COMMENTARY

Care homes and COVID-19 in Hong Kong: how the lessons from SARS were used to good effect

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Abstract

In Hong Kong, about 15% of older people (aged 80 and above) live in care homes, one of the highest proportions in the world. During the spread of severe acute respiratory syndrome in 2003, the crude fatality rate for older people in care homes that were infected was 72%. After taking the advice of a team of international experts, the Hong Kong Government implemented comprehensive preventive measures to cope with the future epidemics. This commentary evaluates the effectiveness of these measures in coping with both influenza outbreaks and COVID-19 and suggests the lessons learnt are relevant to both developed and less developed countries. Lockdown in care homes is very effective under two conditions. Healthcare workers must wear surgical masks in the care home. Hospitals must adopt a strict policy to prevent virus transmission by discharged patients. Care homes situated within high-rise residential towers are particularly vulnerable to COVID-19 transmission; their residents can more easily be infected by asymptomatic carriers from the community. Airborne virus can also be transmitted more swiftly in care homes with open-plan layouts. Lockdown had been shown to significantly reduce influenza outbreaks in care homes. On the other hand, lockdown causes loneliness to residents. Care homes allow residents to move freely within the care home though with the risk of spreading the virus by resident who is an asymptomatic carrier. Finally, lockdown may cause family members to have guilty feelings. Family members can only make video call or window visit to residents.

Keywords: Hong Kong, COVID-19, Care Homes, Older People, SARS

Key points
• Lockdown of care homes is an effective measure to contain the spread of COVID-19.
• Staff wearing surgical masks inside care homes can prevent virus transmission by asymptomatic carriers.
• Strict discharge policies can prevent virus transmission from hospitals to care homes

Introduction

In Hong Kong, older people (aged 65 and above) accounts for 16% of the total population of 7.4 million [1]. The median age of residents in care homes is 83. Approximately 15% of older people aged 80 and above live in care homes [1]. During the severe acute respiratory syndrome (SARS) epidemic in 2003, the crude fatality rate for residents in affected care homes was 72% [2]. Following the SARS episode, a team of international experts made recommendations to mitigate infection in care home [3]. These measures have helped care homes in Hong Kong to cope with COVID-19. As of 23 September 2020, 5,050 people had contracted COVID-19 and 132 persons were infected in 16 care homes [4]. This paper evaluates the post-SARS measures applied to contain the spread of COVID-19, and these lessons may be valuable to both developed and less developed countries.

An Early Response System

To cope with pandemic disease more effectively, the Centre for Health Protection (CHP) was established in 2004 [5] and formulated a three-tier emergency response system in 2005 [5]. The emergency response system was activated in...
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2009 to cope with human swine influenza and with avian influenza in 2010. In 2012 and 2013, a second-level response was activated for avian influenza and for Middle East respiratory syndrome in 2015. Care homes, therefore, have gained considerable experience in coping with potentially pandemic diseases.

The Source Control Approach

The Hong Kong Government adopted a "source control approach" to preventing infection in care homes [6]. This approach focuses on preventing the spread of any initial infections at their source [6].

Visitor Measures

From early February, all care homes banned visitors except independent healthcare workers. Residents maintained contact with family members only through video calls or window visits. These practices are also common in other countries [9]. In Hong Kong, these restrictions were lifted between 10 June and 6 July 2020. However, no infection was detected among visitors even when asymptomatic staff contracted COVID-19. As a consequence of the mask policy, the chances of infecting residents were small. No infection was detected among residents in three of the care homes (10, 11, 13) where staff had been diagnosed positive. Furthermore, three asymptomatic independent healthcare workers (cases 1,972, 1,909, 4,099) had close contact with residents in more than ten of the care homes, but no resident was infected as a consequence. This suggests that wearing surgical masks by both staff and residents can substantially reduce infection even where a staff member is an asymptomatic carrier [7].

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Table 1. Covid-19 care homes for older people in Hong Kong (22 January to 23 September 2020)

| Reference number | Date of the first report | Index case | Resident | Resident infected | Staff | Staff infected | Source infected | Private | Government funded | Location | Purpose-built building | Layout | No. of beds | No. of nurse | No. of care workers | Cumulative no. of confirmed cases in Hong Kong |
|------------------|--------------------------|------------|----------|------------------|-------|---------------|----------------|---------|-------------------|----------|---------------------|---------|-------------|-----------------|--------------------------|---------------------------------------------|
| 1                | 7 July                   | R          | R        | R                | S     | 7             | S               | P       | G                 | Lower floor in residential tower | PB          | O            | 41              | NA                       | 1,300                                      |
| 2                | 14 July                 | R          | R        | R                | S     | 7             | 5               | P       | G                 | Town house | PB          | S              | NA                       | 1,570                                      |
| 3                | 21 July                 | R          | R        | R                | S     | 5             | 4               | P       | G                 | Town house | PB          | S              | NA                       | 2,019                                      |
| 4                | 22 July                 | R          | R        | R                | S     | 4             | 4               | P       | G                 | Town house | PB          | S              | NA                       | 2,235                                      |
| 5                | 27 July                 | R          | R        | R                | S     | 5             | 0               | P       | G                 | Town house | PB          | S              | NA                       | 2,373                                      |
| 6                | 28 July                 | R          | R        | R                | S     | 4             | 0               | P       | G                 | Town house | PB          | S              | NA                       | 2,779                                      |
| 7                | 29 July                 | R          | R        | R                | S     | 1             | 0               | P       | G                 | Town house | PB          | S              | NA                       | 2,885                                      |
| 8                | 31 July                 | R          | R        | R                | S     | 0             | 0               | P       | G                 | Town house | PB          | S              | NA                       | 3,003                                      |
| 9                | 7 August                | R          | R        | R                | S     | 0             | 0               | P       | G                 | Town house | PB          | S              | NA                       | 3,273                                      |
| 10               | 14 August               | R          | R        | R                | S     | 0             | 0               | P       | G                 | Town house | PB          | S              | NA                       | 3,939                                      |
| 11               | 21 August               | R          | R        | R                | S     | 0             | 0               | P       | G                 | Town house | PB          | S              | NA                       | 4,632                                      |
| 12               | 22 August               | R          | R        | R                | S     | 0             | 0               | P       | G                 | Town house | PB          | S              | NA                       | 4,658                                      |

Sources: Centre for Health Protection 2020 (http://data.gov.hk/en-dataset/hk-dh-chosebeddr-novel-infections-agent); Social Welfare Department 2020 (http://www.elderlyinfo.swd.gov.hk/en/ches_natures.html).
Measures Preventing Hospital to Home Infections

The Hong Kong Hospital Authority adopted three measures to prevent virus transmission from hospital to care home. First, community geriatric outreach teams were formed to support care homes, reducing the need for residents to undergo medical consultations in public clinics. Second, negative pressure wards were built in hospitals to isolate infected patients [3]; reducing the risk of infection in crowded wards. Third, every COVID-19 patient was required to pass two consecutive virus tests before discharge from hospital to the community or to a care home [10]. No infections were detected among residents discharged from hospitals to care homes in Hong Kong.

Quarantine Measures

Whenever there is one confirmed case in a care home, the CHP will decide whether to require quarantine measures. If the living environment is considered suitable, residents are quarantined within the care homes (3). Otherwise, residents are quarantined in special quarantine facilities (1, 5, 7, 8, 9, 14, 15, 16). Staff and their immediate family members are quarantined in ordinary quarantine facilities.

Effects of the Location of Care Homes

The extent of infection was much smaller if care homes were purpose-built (3, 4, 10, 13). This finding is contrary to a previous local study [11]. Only one resident contracted COVID-19 in the community (4). These purpose-built homes are usually more distant from densely populated housing estates. In contrast, serious outbreaks mainly took place in care homes occupying the lowers floors of high-rise residential blocks (1, 5, 9) or in care homes set in densely populated areas (7). These accounted for 80% of all confirmed cases in care homes. Subsequent evidence revealed that, before the outbreaks in these care homes, there were many asymptomatic carriers in the vicinity. Restaurants are the most high-risk environments for contracting COVID-19, because people take off their facial masks and chat, often for more than an hour [12].

Impact of the Layout and Design of Care Homes

The most serious outbreaks took place in three private care homes (1, 7, 9) with open-plan layout designs. In these homes four-foot high wooden screens are used to divide whole floors into numerous single-person bedspaces. Other studies show that airborne viruses can travel over a long-distance in large rooms without adequate air ventilation [12]. A large number of residents and staff in these three care homes were infected, representing 71% of the total confirmed care home cases. On the other hand, only 20 residents were infected in the nine care homes designed with separate, though sometime multi-occupancy bedrooms (2, 3, 4, 5, 10, 11, 14, 16). These infections were restricted to residents sharing the same room.

Unintended Consequences of the Measures Taken Since 2003

Firstly, the number of influenza outbreaks in Hong Kong care homes fell drastically this year. The total number for the first 37 weeks was 78, 88 and 24 for 2018, 2019 and 2020, respectively [13].

Secondly, when the emergency response measures were activated for one year from May 2009 to May 2010 in response to the human swine influenza [5], many people regarded this as too quick a response to a false alarm. However, lifting early interventions prematurely can be disastrous. The further outbreaks in the community from July 2020 were indeed a painful lesson. Easing restrictions from 10 June 2020 sent a false signal to many citizens. The city celebrated happily, but unknown to most people, restaurants had become the most dangerous places for virus transmission [12].

Thirdly, loneliness among residents is a common problem in care homes during lockdown. To mitigate this problem, care homes allow residents to move freely within the home. Since they often share a room with three to five roommates [14], they can enjoy daily chats with roommates. Additionally, they can visit friends in other bedrooms. These care homes will run a risk; when one resident is infected, all residents may be quarantined (15, 16). Experience from Hong Kong shows that whenever there is lockdown in care homes, the chance of one resident infecting other residents is very small.

Fourthly, lockdown creates psychological hardship to residents and family members. Residents may feel being abandoned by their relatives. Family members may have guilty feelings. As shown, 56% of residents in care home suffer from dementia [15], video call is not appropriate. Window visit is a more suitable means for communication [16]. For every window visit, family members must inform the care home beforehand for proper arrangement. Generally, healthcare worker will help a resident to sit beside a window or a glass door. Family member and resident can see and talk to each other. As for the 6% of residents who are bed-ridden [15], window visit is not suitable and video call is the only alternative.

Conclusion

The post-SARS measures prepared care homes to contain the spread of COVID-19 in 2020. Lockdown appears to be effective under two fundamental conditions. All staff must wear surgical masks inside care homes, and hospitals must adopt strict policies ensuring that patients discharged to care homes are virus free. When to lift lockdown and
social distance restrictions are complex decisions. Blanket and premature easing can cause disaster. Visiting restrictions, however, can be eased where both visitor and resident wear surgical masks.

The convenient location of many care homes is a double-edged sword. Residents may continue to live in familiar places and family members can pay frequent visits. However, where there were small-scale outbreaks in local areas, asymptomatic carriers transmitted the virus swiftly without notice. Open-plan layout designs may be convenient for care home operators but they allow the infection of many residents and staff within a short period of time and without warning. Separate bedroom designs restrict the infection to residents living in the same room.

Many of the post-SARS measures adopted in Hong Kong are nonpharmaceutical interventions that can be applied in both developed and less developed countries [17]. They include early response systems, preparing staff for infection control, wearing surgical masks and early imposition of visiting restrictions. Above all, transparency in explaining the reasons for interventions and restrictions is most important in obtaining widespread compliance.

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