This is of particular importance under option 3, due to the risk of high-scale transmission if infection is seeded within such concentrated green zones.

6.1 Between green zones and outside

It is crucial to minimise contacts between residents and non-residents as well as movements of non-residents inside green zones in order to limit the risk of transmission. However, social interaction with and support from family and friends should be maintained for the well-being of the residents, while applying strict infection prevention and control measures.

Non-residents should not enter the room(s) / house(s) designated as the green zone, unless it is absolutely necessary and only after washing their hands. Interactions between residents and non-residents should be done at a safe distance (approximately 2 meters).

A single physical entry point should be established and controlled: exchange of people and supplies should exclusively be done through this point. A meeting area, close to the entry point, should be established for non-residents visiting residents. A maximum number of visitors at any given time should be stipulated. A safe distance between residents and non-residents should be maintained in the meeting area (approximately 2 meters), and physical contact should be avoided. Residents and non-residents should wash their hands before entering the meeting area. If any physical items, such as plastic chairs, are kept in the meeting area, these should not be moved outside the meeting area and should be cleaned with soap and water, or equivalent available cleaning solution, after each use. An alternative option could be to designate specific chairs and other physical items to be used by residents only, and others by non-residents only. Non-residents should not go into the green zones, other than the meeting area, unless it is absolutely necessary, and only after washing their hands.

To avoid direct contact, foods and other supplies provided to residents may be left at the entrance of the green zone or in the meeting area. Non-residents should be encouraged to wash their hands before handling foods and other supplies provided to residents. Where appropriate, items should be cleaned with soap and water before being collected from the entry point by the residents.

Residents should only leave the green zone for essential medical care. If for any reason a resident goes out of the green zone, the resident should be abetted to apply social distancing measures (i.e. keep a safe distance of approximately 2 meters), and to wash their hands at the entry point when entering back into the green zone.

As applied during smallpox eradication efforts (albeit for the reverse scenario of isolating infectious people), it may be acceptable to appoint (and possibly remunerate) community members to act as sentinels at the entry point to green zones, so as to gently invigilate proceedings, remind people of appropriate behaviour and organise support if a green zone resident perceives a need to exit.

6.2 Within green zones

Frequent and proper hand hygiene is one of the most important measures that can be used to prevent spread/transmission of infection (25). Uninterrupted access to water and soap for handwashing should therefore be ensured for the residents, as well as non-residents living under the same shelter under option 1. Dissemination of key messages about handwashing (how to wash and key moments) to residents (and non-residents) should be reinforced.

As discussed under key principles, green zones should be, to the extent possible, spacious enough to avoid side-by-side sleeping and concentration of many residents within the same green zone.

Under option 1, because residents will probably not have handwashing facilities in their green zones, water and soap should be provided by the non-resident household members, following the measures described in the above section.

Under option 2 and 3, handwashing facilities should be established in the green zones and easily accessible: the minimum required would be one at the entry point. In addition, and to the extent possible, sanitation facilities (shower/latrines) and a water point should be designated for the residents.

Room(s) / house(s) within the green zones should be kept clean at all times. Residents should be provided with the necessary cleaning products[1] and materials to clean their living spaces.

6.3 Use of masks

WHO recommendations stipulate that masks should only be used when people have respiratory symptoms or by healthy people taking care of a sick person (26). There is mixed evidence on the effectiveness of masks for public protection. Although some studies suggest that wearing masks decreases the risk of viral exposure and infection risk (27), there is little evidence available to date specifically for SARS-CoV-2. In addition, the protective effect of masks depends greatly on how they are used. Finally, the demand for masks has increased dramatically with the spread of COVID-19 and prioritisation should be given to those who need them most (e.g. health workers).

Therefore, masks should not be seen as a requirement for the implementation of the shielding approach. However, if communities express the desire to use masks or face covers, or if local authorities recommend or require this, clear information on how to use masks and how to safely dispose of them should be included in risk communication.

7 Managing symptomatic residents of the green zone

An alert mechanism should be established to immediately report any resident who develops symptoms consistent with COVID-19 (i.e. fever and at least one sign/symptom of respiratory disease, e.g., cough, shortness of breath (28)). Any resident reported with such symptoms should be immediately isolated and – if resources allow – tested for COVID-19. Isolation modalities can vary depending on context and housing arrangements, and should be decided during the design stage of the shielding approach.

The alert system and its modalities should be defined with the community, so that it is tailored to the local context, constraints (e.g. no phone network) and community preferences. Whichever option is selected, the system should comprise the following core elements to be effective:

- Risk knowledge: adequate information on COVID-19 symptoms should be provided to the green zone residents so that they have the capacity to recognise symptoms of possible COVID-19;
- Clear communication channels are established and known at each level of the alert system so that any alert is timely reported;

[1] If possible, regular household soap or detergent should be used for cleaning first and then, after rinsing, regular household disinfectant containing 0.5% sodium hypochlorite should be applied (25). If needed, cleaning materials and water storage items should also be provided (buckets, mops, broom, jerrycans, etc…).

- Clear alert response mechanisms should be defined and known at each level of the alert system so that suspected COVID-19 cases within green zones are immediately isolated.

One option could be that a member of each social care committee or any other community base governance networks are designated as focal points and are alerted verbally, by phone or SMS, or any other appropriate method in case of COVID-19-like illness in a green zone. They should then ensure self-isolation procedures are followed and liaise with health services.

The appropriate conduct for green zone residents in the event that a fellow resident develops COVID-19 symptoms is not presently backed up by clear evidence: depending on the intensity of transmission outside the green zone at that time, it may be less risky on balance to remain within the green zone or to return home. At a minimum, residents should be encouraged to observe very strict physical distancing for a period of at least one week, returning to normal practice if after this period no other resident becomes symptomatic. As above, green zone residents should be at liberty to leave the shielded accommodation if they so prefer.

8 Supportive services

A multisectoral response should be articulated in coordination with the local authorities, the local and international humanitarian organisations, and the community to ensure appropriate living conditions and to provide adequate supportive services to the shielded residents, including but not limited to access to food, basic services and social care.

8.1 Commodity distribution

Households members of shielded residents should organise themselves as they wish, with the support of the social care committees or any other governance bodies, in order to provide the shielded residents with essential commodities (food and household products) so that their basic needs are covered and they can live in dignity in their green zones. A designated individual or team may be identified to collect and deliver these items and deposit them at the green zone entry point. This could be a member of the household (option 1), a member of the social care committee or any other governance bodies (options 2 and 3).

In addition and depending on needs, the shielded residents and their households may be supported by humanitarian actors in order to maintain their livelihoods, ensure adequate living conditions and facilitate the enforcement of IPC measures. Such support could include distribution of non-food items (e.g. household products, hygiene kits), food vouchers, cash transfers, phone and phone credit for shielded residents and household members, etc. Distribution modalities should be carefully defined and adapted to the local context to minimise risks of transmission.

8.2 Health services

To the extent possible, primary health care services should be brought as close as possible to the green zones in order to limit residents' need to exit them. Several delivery modalities are possible depending on context and available resources.

One option is to deploy mobile clinics, which would visit the green zones on a regular basis or on demand and provide primary care to the residents. The number of health staff should be limited to the minimum necessary to provide quality services, and these staff should follow the IPC rules for health care described in the WHO guidance for COVID-19 (29). In order to minimise contacts, residents who require long-term drug therapy (e.g. hypertensives or antiretrovirals) should be provided with the longest-lasting prescriptions considered medically

safe. The feasibility of mobile clinics intervention might be challenging in high-density urban areas, if a high proportion of high-risk individuals are shielded in their own households (option 1).

An alternative could be to provide outreach health services. One or a few health workers from the health facility covering each area where green zones are located could be designated to conduct home visits on demand. A clear line of communication should be established to connect shielded residents to their health facility. This could be done through the community-based governance body and/or community health workers. As for mobile clinics, the number of health staff should be limited to the minimum necessary to provide quality services, and these staff should follow the IPC rules for health care described in the WHO guidance for COVID-19 (29).

In addition to the above, remote consultations for the shielded residents may be conducted by health staff over the phone, in order to perform an initial triage and, depending on needs, either provide counselling and guidance, organise a home visit / dispatch the mobile clinic, or refer to the hospital.

Where none of the above options are feasible, primary health care should be provided at health facility level: this is however discouraged as it may negate some of the benefits of shielding. Health workers should wear appropriate protective equipment and follow the IPC rules for health care described in the WHO guidance for COVID-19 (29). To the extent possible, specific measures should be taken including separate waiting areas for residents, strict observance of social distancing at health facilities, a specific time in the day dedicated only for residents or a specific consultation room allocated at the health facility only for residents.

Secondary health care services should be accessible to residents. Residents must be separated from other patients as much as possible, for example through the implementation of separate waiting and clinical assessment areas. Inpatient admission should be avoided whenever possible and home-based treatment considered to avoid hospital exposure to COVID-19 patients. If admission is necessary, residents must not be admitted to a ward where exposure to COVID-19 patients is possible. A separate bay, ward or isolation room/s should be identified for residents with strict IPC measures enforced as per WHO guidance for COVID-19. Residents admitted with suspected COVID-19 should not be mixed with other COVID-19 patients until the diagnosis can be confirmed.

Green zone residents might be at considerable risk of mental health problems due isolation, high-risk of severe outcomes from COVID-19 etc. They should thus be offered specific mental health and psychosocial support. These services could be integrated with the provision of primary health care by the mobile clinics / home visits or could be provided over the phone. Community-based psychosocial support or other innovative ways of delivering these services should be taken into consideration.

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