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Department for Health and Wellbeing
CDCB COVID Operations Team

Report on Potential Intra-Medi-hotel Transmission of COVID-19 May 2021

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Government
of South Australia

SA Health

Background

On 11 May 2021, SA Health COVID Operations was notified of a case of COVID-19 infection in an adult male whom became infectious whilst in Victoria. The guest (Case A) had recently arrived from overseas on 19 April 2021 (22 days prior to returning a COVID-19 positive result) and had been quarantining in a South Australian Medi-hotel between 19 April and 4 May 2021. Routine laboratory testing and mandatory quarantine had been undertaken and he was released from hotel quarantine on 4 May 2021. He returned to Victoria on 4 May 2021 and was tested after feeling unwell on 8 May 2021. An SMS had been sent to the individual as per standard protocol on day 17 (6 May 2021) to get tested if any symptoms of COVID-19 are experienced. On 11 May 2021, a positive COVID-19 result was received on the patient. Further laboratory testing using whole genome sequencing linked Case A to another person infected with COVID-19 (Case B). Case B was in the same Medi-hotel in South Australia and had been staying in an adjacent room to Case A until Case B was moved to a dedicated COVID-19 positive Medi-hotel. An investigation into the source of infection for Case A was undertaken, due to infection occurring after discharge from the Medi-hotel system and after 22 days after arrival in Australia from international travel.

Aim

To identify the potential source of infection for COVID-19 infection in a male that had recently arrived from overseas and became unwell 22 days after arrival in Australia. To provide recommendations to address identified risks with the aim to improve infection prevention and control practices and standardise practice across Medi-hotels where possible as per the SA Health Medi-hotel Continuous Quality Improvement (CQI) paradigm.

Investigation

The investigation combined several epidemiological methods to identify possible transmission and the associated risk factors. Expert advice was sought from epidemiologists, engineering and infection prevention and control professionals. Laboratory testing, including whole genome sequencing was used to link cases of infection. Epidemiological investigation was conducted by case interviewing, review of staff rostering, review of closed-circuit television (CCTV), telephone records, review of Safety Learning System (SLS) records, onsite investigations, and examination of ventilation and air-condition systems. Other returned travellers (194 guests) who were quarantining in the same facility were retested and there were no other suspected cross transmission cases detected. The 162 guests in the same facility who had resided on different floors were contacted and asked to retest and those on the same floor (32 people) were required to retest and undertake a further quarantine period. All staff (104 people) who worked in the facility during the time period of concern were also immediately tested and their compliance with mandatory Medi-hotel staff surveillance requirements assessed.

Findings

At the time of the investigation, there were four cases of COVID-19 in quarantining travellers that were genomically clustered with the same COVID-19 variant, B.1.617.1.

1. Case A: onset of illness 8 May 2021. The laboratory result was positive in Victoria, 22 days after arrival from overseas. He had undertaken all quarantine requirements including 14 days Medi-hotel quarantine and providing three negative COVID-19 tests in South Australia, on day 1, day 5 and day 13 of quarantine.
2. Case B: onset of illness 3 May 2021. Was a close contact of Case C. Upon Case C becoming positive, Case B was moved to the room adjacent to Case A in the Medi-hotel to enable the shared room to be thoroughly cleaned. Case B would have been infectious from 1 May 2021. Case B was moved to the COVID-19 dedicated Medi-hotel facility on the 4 May 2021.
3. Case C: onset of illness 27 April 2021. Case C and B were sharing a Medi-hotel room. Case C was moved to the COVID-19 dedicated Medi-hotel facility on 29th April 2021.

4. Case D: onset of illness 19 April 2021. Case D arrived in Victoria on the 19 April 2021 and undertook quarantine in a Victorian quarantine facility. Case D flew from Singapore to Melbourne after flying from the Maldives to Singapore. Case A, B and C were also travellers on the Maldives to Singapore flight.

Following all investigations no high-risk infection prevention and control breaches were identified. No records of high-risk breaches or any areas of concern were identified in the SAPOL log which is maintained by Medi-hotel CCTV operators, in relation to the investigation. For completeness, the SLS was also reviewed as part of this investigation. In particular the following should be noted:

1. There were no identified incidences of face-to-face contact or passing of items between rooms.
2. All staff were fully compliant with required testing regimes including post-work testing regime.
3. No other Medi-hotel guests or intermediary cases were identified in this outbreak investigation.
4. HVAC (heating, ventilation, air-conditioning) review did not reveal any contribution of ventilation to the possible transmission event in this case.
5. However, the adjacent rooms were at the end of a corridor on one floor of the Medi-hotel. There were two occasions on 3 May 2021, when entry doors opened within 30 minutes of each other. For example, on one occasion, Case B opened his room door to collect his meal, then 18 seconds later Case A opened his door to collect his meal. This was during the time Case B was infectious but prior to staff knowing his positive COVID-19 status (he was subsequently moved to the dedicated COVID-19 Medi-hotel). A similar situation was observed again, on the same day with a time lapse of less than 12 minutes. Due to the camera angle, it was unclear from the review of the CCTV footage if both Case A and Case B wore a disposable surgical mask during these episodes of door opening.

Discussion

Following the investigation, there are considered to be two possible explanations for Case B contracting COVID-19 in the Medi-hotel setting.

1. There was the potential for aerosol transmission to have occurred on the 3 May 2021, related to the close timing of the door opening and closing between adjacent rooms occupied by Case A and Case B. Case B opening their door could have resulted in potentially contaminated corridor air either directly exposing Case A or forcing contaminated air into his room, particularly given Case B's room was situated at the end of a corridor and the intervening time period may not have allowed exchange of fresh air to have occurred despite adequate ventilation levels in the corridor.
2. There exists the possibility of a very long incubation period for Case A. A systematic review including 42 studies performed predominantly in China showed a mean and median incubation period for SARS COV-2 of maximum eight days and 12 days respectively. While it was difficult to estimate the longest incubation period based on small sample sizes, the highest estimated 99th percentile would be as long as 20.4 days, indicating long incubation periods are possible¹.

Current evidence and guidelines have been predicated on the understanding that COVID-19 transmission is predominately contact, and droplet spread (unless aerosol generating procedures or behaviours are present). However, there is emerging evidence that aerosols are also a transmission risk² and therefore the following recommendations should be considered.

Recommendations

Recommendations have been made based on findings from the investigation by COVID Operations and should be considered and scoped for implementation with the Medi-Hotel service providers. The recommendations recognise existing good practices and identify new recommendations based on the current investigation.

1. Increase support and education for guests to follow optimal infection prevention and control steps including:
 - following established protocol for opening door.

- wearing a disposable surgical mask when opening door and advice regarding removal of mask and hand hygiene. In addition, consider eye protection for guests when opening their doors.
2. Designated zones outside guest rooms for dirty and clean items including:
 - establishing dedicated food and rubbish/laundry zones to facilitate food delivery and collection by Medi-hotel staff, with clear instructions for guests regarding these requirements.
 3. Room deliveries (including food deliveries):
 - Deliveries and opportunities to open guest doors should be kept to a minimum and undertaken only as necessary for clinical care and guest experience. Where possible, items should be held and then delivered in bulk at the same time, whilst ensuring the correct PPE, hand hygiene and delivery and collection processes are practiced.
 4. Guests who have been identified as being in close contact with a case of COVID-19 infection should not be placed in adjacent rooms to other guests where possible given the higher rate of them developing the infection. Instead it is recommended that the option of housing all close contacts in Medi-hotels on a dedicated floor or area within the Medi-hotel system be investigated.
 5. Heating, Ventilation and Air Conditioning (HVAC) systems should continue to be reviewed as per the current CQI recommendations. Additionally, it is recommended specialised HVAC system staff be consulted to determine the value in instructing guests to close any open balcony door or window prior to opening their room door.
 6. Advice to guests to have COVID-19 testing following release from quarantine; this should now include a requirement for all guests to have a day 17 test regardless of symptoms (supported with a discharge letter and pathology form) and an additional SMS at day 21 as a reminder to get tested if they have developed symptoms.

Conclusion

As outlined in this report, there was no high-risk single event or high-risk breach in infection prevention and control practices identified during this investigation. Therefore, while there is no single conclusive cause of transmission, it is highly likely the close timing of doors opening and closing between adjacent rooms was responsible given the clear role of aerosol transmission of this virus. A review of the timing and placement of food/goods/waste/linen outside of guest's rooms is likely to reduce the risk of further episodes of similar transmission events. In addition, careful management and placement of guests at higher risk of developing COVID-19 (i.e. close contacts) will also likely assist.

Reference:

1. Dhouib, W., Maatoug, J., Ayouni, I. et al. The incubation period during the pandemic of COVID-19: a systematic review and meta-analysis. Syst Rev 10, 101 (2021). <https://doi.org/10.1186/s13643-021-01648-y>
2. World Health Organization. Coronavirus disease (COVID-19): How is it transmitted? 30 April 2021. <https://www.who.int/news-room/q-a-detail/coronavirus-disease-covid-19-how-is-it-transmitted>