STRATEGIES FOR MANAGING MILD AND ASYMPTOMATIC CASES OF COVID-19

Updated 23 April 2020

This note was designed for various policymakers, especially those in low- and middle-income countries, who are in the process of developing strategies for managing mild and asymptomatic cases of COVID-19. For further details on the case studies used and requirements of each level of isolation, please refer to the Annex.

RECOMMENDATIONS

Have three levels of isolation available for mild and asymptomatic cases

1. **Formal Facility level**: three options include field hospitals, makeshift health facilities, and designated wards of existing facilities
2. **Community level**: two options include social distancing units, which are established in groups of several households, and Community Care Centers (CCCs), which can be set up in existing facilities such as hotels and schools
3. **Household level**: designate one room and one caretaker per household to care for sick members (home-based care)

To determine which type of facility is best for a patient, weigh the following factors:

- Current severity of symptoms
- Risk factors which might lead to poorer health outcomes, such as age, comorbidities, close contact with a confirmed case, or recent discharge from a health facility for COVID-19
- Whether or not the home environment is suitable for home-based care

Ensure that you select and train the key personnel who will make decisions related to:

- Seeking treatment, facility level triage, and sustainability of home environment for safe isolation

Consider these complementary measures to enable successful isolation:

- Continue to encourage social distancing
- Prioritize clear communication to the public to build trust and encourage compliance
- Community leadership and involvement is vital
- Ensure those in isolation can still access essential services

CONTEXT

While evidence is still emerging, there is reason to believe that a large number of people are likely COVID-positive but unaware. These mild or asymptomatic individuals still spread COVID-19, likely unknowingly, to others, who may experience more severe health and/or economic outcomes.¹ One initial study from the small town of Vo, Italy, found that 43.2% of those who tested positive for COVID-19 were asymptomatic.² Anthony Fauci, Director of the National Institute of Allergy and Infectious Disease in the U.S., recently estimated that the proportion of asymptomatic cases could be as high as 25-50%.³ Thus far, the evidence also indicates that most cases of COVID-19 are not severe. For instance, a large study of nearly 45,000 cases in China found that over 80% were mild.⁴ Taken together, this early evidence suggests that the proportions of both asymptomatic and mild cases are fairly high, meaning that the virus is likely affecting a far larger percentage of the population.

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than official statistics indicate. Given that such a large number of people are likely COVID-positive but unaware, governments across affected countries should take careful and deliberate measures to identify and isolate all cases, including asymptomatic and mild, in order to limit the spread.

Isolation policies, which separate ill or infected persons from others in order to limit the spread, can be accomplished at several different levels, depending on the severity of the symptoms, risks of poor health outcomes, and suitability of the patient’s home environment, as well as constraints in the healthcare system. In an ideal world, people with mild or asymptomatic cases of COVID-19 could be identified using widespread testing. Those with confirmed cases would then be placed in a designated isolation facility (often a repurposed building such as a school or hotel). In the isolation facilities, all patients would be able to access essential services like food and clean water, and those experiencing symptoms could receive treatment and medical advice from experienced and highly trained medical professionals. At the same time, people who may have been exposed to the virus, such as new arrivals into the country or close contacts of confirmed cases could quarantine at similar – but separate – facilities to prevent transmission. Furthermore, the general population would need to be knowledgeable of the above guidelines and have trust in the government and health systems in place to fully comply.

However, many countries of all income levels are finding that real-world constraints make these ideal conditions nearly impossible. Some of the most pressing limitations include:

- **Constraints on number of tests and their supporting supply chains**, make it difficult to test all but the most severe cases
- **Insufficient medical infrastructure**, including the facilities and equipment needed to safely isolate and care for all mild and asymptomatic cases, and quarantine those who may have been exposed
- Low supply and uneven distribution of **sufficiently trained health care professionals** needed to staff these facilities while still continuing to provide basic health services
- **Low levels of trust in government and health systems** due to historical experience and cultural factors, exacerbated by fear of stigma and the spread of rumors and misinformation

Given these challenges, we recommend modifying the ideal approach to provide options for isolation at the community level and household level in addition to formal facilities. This strategy will reserve hospital beds, equipment, and medical professionals for the most severe cases, while still providing effective care and control of the spread. These measures are essential for all governments to consider, regardless of how strict other COVID-19 related strategies, such as degree of lockdown, have been.

5 It will be hard to know for certain until there is capacity to gather data at the population level. Most current studies are fairly small and not nationally representative.

6 In this brief, when we use the term isolation, we are referring to both confirmed cases and suspected cases of COVID-19, given the context that many countries do not have capacity to test all suspected cases. Also, note that there is a distinction between the terms isolation and quarantine. Quarantine, according to the WHO, refers to the restriction of activities of, or separation of, persons who are not ill but who may have been exposed to an infectious agent or disease. The main objective of quarantine is to monitor symptoms and ensure early detection of cases. For example, restrictions related to people who have been in close contact with a confirmed case but are not currently experiencing symptoms would fall under the definition of quarantine, not isolation. While someone under quarantine would need access to basic essentials like food, clean water, and hygiene materials, they would not require the same level of medical attention as those in isolation, because they are not actively experiencing symptoms. Both isolation and quarantine can take place in a facility or at home.


8 Definitions between mild, moderate, severe, and critical cases vary. Generally, mild and moderate symptoms are virtually the same, including low grade fever, dry cough, and shortness of breath. Some studies have also included people with pneumonia or respiratory tract infections in this category, as long as there was no evidence of acute respiratory distress syndrome, organ failure, or admission to an intensive care unit. Severe cases typically require supplemental oxygen, and critical cases might develop septic shock, leading to stroke, organ failure, and respiratory failure. “In Patients of COVID-19, What Are the Symptoms and Clinical Features of Mild and Moderate Cases?” (Center for Evidence-Based Medicine, Nuffield Department of Primary Care Health Sciences, University of Oxford and School of Health Sciences, City University of London, April 1, 2020), [https://www.cebm.net/covid-19/in-patients-of-covid-19-what-are-the-symptoms-and-clinical-features-of-mild-and-moderate-case/]

“How Can You Tell If Coronavirus Symptoms Are Mild, Moderate or Severe?” The Ohio State University, Wexner Medical Center, March 18, 2020, [https://wexnermedical.osu.edu/blog/coronavirus-symptoms].
ISOLATE MILD AND ASYMPTOMATIC CASES USING A STEPWISE APPROACH AT THREE LEVELS

Government actors can set up isolation infrastructure for mild and asymptomatic COVID-19 cases at three different levels. As depicted in Figure 1, the first option requires the most resources and is appropriate for severe cases, while the third option requires less resources and is more suitable for mild cases.

1. **Formal Facility Level**, which might include field hospitals, makeshift health facilities, or designated COVID-19 wards of existing hospitals and health centers.
2. **Community Level**, which can be organized in terms of geographic neighborhood “units” or involve more semi-formal Community Care Centers (CCCs) similar to those used in West Africa during the Ebola outbreaks.
3. **Home-based care**, in which a household designates one room for isolation and one person to act as caretaker.

CONSIDER A PATIENT’S SYMPTOMS, RISK FACTORS, AND HOME ENVIRONMENT WHEN SELECTING ISOLATION LEVEL

Initial evidence from several case studies, as well as guidance from the WHO, suggests that three of the most important factors to consider when determining a patient’s appropriate level of isolation are:

1. The current severity of symptoms;
2. Risk factors which might lead to poorer health outcomes, such as age, relevant comorbidities, whether they are a close contact of a confirmed or suspected case, and whether they were recently discharged from facility-level care for a confirmed/suspected case of COVID-19; and
3. Whether or not the patient’s home environment is suited for safe and effective isolation.

The decision tree in Figure 2 provides a rough framework for weighing these options, although these guidelines should be updated as more evidence becomes available and as health system capacity changes during the course of the outbreak.

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See Annex I of this document
WORK WITH COMMUNITIES TO SELECT AND TRAIN PERSONNEL WHO WILL MAKE THESE DECISIONS

To effectively use the decision tree in Figure 2, the government will need to select and train the key decision makers. The decision-making structure will depend to some degree on the context, as different countries will have different infrastructure and networks in place. Below is one possible approach using the following decision-makers:

- **Patients**: must decide whether to seek treatment, as well as where and how.
- **Triage personnel**: decide whether incoming patients (at a CCC or makeshift hospital) should be admitted or seek medical care and/or isolation at a different level.
- **Home inspectors**: determine whether a patient’s home environment is suitable for home-based isolation.

For a person to receive treatment, they must make the decision to seek health advice. To do this, patients and their families must understand the symptoms of COVID-19, know how and where to seek advice, feel comfortable that they will not be stigmatized, and believe that the benefits of treatment outweigh the costs. The government has an important role to play here in ensuring that awareness-raising and behavior change communication reaches all the way down to the local levels. To do this, we recommend partnering closely with local leaders and community networks to transmit this information in a way that is grounded in local realities.

Patients seeking medical advice will then contact triage personnel through a phone call to a COVID-19 help line, a conversation with a community health worker, an in-person visit to a CCC or health facility, or other mechanism. These triage personnel will then determine whether the patient should be admitted. For those cases not risky enough to be admitted, home inspectors should assess whether the patient’s home environment is conducive for home-based isolation. The government should be responsible for (1) working with communities to determine the appropriate people to act as triage personnel and home inspectors, and (2) ensure that these people receive the necessary training. The appropriate personnel will depend a great deal on local infrastructure and existing networks. These decisions are therefore best when made in close consultation with local leadership.
PROVIDE FACILITY-LEVEL CARE FOR THOSE WITH MILD SYMPTOMS, BUT HIGH-RISK CONDITIONS

When it is impossible to isolate all cases at a healthcare facility, the WHO recommends that these beds be reserved for severe and critical cases, as well as mild cases for those with other risk factors. Known risk factors for COVID-19 include age over 60 years, HIV/AIDS, tuberculosis, undernutrition, and non-communicable diseases such as diabetes, obesity and hypertension.\textsuperscript{10}

Some facility considerations are listed below.

- **Formal facilities are generally larger**, with more highly trained professional staff, and in more centralized locations, as compared to Community Care Centers.
- Facility options include designated COVID-19 wards of existing health facilities, military field hospitals, and repurposed buildings such as hotels, schools, stadiums, and gymnasiums.
- Facilities should cohort patients according to severity, designate separate areas between patients and staff, separate patients from each other as much as possible, and provide services including food, cleaning, trash removal, laundry, and pharmacies.\textsuperscript{11}

AT THE COMMUNITY LEVEL, CONSIDER SOCIAL DISTANCING UNITS AND COMMUNITY CARE CENTERS

A home-based isolation strategy will be impractical for many low-income households living in dense quarters. For those who are unable to isolate at home, but who do not present any particularly high-risk factors for poor health outcomes, there should be a community level option to allow for safer isolation without overcrowding formal facilities with mild cases of low-risk patients. In this section, we outline two potential models for community-based isolation: (1) social distancing “units”, and (2) Community Care Care Centers (CCCs).

**Governments should work in close consultation with community leaders to determine which model serves community needs, which adaptations might be required, and the training, infrastructure, and other resources needed to operationalize it.** Depending on the country context, policymakers might decide that one model is more appropriate than the other, or decide to adapt both concepts for different groups. For instance, social distancing units might be more suited to densely populated urban areas, while CCCs may be more relevant in rural settings.

Social distancing units encourage multiple households in one geographic area to combine together for the purposes of social distancing and preparing for isolation of any sick members of the unit. The unit should be as small as possible while still providing the essential isolation provisions, and might encompass a compound, street, or block.\textsuperscript{12} In practice, the facility requirements and level of care provided is very similar to home-based care, except in slightly larger units. It will likely be easier for people to find appropriate isolation settings and implement home-based care if they combine resources with several other households rather than leaving each family to fend for itself.

Alternatively, communities could also consider adapting the concept of CCCs used in West Africa during the Ebola outbreak for the purposes of managing the spread of COVID-19. Some CCCs are located in repurposed structures at the local level, such as schools or guesthouses, while others may use temporary structures like tents. **CCCs offer more comprehensive services and formalized standards of care than social distancing units, but are also more resource-intensive.** Whether communities take the unit or CCC approach, in both cases, it


is important for patients to have access to rapid health advice. In particular, they and their caretakers will need advice on managing symptoms and, if their condition worsens, guidance on shifting to hospital facilities. To facilitate referrals, the WHO recommends a “hub and spoke” model, in which each unit or CCC is linked to a predetermined health facility. Table 1 below provides a comparison of both options.

Table 1: Comparison of Social Distancing “Units” and Community Care Centers

<table>
<thead>
<tr>
<th>Social Distancing “Units”</th>
<th>Community Care Centers</th>
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<tbody>
<tr>
<td><strong>Basic idea</strong></td>
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<tr>
<td>Combine households together into larger geographic units. Each unit designates isolation quarters and a caretaker in case someone falls ill.</td>
<td>Set up a small facility at the community or village level to care for the sick. The community participates directly in the design, staffing, and management.</td>
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<thead>
<tr>
<th><strong>Facility Requirements</strong></th>
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<tr>
<td>- A well-ventilated single room per patient, chosen from existing structures among the unit members’ homes</td>
<td>- Capacity of 8-10 beds</td>
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<tr>
<td>- Patient must have his/her own set of eating utensils</td>
<td>- Extensive community involvement</td>
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<tr>
<td>- Masks for both patient and caretaker</td>
<td>- Access to clean water source</td>
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<tr>
<td>- Daily disinfection of patient’s room, shared spaces, and toilet</td>
<td>- Well demarcated from surrounding community</td>
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<tr>
<td>- Strict limits on movement and presence in shared spaces within the unit</td>
<td>- Separate access points for staff and patients</td>
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<tr>
<td>- High risk factors to stay safe</td>
<td>- Designated red zone, green zone, and triage zone</td>
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<th><strong>Services offered</strong></th>
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<tr>
<td>Very basic care to manage symptoms, guided by contact with healthcare professional as needed</td>
<td>More comprehensive services include:</td>
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<tr>
<td></td>
<td>- Food and water</td>
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<td></td>
<td>- Supportive services to manage symptoms rather than invasive procedures</td>
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<tr>
<td></td>
<td>- Psychosocial support for patients and families</td>
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<tr>
<td></td>
<td>- Community awareness</td>
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<tr>
<td></td>
<td>- Contact tracing and monitoring</td>
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<tr>
<td></td>
<td>- Water and sanitation</td>
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<td>- Safe waste management</td>
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<tr>
<th><strong>Staff Requirements</strong></th>
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<tbody>
<tr>
<td>- Identify one person from the unit to serve as the designated caregiver in case someone from the unit falls ill.</td>
<td>Community volunteers - often community health workers:</td>
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<tr>
<td>- The caretaker should not have his/her own high risk factors</td>
<td>- Workers receive comprehensive training in infection management</td>
</tr>
<tr>
<td>- Caregiver must be trained (ideally, through existing networks like Community Health Workers) in managing the patient’s symptoms and observing strict hygiene measures to keep themselves and other members of the unit safe</td>
<td>- Supervisory team regularly visits and observes</td>
</tr>
<tr>
<td></td>
<td>- Also includes cleaners and communicators</td>
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</tbody>
</table>

Both the social distancing units and CCCs could complement existing health facilities by providing an intermediate step in the chain of care between home-based care and facilities. In particular, they have the


16 The red zone is designed for suspected COVID-19 patients, the green zone is for COVID-19 negative CCC staff, and the triage zone is used for initial screening and intake. Further details can be found in the Annex.

potential to provide an alternative that enables effective isolation for mild cases who are unable to safely isolate in their homes without spreading the virus to their families.

**ENCOURAGE HOUSEHOLD LEVEL CARE FOR THOSE WITH MILD SYMPTOMS, LOW RISK LEVELS, AND A CONDUCIVE ENVIRONMENT**

- This decision should be informed by an outside assessment of the patient’s home environment to determine whether it is possible for them to isolate effectively in their homes.
- Suitable environments should include a well-ventilated single room, communication channel with health care provider, and a designated caregiver from the same household, who is trained to observe strict hygiene measures, monitor symptoms, and wear a protective mask.18
- Community Health Workers can be a useful network for assessing home environments and providing extensive awareness-raising on appropriate home care and hygiene measures.19

**CLOSE CONTACTS AND RECENTLY DISCHARGED COVID-19 PATIENTS SHOULD ALSO QUARANTINE, EITHER AT HOME OR IN THE COMMUNITY**

If capacity is available, government actors should also consider measures for two other groups: (1) asymptomatic close contacts of suspected cases; and (2) patients who have been recently discharged from facility-level treatment for COVID-19. Ideally, both of these groups should isolate at home, so that community level facilities can be reserved for those experiencing symptoms. However, if the home environment is not conducive to safe isolation according to the guidelines above, it is possible to use community level care for these cases. However, patients in these two groups should be cared for in a separate room from people who are experiencing symptoms, in order to avoid transmission between these cohorts.

**PROVIDE SUPPORTING MEASURES TO ENABLE SUCCESSFUL ISOLATION**

Finally, it is important to recognize that isolating at home, in the community, or in a formal health facility comes with costs to livelihoods, social support, and other medical conditions. Policymakers should seek to ease these burdens as much as possible to encourage compliance with isolation and social distancing measures. We recommend that government actors implement several complementary measures which will support successful isolation:

- **Continue to encourage social distancing measures** to avoid further spread from asymptomatic or presymptomatic individuals, especially in a context in which it is not possible to test them.
- **Prioritize clear communication:** the public must understand that the virus can spread from asymptomatic individuals or those with mild symptoms, who should isolate and how, the best methods to care for mild cases at home, and the importance of sustained social distancing. When possible, communication should be two-way - both the government communicating to the people, and also the people communicating to the government.20 This could be in the form of community dialogues, workshops, interactive SMS-based messaging, or other approaches that enable people to ask questions and engage with the information.
- **Community leadership and involvement is essential** for disseminating information, building trust and acceptance of isolation measures, adapting recommendations to varied contexts, and mobilizing local networks of volunteers to assist in the response.

• **Ensure that those in isolation are still able to access essential services**, including staple foods, clean water, soap, basic utilities, accurate information, health advice (consider tele-health and COVID-19 hotlines), and enough income to support other basic needs given interruptions in livelihoods. One option might be to mobilize existing networks such as community health workers or youth organizations to assist in the distribution of essential supplies. *For recommendations on how to implement or adapt cash transfers effectively in the context of COVID-19, please see the related brief on IDinsight’s website.*

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ANNEX

1. CASE STUDIES

In Table 2 below, we examine four relevant case studies of how other countries have handled similar constraints in responding to COVID-19 (South Korea, China, and Singapore) and similar outbreaks (Ebola in Liberia and Sierra Leone). This list of cases is not intended to be exhaustive, but merely begins to note several commonalities in how other governments have adapted their approaches based on realities in these rapidly changing environments. For example, in both China and South Korea, hospitals were quickly overwhelmed by COVID-19 cases, and needed to find alternative solutions for isolating mild and asymptomatic cases. In Singapore, a recent second wave of outbreaks have highlighted failures to adjust their response to protect migrant workers, a particularly vulnerable group that tends to live in much closer quarters, where home-based isolation is difficult. In Sierra Leone and Liberia, governments responded to shortages and delays in formal Ebola treatment facilities by encouraging local, community-based approaches to manage the outbreak in CCCs.

Table 2: Case Study Comparison

<table>
<thead>
<tr>
<th>Case</th>
<th>Initial Approach</th>
<th>Pivot</th>
<th>Lessons Learned</th>
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<tbody>
<tr>
<td>Liberia and Sierra Leone</td>
<td>The governments of both countries created Ebola Treatment Units, but there were delays in set-up and they weren't received well in communities. Therefore, many people chose to treat their sick family members at home, increasing the spread.</td>
<td>They created a network of small, locally-led CCCs as a more community-based approach and a step above home isolation. CCCs were often based in temporary structures like tents and staffed by local volunteers.</td>
<td>Local staff, proximity to home, and community involvement built a lot of trust, reduced stigma and improved timely identification of potential cases. Overall, community members viewed CCCs as more accessible and acceptable and less intimidating than higher levels of care. Furthermore, creating separate facilities helped to avoid crowding out basic health services. However, Ebola is a very different virus; COVID-19 spreads much easier and so the concept would need to be adapted.</td>
</tr>
<tr>
<td>South Korea’s response to COVID-19 in Daegu</td>
<td>Initially, health authorities quarantined all confirmed cases in hospitals, but this overwhelmed the system.</td>
<td>Beginning in early March, they categorized patients into asymptomatic, mild, severe, and critical. Only severe and critical cases were hospitalized, and others were sent to “residential treatment facilities” for isolation.</td>
<td>It is very important to avoid overwhelming the health care system in the initial phases. Even hospitalizing only confirmed cases, as was done in Wuhan (see below), can overwhelm the system. At this point, it is best to triage according to the severity of the disease. Also note that these measures were combined with particularly aggressive testing, even for mild and suspected cases.</td>
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### 2. DETAILED OVERVIEW OF EACH LEVEL OF ISOLATION

#### 2.1 FACILITY LEVEL: AIM TO PROVIDE FACILITY-LEVEL CARE FOR THOSE WITH MILD SYMPTOMS, BUT HIGH RISK CONDITIONS

Suspected mild cases can also isolate at home, as long as they do not have other high-risk conditions. In addition, as the Singapore case demonstrated, this decision should be informed by an outside assessment of the patient’s home environment to determine whether it is possible for them to isolate effectively in their homes. Furthermore, this approach requires extensive awareness-raising activities to ensure that household members understand the strict measures they must take to avoid contracting and spreading the virus themselves.

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#### China’s Efforts to Control Spread of COVID-19 in Wuhan

Initially, both confirmed and suspected cases were quarantined in hospitals, and close contacts were asked to self-isolate at home. However, hospitals were soon overwhelmed. In early February, Wuhan moved to a more aggressive system in which community leaders categorized cases, and only confirmed cases were sent to hospitals, and suspected cases, mild cases, and close contacts of confirmed cases were sent to temporary centers for quarantine/isolation. In these centers, suspected cases were isolated separately from close contacts and recently discharged patients to avoid possible spread between groups.

Hospital beds should ideally be reserved for patients with confirmed cases. To avoid spread within temporary quarantine facilities, it was useful to separate suspected cases from other categories.

Officials in China also found that quarantining confirmed cases that had been hospitalized and then discharged was important, as 10-15% tested positive again after being discharged.

As in the Daegu example above, these measures were enabled by a dramatic ramp-up in testing capacity. In addition, thousands of health professionals deployed to the area from other regions of China.

#### Second wave of COVID-19 outbreaks in Singapore

Early on, Singapore was lauded as a success story. However, in early April, cases started to spike among migrant workers, many of whom tend to live in crowded dormitories. Once cases in the dormitories were identified, authorities asked residents to isolate in their rooms for two weeks. But in mid-April, a new round of cases was announced, including 1,426 new cases among migrant workers in one day.

Health authorities report that most cases among migrant workers are mild. The mild cases are now being monitored either in general wards of hospitals or in community isolation facilities.

It is important to identify which groups are likely to be particularly vulnerable in each country’s context, and then take special precautions to provide for these cases.

Before recommending home isolation, medical professionals must consider whether or not the patient can safely isolate in his or her home environment. These migrants often live in dormitory rooms with 12-20 people per room, with no separate quarters available for someone attempting to isolate.

More broadly, communities living in dense quarters in urban environments are particularly at risk.

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The WHO suggests that community health workers can assist with making suitability assessments for patients’ homes and educating household members and caretakers on the measures they must take. The current guidelines for home isolation include the following requirements:

- A well-ventilated single room for patient and own set of eating utensils
- Strict limits on movement and presence in shared spaces
- Designated caregiver who does not have his/her own high risk factors
- Both patient and caregiver must wear masks, which should be carefully cleaned
- Frequent hand washing using proper technique, especially after caregiver comes into contact with patient and his/her immediate surroundings
- Daily disinfecting of patient’s room, shared spaces, and toilet
- Careful washing of patient’s clothes and disposal of any waste, contaminated PPE, etc.
- Communication channel with healthcare provider for duration of home isolation
- Regular monitoring of symptoms for other household members

2.2 COMMUNITY LEVEL: ENABLE ISOLATION AT THE COMMUNITY LEVEL, ESPECIALLY FOR THOSE WHO CANNOT ISOLATE AT HOME

Social distancing units

One option for this level of isolation is for communities to designate “units” of social distancing, likely at the compound, street, or block level rather than individual households. These units could also be organized by extended families, as long as they reside in one defined geographic area. The members of each unit should come together to identify a place for isolating any members who might experience mild symptoms. In theory, it should be easier to find an empty structure within a larger unit rather than expecting each individual household to have this extra space. If one member becomes infected, a predetermined caretaker can move them into the isolation room and help them manage their symptoms using the same guidelines as for home-based care. In this case, all unit members, regardless of whether they are the direct caretaker, should also isolate themselves from other units in case they are pre-symptomatic or asymptomatic. In particular, experts have put forward this idea as a plausible option in urban informal settlements.

In practice, application of this approach might follow along these lines:

1. Community leader identifies defined geographic units and designates community volunteers
2. Each unit prepares by selecting a space for isolation and one person from the unit households to act as caretaker for anyone who develops symptoms
3. Community volunteers receive PPE, and training on raising community awareness, conducting assessments of isolation rooms, and information to pass on to unit caretakers for appropriate home-based care, guidance for managing symptoms (Ideally, these volunteers would also receive regular testing)
4. Isolation is triggered when one person in the unit develops mild symptoms or there is a positive test result in the community

5. The patient with mild symptoms is moved into the isolation room and the caretaker begins home-based care under the guidance of community volunteers and healthcare professionals.

6. The unit as a whole observes strict isolation from other units until the sick person is recovered and they receive clearance from a healthcare professional.

**Community care centers**

The second option, which draws heavily from the experience of Sierra Leone and Liberia during the Ebola outbreak, involves establishing a more formal system of CCCs. As in West Africa, a CCC model could help to isolate cases of coronavirus while still allowing them to remain in close proximity to their families and provide care that is familiar and non-threatening, since it is managed by local volunteers designed with them in mind. In fact, one modelling study found that, while Ebola Treatment Units helped avert 2,244 additional cases (from September-October 2014 in Liberia), the existence of CCCs helped avert an additional 4,487 cases. This strategy might be particularly well-suited to rural areas, which are further away from other facilities and sometimes have more formal leadership structures than urban neighborhoods.

Generally, CCCs are small, low-tech facilities designed to house and manage suspected and probable cases. The versions used in West Africa typically housed between 8-10 patients, included extensive community involvement, and were often staffed by community health workers. Compared to community units, they would also provide more extensive services, including psychosocial support, community awareness raising, and contact tracing. The physical layout is carefully designed to prevent infection, including a triage zone, a green zone, and a red zone:

- **Triage zone:** used for initial screening and intake, and determining where patient should go
- **Green zone:** includes staff entrance as well as staff changing facilities, latrines, storage, and break rooms
- **Red zone:** includes two or more rooms to cohort patients; patient latrines and shower facilities; three separate exits: one to mortuary, one for discharge into the community, and one gated entrance to green zone

However, while CCCs do have many advantages, it is worth noting that careful attention would be needed in order to effectively adapt this concept to the management of COVID-19. The two viruses have different symptoms, transmission vectors, and treatments, and these COVID-19 CCCs must take these differences into account. Furthermore, the CCCs in West Africa were not without their challenges, including more limited supervision than expected, disruptions in supply chains, and accidental exposure for patients who did not actually have Ebola at the time of admission.

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2.4 HOUSEHOLD LEVEL CARE: ANYONE WITH MILD SYMPTOMS AND NO HIGH RISK CONDITIONS SHOULD ISOLATE AT HOME WHEN SUITABLE

Suspected mild cases can also isolate at home, as long as they do not have other high-risk conditions. In addition, as the Singapore case demonstrated, this decision should be informed by an outside assessment of the patient’s home environment to determine whether it is possible for them to isolate effectively in their homes. Furthermore, this approach requires extensive awareness-raising activities to ensure that household members understand the strict measures they must take to avoid contracting and spreading the virus themselves. The WHO suggests that community health workers can assist with making suitability assessments for patients’ homes and educating household members and caretakers on the measures they must take. The current guidelines for home isolation include the following requirements:

- A well-ventilated single room for patient and own set of eating utensils
- Strict limits on movement and presence in shared spaces
- Designated caregiver who does not have his/her own high risk factors
- Both patient and caregiver must wear masks, which should be carefully cleaned
- Frequent hand washing using proper technique, especially after caregiver comes into contact with patient and his/her immediate surroundings
- Daily disinfecting of patient’s room, shared spaces, and toilet
- Careful washing of patient’s clothes and disposal of any waste, contaminated PPE, etc.
- Communication channel with healthcare provider for duration of home isolation
- Regular monitoring of symptoms for other household members

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