BOARD OF INQUIRY INTO THE COVID-19 HOTEL QUARANTINE PROGRAM

WITNESS STATEMENT OF DR CHARLES GIDEON ALPREN

I, Dr Charles Gideon Alpren of professional address 50 Lonsdale Street, Melbourne, Victoria 3000, Epidemiologist, say:

1. I make this statement in response to a notice to produce from the Board of Inquiry into the COVID-19 Hotel Quarantine Program, dated 28 July 2002.

2. Except where I otherwise indicate, I make this statement from my own knowledge and, wholly or substantially, from my area of expertise (epidemiology).

3. To the extent that I express opinions in this statement, I set out the assumptions on which my opinions are based. I have also identified the documents that I have had regard to in making this statement.

PROFESSIONAL BACKGROUND & ROLE

1. What are your relevant qualifications, professional background and work history?

4. I am a registered medical practitioner with the Australian Health Practitioner Regulation Agency (registration number MED0001218683), and a fellow of the Royal Australian College of General Practitioners.

5. I received a Bachelor of Medicine/Bachelor of Surgery from the University of Leeds, in the United Kingdom in 1997. I have also received a Masters of Public Health from James Cook University 2016, and a Masters of Business Administration from Charles Sturt University in 2008.

6. I have worked as a General Practitioner in rural and regional Australia, as well as metropolitan Melbourne. Since moving from general practice to public health in 2014, I have worked in Sierra Leone in the Ebola response and post Ebola recovery with WHO and the US Centers for Disease Control and Prevention (**CDC**).

7. Between 2017 and 2019, I worked for and undertook epidemiology training at the CDC. The CDC is based in Atlanta, Georgia in the United States of America; my fellowship placement was at the Boston Public Health Commission, Infectious Disease Bureau.

8. I first worked for the CDC in Sierra Leone in the period October 2015 to June 2017 in the field of Emergency Preparedness, Ebola Outbreak Response and Ebola Survivor Care.

9. I then worked for CDC as an Epidemic Intelligence Service Officer at the Boston Public Health Commission, which involved data collection, analysis and interpretation to inform communicable disease prevention control. I received comprehensive epidemiological training as part of this fellowship to supplement my academic qualifications listed above.

10. On my return to Melbourne in June 2019, I commenced work with the Department of Health and Human Services (**Department**) as an epidemiologist first with responsibility for HIV epidemiology, and subsequently, from October 2019, as Principal Epidemiologist for blood borne viruses and sexually transmissible infections.

11. I began working with the Incident Management Team, set up to address novel coronavirus, as part of the Public Health Unit of the Department as the Intelligence Officer in January 2020.

2. What is your role within the Department of Health and Human Services (the Department)?

12. I work as one of the leads in the Intelligence Section (**Intelligence**) of the COVID-19 Public Health Incident Management Team. My role is to oversee the entry, management, epidemiological analysis, interpretation, and reporting of data pertaining to COVID-19 that is collected through the Department's notifiable diseases surveillance system.

13. As part of the Incident Management Team structure, I report to the Deputy Public Health Commander for Intelligence. The role of Intelligence is described in answer 27, below.

3. What are your key responsibilities, and what does your day-to-day work, at the Department involve?

14. I supervise and advise epidemiologists in collection, management and analysis of COVID-19 data to inform the public health response, including advising Deputy Public Health Commanders, the Public Health Commander and contributing to submissions to Crisis Council of Cabinet addressing the progress of pandemic spread in Victoria and assisting advice on the response, including in relation to restrictions.

15. My key responsibilities are to provide general oversight of the activities conducted by Intelligence, providing technical expertise when called upon, and liaising with internal and external stakeholders as it relates to Intelligence.

16. I have a responsibility for general oversight of many of the sections of Intelligence, including data entry, systems development and maintenance, modelling and analysis.

EPIDEMIOLOGY

4. (a) Generally, and (b) medically, what is epidemiology?

17. (a) Generally, epidemiology is the study of the patterns and determinants of disease in specific populations.

(b) Medically, epidemiology and public health medicine are distinct from patient-specific medicine as they advise and implement broad interventions on large groups of people to achieve overall health benefit.

5. What role do epidemiologists play in: (a) understanding; and (b) controlling, the spread of communicable diseases? How do they fulfil these roles?

18. Epidemiologists (a) analyse data to look for patterns that can forecast the trajectory of disease and (b) inform interventions to alter that trajectory. Typically, within communicable disease, epidemiologists integrate key known facts about the disease including its mechanism of transmission, incubation period and infectious period, with the spatial and temporal patterns observed within a population. This could involve a group of infected

people in a defined location whose disease onset occurred between set dates. Analysis of this group and the circumstances of their interactions can reveal how the disease spread within the group. Understanding the specifics of disease transmission within the group can inform interventions to stop that transmission.

19. Typically, communicable disease epidemiologists obtain information from questionnaires administered to patients. These questionnaires capture details such as recent travel and movement, illness onset and symptoms, as well as people the patient has been in contact with.

20. This information, having been recorded in a database, can be analysed using descriptive and statistical techniques to understand how and why disease is spread. From this understanding, advice can be provided on how to interrupt the spread of disease.

6. Can epidemiologists make predictions in relation to the future spread of communicable diseases? How is this done?

21. Epidemiologists examine data to look for patterns of disease transmission that are emerging under the circumstances present at the time. Epidemiology can inform an understanding of risk factors which are characteristic of people or environments that place individuals at higher risk of acquiring or becoming affected by disease. Epidemiology can therefore make broad predictions about people or circumstances that present a higher risk of disease. It can also predict disease trajectory under known parameters and assumptions.

22. However, some parameters and assumptions are changeable. For example, restrictions put in place on a population will change the amount of opportunity the virus has to spread. If restrictions change after a broad prediction has been made, that prediction will no longer apply. Furthermore, it is impossible to predict the precise effect of restrictions, which may have different effects at different times and places. Therefore, epidemiology can attempt to answer the question "what could happen if...?", but cannot answer "what will happen?"

THE DEPARTMENT - COMMUNICABLE DISEASE PREVENTION AND CONTROL

7. Generally speaking, what function does the Department fulfil in respect of the detection, surveillance and control of communicable disease? What is the role of your area within the Department in respect of this?

23. The Chief Health Officer, who works in the Department, has powers under the Public Health and Wellbeing Act (2008) which can be used for purposes including the prevention and control of communicable disease. A mainstay of communicable disease control is the collection and analysis of data pertaining to specific communicable diseases that laboratories and clinicians are legislatively bound to notify the Department of upon diagnosis. These are called notifiable diseases.

24. When it emerged in January 2020, novel coronavirus as it was then called (now Coronavirus Disease 2019 - COVID-19) was added to the list of notifiable diseases. Laboratories and clinicians therefore are obliged to inform the Department of any new diagnoses of COVID-19.

25. The Communicable Disease section of the Health Protection Branch of the Department is responsible for the collection and management of incoming notifications, and any relevant public health actions. The Public Health arm of the COVID-19 response has grown from the Communicable Disease section of the Health Protection Branch.

8. What are the different teams, groups or components within your part of the Department? What work does each undertake?

26. Broadly speaking, in the Public Health arm of the Department's response to COVID-19, the collection of information and contact tracing is performed by the Case, Contact and Outbreak Management Team (CCOM), who are not part of Intelligence.

27. There are several duties and responsibilities of Intelligence. These include the following:

    (a) Management, development, and maintenance of the infectious disease passive surveillance database used by the Department, the Public Health Event Surveillance

System (**PHESS**) in as far as its use pertains to COVID-19; data entry, classification, and checking;

(b) provision of data to assist case, contact, and outbreak management and compliance with quarantine and isolation;

(c) reporting to the Department and across government on current case and test numbers by location, sex, age and other criteria including issuing a daily situation report;

(d) reporting to external parties including the Commonwealth on COVID-19 in Victoria;

(e) reporting to the public, via the Department's COVID-19 Media and Communication team, statistics pertaining to COVID-19 cases and tests;

(f) analysis of epidemiological data to reveal trends and inform the response to COVID-19;

(g) modelling of case counts and hospital demand under set assumptions to assist planning;

(h) analysis and collation of peer reviewed literature on COVID-19 and provision of general and specific reports on current international evidence;

(i) assistance with provision of data and analysis to Crisis Council of Cabinet to inform the response including restrictions;

(j) development of centralised, integrated reporting for COVID-19 using data from across the Department;

(k) development of extended surveillance systems in addition to that provided by the passive surveillance system such as primary care-based surveillance, and

(l) governance of data pertaining to COVID-19 and supervision of data requests made to the Department from researchers and external parties.

28. CCOM and Intelligence have evolved from teams within the Communicable Disease section of the Health Protection Branch. The activities performed by Intelligence has been drawn from the Communicable Disease Epidemiology and Surveillance (**CDES**) team, and the CCOM has been drawn from the Communicable Disease Prevention and Control Team (**CDPC**).

29. Prior to (and since) COVID-19 emerged, CDES and CDPC worked extremely closely together on all notifiable diseases.

9. What are the usual qualifications and professional background of people working in within each of the teams, groups or components referred to above?

30. The usual qualifications and professional background of team members are as follows.

31. I base my knowledge of CDES and Intelligence on my experience managing the Intelligence team. However, I base my knowledge of CDPC and Case, Contact and Outbreak Management (**CCOM**) on my understanding of the background of my work colleagues in these teams. I have no professional or organisational responsibility for these teams.

32. CDES and Intelligence:

    (a) Surveillance Officers - no prerequisite qualification, primarily with an academic science background and responsible for data entry;

    (b) Data Managers - data analysts or science background and responsible for bulk management of data, and day-to-day management of surveillance officers;

    (c) Epidemiologist Support (junior epidemiologist) - recent or undertaking Masters of Public Health degree; basic data analysis and advanced data management;

    (d) Epidemiologists - Masters of Public Health, Masters of Applied Epidemiology or PhD and responsible for advanced data analysis and data management. Epidemiologists are responsible for reporting issued by the team; and

(e) there are also individuals responsible for maintaining databases and IT infrastructure necessary for the function of the notifiable disease surveillance system.

33. CDPC and CCOM:

(a) Public Health Officers - background as Environmental Health Officers or nurses and responsible for collection of data from cases and clinicians, contact tracing and implementation of public health action; and

(b) Public Health Physicians - medical doctors and members of Faculty of Australasian Public Health Medicine within the Royal Australasian College of Physicians - oversight of public health actions and development of policy.

10. Prior to the COVID-19 outbreak what were the respective sizes and general workloads of each of the teams, groups or components referred to above? What are their current sizes and roles?

34. I joined the Department in mid-2019 and have limited managerial experience in CDES. To the extent I can answer this question, I base my answer on my understanding of an Organisational Chart dated September 2019[1] and my experience of roles on that chart that were occupied at that time. My understanding of that chart indicates that CDES, CDPC and Public Health Medicine Unit was composed of approximately 55 people.

35. Workloads fluctuated based on diseases incidence, but were generally within the bounds of relevant VPS ranges to which people were employed.

36. Intelligence and Pathology are a new teams and did not exist prior to January 2020. The Incident Management Team was established in mid-January at which point I joined as Intelligence Officer in addition to my regular work as Principal Epidemiologist in Blood-Borne Viruses and Sexually Transmissible Infections. During February three people with regular positions in CDES also worked on novel coronavirus. This has increased and we

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[1] Health Protection Branch Organisational Chart, September 2019, DHS.0001.0036.0115

now have over 200 people in the Intelligence team, that I manage. It has been a significant scale up.

37. Workloads have substantially increased. In order to fulfil the requirements of the Response, Intelligence and CCOM are staffed 24hrs a day, 7 days a week.

CONTACT TRACING

11. What is 'contact tracing'?

38. Contact tracing is a term that refers to the identification, assessment and management of people who have potentially been exposed to disease and are therefore at higher risk of developing and spreading disease, and working with those people to interrupt the spread of disease.

12. What are the guiding principles and key methods used in contact tracing?

39. I have not been involved in conducting contact tracing for the Department in Australia, as the Department separates CCOM from epidemiology. However, in working in this field in Sierra Leone and in the United States, these functions were not separated and my work as an epidemiologist included contact tracing and case management for the purposes of outbreak control. While I base my answer to this question on those experiences, they are also relevant to Australia and to the contact tracing approach to COVID-19.

40. Most information for contact tracing is obtained by interviewing people notified with disease (cases) about their movements during the period of time they could have been transmitting the disease (infectious period). The steps involved in contact tracing can differ depending on the relevant disease. For example, contact tracing for a sexually transmitted disease differs from what is involved in contact tracing for COVID-19 or measles.

41. For COVID-19, the role of CCOM is to identify people who could have been exposed to the disease (contacts). Some contacts are identified directly from the case interview, others are

identified from further investigation, including interviews with employers, examination of employment rosters, school attendance sheets and other relevant data sources.

42. Once contacts are identified, they are informed of their responsibilities to quarantine until such time as we can be confident that there is no risk of them transmitting disease to others. Quarantine refers to instructing contacts to separate themselves from other people so that they cannot transmit disease. Note (as described below), disease can be spread prior to the onset of symptoms. Furthermore, the time period between disease acquisition to onset varies from disease to disease. This is referred to as the incubation period. Hence, contacts are instructed to quarantine for a set amount of time determined by the maximum incubation period of the disease in question.

43. Cases are also instructed to isolate from others to ensure that they do not transmit virus. As such, contact tracing and case management assists in the control of disease by ensuring cases and contacts are instructed and enabled to act in a manner that ensures they do not spread disease.

44. Contact tracers work with epidemiologists to identify patterns and risk factors involved in disease transmission, so interventions can be put in place that will stop disease spread.

13. What types of information inform contact tracing? What are its limitations?

45. For COVID-19, information collected comprises questionnaires populated from case interviews which include who the person has seen, where they've been and members of their household. This information is collected from phone calls with people who have been identified as cases or contacts. Other sources of information include workplace assessments to understand potential patterns and mechanisms of disease transmission, and corroborating information offered from third parties.

46. Therefore, the information received by CCOM used for contact tracing and to inform the control of infectious disease is limited by what people remember, and what they are

prepared to disclose. In my experience, while people seek to engage in behaviours to limit transmission of disease, competing priorities (such as financial or caring obligations) can conflict with this agenda.

14. When you undertake contact tracing, are you able to determine the 'direction' of infection? That is, how might you determine that person A was infected by person B (as opposed to person B being infected by person A, or the involvement of person C with A and B separately)? What information informs your ability to draw conclusions about the 'direction' of infection?

47. Contact tracing can determine the sequence of symptom onset from which we can infer the order of viral acquisition. However, transmission often occurs within networks of people who have been exposed to one another multiple times in different settings (including different degrees of exposure). There is often, as is the case with COVID-19, a significant potential range of incubation period, hence, precise directionality and source of acquisition often cannot be concluded. Contact tracing recognises "epidemiological links" between individuals. These are similarities in time and place that suggest potential for disease transmission with a common source.

48. For example, imagine person A arriving on an island where persons B and C have been isolating for period of time that significantly exceeds the incubation period of COVID-19. Immediately after their arrival, person A becomes ill with COVID-19. Four days later, person B becomes unwell with COVID-19, and four days after that person C becomes ill with COVID-19. The incubation period of COVID-19 ranges from 2-14 days. Hence, we can conclude that person A transmitted virus to person B, however, we cannot conclude whether person A or person B (or both) transmitted virus to person C. We do know, however, that persons A, B, and C fall within the same transmission network and are epidemiologically linked.

15. In respect of contact tracing and, if relevant, predictions regarding future spread, how does epidemiology interact with genomic science? What does each field offer the other?

49. Genomic science allows us to examine a large group of cases consisting of multiple transmission networks, and determine, within the bounds of limitations of the science, which cases belong to the same, similar, or different networks.

50. By incorporating information from epidemiological investigation (contact tracing), and genomic science, further inferences can be drawn about these transmission networks and the mechanisms and risks associated with viral transmission. For example, healthcare workers are known to be at higher risk than others in the community for acquisition of COVID-19.

51. When there are many positive cases in the community, it can be challenging to ascertain whether an infected healthcare worker acquired infection in or out of the workplace. While this applies to any disease, it is particularly relevant to COVID-19 because health care workers are at particular risk of acquiring and transmitting this disease which is not vaccine preventable, and given its manner of transmission (as opposed to blood borne disease for example). Understanding the place of infection can, however, be of crucial importance to prevention of future transmission to others.

52. Genomic analysis can help determine which other cases a healthcare worker shares a transmission network with. If cases known to have been patients where the healthcare worker works are among that transmission network, the possibility of healthcare facility-associated transmission is raised. However, if the healthcare workers' virus clusters, genomically (in that they belong to the same transmission network), with cases that have not been to the facility and do not cluster with any that have been to the facility, that serves as evidence against facility-associated transmission having been responsible for the infection. These principles apply generally across other contexts too. One can interrogate genomic clusters and incorporate knowledge about a person's movement during the time they could have acquired virus to attempt to ascertain the circumstances of acquisition of virus.

53. Other epidemiological information such as place of acquisition (from overseas, from a known contact or outbreak, or from an unknown source in Australia), location of residence, or age group can also be integrated with genomic cluster information and the sequence of symptom onset to understand how viruses spread between different settings and populations.

COVID-19

16. What are the main characteristics of COVID-19, from an epidemiological perspective (including its incubation period, transmissibility and the 'age' of the virus)?

54. I base my answers to this question on a report, produced by Intelligence, of evidence collated from international literature. We update these reports every 1 to 2 weeks. I base these answers on the report updated 27 July 2020, which contains references to the international literature used therein.[2] Evidence about COVID-19 is evolving and has changed over the past 7 months since the virus was first recognised.

55. SARS-CoV-2, the virus that causes COVID-19, is a highly infectious virus that can be transmitted from person to person prior to the onset of symptoms. It can cause a wide spectrum of severity of disease meaning that a person can be infectious with COVID-19 despite feeling well. It is therefore difficult to control.

56. Control requires isolation of cases and quarantine of contacts as well as distancing of people not known to be cases or contacts.

57. Key parameters for control of infectious disease that have been identified in the scientific literature[3] as being particularly relevant for transmission of COVID-19 include:

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2 Intelligence report on international literature, 27 July 2020, DHS.0001.0036.0133

3 Ibid.

(a) R_0 of 2.71. This refers to the number of people who would become infected from one person with the disease, on average, across a population who were susceptible to the disease and without disease control measures. R_0 of 2.71 means that without control measures including contact tracing and physical distancing, approximately 27 people would become infected from 10 people with disease.

(b) An average **incubation period** of 5.5 days with a range of 2 to 14 days. This refers to the time between an individual being exposed to the virus to the time they experience symptoms or start feeling sick.

(c) An **infectious period** commencing 2 days prior to symptom onset. This refers to the time that an individual exposed to the virus could potentially spread virus to others. This means that someone exposed to the virus may be able to infect other people 2 days before they start to feel sick.

(d) Approximately 17.9% of cases experience **asymptomatic infection**. This refers to the percentage of cases that will not experience any symptoms. This means that people who are infected may not know they are sick. However, because symptomatology can vary throughout the course of the illness, the proportion of cases who remain asymptomatic throughout illness is unknown, as is their degree of infectiousness.

(e) A **serial interval** of approximately 5 days (range 3.0-7.5 days). This refers to the time between successive cases in a chain of transmission developing symptoms. This is the time between a case being exposed to the virus and that case exposing the next person to the virus.

(f) The true **'age'** of the virus is unknown, however, it was first identified in humans in late December 2019 in Wuhan, China.

THE DOHERTY INSTITUTE

17. What role does the work of the Doherty Institute play in relation to the detection, surveillance and control of COVID-19?

58. The Peter Doherty Institute for Infection and Immunity is a joint venture between the University of Melbourne and The Royal Melbourne Hospital, combining research, teaching, public health and reference laboratory services, diagnostic services and clinical care in infectious diseases and immunity. The Doherty Institute houses the Microbiological Diagnostic Unit – Public Health Laboratory (MDU).

59. The Department liaise with MDU directly, without engagement with the Doherty Institute. The Department and MDU have engaged in a data sharing agreement that operates to facilitate improved surveillance of COVID-19 in Victoria through integration of genomic data (obtained by MDU through analysis) with epidemiological data (obtained during case investigation by the Department).

60. The role of MDU in detection, surveillance and control of COVID-19, is to perform genomic sequencing and analysis of the virus from Victorian cases in order to inform and guide action taken by the Department. This directly facilitates virus surveillance which may assist in the Department's efforts to detect and control the virus.

61. MDU provide enhanced surveillance through identification of genomic links between cases, to characterise transmission networks. This allows for improved understanding of the spread of the virus.

62. MDU also perform diagnostic testing for COVID-19. The Victorian Infectious Diseases Reference Laboratory, which is the viral reference laboratory for Victoria and has been central to development of diagnostic capability for COVID-19 in Victoria is also housed at the Doherty Institute.

18. Do the Department and the Doherty Institute share information? If so, how? Does one 'direct' the other?

63. The Department and MDU share information between one another to benefit COVID-19 surveillance in Victoria.

64. From the Department, epidemiological data from PHESS obtained from case investigation is provided daily for all confirmed cases and stored in a secure database at MDU.

65. This information is de-identified prior to sharing and specific to laboratory samples (to assist MDU in identification), mode of acquisition (whether overseas acquired, thought to have been acquired from a known contact, acquired in Australia from an unknown source, or still under investigation), epidemiological cluster assignment, and case symptom onset and diagnosis date.

66. MDU receive all SARS-CoV-2 positive samples in Victoria to perform genomic sequencing. The result of this sequencing and analysis is provided to the Department as a 'genomic cluster assignment'.

67. A case will only be assigned a genomic cluster where MDU are able to allocate one. Where there is insufficient genomic evidence to allocate a cluster, a case will not be allocated a genomic cluster.

68. The provision of genomic information to the Department from MDU enables an improved understanding of networks of transmission.

69. Identification by MDU of cases that cluster genomically where there was no known epidemiological link can assist in providing insights undetectable from contact tracing alone. Therefore, the combination of genomic and epidemiological information guide and inform the COVID-19 Public Health Response. The collaborative sharing of data and information advises surveillance of COVID-19.

19. After the Doherty Institute receives information about an infected individual or cluster of infections, how long does it typically take the Doherty Institute to provide you with corresponding genomic information?

70. The time for the Doherty Institute to provide timely information is dependent on several factors, namely:

    (a) the presence of a clear question from the Department that genomic sequencing can inform;

    (b) time of diagnosis;

    (c) availability of sample at MDU to be sequenced;

    (d) quality of the sequence;

    (e) availability of other sequences for comparison.

71. MDU and the Department have regular weekly teleconferences, after which MDU provide reports and spreadsheets that summarise the information discussed.[4] The cadence and content of these meetings and emails can be influenced by the availability of samples.

72. The Department can make requests to MDU to prioritise and expedite samples for sequencing and analysis. These requests can pertain to outbreaks of note or sensitive cases.

73. The turnaround time, for samples that pass quality checks, from arriving at MDU to being sequenced and analysed is approximately 5 days, following which MDU promptly informs the Department of their findings at the weekly or ad-hoc meetings.

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[4] Interim Genomic Report, 1 August 2020, DHS.0001.0037.0029

CURRENT CASES

20. At any given time, how up to date is the information available to you about the rate of COVID-19 infection in Victoria? What are the factors that affect the accuracy and completeness of this information?

74. Laboratories and clinicians are obliged to notify the Department of any case of COVID-19 in a timely manner after diagnosis. This notification is usually received on the same day as diagnosis and entered into PHESS on the same day. Case volume can delay entry to PHESS.

75. Each morning, the Department reports cases up to midnight the previous day.

76. Case and contact interviews take place as soon as possible after notification. Every effort is taken to assign cases to interviewers within 24 hours of receipt of notification, however, case volume can affect the timeliness of interview allocation and completion. Furthermore, interview completion depends on the availability and willingness of the case to be interviewed.

77. The accuracy and completeness of information available to the Department about COVID-19 in Victoria is dependent on several factors:

(a) individuals with a COVID-19 infection being tested accurately;

(b) the Department being notified of all positive test results;

(c) the capacity of the Department to interview cases and contacts and other necessary people in a timely manner;

(d) the capacity of the Department to enter cases and contacts to PHESS in a timely manner;

(e) completeness of information provided at the case and contact interview; and

(f) the capacity of the Department to review PHESS records for accuracy and ensure records reflect the content of the interview.

21. Has the Department traced current Victorian COVID-19 cases to particular times, transmission events and/or locations? 21.1. If so, what are those events and/or locations? What are the bases for any conclusions you and/or the Department have reached in this regard?

78. My answer to this question addresses whether current Victorian COVID-19 cases have been traced to times, transmission events or locations connected with the Hotel Quarantine Program. As outbreaks in Victoria continue and are now found in various settings, I have not also addressed how later outbreaks in Victoria may be connected to each other (for example, across public housing towers or in aged care settings). Within those parameters, however, yes.

79. Combining genomic data provided by MDU[5] and epidemiological data from PHESS, the Department has concluded that almost all cases of COVID-19 in the community (not acquired overseas) that have been sequenced among cases diagnosed after 30 May 2020 can be traced back to transmission that started at the Rydges Hotel Swanston Street and Stamford Plaza Hotel.

80. The only exceptions to transmission from Rydges or Stamford are 2 episodes of transmission described below, in paragraph 107. The bases for the above conclusion in paragraph 78 are as follows.

Rydges Hotel Outbreak

81. On 9 May 2020 a family of four [redacted] returned to Australia from overseas and commenced mandatory hotel quarantine.

    (a) On the same day, 9 May 2020, the adult (person A) became symptomatic.

    (b) On 10 May 2020 a second family member (person B) became symptomatic.

    (c) On 11 May 2020 a third family member (person C) became symptomatic.

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[5] Interim Genomic Report, 1 August 2020, DHS.0001.0037.0029

(d) On 12 May 2020 the fourth and final member of the family (person D) became symptomatic.

82. On 14 May 2020 persons A and B were diagnosed with COVID-19.

83. On 15 May 2020 the whole family moved to Rydges Hotel Swanston Street.

84. On 17 May 2020 person D was diagnosed with COVID-19.

85. On 18 May 2020 person C was diagnosed with COVID-19.

86. On 25 May 2020 three members of staff became symptomatic and were subsequently diagnosed with COVID-19.

87. Between 26 May and 18 June 2020, a total of 17 people were epidemiologically linked to the Rydges Hotel, because they were either people working in the hotel in a range of roles, or household or social contacts of staff members were diagnosed with COVID-19 in Victoria. An additional case, a household contact of a member of staff at Rydges Hotel, was diagnosed in Queensland.[6]

88. On 30 May 2020, the Department received the first report of genomic analysis relating to the outbreak at Rydges Hotel Swanston Street from MDU.[7] The report revealed that the first case among a member staff at the hotel clustered genomically with viruses sequenced from the family mentioned above. Meaning the similarity of the genomic sequences of virus identified from the staff member and the family allows a conclusion that they belonged to the same transmission network.

89. Throughout June 2020, MDU provided weekly genomic updates. These revealed that all sequenced cases that shared epidemiological links to the Rydges Hotel outbreak, genomically clustered together.

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6 COVID-19 Outbreak Management Report Rydges on Swanston, 13 July 2020; DHS.0001.0036.0145

7 Email from [redacted], University of Melbourne to Dr Charles Alpren, copied to others, 30 May 2020, DHS.0001.0037.0001

90. As of 31 July 2020, the Department have received genomic sequence reports of 14 of the 17 cases epidemiologically linked to the outbreak. All 14 cases cluster genomically together and cluster genomically with the family of overseas returnees detailed in answer 80.

91. At the time of the Rydges outbreak, in Victoria, there were few other cases of COVID-19 which had been acquired in Australia. I know of no links between cases in the Rydges Hotel outbreak and cases involved in other outbreaks at the time.

92. All the other outbreaks active when cases from the Rydges outbreak first appeared have now ceased. The most recent diagnosis of a case genomically linked to any outbreak known prior to Rydges is 30 May 2020. Since that time, only sequences that cluster with Rydges or subsequent overseas returnees (including those that cluster with Stamford Plaza outbreak described below) have been identified in Victoria.

93. I conclude from information detailed in 81 to 92 that it is highly likely that all cases in the Rydges Hotel, including those for which no genomic sequence is available, belong to the same transmission network.

94. I conclude from information in answers 81 to 93 that all cases the Department has identified as epidemiologically linked to the Rydges Hotel outbreak can be traced to the family of overseas returnees detailed in answer 81.

Stamford Plaza Hotel Outbreak

95. On 1 June 2020, a man returned to Australia from overseas and commenced mandatory hotel quarantine. On the same day, he became symptomatic. He was tested for COVID-19 on 3 June 2020 and diagnosed with COVID-19 on 4 June 2020.

96. On 11 June 2020, a couple returned to Australia from overseas and commenced mandatory hotel quarantine. On the same day, one of them became symptomatic. On 12 June 2020,

the other became symptomatic. Both were tested for COVID-19 on 14 June 2020 and diagnosed with COVID-19 on 15 and 16 June 2020.

97. On 10 June 2020, a member of staff became symptomatic. He was diagnosed with COVID-19 on 14 June 2020.

98. As of 13 July 2020, a total of 46 people epidemiologically linked (as explained in answer 47) to the Stamford Plaza Hotel outbreak were diagnosed with COVID-19 in Victoria. These links indicated acquisition of virus linked through contact, for example through working at the Stamford Hotel or being household contacts of staff members.[8]

99. Subsequent genomic sequencing performed by MDU has concluded that this outbreak has consisted of two distinct chains of transmission, indicated by 2 genomic clusters among cases identified as epidemiologically linked to the outbreak. One of these clusters has arisen from the overseas returnee from 1 June 2020, and the other from the overseas returnees from 11 June 2020.

100. To date, the Department has received genomic sequence reports of 35 of the 46 cases epidemiologically linked to the outbreak. All 35 cases cluster genomically within one of the 2 chains of transmission detailed in answer 99.

101. At the time of the Stamford Plaza outbreak, in Victoria there was no other case of COVID-19 acquired in Australia other than that linked to the Rydges Hotel outbreak. I know of no links between cases in the Rydges Hotel outbreak and cases involved in Stamford Plaza outbreak.

102. Since the time of the Stamford Hotel outbreak, only genomic sequences that cluster with Stamford, Rydges, or subsequent overseas returnees have been identified in Victoria.

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[8] Outbreak Management Report - Stamford Plaza Outbreak 19 July 2020, DHS.0001.0036.0203

103. I conclude from information detailed in 95 to 102 that it is highly likely that all cases in the Stamford Hotel, including those for which no genomic sequence is available, belong to 1 of the 2 transmission networks identified as linked to Stamford Hotel by genomic sequencing.

104. I conclude from information in answers 95 to 103 that all cases the Department has identified as epidemiologically linked to the Stamford Hotel outbreak can be traced to the 3 overseas returnees detailed in answers and 96.

Epidemiological and Genomic clustering since Rydges and Stamford Outbreaks

105. With the exception of the cases noted below, all subsequent genomic sequences reported to the Department by MDU for cases acquired in Australia have clustered genomically with the Rydges Hotel Swanston Street Outbreak or Stamford Plaza Hotel Outbreak.[9] As per a report received from MDU on 31 July, of the 7,692 cases diagnosed since 26 May (the date of the first case in Rydges outbreak), 2,109 have been received by MDU, sequenced and assigned a genomic cluster, 86 have been sequenced and not assigned a cluster because they did not cluster with other cases – these are overseas returnees, 457 were received but failed quality checks and could not be sequenced, and 5,040 have not been received at MDU. The remainder (17 cases) are from cases diagnosed around the start of Rydges outbreak, which have not clustered with any more recent cases, or relate to the exceptions detailed below.

106. To date, of the 2,109 sequenced samples from cases since 26 May, 1,996 cases cluster with Rydges Hotel-associated genomic clusters, and 96 cases cluster with Stamford Hotel-associated clusters.

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9 Interim Genomic Report, 1 August 2020, DHS.0001.0037.0029

Exceptions to Rydges and Stamford-Related Transmission

107. There have been two recognised episodes of COVID-19 transmission unrelated to the hotel outbreaks.

108. In the first, an overseas returnee whose symptoms started on 29 June 2020 clustered genomically with a person resident in metropolitan Melbourne whose symptom onset was 28 June 2020. These cases did not sequence with any other cases examined. Neither case was found to transmit virus to their families or close contacts. The cases are not epidemiologically linked, that is they are not known to have had contact or have had the opportunity for contact. One explanation for this is that an unrecognised case, most likely an overseas returnee (because this genomic cluster has not been seen elsewhere in Victoria), developed COVID-19 prior to either of these cases and transmitted virus to both.

109. The second episode of transmission involves a healthcare worker who developed COVID-19 symptoms on 2 July having looked after an overseas returnee who was admitted to hospital with COVID-19 between 19 June and 9 July. The sequences from the returnee and the healthcare worker cluster together. I am not aware of any further transmission at the time of writing this report. Contact tracing and monitoring in respect of this case is underway to detect and stop ongoing transmission to contacts of either of these cases.

22. What is your opinion as to the level of certainty that current Victorian COVID-19 cases can be traced to those transmission events and locations?

110. As detailed in answer 105, a large proportion of cases that have occurred in Victoria since the start of the Rydges outbreak have not yet been sequenced.

111. As detailed in answers 108 and 109 the Department has detected transmission events not related to the hotels outbreaks. These events have been isolated and have not led to known onward transmission.

112. My understanding from colleagues and the media is that there are currently no overseas returnees accepted into Victoria and therefore there is no current opportunity for importation of new transmission networks.

113. My opinion is that, if a significant proportion of current unsequenced infections were due to cases not traceable to the hotel outbreaks, we would have seen more genomic evidence of transmission unrelated to those outbreaks than that detailed in 108 and 109.

114. Therefore, my opinion is that there is a high level of certainty that almost all current Victorian COVID-19 cases can be traced to the transmission events and locations relating to Rydges and Stamford Plaza Hotels.

23. As at: (a) 15 July 2020; and (b) the date of receiving these questions, was / is it your understanding that a COVID-19 transmission event occurred at the Rydges Hotel in Carlton during the Hotel Quarantine Program? Please identify the information on which that understanding is based.

115. From the epidemiological and genomic data presented above, I conclude that a transmission event or events occurred at Rydges Hotel, Swanton Street during the Hotel Quarantine Program. This event or events has not been identified.

116. The interval between the family's symptoms onsets and those of the cases could represent unrecognised transmission between the family and an unknown person or people, which was then passed to the recognised cases or represent direct transmission from the family.

117. Case investigation that is recorded in the Department's report for this outbreak recognises the potential for this to have occurred but has not identified a single transmission event to a known case. The family returned from overseas; the first family member to become unwell did so immediately upon arrival in Australia; the family did not leave the hotel throughout their stay and were supervised when outside their room; and the sequences from their samples cluster genomically with those from cases from the hotel, all of which commenced after the family. From this I conclude that a transmission event occurred in the Rydges Hotel

during the Hotel Quarantine Program. I held this opinion on 15 July and have not changed since that time.

24. To the extent that you can do so without identifying any particular individual(s), please state what understanding, if any, you have in respect of the precise circumstances in which the transmission event(s) occurred.

118. As detailed in 117, above, no specific transmission event has been identified. Departmental records of the outbreak response[10] indicate that an episode of environmental contamination occurred in the family's room on 18 May, which required assistance from nursing staff to rectify. Subsequently, there is suggestion that the family were approved to walk outside their room, during which they were accompanied by security guards. It is possible a transmission event or events happened at this point, however, cases have not been identified that were involved in the environmental contamination or the walk. Transmission could have occurred directly from the family to staff or through contamination with virus of surfaces in the hotel with which staff then had contact with.

25. As at the date of receiving these questions, in your opinion, what percentage of current COVID-19 infections in Victoria can be linked to transmission events at the Rydges Hotel in Carlton?

119. As of 29 July the Department had received reports of sequences pertaining to 827 currently active cases. Of those, 817 (99%) sequenced with Rydges-associated genomic clusters.

120. As detailed in answers 108 to 112, it is my opinion that it is likely that no large transmission networks are present in Victoria for which no cases have been sequenced.

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[10] COVID-19 Outbreak Management Report Rydges on Swanston, 13 July 2020, DHS.0001.0036.0145; Email from [redacted]s (DHHS) to [redacted]d (DHHS), 05 June 2020, DHS.0001.0036.0171 attaching "AO notes Rydges 16-27 May.pdf, 05/06/2020", DHS.0001.0036.0173

121. It is impossible to precisely ascertain the number of cases to have arisen from each of the active cases for which we have sequences.

122. Therefore, I am satisfied to conclude that in my opinion, it is likely that a high proportion, approximately 99%, of current cases of COVID-19 in Victoria have arisen from Rydges or Stamford. However, I cannot be very precise in the number or proportion to have arisen from each outbreak separately. It is likely that the large majority, approximately 90% or more of current COVID-19 infections in Victoria can be traced to the Rydges Hotel.

TRANSMISSION EVENTS AT THE STAMFORD PLAZA HOTEL

26. As at: (a) 15 July 2020; and (b) the date of receiving these questions, was / is it your understanding that a COVID-19 transmission event occurred at the Stamford Plaza Hotel during the Hotel Quarantine Program? Please identify the information on which that understanding is based.

123. From the epidemiological and genomic data presented above, I conclude that at least 2 transmission events occurred at Stamford Plaza Hotel during the Hotel Quarantine Program. The specific events have not been discovered as far as I am aware.

124. The genomic clusters that characterize this outbreak had not been seen prior to this outbreak in Victoria. The dates of onset of symptoms of the first overseas returnees in these clusters are earlier than the dates of onset of the other cases with which they cluster genomically. From this I conclude that there was at least one a transmission event in the hotel for each of the two recognised genomic clusters in this outbreak.

125. I held my opinion on this matter on 15 July and it has not changed since that time.

27. To the extent that you can do so without identifying any particular individual(s), please state what understanding, if any, you have in respect of the precise circumstances in which the transmission event(s) occurred.

126. I have no information on the precise circumstances in which the transmission events occurred.

28. As at the date of receiving these questions, in your opinion, what percentage of current COVID-19 infections in Victoria can be linked to transmission events at the Stamford Plaza Hotel?

127. As of 29 July the Department had received reports of sequences pertaining to 827 currently active cases. Of those, 10 (1%) sequenced with Stamford-associated genomic clusters.

128. As detailed in answers 110 to 114, it is my opinion that it is likely that no large transmission networks are present in Victoria for which no cases have been sequenced.

129. It is impossible to precisely ascertain the number of cases to have arisen from each of the active cases from which we have sequences.

130. Therefore, I am satisfied to conclude that in my opinion, it is likely that a high proportion, approximately 99%, of current cases of COVID-19 in Victoria have arisen from Rydges or Stamford. However, I cannot be very precise in the number or proportion to have arisen from each outbreak separately. It is likely that a small proportion, approximately 10% or less of current COVID-19 infections in Victoria can be traced to the Stamford Hotel.

FURTHER INFORMATION

29. If you wish to include any additional information which provides further context or explanation to your answers to the questions above, please set it out below, identifying the question or question(s) to which it relates.

131. I have no other additional information that I wish to add.

132. The contents of this witness statement are true and correct and I make it knowing that a person making a false or misleading statement to the Board of Inquiry commits an offence under the *Inquiries Act 2014* (Vic).

Signed at Melbourne
in the State of Victoria
on 4 August 2020

Dr Charles Gideon Alpren