c. In terms of culture, the review team recommends refocusing policies and procedures for managing hotel quarantine to maximise alignment with the primary goal of the quarantine system, that is, to keep guests and the community safe. Approaching systems redesign (policies, procedures, accountabilities, training and quality assurance) with this lens is considered to be essential. This includes a significant strengthening of the importance of infection control in the procedures and a single consistent approach to infection prevention and control across the quarantine hotel system.

Immediate actions taken in response to learnings

1. As at 19/01/21, CCTV had been installed on all floors of 2 quarantine hotels and is underway at an additional 3. This work will continue until all quarantine hotels are completed. The installation also includes motion detection and a requirement for 24/7 monitoring by a QPS member.
2. During the review, the Queensland Health review team members identified a number of infection prevention and control recommendations for immediate actioning. These recommendations are being progressed under the direction of the newly appointed Queensland Health Executive Director State Quarantine.

Outstanding enquiries and continuous improvement actions

The below outstanding issues and recommended future actions refer to activities that were not concluded prior to the submission of the final review report. As some of these processes have commenced, they will be followed through as appropriate (i.e. collation of emails, conclusion of arranged interviews). In all cases, information and learnings from these responses and remaining outstanding actions will be referred to the Executive Director State Quarantine and QPS COVID-19 Command for consideration of further action.

Requests for information

While a large number of persons have been spoken to, it is recognised all persons who may have information should be offered the opportunity to provide it within a reasonable timeframe. Accordingly, in addition to the email advice to previously quarantined persons at the HGC seeking and providing methods for their input, a similar offer has been made to QPS and ADF personnel who performed duties at the HGC. It is anticipated these responses were not all received prior to the submission of the final review report. The QPS have committed to continuing to monitor and action these responses as indicated above.

Queensland Health staff will be engaged through the work of the Executive Director State Quarantine and the Hotel Quarantine Steering Committee.

Interviews

While interviews were prioritised and those identified as key have been interviewed, there are a number of outstanding interviews considered useful to further validate recommendations. Where considered relevant these will continue and be referred as indicated.

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Cleaning practices

Further review of cleaning processes and associated education material by an ICP (infection control practitioner) is required. While many resources were received by the review team, further consultation with relevant Queensland Health and other staff regarding the range of documents, policies, procedures, guidelines and practices is recommended.

End to end transport

The review team did not explore practice and process for passengers arriving at Brisbane International airport, transiting through immigration and transport to their quarantine hotel.

Complimentary CHO direction changes

It is noted that the recommendations, if implemented, may require corresponding changes to relevant legal frameworks (including directions issued by the CHO) supporting the quarantine program. The CHO should be engaged during these considerations to ensure the practical requirements are supported by the legal framework.

Deliverables and timeframes

It is noted that while the Terms of Reference provided for the conduct of a joint investigation and analysis and delivery of a report complete with recommendations, which are completed through the delivery of this review report, there are some lines of inquiry the review team commenced that have not concluded. Guidance was provided by the Director-General of Queensland Health and Commissioner, QPS that recommendations and issues arising from these outstanding items, post the finalisation of this review are to be referred to the other activities underway. An Executive Director of State Quarantine has been appointed to focus on policy, planning and leadership. A commitment has been made for this review to be a key focus for continual improvement in the area of hotel quarantine.

Recommendations

1. Compliance monitoring

a. Install CCTV in all state government-run mandatory quarantine hotel venues to capture all movements in and out of guest rooms. The system should include continual monitoring and movement-detection or similar. This recommendation may not apply where there is a physical, continuing security presence on each hotel floor.

2. Cleaning

a. Review the deep clean initiation process following a quarantined person testing positive to COVID-19 and adopt a whole of government procedure that is consistent across the entire hotel quarantine program. As a minimum, this procedure should include processes for:

(i) Securing the room immediately when a quarantined person is moved out of a hotel.

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(ii) Ensuring the room is not entered or returned to service until the agreed cleaning process has been concluded.
(iii) Ensuring all stakeholders are engaged and informed throughout the procedure and addresses situations where there are multiple guests in a room but not all are transported away from the hotel.
(iv) Assurance checks that the cleaning process has been completed.

b. Implement a process of environmental surveillance post deep clean including supervision, monitoring, auditing and environmental sampling (including swabbing of walls, high touch surfaces, under door seals be considered post deep clean).

3. Infection prevention and control systems, policies and procedures

a. Iterative revisions of infection prevention and control policies and procedures for quarantine hotels are to include:

(i) Minimising guest room door openings (for example, linen collection at the same time as meal delivery so doors need only be opened once instead of twice).
(ii) Minimise traffic through corridors outside the rooms of quarantined guests.
(iii) Additional measures to reduce the potential for spread of infection into common areas:
- When entry to a room is required, give notice to guests and request they put on a mask, and allow a period of time for air (droplets) to settle prior to staff entering the room.
- Ensure door seals are in good condition to minimise under-door airflows.

(iv) A requirement for access to alcohol-based hand sanitiser to hotel staff (personal) and in common areas to provide additional opportunities for hand hygiene (eg. after glove changes).
(v) System for identifying room status and workflow management (for example, a notice on the door of the room re: type of clean required/date completed)
(vi) Management of hotel staff uniforms.
(vii) Mandatory completion of infection prevention and control training for staff involved in the hotel quarantine program.
(viii) Description of minimum infection prevention and control training requirements for staff involved in the hotel quarantine program including competency assessments (handwashing, donning and doffing of PPE).
(ix) Description of roles and accountabilities of hotel staff (supervisors and management) and other agencies involved in site-level quarantine systems monitoring and operational performance (to enable a high level of adherence with cleaning protocols and PPE utilisation).

b. Establish onsite quarantine hotel support from a registered nurse with infection prevention and control knowledge, with on-call access to an infection control practitioner, to provide operational infection prevention and control advice to hotel and other staff. This role would assist in mitigating transmission risk by providing PPE training, monitoring compliance with infection control procedures, conducting regular infection prevention and control audits and engaging with all onsite agencies around infection prevention and control protocols.

c. Implement an end-to-end risk-based quality assurance system to ensure early detection of practice variations, build confidence that performance standards are being met continuously and to restore performance when deviations are noted.

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d. Implement an infection prevention and control 'buddy' system across the hotel quarantine program for hotel staff (eg. a pair of cleaning staff would watch out for the other and prompt when their 'buddy' has not adhered to correct infection control practices).

4. Infection prevention and control workplace culture

a. Adopt a 'Speaking up for Safety' culture across the hotel quarantine program. This would include training to support increasing skills in respectfully raising concerns using graded assertiveness communication skills. A culture of all involved (guests and staff) looking out for each other is critical to this approach, as is the alignment with just culture principles. Strategies such as team briefings at shift commencement, debriefings at shift completion and walkthroughs by supervising staff could be included in this approach. An appreciative understanding of the challenges in frontline service delivery is vital to team-based continuous quality improvement. These measures will help create greater convergence between actual practice (work-as-done) and desired performance standards.

5. Infection prevention and control training materials

(a) Iterative and user-centred revisions of infection prevention and control training materials for quarantine hotels are to include training materials pitched for different target groups (senior hotel management, catering staff and cleaning staff) that details the scope of duties expected of them.

6. Hotel guest pack and infection prevention and control information

(a) Iterative revisions of the hotel guest pack are to adopt an 'easy read' succinct format to enhance clarity, using plain English with diagrams to aid understanding. Guest packs are to be available in other languages to cater for culturally and linguistically diverse guests.
(b) Consider a 'Priority Advice FAQ' for travellers of 'Must Do's' between the airport and entering their quarantine to ensure clear understanding of PPE and door management processes in the first hours of quarantine.
(c) Iterative revisions of important infection control information sheets for guests are to adopt an 'easy read' format and be made available in multiple languages.

7. Airflow management

(a) Whilst there are no specific findings of airborne transmission, airflow has been considered and forms part of good practice worldwide in minimising risk of transmission. For this reason, the review team also recommends ensuring air extraction and ventilation of corridors.

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Appendix 1

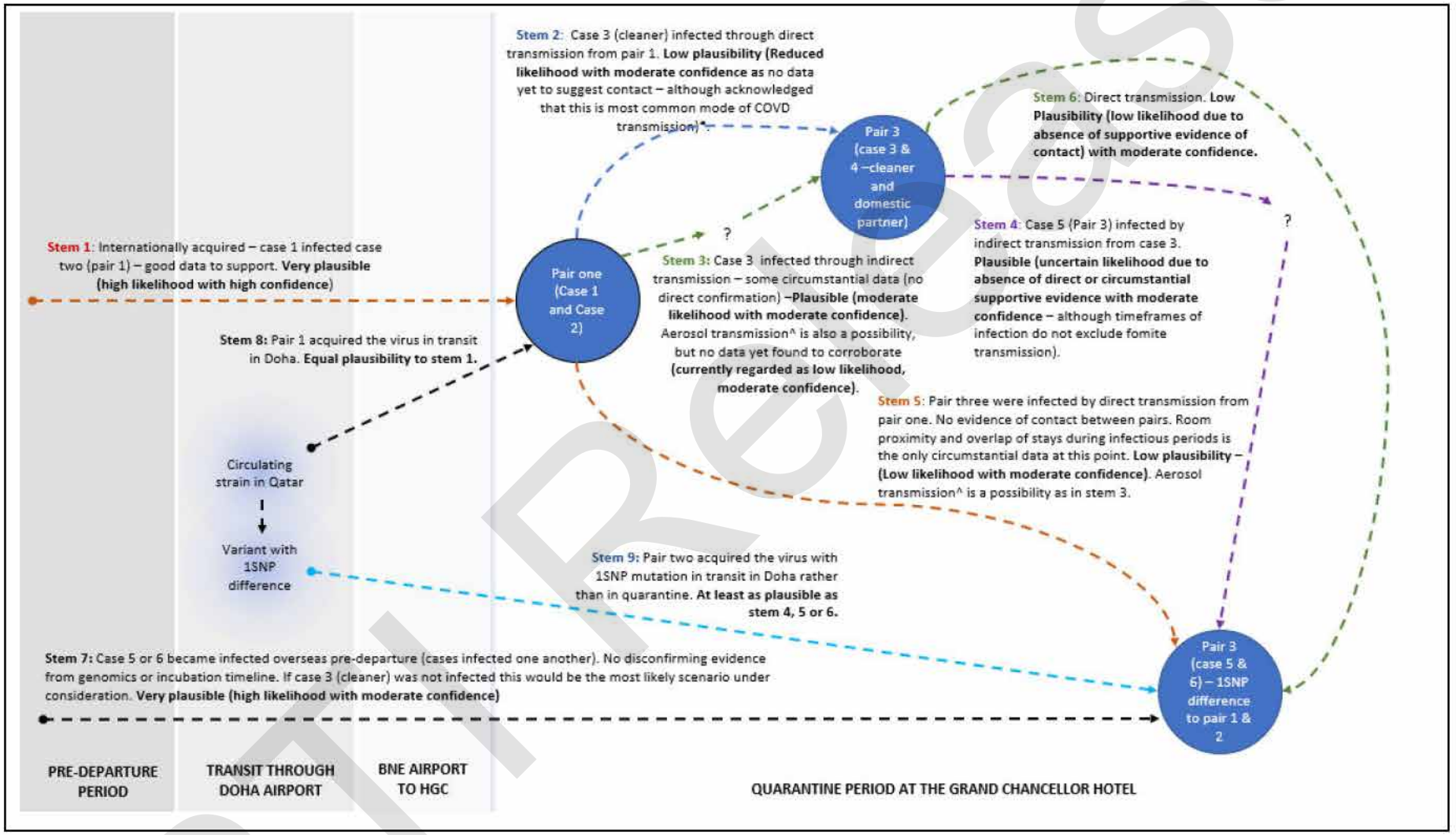
Case Timeline 23/12/2020 - 12/1/2012

	23-Dec	24-Dec	25-Dec	26-Dec	27-Dec	28-Dec	29-Dec	30-Dec	31-Dec	1-Jan	2-Jan	3-Jan	4-Jan	5-Jan	6-Jan	7-Jan	8-Jan	9-Jan	10-Jan	11-Jan	12-Jan
Case 1	X						Doha	Arrived	Q		X										
Case 2							Doha	Arrived	Q		X		X		X						
Case 3							X				Work				X						
Case 4																				X	
Case 5									Doha	Arrived	Q		X							X	
Case 6									Doha	Arrived	Q		X							X	X

X	Negative test
X	Positive
	Possible incubation period
	Likely incubation period
	Infectious period
	In isolation (in hospital / home)
	Rostered shift for Case 3

Note:
Cases 1 and 2 arrived in Australia from Doha late on 30/12/2020 and were placed in quarantine (Q) in the early hours of 31/12/2020.
Cases 5 and 6 arrived in Australia from Doha late on 1/1/2021 and were placed in quarantine in the early hours of 2/1/2021.
Case 5 was transferred to hospital on 11/1/2021. Case 6 was transferred to hospital on 12/1/2021.

Appendix 2



Note: Pair 1 and 3 were in Doha airport within 48 hours of each other – this lends credence to a common source hypothesis in Doha Airport (Stems 8 and 9). The review team has a high level of confidence transmission occurred from pair 1 to case 3 although this could be via stem 2 or 3. ^Aerosol transmission up to 1.5 metres.

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Queensland Police Service

Queensland Government

Queensland Health

Queensland Health and Queensland Police Service joint agency continuous improvement review of the COVID-19 infection of a hotel worker (Hotel Grand Chancellor)

Review report

January 2021

Queensland Government

Executive summary

The SARS-CoV-2 (COVID-19) global pandemic is arguably the most significant issue of the present time and one that continues to impact the Queensland community in terms of safety, the economy and confidence in government. The situation has warranted an unprecedented multi-agency response to effectively and efficiently reduce the risk of spread of the virus in Queensland.

The Queensland quarantine hotel program commenced on 27 January 2020 and at the time of this review, Queensland had recorded in excess of 64,800 people having been accommodated, largely without incident. Mandatory government-run hotel quarantine for returning international travellers was implemented on 28 March 2020 with Australia receiving approximately 220,000 travellers arriving by air up to 13 January 2021. Of these, 1.2% tested positive for COVID-19. A cumulative total of 544,656 room nights have been occupied for quarantine in Queensland since 28 March 2020. Of those quarantined in Queensland since the commencement of the program, in excess of 32,800 were international arrivals. Since the commencement of the mandatory hotel quarantine program, 74 quarantine hotels have been engaged as part of the program with 20 quarantine hotels remaining in use at the time of this review.

This review considered the circumstances leading to a cluster of COVID-19 infections at a government-run mandatory quarantine hotel venue in Brisbane, Queensland, in January 2021. The infected persons were four returned international travellers in two separate groups, a hotel cleaner and the cleaner's domestic partner. The review was undertaken jointly between Queensland Health and the Queensland Police Service (QPS). The Terms of Reference required a rapid and thorough investigation focussed on the circumstances of this particular cluster, conclusions related to its causal links and to provide recommendations acknowledging some of these may have application to the entire hotel quarantine program.

The infections can be viewed as three pairs.

Cases 1 and 2 (Pair 1) are returned travellers who left Doha on 29/12/2020 at 22:14 UTC (08:14 30/12/21 Brisbane time), arrived at Brisbane Airport at 23:45 on 30/12/20, were checked into the hotel at 00:20 on 31/12/21 and into a hotel room at 01:08 on 31/12/21. Case 1 tested positive first and was transported to hospital on 03/01/21 while Case 2 remained in their hotel room until they were transferred to hospital with symptoms on 06/01/21.

Cases 3 and 4 (Pair 2) are a part-time hotel cleaner and domestic partner. Case 3 tested positive on the 06/01/21 after working on the 02/1/21 including cleaning unoccupied rooms on floor 7. Case 3 had no direct contact with Cases 1, 2 ,5 or 6 and did not enter their rooms at any time.

Cases 5 and 6 (Pair 3) are returned travellers who left Doha on 31/12/2020 at 22:08 UTC (08:14 1/1/21 Brisbane time), arrived at Brisbane airport at 23:15 on 01/01/21 and were checked into a hotel room at 02:01 on 02/01/21. Cases 5 and 6 arrived after Cases 1 and 2 prior to Case 3 working at the hotel. Case 5 has unrelated, underlying health issues. Neither Case 5 or 6 tested positive on their initial 2-3 day test, however, when Case 6 was transported to hospital accompanied by Case 5 on 11/01/21 for underlying issues, they both tested positive.

Case 1 and 2 and Case 5 and 6 travelled to Australia from different countries although both transited through Doha International Airport on different dates. While both groups transited Doha and flew with the same airline, QPS confirmed they were on different aircraft.

The review team conducted investigations using multiple methods including:

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- QPS interviews (Queensland Health participated as appropriate) with 5 of the 6 infected persons, 2 hotel management, 8 cleaners, 3 other hotel staff, 17 other guests from floor 7, and email contact with 116 other hotel guests.
- Reviews of a range of documents including policies and procedures, training material and instructions, operational logs from QPS and the hotel, emails and contracts and CCTV footage.
- Genomic analysis, environmental swabbing and epidemiology including incubation timeline analysis.
- Consideration of previous reviews including the National Review of Hotel Quarantine, the Victorian COVID-19 Hotel Quarantine Inquiry and the South Australian COVID-19 Transmission in the Peppers Weymouth Hotel, Adelaide.

The review team were unable to determine the exact root cause of transmission. No direct breaches in quarantine or security were identified and no matters were identified to support any conclusion that offences were committed. It is considered that the cluster is most likely a result of multiple gaps in Infection Prevention and Control (IPC).

In summary, it is the review teams' position that:

Case 1 acquired the infection overseas and likely passed it to Case 2 in a domestic hotel setting. Case 3 most likely acquired the infection in the hotel on the 02/01/21, through indirect contact with a surface exposed to the virus by Cases 1 or 2. Case 4 acquired the infection from Case 3 in a domestic household setting. Cases 5 and 6 likely acquired the infection at around the same time as each other and while overseas acquisition cannot be excluded, they most likely acquired their infection at the hotel. The infection at the hotel is most likely to be from indirect contact with a surface that was exposed indirectly to the virus by Case 1 or 2, or from a surface that contacted a surface exposed by Case 1 or 2. Further review of hotel airflows and the analysis to identify live virus from the environmental swabs is continuing. The review team however, have excluded the hotel air-conditioning systems as a cause of transmission.

The review team have made a series of recommendations related to compliance monitoring; cleaning; IPC systems, policies and procedures; IPC workplace culture; IPC training materials; hotel guest pack and IPC information and airflow management. These recommendations are primarily to implement a greater focus on IPC relative to other pieces of information and strengthening and standardising quality management systems related to IPC. These recommendations recognise that the door to guest rooms is a potential high risk of opportunity for transmission of virus and offers suggestions for minimisation of this risk.

The review report also notes the actions taken immediately by Queensland Health and the QPS to address issues identified early in the review, including the installation of more CCTV, an amended deep-clean procedure and a number of IPC recommendations.

The review recognises the substantial body of work, in setting up the excellent systems to accommodate rapidly evolving situations and science whilst meeting local and international developments. The efforts to date have been outstanding and represent significant achievements for Queensland.

SIGNED

Dr Jillann Farmer
Deputy Director-General
Clinical Excellence Queensland

SIGNED

Mr Brad Wright
A/Superintendent
COVID-19 Command

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Queensland Health Service	**Queensland Police**
27/01/2021	27/01/2021

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Introduction

Since 2 February 2020 during the pandemic, figures obtained from the Australian Health Protection Principal Committee (AHPPC) reported hotel quarantine measures implemented on 28 March 2020, have seen Australia receive approximately 220,000 passengers arriving by air up to 13 January 2021. Of these, 1.2% have tested positive for COVID-19.

Since the beginning of November 2020, 0.9% of arrivals into Australia have been reported as confirmed COVID-19 cases. The AHPPC recognises that stringent quarantine and infection control measures need to be maintained to prevent the introduction of more highly transmissible variants of COVID-19 into the Australian community.

The number of people that have been in hotel quarantine since the commencement of the quarantine program on 28/03/2020 to 21/01/2021 is 64,883, of which 32,832 have been overseas arrivals. This has been largely without incident. A cumulative total of 544,656 room nights have been occupied for quarantine since 28 March 2020. Of those quarantined in Queensland since the commencement of the program, in excess of 32,800 were international arrivals.

From 27 January 2020 to 21 January 2021, 361 days of quarantine accommodation were provided in Queensland. Notably, since the commencement of the mandatory hotel quarantine program in Queensland, 74 quarantine hotels have been engaged as part of the program with 20 quarantine hotels remaining in use at the time of this review.

Quarantine of international arrivals into Queensland continue to be a challenge with a current average daily rate of 83 which is a temporary relief from the previous average of around 142 per day, as experienced prior to a National Cabinet announcement on 8 January 2021. This meeting outlined that it is necessary to adopt measures to manage the flow of returning Australians and other travellers who may have been exposed to new variants of COVID-19.[1]

The data emphasises the effectiveness of the program that has been instituted in Queensland, the resilience of its support systems and the strength of partnerships created to meet community expectations against a backdrop of a rapidly evolving context of operations and a changing evidence base.

The primary response to the COVID-19 public health emergency in Queensland has been a public health and safety response led by Queensland Health. Recent events in Queensland highlight the risks to the community, heightened levels of anxiety within the broader community and the need for vigilance and rapid action to control the spread of the virus.

Noting that infection control can never be risk free, nor is it possible to eliminate all risks associated with the mandatory hotel quarantine program, the existing efforts including early detection and management have been the hallmark of Queensland's success to date.

It is evident through decisive actions of authorities and the community, that community transmission of the virus has been either contained or resolved with minimal long-term impacts to date. Regrettably, challenges remain and will likely continue for a considerable time into the

[1] https://www.pm.gov.au/media/statement-national-cabinet

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future with global examples continuing to highlight the risk of community transmission. This review has highlighted the benefits of multi-faceted and collective efforts across government. Key challenges to maintaining an effective response have been highlighted. The complexity of the response and compliance of individuals within the community and in hotel quarantine will continue to be a risk.

This review considered the circumstances leading to the cluster of COVID-19 infections at the government-run mandatory quarantine hotel venue, the Hotel Grand Chancellor (HGC) in Brisbane, Queensland, in January 2021. The infected persons are four returned international travellers in two separate groups, a hotel cleaner and the cleaner's domestic partner. The infection of the hotel cleaner led to the Chief Health Officer (CHO) Restrictions for Impacted Areas Direction 2.

The review was undertaken jointly between Queensland Health and the Queensland Police Service (QPS) at the direction of the Premier of Queensland. A draft Terms of Reference (Attachment 1) was developed on 11 January 2021 with the QPS team commencing immediately with the view to the full review team commencing by 13 January 2021. In summary, the Terms of Reference required a rapid and thorough investigation focussed on the circumstances of this particular cluster, conclusions related to its causal links and to provide recommendations acknowledging some of these may have application to the entire hotel quarantine program.

This review reports to the Commissioner, QPS and the Director General, Queensland Health.

The review team recognises and acknowledges the contributions and cooperation of HGC management, guests and staff, and the Queensland Health, QPS and Maritime Safety Queensland departments and individuals who have given their time voluntarily to assist the review team.

Methodology

The joint-agency team included members of both agencies with expertise relevant to the review. Where required, these members were responsible for coordinating inquiries and support within their own agencies. Further, the QPS members were responsible for inquiries within the Disaster Management system. The agreed separation of responsibilities was as follows, noting this was a general guide with a focus on collaboration:

- QPS used an appreciative enquiry methodology. The focus was on people and processes and traditional information sources (i.e. CCTV) through interviews of all persons identified as relevant, review of documents held by QPS and State Disaster Coordination Centre and CCTV;
- Queensland Health used mixed methodology including after action review processes and human factors analysis. The focus was on scientific and technical issues and within Queensland Health for infection prevention and control processes and procedures; and
- Joint – sharing of information was possible through a Microsoft Teams folder, invitation of Queensland Health to all interviews (subject to consent of interviewees) and joint reporting.

Findings and observations of the review will inform the work of current broader system-based quarantine hotel reviews. It is recommended that the review report is provided to the Executive Director State Quarantine.

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Case identification

The infections can be viewed as three pairs:

Pair 1

Cases 1 and 2 are returned travellers who left Doha on 29/12/2020 at 22:14 UTC (08:14 30/12/21 Brisbane time), arrived at Brisbane Airport at 23:45 on 30/12/20 and were checked into the hotel at 00:20 on 31/12/21 and into a hotel room at 01:08 on 31/12/21.

Case 1 tested positive first and was transported to hospital 03/01/21 while Case 2 remained in room 702 until they were transferred to hospital with symptoms 06/01/21.

Pair 2

Cases 3 and 4 are a part-time hotel cleaner and their domestic partner. Case 3 tested positive on the 06/01/21 after working on the 02/01/21 including cleaning unoccupied rooms on floor 7. Case 3 had no direct contact with Cases 1,2,5 or 6 and did not enter their rooms at any time.

Pair 3

Cases 5 and 6 are returned travellers who left Doha on 31/12/2020 at 22:08 UTC (08:14 01/01/21 Brisbane time), arrived at Brisbane airport at 23:15 on 01/01/21 and were checked into a hotel room at 02:01 on 02/01/21. Cases 5 and 6 (Pair 3) arrived after cases 1 and 2 (Pair 1) but before Case 3 worked at the hotel.

Case 1 and 2 and Case 5 and 6 travelled to Australia from different countries although both transited through Doha International Airport on different dates.

In relation to flights, while both groups of travellers transited Doha and flew with the same airline, QPS has confirmed that they were on different aircraft. Further, the departure times from Doha are approximately 48 hours apart. Given the timelines and other logistical difficulties, no inquiries were made in Qatar to examine commonalities in aircrew or airport personnel related to the transiting of Cases 1 and 2 and 5 and 6.

Interviews

A collection plan was developed and persons for interview prioritised. Interviews are in-depth and conducted by QPS investigators. Queensland Health team members participated in the interviews as determined relevant by Queensland Health and when consented to by the interviewed person. The Queensland Health team provided suggested questions to complement QPS questions. Where clarification was required, some persons were involved in secondary interviews.

As at 21 January 2021, the following interviews had been conducted:

Infected persons	5 of 6 – 1 declined for health reasons
Hotel management	2 (general manager and cleaning supervisor)
Hotel cleaners	8 (*including the infected cleaner)
Other hotel staff	3
Other guests from floor 7	17

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Other guests from HGC	154 identified but some contact details incorrect. As at 19/01/21, 116 have been emailed, 14 have responded, some provided email information, nil interviewed as yet
QPS personnel	70 identified, contact being coordinated with union representatives
ADF personnel	26 identified, method of contact being coordinated with JTG command
Queensland Health personnel	1 Infection Control CNC

From the interviews, gaps were found in components of quality management systems at the hotel and individual lapses, specifically related to infection prevention and control (IPC) practices but these are not consistent with any culpable actions. No matters were identified that support a conclusion that offences were committed by any persons or that further investigation in relation to offences is warranted. QPS investigations did identify opportunities potentially available to persons to breach security (noting no evidence of this was discovered) and processes that may have improved the information available to the review team to support post infection review.

It is recognised that many stakeholders have detailed knowledge of the hotel quarantine program and could have potentially contributed to the review. It is anticipated that these stakeholders will have an opportunity to contribute through the current broader system-based reviews of the hotel quarantine program (refer also to outstanding enquiries).

Information obtained through the QPS interviews also directly supported the Queensland Health review activities including considerations of possible transmission methods and recommendations related to issues that can be excluded.

Genomic analysis

Genetic sequencing of isolates revealed that the virus responsible for the infection of Case 1 and 2 and Case 3 and 4 are genetically identical. This particular strain of SARS-CoV-2 has not been widely reported in Australia to date. This, along with the epidemiologic analysis strongly suggests transmission to Case 3 in the HGC.

The genetic sequence of the virus isolated from Case 5 and 6 is genetically identical, and very similar (but not identical) to the strain isolated from the other four cases. This could be consistent with indirect acquisition from Cases 1-3. However, this is not able to be assumed as the only (or even the most likely) possibility from genomics data alone.

Therefore, two likely transmission possibilities would be:

1. A common strain (from Doha) and 2 independent importations, with point mutation between infections (i.e. Cluster 1 and Cluster 3 were both internationally acquired) or
2. Indirect acquisition from within hotel quarantine or quarantine process (locally acquired).

Timelines

QPS produced a timeline 'living document' (Attachment 2). A summarised version is attached to this brief along with the HGC level 7 floor plan (Attachment 3).

Queensland Health produced an incubation timeline (Appendix 1) for the infected persons. This timeline supports the most likely transmission scenario but cannot exclude other scenarios.

Policies and procedures review

QPS has collated documents relevant to the hotel quarantine program including communications between QPS, HGC and SDCC, and QPS operational logs. The review of these documents did not raise additional issues to those noted in the findings and recommendations.

Queensland Health collated documents relevant to the Metro South Hospital and Health Service (MSHHS) health support role for the HGC. These documents include a Queensland Health quarantine hotel induction PowerPoint presentation pack, Queensland Health guides for COVID-19 cleaning, disinfection and waste management and a Queensland/MSHHS quarantine hotel cleaning COVID-19 guidelines PowerPoint presentation. These documents were reviewed specifically to understand existing infection prevention and control (IPC) standards that are relevant for quarantine hotels.

Closed Circuit Television (CCTV)

The HGC has a system of CCTV cameras. The only CCTV cameras on the floors are on floor 8 installed by MSQ as part of the mariner quarantine program. There were significant technical issues with obtaining all the CCTV holdings due both to their design and the infection risk remaining at the hotel. These issues were overcome and all CCTV holdings are now in the possession of the QPS. To date, only one camera has been identified as potentially capturing Case 3's movements (basement level). This video has been reviewed and is not clear and does not offer any information of value. Other CCTV has provided some information relevant to other events at the hotel and has been viewed (i.e. the departure of Case 1 to hospital via the foyer).

The value of additional CCTV for security compliance and its links to monitoring of infection control practices for subsequent review of incidents and infection control practices and to reduce the requirement for patrols of corridors and common spaces is a clear recommendation of this review and actions by QPS are already underway.

Environmental factors

Environmental swabbing of various areas on Level 7 of the hotel was carried out. While these swabs can neither definitively rule in nor rule out the role of the environment in the transmission of COVID-19, it is noteworthy that only swabs from inside the rooms occupied by the infected travellers were positive. Swabs collected from two other nearby rooms and common areas including staff-only areas on level 7 were all negative. One of the rooms had undergone post-discharge cleaning (711) but remained positive, while the other room (702) had not yet been cleaned so positive results are not unexpected.

The positive swabs will prompt further detailed review of the room cleaning procedures. While residual viral RNA may suggest a need to further review room cleaning procedures, it may also indicate that the cleaning of high touch areas in the common areas is effective in removing viral RNA if there was more widespread contamination of common areas.

Concerns were raised by members of the public (including from outside Queensland) about the possibility of transmission via aerosol transmission or via air conditioning units or via bathroom

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plumbing (the latter based on reports associated with SARS-CoV-1[2]). The investigation team notes the environmental swabs collected from the ducts of the air conditioners in the rooms occupied by Case 1 and 2 and Case 5 and 6 returned a negative test result. Transmission via aerosol route would be more likely to yield positive environmental swabs across greater distances, or in other common areas, which was not supported by environmental swab results.

Further review of air conditioning to level 7 is currently awaited and this review recommends this analysis be considered by the Executive Director State Quarantine.

The review team further notes the investigation into cases in a South Australian Quarantine Hotel[3] in which smoke testing found that there were circumstances in which air flowed from the hotel rooms into the corridors. Contamination of common areas via this method cannot be excluded by this review. The review team further notes that the South Australian report excluded transmission via bathroom plumbing in their investigations.

Deep cleaning procedures

Cleaning and disinfection are critical to minimising any risk of contamination. There are a number of opportunities for improvement identified to date with deep cleaning a quarantine hotel room following the confirmation of an infected person. Improvements directed at reducing the complexity of processes will decrease multiple opportunities for error, increase post cleaning confirmation and address technical issues which will further reduce overall risk and ensure the deep clean processes are effective.

QPS is leading multi-agency work to amend the deep cleaning procedure and a draft is currently in consultation.

The ongoing presence of SARS-CoV-2 RNA in environmental samples in room 711 following a deep clean of the room is an important marker that these cleaning procedures provide an opportunity to be enhanced. Worldwide, it has been common to isolate RNA (which is not live virus, so does not pose a transmission risk) from environments where infected persons have been accommodated, but it has been much less common to isolate infectious virus. The attempt to isolate infectious virus continues through viral culture, but this process takes several weeks and was not available at the time of finalising the review report.

Infection Prevention and Control (IPC)

Infection control can never be risk free and it is not possible to eliminate all risk from hotel quarantine. Implementation of IPC is usually multifactorial as are the possible causal IPC breaches in any transmission event. Risk can be minimised through strong quality management systems related to infection prevention and control.

The review team notes the challenges of adapting hospital IPC practices into the hotel environment. It is considered there may be several opportunities for improvement in this area

[2] McKinney KR, Goong YY & Lewis TG. *J Environ Health* 2006. May;28(9):26-30. PMID: 16696450

[3] Government of South Australia, COVID-19 Transmission in the Peppers Waymouth Hotel, Adelaide, November 2020

for protection of staff, for staff to protect themselves and to reduce opportunities for transmission.

The door to guest rooms is recognised as a potential high risk of opportunity for transmission of virus. Recommendations for minimisation of this risk include consideration of reducing the number of times staff attend guest rooms for delivery of meals / linen / cleaning supplies and the like, and for guests to be required to wear masks when opening the door for any reason.

The ICP training packages for hotel staff, and information provided to guests while scientifically accurate and in line with best-practice principles, were found to be complex for lay people and written in language which may not be easily understood by hotel staff, people from Culturally And Linguistically Diverse (CALD) backgrounds or with lower levels of (health) literacy. There is an opportunity for development of more clear and simple materials. There are also opportunities to consider the modes of delivery (such as incorporation of multimedia resources / an information channel in guest rooms) and confirmation that critical material has been understood sufficiently to translate into practice.

The overarching procedures for management of hotel quarantine could place a greater focus on IPC relative to other pieces of information, given its' central role in preventing harm to guests, staff and other support staff through acquisition of COVID-19 while in care/quarantine, as well as minimising the risk of disease spread to the community.

Practical infection control

There is a need to ensure that 'Work as Done' is in line with the infection prevention and control advice/ training delivered to guests and to staff and the procedures underlying them. This would require a program of cyclical auditing of PPE use and cleaning procedures (adherence with standards and efficacy) during normal work and to include ongoing IPC overview of end to end processes.

Communication

Information relating to the operation of the quarantine hotels is held by multiple agencies including COVID-IMT, SHECC, QPS, SDCC, the hotel and the HHSs (including the Public Health Unit and HEOC). This is often unavoidable due to the internal structures and requirements of various agencies. Regardless, this complexity in communication channels creates opportunities for information degradation, errors and delays which could adversely impact system performance and quality such relating to the management of hotel guests, or of processes (eg. around deep cleaning).

Most likely transmission method

Case 1 almost certainly acquired COVID-19 overseas. It is unclear if Case 2 acquired the infection at the same time or from Case 1 as a household contact in hotel quarantine, although the second is felt to be more likely based on epidemiology. The acquisition of SARS-CoV-2 by Case 2 is not considered by the reviewers to be a failure of quarantine.

The review was not able to definitively identify a quarantine breach which led to the infection of Case 5 and Case 6. Their near-concurrent onset of illness suggests the acquisition was at the same time. The relatively long lag time between their arrival and onset of illness makes in-hotel

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acquisition more likely but the possibility of overseas-acquisition cannot be excluded. The infectious diseases physician on the review team sought further opinions from colleagues, concluding there is insufficient evidence to definitively support or refute the possibility the virus was acquired prior to arrival in Australia.

Case 3's acquisition of COVID-19 almost certainly occurred in the hotel with subsequent onward transmission to Case 4. No direct quarantine breach has been discovered in the course of the investigation to date. There was no identified evidence to suggest direct contact between the infected cleaner and the occupants of any of the occupied rooms. A number of factors associated with infection prevention and control systems likely contributed to the transmission of infection, including potential for indirect contact or fomite spread.

Other possible methods of transmission

Direct contact

Pathology specimen collection occurred from Case 2, 5 and 6 on 04/01/21, which could have been during Case 2's pre-symptomatic infectious period. Documentation from the Metro South Health Emergency Operations Centre (MSHEOC), Metro South Public Health Unit (MSPHU) and the private pathology provider's records indicate that Case 2's swab was the third of the three to be collected, which excludes transmission from Case 2 to the others by this route.

Airflow

Further analysis of airflow in Room 702 and of air movement between room 702 and common areas is pending. Airborne transmission via balconies is felt to be unlikely given rooms 702 and 711 are located geographically distanced. They are on opposite sides of the building and the balconies are not adjacent to each other.

Issues excluded

Security breach/quarantine non-compliance

In the absence of CCTV, investigations to determine if a breach occurred (such as a guest leaving their room) has focussed on interviews with guests themselves and quarantine workers who may have made observations. There is no evidence to indicate any of the guests from rooms 702 or 711 ever left their rooms without approval. Further, there is no evidence to suggest any person entered rooms 702 or 711 without approval. Additionally, although the cleaner was allocated to clean vacant rooms on level 7 there is no evidence to suggest the cleaner who became infected entered rooms 702 or 711.

Air-conditioning

Pending the outstanding airflow analysis, HGC management advise that two independent systems are maintained. One has a central cooling system that pumps chilled water throughout the building where individual units in the rooms distribute cool air. The second is independent split systems in individual rooms that have a condenser on the balcony. Room 702 is on the central system, room 711 has a split system.

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Accordingly, on advice from the hotel, there is no system that 'shares air' between rooms 702 and 711.

The review team notes there was no virus detected on swabs of the air-conditioning systems in rooms 702 and 711, although this does not by itself conclusively rule out transmission.

Findings and observations

In summary, Case 1 acquired the infection overseas and likely passed it to Case 2 in a domestic hotel setting. Cases 5 and 6 likely acquired the infection at around the same time as each other and overseas acquisition is possible. No direct breach in quarantine has been identified, but infection within the hotel cannot be excluded. Case 3 acquired the infection in the hotel on the 02/01/21, with Case 1 being the indirect source. Case 4 acquired the infection from Case 3 in a domestic household setting.

If a position were taken that Cases 5 and 6 acquired their infection at the hotel, then the infections of Cases 5 and 6 are most likely to be indirect contact with a surface that was exposed indirectly to the virus by Case 1 or 2, or from a surface that contacted a surface exposed by Case 1 or 2. Further analysis of airflows on level 7 are awaited however the information the review team has available at present contains several factors which may have facilitated indirect contact transmission.

In relation to Case 3, infection is most likely to have occurred in the hotel on the 02/01/21 through indirect contact with a surface exposed to the virus by Cases 1 or 2.

There were multiple opportunities for the virus to have passed to such surfaces. This includes meals, laundry etc. leaving and entering rooms 702 and 711; contact points external to the rooms accessed on arrival by Case 1 on the 31/12/20 and by Cases 5 and 6 on the 01/12/21 and while working by Case 3 on the 02/01/21; movement of persons into room 711 when medical support was provided and during the removal of Case 1 from room 702 and the 'fogging' (use of a cleaning device that delivers an aerosol antiseptic mist to an area) of that room.

While it appears unlikely that the exact root cause of transmission will be determined, it is apparent to the review team there are multiple infection prevention and control practices that would benefit from further review and improvement. Some of the practices require ongoing review and quality assurance and some may be considered less than optimal (PPE practices and knowledge and room cleaning procedures).

Accordingly, through a continuous improvement lens rather than delivering a scientific determination, in that the science was unable to determine a definitive cause, the cluster is most likely to be the result of multiple weaknesses in infection prevention and control. Furthermore, actions in response to this cluster should focus on strengthening and standardising quality management systems related to infection prevention and control. Although the review team have not looked at practices within other hotels, opportunities for implementation across the quarantine program in Queensland should also be considered.

Key learnings

Through the interview process and review of a range of materials including but not limited to information provided to guests in hotel quarantine, and education material available to hotel

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staff and quarantine hotel cleaning guidelines, it is apparent there are opportunities for improvement. The improvements can be made across the following areas:

1. Consistent practice across all hotels providing guest quarantine

Some staff potentially work across multiple quarantine hotels. From interviews it has been suggested that there are different practices undertaken in different locations. This requires further clarification, however the review team consider there is merit in ensuring systems, processes, information and guidance is consistent across the hotel quarantine program. The review team reinforces the benefit of consistent standards and practice across the hotel quarantine system. At minimum, this would mean resolving any contradictory practice recommendations and ensuring alignment with international best practice and applicable national and state guidelines.

Consistent practice is helpful in reducing opportunity for error and omission, particularly when there is fatigue, high levels of stress and cognitive overload. Whilst the review has been restricted to examination of the circumstances of a cluster in HGC in January 2021, given the increasing risk associated with new strains of the virus, there is merit of considerations of learnings from this hotel be applied across all hotels as part of a strengthened and standardised quality management system.

2. Infection Prevention and Control

a. Advice and education on IPC, including appropriate wearing of PPE, hand hygiene, waste disposal, cleaning practices, uniform management, management of guest luggage and deliveries is available. Inconsistent adherence to prescribed practice became evident through the interview process with hotel cleaning staff.

b. Materials available to date that support IPC were considered by the review team. There are some excellent resources, however, it is recognised that many of the resources may require additional customisation (user centred redesign) particularly for people who have low literacy levels or from CALD communities. No resources in languages other than English have been identified to date. Documents available for education and guidance are generally unclear, wordy and make no mention of supervision, validation or monitoring processes. Many resources are generic and have opportunity for specific detail for infection prevention and control quarantine processes to be included.

c. Interviews have highlighted that adherence to recommendations is challenging given how the nature of the work is currently configured. For example, access to hand sanitiser in common areas is available. However, whist cleaning guest rooms it was reported that no personal hand sanitizer was provided to support hand sanitation between glove changes. Additional process optimisations could be discovered by undertaking participatory co-design with cleaning and supervisory staff.

d. Further information and confirmation of practices through arrival at Brisbane airport and through immigration and transportation to hotel quarantine is required to provide a complete picture of the opportunities for transmission and minimisation of risks.

e. Interview information indicates that education for hotel staff on COVID-19, IPC practices and cleaning practices is available in PowerPoint form. It is of a good standard, although may be difficult for people from CALD communities. In addition, it appeared that not all hotel staff have completed the training. Although a minor recommendation, we suggest

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that the information delivered through this education program could be reorganised using human factors principles so that critical information is emphasised (by being delivered earlier in the session and/or allocated more time and/or supplemented with a colour scheme to focus attention on key information as needed).

f. There also appears to be gaps around supervision and monitoring of compliance to IPC strategies.

3. Method for identification of room status

a. It was recognised that information regarding room status, i.e., occupied type of clean required date clean completed etc. was not always correct. An example given was that a room was considered to be vacant when in fact it was occupied. This may lead to inadvertent entry and/ or attending of rooms by cleaning or other hotel staff.

b. Communication of results to guests and hotel staff should be improved. In particular, the fact that Case 5 states they found out about their results from the news media and notified the hotel themselves. This demonstrates opportunities for enhanced communication processes and in good clinical care of quarantine guests.

c. In terms of culture, the review team recommends refocusing policies and procedures for managing hotel quarantine to maximise alignment with the primary goal of the quarantine system, that is, to keep guests and the community safe. Approaching systems redesign (policies, procedures, accountabilities, training and quality assurance) with this lens is considered to be essential. This includes a significant strengthening of the importance of infection control in the procedures and a single consistent approach to infection prevention and control across the quarantine hotel system.

Immediate actions taken in response to learnings

1. As at 19/01/21, CCTV had been installed on all floors of 2 quarantine hotels and is underway at an additional 3. This work will continue until all quarantine hotels are completed. The installation also includes motion detection and a requirement for 24/7 monitoring by a QPS member.
2. During the review, the Queensland Health review team members identified a number of infection prevention and control recommendations for immediate actioning. These recommendations are being progressed under the direction of the newly appointed Queensland Health Executive Director State Quarantine.

Outstanding enquiries and continuous improvement actions

The below outstanding issues and recommended future actions refer to activities that were not concluded prior to the submission of the final review report. As some of these processes have commenced, these will be followed through as appropriate (i.e. collation of emails, conclusion of arranged interviews). In all cases, information and learnings from these responses and remaining outstanding actions will be referred to the Executive Director State Quarantine and QPS COVID-19 Command for consideration of further action.

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Requests for information

While a large number of persons have been spoken to, it is recognised all persons who may have information should be offered the opportunity to provide it within a reasonable timeframe. Accordingly, in addition to the email advice to previously quarantined persons at the HGC seeking and providing methods for their input, a similar offer has been made to QPS and ADF personnel who performed duties at the HGC. It is anticipated these responses were not all received prior to the submission of the final review report. The QPS have committed to continuing to monitor and action these responses as indicated above.

Queensland Health staff will be engaged through the work of the Executive Director State Quarantine and the Hotel Quarantine Steering Committee.

Interviews

While interviews were prioritised and those identified as key have been interviewed, there are a number of outstanding interviews considered useful to further validate recommendations. Where considered relevant these will continue and be referred as indicated.

Cleaning practices

Further review of cleaning processes and associated education material by an ICP (infection control practitioner) is required. While many resources were received by the review team, further consultation with relevant Queensland Health and other staff regarding the range of documents, policies, procedures, guidelines and practices is recommended.

End to end transport

The review team did not explore practice and process for passengers arriving at Brisbane International airport, transiting through immigration and transport to their quarantine hotel.

Complimentary CHO direction changes

It is noted that the recommendations, if implemented, may require corresponding changes to relevant legal frameworks (including directions issued by the CHO) supporting the quarantine program. The CHO should be engaged during these considerations to ensure the practical requirements are supported by the legal framework.

Deliverables and timeframes

It is noted that while the Terms of Reference provided for the conduct of a joint investigation and analysis and delivery of a report complete with recommendations, which are completed through the delivery of this review report, there are some lines of inquiry the review team commenced that have not concluded. Guidance was provided by the Director-General of Queensland Health and Commissioner, QPS that recommendations and issues arising from these outstanding items, post the finalisation of this review are to be referred to the other activities underway. An Executive Director of State Quarantine has been appointed to focus on policy, planning and

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leadership. A commitment has been made for this review to be a key focus for continual improvement in the area of hotel quarantine.

Recommendations

During this review, it became evident there are innumerable examples of best practices and correspondingly, opportunities for improvement. The review team appreciates that the pandemic environment is inherently unpredictable and therefore risk management must be approached dynamically. This also relates to the hotel quarantine program in Queensland, where it is incumbent on relevant agencies to continually review the program for sufficiency against current needs and to implement strategies to assure and maintain community safety and trust in government and to improve systems and processes where necessary. This will best be achieved through ongoing monitoring and reviews and quality assurance of residual risks to assure and maintain community safety and the confidence and support of the Queenslander community.

1. Compliance monitoring

a. Install CCTV in all government-run mandatory quarantine hotel venues to capture all movements in and out of guest rooms. The system should include continual monitoring and movement-detection or similar. This recommendation may not apply where there is a physical, continuing security presence on each hotel floor.

2. Cleaning

a. Review the deep clean initiation process following a quarantined person testing positive to COVID-19 and adopt a whole of government procedure that is consistent across the entire hotel quarantine program. As a minimum, this procedure should include processes for:

(i) Securing the room immediately when a quarantined person is moved out of a hotel.
(ii) Ensuring the room is not entered or returned to service until the agreed cleaning process has been concluded.
(iii) Ensuring all stakeholders are engaged and informed throughout the procedure and addresses situations where there are multiple guests in a room but not all are transported away from the hotel.
(iv) Assurance checks that the cleaning process has been completed.

b. Implement a process of environmental surveillance post deep clean including supervision, monitoring, auditing and environmental sampling (including swabbing of walls, high touch surfaces, under door seals be considered post deep clean).

3. Infection prevention and control systems, policies and procedures

a. Iterative revisions of infection prevention and control policies and procedures for quarantine hotels are to include:

(i) Minimising guest room door openings (for example, linen collection at the same time as meal delivery so doors need only be opened once instead of twice).
(ii) Minimise traffic through corridors outside the rooms of quarantined guests.
(iii) Additional measures to reduce the potential for spread of infection into common areas:

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- When entry to a room is required, give notice to guests and request they put on a mask, and allow a period of time for air (droplets) to settle prior to staff entering the room.
- Ensure door seals are in good condition to minimise under-door airflows.

(iv) A requirement for access to alcohol-based hand sanitiser to hotel staff (personal) and in common areas to provide additional opportunities for hand hygiene (eg. after glove changes).

(v) System for identifying room status and workflow management (for example, a notice on the door of the room re: type of clean required/date completed)

(vi) Management of hotel staff uniforms.

(vii) Mandatory completion of infection prevention and control training for staff involved in the hotel quarantine program.

(viii) Description of minimum infection prevention and control training requirements for staff involved in the hotel quarantine program including competency assessments (handwashing, donning and doffing of PPE).

(ix) Description of roles and accountabilities of hotel staff (supervisors and management) and other agencies involved in site-level quarantine systems monitoring and operational performance (to enable a high level of adherence with cleaning protocols and PPE utilisation).

b. Establish onsite quarantine hotel support from a registered nurse with infection prevention and control knowledge, with on-call access to an infection control practitioner, to provide operational infection prevention and control advice to hotel and other staff. This role would assist in mitigating transmission risk by providing PPE training, monitoring compliance with infection control procedures, conducting regular infection prevention and control audits and engaging with all onsite agencies around infection prevention and control protocols.

c. Implement an end-to-end risk-based quality assurance system to ensure early detection of practice variations, build confidence that performance standards are being met continuously and to restore performance when deviations are noted.

d. Implement an infection prevention and control 'buddy' system across the hotel quarantine program for hotel staff (eg. a pair of cleaning staff would watch out for the other and prompt when their 'buddy' has not adhered to correct infection control practices).

4. Infection prevention and control workplace culture

a. Adopt a 'Speaking up for Safety' culture across the hotel quarantine program. This would include training to support increasing skills in respectfully raising concerns using graded assertiveness communication skills. A culture of all involved (guests and staff) looking out for each other is critical to this approach, as is the alignment with just culture principles. Strategies such as team briefings at shift commencement, debriefings at shift completion and walkthroughs by supervising staff could be included in this approach. An appreciative understanding of the challenges in frontline service delivery is vital to team-based continuous quality improvement. These measures will help create greater convergence between actual practice (work-as-done) and desired performance standards.

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5. Infection prevention and control training materials

(a) Iterative and user-centred revisions of infection prevention and control training materials for quarantine hotels are to include training materials pitched for different target groups (senior hotel management, catering staff and cleaning staff) that details the scope of duties expected of them.

6. Hotel guest pack and infection prevention and control information

(a) Iterative revisions of the hotel guest pack are to adopt an 'easy read' succinct format to enhance clarity, using plain English with diagrams to aid understanding. Guest packs are to be available in other languages to cater for culturally and linguistically diverse guests.
(b) Consider a 'Priority Advice FAQ' for travellers of 'Must Do's' between the airport and entering their quarantine to ensure clear understanding of PPE and door management processes in the first hours of quarantine.
(c) Iterative revisions of important infection control information sheets for guests are to adopt an 'easy read' format and be made available in multiple languages.

7. Airflow management

(a) Whilst there are no specific findings of airborne transmission, airflow has been considered and forms part of good practice worldwide in minimising risk of transmission. For this reason, the review team also recommends ensuring air extraction and ventilation of corridors.

Appendix 1

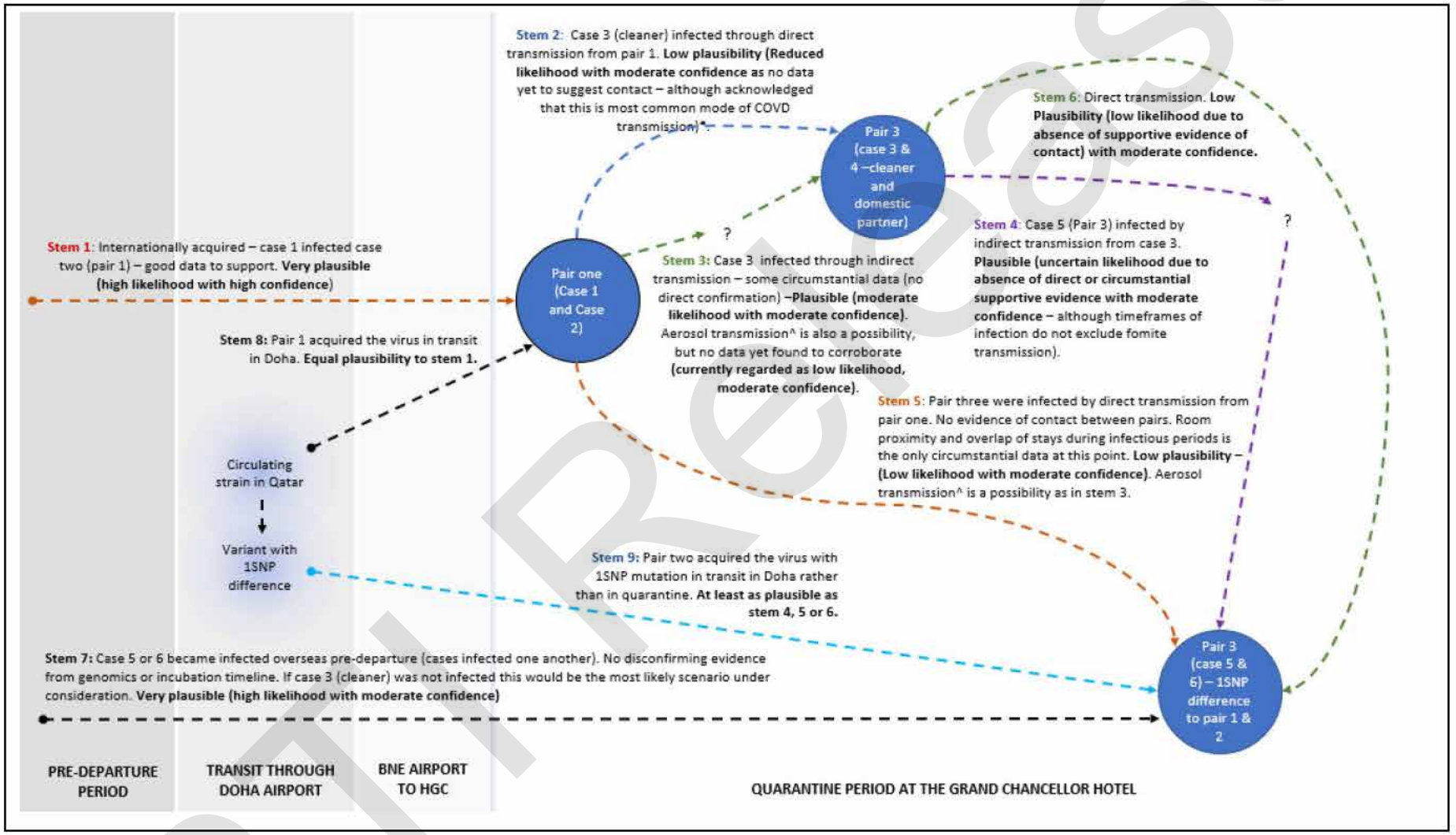
Case Timeline 23/12/2020 - 12/1/2012

	23-Dec	24-Dec	25-Dec	26-Dec	27-Dec	28-Dec	29-Dec	30-Dec	31-Dec	1-Jan	2-Jan	3-Jan	4-Jan	5-Jan	6-Jan	7-Jan	8-Jan	9-Jan	10-Jan	11-Jan	12-Jan
Case 1	X						Doha	Arrived	Q		X										
Case 2							Doha	Arrived	Q		X		X		X						
Case 3							X				Work				X						
Case 4																				X	
Case 5									Doha	Arrived	Q		X							X	
Case 6									Doha	Arrived	Q		X							X	X

X	Negative test
X	Positive
	Possible incubation period
	Likely incubation period
	Infectious period
	In isolation (in hospital / home)
	Rostered shift for Case 3

Note:
Cases 1 and 2 arrived in Australia from Doha late on 30/12/2020 and were placed in quarantine (Q) in the early hours of 31/12/2020.
Cases 5 and 6 arrived in Australia from Doha late on 1/1/2021 and were placed in quarantine in the early hours of 2/1/2021.
Case 5 was transferred to hospital on 11/1/2021. Case 6 was transferred to hospital on 12/1/2021.

Appendix 2



Note: Pair 1 and 3 were in Doha airport within 48 hours of each other – this lends credence to a common source hypothesis in Doha Airport (Stems 8 and 9). The review team has a high level of confidence transmission occurred from pair 1 to case 3 although this could be via stem 2 or 3. ^Aerosol transmission up to 1.5 metres.

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