Witness Name: Sir Frank Atherton
Statement No.: M3 2
Exhibits: 58
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UK COVID-19 INQUIRY

WITNESS STATEMENT OF SIR FRANK ATHERTON

I, Sir Frank Atherton, will say as follows: -

1. I am writing this supplementary statement to provide further detail on my understanding of the SARS-CoV-2 virus and Covid-19 in response to a letter from the Inquiry dated 15 March 2024.

2. In writing this statement I have had access to contemporaneous documentation, and I have done my best to recall the state of my understanding in early March 2020. Given the pace of events at that time and the speed with which our understanding evolved at certain points, I have not always been able to identify the precise state of my understanding in early March 2020. Where that is the case, I have said so below. It is also almost impossible to pinpoint precisely when my understanding about various aspects of the virus changed. My view is that our knowledge gradually accumulated such that there was not a single date when knowledge changed, rather our understanding moved from matters being a possibility or there being some likelihood that the virus was acting in a particular way towards greater degrees of clarity and certainty. I try to reflect key points along this spectrum of understanding in response to the issues I have been asked about below. Whilst I have tried to be as comprehensive as possible, I have not been able to reflect the volume of information that I was receiving and considering during the pandemic.

3. I have read and agree with Professor Sir Chris Whitty's evidence on 'Understanding of Covid-19' in his Fifth witness statement[1]. He refers to the Technical Report for additional detail in his statement[2]. I was involved (with the other UK CMOs) in writing that report and I also adopt it and refer the Inquiry to it for a detailed consideration of how the technical information evolved over the course of the pandemic.

4. I should also say that whereas I have now had the chance to consider these contemporaneous documents with the benefit of time, during the pandemic I was often being sent considerable amounts of information to consider and assimilate daily. Therefore, the summary information rather than the detailed information contained in papers was often my primary source of information.

5. The emails from Rob Orford (the Chief Scientific Adviser for Health) in which he set out what was being discussed at SAGE meetings between 11 February 2020 and 27 February 2020 and his updates on the 3 and 5 March 2020 have been a useful source of information for the state of my knowledge as at early March 2020 [exhibited as **FAM3/CMOW/02/01-INQ000383621, FAM3/CMOW/02/02-INQ000313343, FAM3/CMOW/02/03-INQ000300190**]. The updates I received from the Technical Advisory Cell (referred to as TAC) throughout the pandemic have been used to try and understand how my understanding of the virus changed over time. To assist the Inquiry the TAC briefings received over the pandemic period and reviewed to compile this statement are set out as Appendix 1 to this statement (with the Inquiries Unique Reference Numbers set out). I have also considered the advice I provided to the Welsh Ministers for the 21-day reviews of the Health Protection (Coronavirus Restrictions) Wales Regulations (as amended and replaced during the pandemic period) imposing restrictions during the pandemic. Again to assist the Inquiry I have set out a list of this advice in Appendix 2 of this statement (with the Inquiries Unique Reference Numbers set out). Other contemporaneous documents are set out in the body of this statement where relevant.

A. CMO(W)'s initial understanding (as at early March 2020) of the nature and spread of Covid-19

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[1] See **INQ000410237_0033 – 0065**.
[2] See **INQ000203933** Report by Chief Medical Officers and Deputy Chief Medical Officers titled 'Technical report on the COVID-19 pandemic in the UK', dated 01/12/2022. [Publicly Available]

6. I have done my best to consider what my initial understanding was of the virus in early March 2020. There were many aspects of the virus which were still unknown or uncertain at this stage. I note that even in the TAC update on 28 March 2020 it was not possible to meaningfully forecast the epidemic as "*its epidemiology [was] still uncertain*" [exhibited at **FAM3/CMOW/02/04-INQ000312245**].

Whether the virus could be spread by airborne transmission

7. My understanding in early March 2020 would have been primarily informed by the SAGE information which I was receiving from Rob Orford, the Welsh Government's Chief Scientific Officer for Health (CSA(H)). A paper dated 14 February 2020 which was distributed with SAGE papers stated: "*The primary mode of SARS-CoV-2 transmission is generally thought to be direct mucous membrane contact with infectious respiratory droplets and/or through exposure to fomites. SARS cases occurred primarily in persons with close contact with infected persons in health care and household settings (WHO, 2003). However, airborne/aerosol transmission may be possible, particularly following aerosol generating procedures or events*" [paper exhibited at **FAM3/CMOW/02/05-INQ000074898**, covering email at **FAM3/CMOW/02/06-INQ000310082**]. It does not appear that this understanding had changed by the end of February; a SAGE paper dated 26 February 2020 stated: "*current understanding is that the transmission route is respiratory and via contact. This means that viruses are transmitted via touching an infected person and spray of droplets such as coughing and sneezing*" [exhibited at **FAM3/CMOW/02/07-INQ000087035**].

8. I conclude that by early March my understanding would have been that the main two modes of transmission were touch (or fomite) and droplet, but that airborne transmission was a possibility, particularly following aerosol generating procedures or events.

The possibility of re-infection with Covid-19

9. From the sources I have consulted I have been unable to find any contemporaneous documentation that by early March 2020 there was evidence of the possibility of re-infection with Covid-19. I note what Professor Sir Chris Whitty says about reinfection in his fifth witness statement and agree that from an early stage there was an

assumption that reinfections with SARS-CoV-2 were possible (in the absence of evidence one way or another). This was based on our knowledge of other coronaviruses.

10. I note that Heather Payne and Rob Orford were sharing information from The Scientific Pandemic Infections group on Modelling (SPI-M) which touched on the possibility of reinfection and stated on 9 March 2020 that "*reinfection may be common*", and it is likely that this was discussed with me at the time, although I have no recollection of that now [see exhibits **FAM3/CMOW/02/08-INQ000471104** which is a note of the meeting drafted by Heather Payne, and **FAM3/CMOW/02/09-INQ000471105** which is a set of post-meeting SPI-M-O papers].

The rate of severe illness in infected people

11. My source of information for this in early March 2020 was primarily the information coming out of SAGE. The rate of severe illness can be measured by those hospitalised and those who die. Initial indications (February 2020) were that approximately 25% of confirmed cases resulted in severe illness and that the mortality rate was less than for MERS or SARS [Novel Coronavirus Update 7 exhibited at **FAM3/CMOW/02/10-INQ000409954**]. As at 13 February 2020, the case fatality rate was estimated to be 2-3% but with 'wide uncertainty' [page 16 of UK Government SITREP dated 16 February, exhibited at **FAM3/CMOW/02/11-INQ000279718**]. By early March the mortality rate was thought to be closer to 1% of those infected [Welsh Government Cabinet minutes of 2 March 2020 exhibited at **FAM3/CMOW/02/12-INQ000048787**] and it was thought that around 20% of those infected had a severe illness [Ministerial Briefing Note, 6 March 2020 exhibited at **FAM3/CMOW/02/13-INQ000471102**].

12. In early March 2020 it was clear that age was a key factor and SAGE agreed[3] the following estimates as of 5 March 2020:

13. Infection fatality rate:

Age	Proportion of infected that die

[3] Confirmed in **INQ000074987** Presentation titled current understanding of COVID-19 compared with NSRA 2019 Pandemic Influenza planning assumptions, dated 04/03/2020 from Government Office for Science.

0-9	0.01%
10-19	0.01%
20-29	0.04%
30-39	0.09%
40-49	0.15%
50-59	0.69%
60-69	2.21%
70-79	5.92%
80+	8.76%

14. Proportion of infected people hospitalised (threshold for hospitalisation assumed to be needing oxygen):

Age	hospitalised
0-9	0.24%
10-19	0.34%
20-29	1.05%
30-39	2.34%
40-49	3.95%
50-59	9.81%
60-69	22.50%
70-79	36.20%
80+	43.79%

Whether any specific pre-existing health conditions increased the likelihood of becoming severely ill with Covid-19 infection

15. The notion of a group of people who would be particularly vulnerable to the virus needed to shield was being discussed amongst CMOs and other officials by early March 2020. The final shielding list was finalised around 17 March 2020 [exhibited at **FAM3/CMOW/02/14-INQ000226948**] but it was being discussed before that date. I have not been able to pinpoint what my understanding would have been in early March but by 17 March, the shielding list was based on the understanding that the following groups would be particularly vulnerable to the virus and should be advised to shield:

    a. Solid organ transplant recipients;

    b. People with specific cancers;

    c. Severe respiratory conditions including all cystic fibrosis and any other respiratory condition which has resulted in an ITU/HDU admission;

    d. Severe single organ disease which has resulted in an ITU/HDU admission;

    e. Rare diseases and inborn errors of metabolism that significantly increase the risk of infections;

    f. Pregnancy with significant congenital heart disease.

Whether age, sex and/or ethnicity affected the likelihood of becoming severely ill with Covid-19 infection

16. It was apparent from the earliest stage of the pandemic that the virus affected the elderly more than it affected the young. As far as I can recall and from looking at contemporaneous documents, that was my understanding at the beginning of March 2020. The TAC advice for CMO – Update 8 document which was based on the SAGE meeting on 5 March 2020 [exhibited at **FAM3/CMOW/02/15- INQ000471126**] included the measure "*social distancing of over 65 years of age*" in accordance with the understanding at the time that those over 65 years of age would be more severely affected. I do not think that there was an appreciation in early March 2020 that sex or ethnicity affected the likelihood of becoming severely ill with the virus although as

March progressed it relatively quickly started to become apparent that men, those with co-morbidities, and those from ethnic minority backgrounds were being more severely affected.

The risks of infection for pregnant women and to foetal health;

17. I was told by Rob Orford on 18 February 2020 that the SAGE discussion had indicated that there was a "*small amount of evidence to suggest no significant impacts on late-stage pregnancy*". At this stage the information was based on information from only nine women.

18. The TAC advice for CMO – Update 9 (from 10 March 2020) [exhibited at **FAM3/CMOW/02/16- INQ000312231**] contained a paper called "CoV in pregnancy Rapid review" which concluded that morbidity and mortality from C-19 appears less marked than for SARS and MERS, acknowledging the limited number of cases reported to date (19 women) [paper exhibited at **FAM3/CMOW/02/17-INQ000251955**]. This position changed over time. I refer to Professor Sir Chris Whitty's evidence on this issue which mirrors my recollection. Our understanding evolved and it became clearer that the risks of severe infection for pregnant women were significantly higher than for non-pregnant women of the same age, and there were increased rates of mortality in pregnant women. The risks were higher for pregnant women in the later stages of pregnancy (28 weeks or beyond). Those aged over 30, living with obesity or with gestational diabetes were at particularly high risk[4].

Any increased risks to workers in healthcare settings.

19. It was known that workers in health care settings would have increased risk factors by early March 2020. This was for a range of reasons: they were at greater risk of coming into contact with infectious people; symptomatic people who were coughing and sneezing would be generating droplets which would transmit the virus; and some of the procedures which healthcare workers might need to carry out would be aerosol generating. These matters were all known by early March 2020.

[4] As confirmed in **INQ000381222** Article from Nicola Vousden, et al. titled Management and implications of severe COVID-19 in pregnancy in the UK: data from the UK Obstetric Surveillance system national cohort, dated 30/09/2021. [Publicly Available]

B. The dates of any changes in CMO(W)'s understanding and an explanation of the reason(s) for any change in this understanding

Modes of transmission, including asymptomatic, presymptomatic, airborne, and surface

20. I agree with the detailed evidence that Professor Sir Chris Whitty's gives on routes of transmission in his fifth witness statement[5]. As he set out, it was known from an early stage that Covid-19 was predominantly an infection spread by the respiratory route but there remained uncertainty about the relative split between droplet, aerosol and surface (or fomite) transmission from droplets. The relative contribution of aerosol was understood to be greater as time went on, but this was due to a gradual accumulation of evidence rather than a single piece of evidence.

21. I would not categorise asymptomatic or presymptomatic as modes of transmission; but the question does arise whether and to what extent individuals who are asymptomatic or presymptomatic or pauci-symptomatic transmit the virus (by the three main modes – droplet/aerosol and surface).

22. I have been aided with contemporaneous documents to attempt to track when my understanding changed in respect of the modes of transmission for the virus and, separately, my understanding of the extent to which asymptomatic/pauci-symptomatic/presymptomatic individuals could transmit the virus.

23. My recollection is that in February 2020 it was generally understood that the modes of transmission were surface touching and droplet. In the 18 February 2020 SAGE update, Rob Orford wrote "*Environmental persistence studies are showing CoV to be more stable than influenza with a low residual risk on solid work surfaces after 48 hours, with a minimal risk considered to be at 72 hours. Routine disinfection works well*" [update exhibited at **FAM3/CMOW/02/01-INQ000383621**]. The UK Government Sitrep which I was sent with the SAGE update recorded the view of SAGE on 13 February 2020 on page 16: "*Current understanding is that the transmission route is respiratory and via contact. This means that viruses are transmitted via touching an infected person and spray of droplets such as coughing and sneezing*" [Sitrep exhibited at **FAM3/CMOW/02/11-INQ000279718**]. This is also reflected in a paper

[5] See **INQ000410237_0033-0042**.

dated 14 February 2020 which was distributed with SAGE papers which states: "*The primary mode of SARS-CoV-2 transmission is generally thought to be direct mucous membrane contact with infectious respiratory droplets and/or through exposure to fomites. SARS cases occurred primarily in persons with close contact with infected persons in health care and household settings (WHO, 2003). However, airborne/aerosol transmission may be possible, particularly following aerosol generating procedures or events*" [papers exhibited at **FAM3/CMOW/02/05-INQ000074898** and **FAM3/CMOW/02/06-INQ000310082**].

24. In a TAC briefing dated 13 May 2020 [exhibited at **FAM3/CMOW/02/18-INQ000311881**] there was further information about how long the virus could persist in the environment (SARS-CoV-2 Persistence in Environment) in the following terms:

    a. Evidence that the virus is likely to be stable for long periods of time on indoor surfaces and in air.

    b. Decay rate on surfaces increases with higher temperature and humidity. There may likely be small benefits in operating buildings at a higher temperature and/or humidity where this doesn't cause significant thermal discomfort to occupants.

    c. Ventilation rates should not be reduced to achieve this.

    d. The virus is very likely to decay very quickly (a few minutes) in air and on surfaces when exposed to sunlight. This adds to the evidence that outdoor environments are highly likely to be a lower risk for transmission".

25. The existence of asymptomatic infection (as opposed to asymptomatic transmission) was considered from early on in the pandemic and certainly as of 20 February 2020 when SAGE was considering information from the Diamond Princess [see Rob Orford's summary of SAGE on 20 February 2020 which stated: "*From cruise ship – 30-50% asymptomatic-mild*", exhibited at **FAM3/CMOW/02/01-INQ000383621**]. I did not consider at the time that asymptomatic infection would automatically mean that there was asymptomatic transmission, but I was also aware in mid-February 2020 that asymptomatic transmission could not be ruled out and that transmission from mildly symptomatic individuals was likely [see SAGE influenza planning assumptions papers

at **FAM3/CMOW/02/19-INQ000448764**[6] and **FAM3/CMOW/02/20-INQ000383642**]. A paper that I was sent which set out Public Health England's approach to infection control dated 24 February 2020[7] stated: "*Asymptomatic infection is now well documented, but there is very limited evidence of transmission from asymptomatic cases. It is assumed that the substantial majority of transmission is from symptomatic individuals with Covid-19*" [paper exhibited at **FAM3/CMOW/02/21-** **INQ000074910**].

26. By early April 2020 there was some emerging evidence of presymptomatic transmission. The paper – "Temporal dynamics in viral shedding and transmissibility of Covid-19" – sent to me with the TAC briefing of 9 April 2020 stated: "*We estimated that 44% of transmission could occur before first symptoms of the index. Disease control measures should be adjusted to account for probable substantial pre-symptomatic transmission*" [papers exhibited at **FAM3/CMOW/02/22-INQ000336398 and FAM3/CMOW/02/23-INQ000312305**].

27. In a TAC briefing paper dated 21 April 2020, TAC was advising (in relation to assessing the benefits of face coverings) that asymptomatic and pre-symptomatic transmission of Covid-19 remained '*poorly understood*' [paper exhibited at **FAM3/CMOW/02/24-INQ000336442**]. A 5 May 2020 TAC summary [exhibited at **FAM3/CMOW/02/25-INQ000411802**] stated that "*SAGE reports that around 33% of current Covid-19 cases are HCW to HCW or patient to community, suggesting a significant asymptomatic spread*".

28. The 5 June 2020 TAC summary [exhibited at **FAM3/CMOW/02/26-INQ000311885**], when considering the need for face coverings in hospitals, cited "*the ongoing potential for asymptomatic or pre-symptomatic COVID-19 in healthcare workers (or members of the public) in hospitals*" as a reason to use face coverings in hospital settings. The same document set out the key conclusions from the SAGE Environmental Modelling Group Report on Transmission of SARS-CoV-2 and Mitigating Measures as follows:

    a. "Transmission of SARS-CoV-2 is most strongly associated with close and prolonged contact, suggesting that close-range direct person-to-person

[6] This exhibit has been provided by another material provider to the UK Covid-19 Inquiry and is a duplicate of a document held by the Welsh Government and disclosed to the UK Public Inquiry.
[7] Dated 24 February 2019 in error.

transmission (droplets) and indirect contact transmission (via surfaces and objects) are the most important routes of transmission.

b. There is weak evidence that aerosol transmission may play a role under some conditions such as in poorly ventilated crowded environments. This evidence is predominately from one outbreak investigation. Laboratory bio-aerosol experiments show that SARS-CoV-2 can survive in the aerosol state for over 1 hour.

c. There is evidence for asymptomatic transmission and weak but evolving evidence for super-spreading events where a small number of people infect large numbers of others. Given that these people may be asymptomatic (and thus not coughing or sneezing) it is possible that they are able to disperse large amounts of virus through normal respiratory activities".

29. In a TAC summary dated 26 June 2020 it was noted that asymptomatic but positive care home residents and staff are potential reservoirs for on-going transmission and therefore symptom-based screening alone is not sufficient for outbreak control, and a wider testing regime is required [exhibited at **FAM3/CMOW/02/27–INQ000311888**].

30. In a TAC summary dated 17 July 2020, the relative importance of the different transmission routes remained unclear but there appeared to be more evidence in respect of aerosol transmission (smaller particles): "*It remains uncertain what the relative contributions from large droplet contact, aerosol inhalation and surface contamination are in the transmission of COVID. It's likely that all play a role with the circumstances acting at any given moment defining what may happen. Despite all we know about influenza, it has proven very difficult to tease out what the most common mechanism(s) is and the same currently holds true for COVID. Nevertheless, most authorities currently state that large droplet and surface contamination are dominant routes for COVID. In support of a role for aerosols, evidence is accumulating that virus laden aerosols can be detected around patients with COVID and a case report describes the likely involvement of aerosols in an outbreak scenario*" [TAC summary exhibited at **FAM3/CMOW/02/28-INQ000311891**].

31. The gradual accumulation of evidence for aerosol transmission continued and the TAC summary of 24 July 2020 [exhibited at **FAM3/CMOW/02/29-INQ000311892**] referred

to the "SAGE Environment and Modelling Group: Paper on Role of Aerosol" which stated:

a. "The possibility of aerosol transmission of SARS-CoV-2 (outside of aerosol generating procedures in healthcare) has recently been formally acknowledged by WHO and hence interest in airborne transmission has increased.

b. EMG and NERVTAG have previously recognised the possibility of aerosol transmission of SARSCoV-2. This paper reviews current knowledge on aerosol transmission mechanisms and mitigations to ensure that recommendations are still appropriate.

c. Aerosol transmission can occur when small respiratory aerosols (<10 pm diameter) containing the virus remain in the air and can be inhaled by another person. This is most likely to happen at close range (within 2m) though there is a small amount of evidence that this could happen in an indoor environment more than 2m from an infected person. There is currently no evidence for long range aerosol transmission where the virus is dispersed between rooms in a building or long distances outdoors".

32. The TAC summary dated 11 September 2020 noted "*Aerosols are increasingly recognised as a route for transmission of SARS-CoV-2*" [exhibited in **FAM3/CMOW/02/30-INQ000473996**]. In my advice note to the Cabinet in November 2020 I stated that: "*There has been considerable progress in the understanding of Covid-19 transmission through droplets, small aerosol particles and on surfaces, with the most significant risks being indoors, in crowded and unventilated settings*" [advice note exhibited at **FAM3/CMOW/02/31-INQ000350011**]. By October 2021 it was clearer that airborne transmission was a significant factor [as set out in the Deputy CMO(W)'s statement published on 8 October 2020, exhibited at **FAM3/CMOW/02/32-INQ000048772**].

33. As Professor Sir Whitty makes clear in his fifth witness statement, there is a significant difference between the possibility that asymptomatic infection might occasionally occur (likely), and the idea that asymptomatic transmission would be a major part of the force of transmission. As was the case for the UK CMO, and as set out above,

there was no single point where I moved from thinking it was possible to thinking it was a major issue. Certainly, by the TAC summary on 5 June 2020 there was good evidence that some asymptomatic/presymptomatic transmission was taking place but the scale of it was not known or understood [previously exhibited above at **FAM3/CMOW/02/26-INQ000311885**]. I note that even as late as 9 July 2020, the WHO's position was that the scale of asymptomatic transmission was unknown[8]. The TAC summary of 11 September 2020 noted that "asymptomatic transmission is known to occur" but extent to which it was a driver of transmission was not known [previously exhibited above as **FAM3/CMOW/02/30-INQ000473996**]. By 2 December 2020 in my advice note to the Cabinet, I wrote: "*We know that transmission in households happens quickly and that pre- and early symptomatic individuals are highly contagious*" [exhibited at **FAM3/CMOW/02/33-INQ000410140**]. Looking at the contemporaneous documents, it seems I was drawing on the TAC summary dated 27 November [exhibited at **FAM3/CMOW/02/34-INQ000412118]** which referred a SAGE paper which highlighted that most transmission occurs due to prolonged, close interaction with familiar people.

34. By April 2021 when advising the Cabinet, I wrote: "*As restrictions are removed, it is incumbent on sectors to undertake the risk assessments and to put into place the mitigations that will prevent transmission such as ventilating shared spaces to avoid the build up of aerosols if someone is infected and the use of face coverings where necessary, to protect each other from asymptomatic spread of the virus*".

The infectiousness of the disease

35. I can see that I was briefed by TAC on 20 March 2020 that it appeared (from Spi-M data) that the disease may be more infectious than had previously been thought – both the doubling number and the R0 rate were suspected to be higher than originally estimated [paper exhibited at **FAM3/CMOW/02/35-INQ000068510**]. A TAC summary from 17 July 2020 noted that "*the R value for SARS-CoV-2 in an immune naive population with usual societal mixing is approximately 3*". This R value meant that

[8] See **INQ000203997** Brief by the WHO regarding transmission of Covid-19 and prevention, dated 09/07/2020. [Publicly available].

Covid-19 was highly infectious - more infectious than seasonal flu (which has a R value of around 1.5).

36. As far as I recall, and can tell from the contemporaneous documents, our understanding of the infectiousness of the disease did not vary much after this point save in respect of the different variants - Alpha, Delta and Omicron – each of which was more infectious than the last. I deal with my understanding of the variants in more detail below.

The possibility of re-infection

37. As I said above, the assumption from the earliest days of the pandemic was that re-infection was likely based on our understanding of other coronaviruses. The TAC briefing paper dated 21 April 2020 included the key points from a paper: "*The dynamics of the human immune response following SARS-CoV-2 infection and the potential for reinfection*". The paper summarised knowledge about the antibody response to human coronavirus infections and catalogued recent insights into SARS-CoV-2 serology, including non-peer reviewed studies, in humans and non-human primates. The key points were:

    a. Most patients infected with SARS CoV2 mount an antibody response at 10-14 days after clinical infection, but a small proportion (30% in one recent study, often after mild disease) show a later response (first detected at 28 days) or no antibody response at all.

    b. Low or absent immune response might be partly explained by poor sensitivity (70%) of the tests being employed, but nonetheless there is considerable variation in the amount of antibody produced by different individuals after infection.

    c. There is no data in the public domain about how long antibody responses last after SARS CoV-2 infection, beyond about 2 weeks after recovery.

    d. A single animal study (NHP) shows that antibody protected from reinfection with SARS CoV-2 at 28 days after infection and this supports antibody as a correlate of immunity.

e. Based on literature for other coronaviruses, mild infections can result in low antibody responses that wane over the months after infection.

f. People who have experienced mild infection with SARS-CoV2 may mount weak antibody responses, making it difficult to detect them using serological assays and such low responses may wane over months allowing them to be reinfected in a second wave.

38. The paper recommended that:

a. Longitudinal serology studies were urgently required to understand whether antibody to SARS CoV-2 will wane and over what time scale, especially from mild cases.

b. If immunity passports were issued to allow key workers to return to work, frequent (monthly) retesting would be important to ascertain antibody levels were maintained over time.

c. Seroepidemiology should take into account low sensitivity and slow time course of the antibody response when serological tests are used to detect mild cases.

39. The 5 June 2020 TAC summary made clear that there remained uncertainty about the effectiveness of antibodies in preventing reinfection: "*There is high confidence that most people have an antibody response after SARS-CoV-2 infection, but further investigation is needed to understand the degree and duration of protection, and whether it prevents acquisition and transmission of the virus*" [summary exhibited at **FAM3/CMOW/02/36-INQ000349537**]. This remained the case on 5 July 2020: "*What is not currently known is what level of antibody is required to confer protection in humans against a natural dose of SARS CoV2, such as would be faced during a transmission event*" [summary exhibited at **FAM3/CMOW/02/37-INQ000311889**].

40. The SAGE summary I was sent on 4 September 2020 noted that a very small number of cases of Covid-19 reinfection had been reported. Continued public health messaging was said to be needed to emphasise that having Covid-19 did not mean that you could not get it again and therefore existing guidance should be followed [summary exhibited at **FAM3/CMOW/02/38- INQ000471129**].

The mortality rate of the disease

41. As I set out above, the mortality rate of the disease had changed from an estimate of 2-3% in February 2020 to a figure closer to 1% by the beginning of March 2020. This overarching mortality rate figure remained around the 1% mark and then declined as vaccinations and other treatments were developed. What differed was our understanding of the mortality rate amongst different groups. It was far higher for the elderly, in deprived areas, for those with certain underlying conditions and relatively higher for men rather than women and for those from ethnic minority backgrounds. The mortality rates were tracked throughout the pandemic but are far too detailed to give a summary here.

T*he rate of severe illness in infected people*

42. As with the mortality rate, the overarching rate of severe illness did not change significantly from the 20% identified in early March 2020 although it did improve once there was widespread vaccination and treatment options improved. Different groups were, however, impacted to different degrees and our understanding of which groups were more likely to succumb to severe illness and hospitalisation improved over time as the methodology for tracking cases improved.

W*hether any specific pre-existing health conditions increased the likelihood of becoming severely ill with Covid-19 infection*

43. On 7 April 2020, TAC advised me that obesity had been identified as a potential risk factor that increased the likelihood of hospital admission and severity of effect [exhibited at **FAM3/CMOW/02/39-INQ000313020**].

44. A paper titled "Characteristics of Covid-19 UK patients and risk factors associated with requiring ventilation and death" [exhibited at **FAM3/CMOW/02/40-INQ000312306**] was included with my TAC briefing on 9 April 2020. It stated that obesity, diabetes and rheumatologic conditions were associated with an increased risk of ventilation. Pulmonary disease, renal disease, chronic neurological disorder, chronic hematologic disease, obesity and possibly dementia were associated with increased risk of death. The results of that paper were also summarized in the TAC CMO brief dated 14 April 2020 [exhibited at **FAM3/CMOW/02/41-INQ000312325**].

45. The TAC summary of 7 August 2020 stated that SAGE had agreed that there was a statistically significant increased mortality rate for those who had HIV and noted that HIV could also be associated with atypical Covid-19 presentations [summary exhibited at **FAM3/CMOW/02/42-INQ000311894**].

46. As we understood more about the virus our understanding of conditions which had increased risks evolved. By September 2020, deaths were being reported against a list of the following underlying risk conditions [TAC summary dated 20 September 2020, exhibited at **FAM3/CMOW/02/43-INQ000412131**]:

    a. Asplenia/ splenic dysfunction

    b. Chronic heart disease

    c. Chronic kidney disease

    d. Chronic respiratory disease

    e. Asthma

    f. Immunosuppression

    g. Morbid obesity

    h. Neurological conditions

    i. Type 1 diabetes

    j. Type 2 diabetes

    k. Pregnancy

    l. Any reported risk

    m. More than 1 reported risk

Whether age, sex and/or ethnicity affected the likelihood of becoming severely ill with Covid-19 infection

Age

47. As I set out above, even by early March 2020 it was apparent that age affected the likelihood of becoming severely ill with Covid-19. As the pandemic progressed it became clearer that men and ethnic minorities were also at greater risk from the virus.

48. The paper I referred to above, sent to me on 9 April 2020 - "Characteristics of Covid-19 UK patients and risk factors associated with requiring ventilation and death" [exhibited above as **FAM3/CMOW/02/40-INQ000312306**] – reiterated that age was a clear factor affecting the likelihood of becoming severely ill with Covid-19 (although it stated that comorbidities would also be a factor).

49. The 17 April 2020 TAC update stated that "the highest indicator of death from COVID-19 is still age. Anyone over 50 is at higher risk" [exhibited at **FAM3/CMOW/02/44-INQ000312963**].

50. The 5 June 2020 TAC summary stated: "*The largest disparity found was by age. Among people already diagnosed with COVID19, people who were 80 or older were seventy times more likely to die than those under 40*". This was based on a Public Health England paper on disparities [exhibited earlier at **FAM3/CMOW/02/36-INQ000349537**]. As far as I can recall (and from looking at the contemporaneous documents) there was no change in this understanding as the pandemic progressed. Older age was always an increased risk factor for Covid-19. That remained the case for the variants which emerged.

Sex

51. The 5 June 2020 TAC summary stated: "*Risk of dying among those diagnosed with COVID-19 was also higher in males than females*". This was based on a Public Health England paper on disparities [exhibited earlier at **FAM3/CMOW/02/36-INQ000349537**]. There had been some indicators that this was likely to be the case in advance of this date but with a lower degree of certainty.

52. The increased risk to males over females remained the case throughout the period considered by the Inquiry. There was some emerging evidence that women were more at risk of developing long-Covid but that was not clear at the time. The TAC summary dated 2 April 2021 reported that over the four-week period ending 6 March 2021, the

COVID-19 infection survey estimated that 56,000 people in private households Wales were experiencing self-reported long COVID. Of study participants who tested positive for COVID-19, symptom prevalence at 12 weeks post-infection was higher for female participants (14.7%) than male participants (12.7%) and was highest among those aged 25 to 34 years (18.2%) [exhibited at **FAM3/CMOW/02/45-INQ000473986**].

Ethnicity

53. Ethnicity data were included in the TAC CMO brief dated 14 April 2020 [exhibited earlier at **FAM3/CMOW/02/41-INQ000312325**]. It reported that "*more deaths are observed than expected in the Black ethic group compared to the white ethnic group. The number of deaths in the Asian and Other groups was not different to the White ethnic group*" [see also a paper produced for SAGE entitled 'Investigating associations between ethnicity and outcome from COVID-19', exhibited at **FAM3/CMOW/02/46-INQ000425563**]. The 17 April 2020 TAC briefing set this out in the following terms: "*Risk of death is twice as high for black ethnicity that for any other ethnic group but only when co-morbidities are added. This will be investigated at SAGE, as we have questions about the confidence in these data*" [exhibited earlier at **FAM3/CMOW/02/44-INQ000312963**].

54. The TAC briefing dated 28 April 2020 included the preliminary results of the Open Safely paper based on the NHS electronic records of 17 million adults between 1 February 2020 and 16 April 2020. The preliminary results indicated that death from Covid-19 was strongly associated with being male. Asian and black groups were also at a marked increased risk of death from Covid-19. Deprivation was also said to be a major factor [briefing exhibited at **FAM3/CMOW/02/47- INQ000311878**]. In Wales, outbreaks in food processing facilities (in Anglesey and Merthyr) also demonstrated that low paid migrant workers faced an increased risk. The increased risk was due to the greater risk of infection in food processing facilities and some other work environments, described as 'high connectivity occupations' [see June SAGE paper **FAM3/CMOW/02/48–INQ000310205**, NERVTAG paper from November 2020 – **FAM3/CMOW/02/49–INQ000412120**]. People working in food processing facilities (often meat packing plants) were at an increased risk of being infected over individuals not working in such environments. In the case of low paid migrant workers, the fact

that they could not afford to self-isolate and therefore continued to work increased transmission.

55. By the TAC briefing of 5 June 2020 it was clear that there was a link between those from ethnic minority backgrounds and increased risk from Covid-19: "*There is an increased risk from Covid-19 to BAME groups, which should be urgently investigated through social science research and biomedical research, and mitigated by policy makers*" [briefing exhibited earlier at **FAM3/CMOW/02/36-INQ000349537**]. From this point onwards the focus of scientific/medical research shifted to trying to understand the reasons for the increased risk and policy makers were urged to implement mitigating measures to address the increased risk.

56. As the pandemic progressed, new information was received about which minority ethnic groups were being more affected by Covid-19. The 15 January 2021 TAC summary indicated that multiple studies indicated that South Asians (particularly people from Pakistani and Bangladeshi backgrounds) had had higher hospital admissions and mortality rates than those in the White majority group during the second wave. Although children of all ethnicities remain at low risk of severe disease, analysis from QResearch indicated that South Asian children were more likely to be admitted to intensive care than others [exhibited at **FAM3/CMOW/02/50-INQ000313416**].

The risks of infection for pregnant women and to foetal health

57. The TAC briefing dated 21 April 2020 reported that "*The proportion of pregnant women affected is broadly in line with the proportion of pregnant women in the general population*" [exhibited earlier at **FAM3/CMOW/02/24-INQ000336442**]. This had been reported in a previous briefing, but the numbers were increasing and there was more confidence in the data by this point.

58. I haven't been able to find any documents to chart my changing understanding of the risk to pregnant women but I agree with the summary given in paragraphs 4.50 – 4.52 of Professor Sir Chris Whitty's fifth witness statement. I also note that 'pregnancy' was added to the list of underlying risk factors which were tracked by the Welsh Government (see paragraph 46 above).

Any increased risks to workers in healthcare settings

59. As I set out above, from early March there was an appreciation that healthcare workers would be at increased risk of being infected with the virus. The 5 June 2020 TAC summary emphasised this, noting: "*the —10- fold increased rate of COVID-19 in healthcare workers compared with members of the public*" [exhibited earlier at **FAM3/CMOW/02/36-INQ000349537**].

60. As far as I can recall, this increased risk was always acknowledged, it formed the basis of my advice to the decision makers and was reflected in the evolving infection, protection control guidance. It was also the reason that health and social care workers were among the first groups to be vaccinated.

The emergence of variants of concern, and whether variants differed in their infectiousness, presentation or severity of symptoms

61. I was made aware of the increased transmissibility of the Alpha (also known as the Kent) variant in mid-December 2020. It had a Rt of 0.5+ on the previous iteration of Covid-19. It was not known at this point whether, as well as being more infectious, it was more virulent (leading to worse outcomes). The advice I gave to the Cabinet on 7 January 2021 indicated that it was likely to be more transmissible: "*Preliminary analysis suggests that this variant is significantly more transmissible with an estimated potential to increase the reproductive number (R) by 0.4 and an estimated increased transmissibility of up to 70%*". I set out that there was no evidence that infections with the strain were more severe but that the increased transmissibility would lead to a high level of infections and deaths [advice exhibited at **FAM3/CMOW/02/51-INQ000048761**]. The update I was given from TAC on 22 January 2021 contained a NERVTAG paper which suggested that there was some evidence that the Alpha variant (B.1.1.7) was more virulent (increased risk of death). There was no evidence of significant antigenic escape from naturally or vaccine acquired immunity for the Alpha (B.1.1.7) variant and there was increasing evidence that immune responses to vaccine would be effective against this variant. There was more concern and more evidence for antigenic escape for variants identified in South Africa and Brazil [TAC update exhibited at **FAM3/CMOW/02/52-INQ000313350**].

62. The 21 May 2021 TAC summary I received gave an update on variants of concern. The Alpha variant was dominant in Wales, but it was noted that the B.1.617.2 variant (later to be known as the Delta variant) was continuing to increase in the UK at this point it was most pronounced in London, the North West, and the East of England [exhibited in **FAM3/CMOW/02/53-INQ000473968].**

63. A CMO advice note written by my deputy, Chris Jones, on 1 June 2021 (I was on leave at this point) noted that the WHO had designated a new variant (Delta) and noted that it continued to show a greater rate of transmission than preceding variants [exhibited at **FAM3/CMOW/02/54-INQ000471135**]. At that point, there were only a limited number of known cases of the Delta variant in Wales. The SAGE minutes for 9 June 2021 record that R was estimated to be between 40 – 80% higher for Delta than it was for Alpha [exhibited at **FAM3/CMOW/02/55-INQ000120627**][9]. There was some uncertainty about the effect that vaccinations would have on hospitalisations at that point and uncertainty generally about the effect of Delta at this point. By 2 July 2021 the Delta variant was the dominant variant in Wales [the 2 July 2021 TAC summary exhibited in **FAM3/CMOW/02/56-INQ000474031**]. On 9 December 2021 the Delta variant was still the dominant variant in Wales but the Omicron variant had been identified and was "*a matter of significant concern*" as the intelligence from South Africa and its rapid transmission globally suggested that it was even more transmissible than the Delta variant. As I set out in my advice at the time, there was "*insufficient information at present to make a judgment about potential for vaccine escape and both the symptomatology and the degree of clinical severity in infected individuals remain*[s] *uncertain*" [exhibited at **FAM3/CMOW/02/57-INQ000048774**]. By 22 December 2021 the Omicron variant had already taken over as the dominant variant in Wales, I wrote: "*it has a clear transmissibility advantage and significant prospects for vaccine escape. The case to hospitalisation, case to ITU admission, and case to mortality rates remain unclear*" [advice exhibited at **FAM3/CMOW/02/58-INQ000048775]**.

[9] By November 2021 the estimate had settled at 70% [see Appendix 1 - 24 November 2021 TAC update].

64. Luckily, although the variants increased in infectiousness (transmissibility), they were not more virulent. The availability of vaccines also meant that the effects of these variants were not as great as they would have been in an unvaccinated population.

Statement of Truth

I believe that the facts stated in this witness statement are true. I understand that proceedings may be brought against anyone who makes, or causes to be made, a false statement in a document verified by a statement of truth without an honest belief of its truth.

Signed: Personal Data

Professor Sir Frank Atherton, Chief Medical Officer for Wales

Dated: 1 May 2024

Appendix 1

Technical Advisory Cell/Technical Advisory Group Advice to Chief Medical Officer

Date of Advice	Name of document	URN
11/02/2020	20200211 CMO SAGE update	INQ000383621
14/02/2020	20200214 CMO SAGE update	INQ000383621
18/02/2020	20200218 CMO SAGE update	INQ000383621
20/02/2020	20200220 CMO SAGE update	INQ000383621
27/02/2020	20200227 CMO SAGE update	INQ000383621
03/03/2020	20200302 CMO SAGE 12 update	INQ000313343
05/03/2020	20200306 CMO SAGE 13 update	INQ000312884
10/03/2020	20200310 CMO SAGE 14 update	INQ000313026
15/03/2020	20200315 CMO SAGE 15 update	INQ000312895
16/03/2020	20200316 CMO SAGE 16 update	INQ000312856
20/03/2020	20200320 TAC CMO Briefing v1.2	INQ000083241
23/03/2020	20200322 TAC CMO Briefing v2.3	INQ000312930
28/03/2020	20200327 TAC CMO Briefing v5	INQ000312245
31/03/2020	20200331 TAC CMO Briefing v1.2	INQ000472025
03/04/2020	20200402 TAC CMO Briefing v0.1	INQ000312260
07/04/2020	20200407 TAC CMO Briefing v0.1	INQ000312264
09/04/2020	20200409 TAC CMO Briefing v1	INQ000312287
14/04/2020	20200414 TAC CMO Briefing v2.1	INQ000312325
15/04/2020	20200415 TAC CMO Briefing v0.1	INQ000312366
17/04/2020	20200417 TAC_COVID19 Summary brief v0.1_AN	INQ000312963
21/04/2020	20200421 TAC CMO Briefing v1.5	INQ000312870
28/04/2020	20200428 TAC CMO Briefing v0.1	INQ000312871
05/05/2020	20200505 TAC CMO Briefing Internal	INQ000336545
13/05/2020	20200513 TAC CMO Briefing v2	INQ000311881
19/05/2020	20200519 TAC CMO Briefing v1	INQ000311882
28/05/2020	20200529 TAC CMO Briefing v1.0	INQ000311884
05/06/2020	20200605 TAC Briefing_v1.0_AN internal version (includes annex)	INQ000311885
19/06/2020	20200618 TAC Briefing_v1.0	INQ000311887
05/07/2020	20200705 TAC Briefing v1.0	INQ000311889
10/07/2020	20200710 CMO TAC Briefing v1.0_BL_FB	INQ000311890
17/07/2020	20200717 CMO TAC Briefing v0.1	INQ000311891
24/07/2020	20200724 CMO TAC Briefing_v0.1_AN	INQ000311892
31/07/2020	20200731 CMO TAC Briefing v0.2 AN BC	INQ000311893
07/08/2020	20200807 CMO TAC Briefing_v0.1_BL	INQ000311894
14/08/2020	20200814 CMO TAC Briefing_v0.1	INQ000311895
21/08/2020	20200821 draft CMO TAC Briefing v0.1	INQ000311896
28/08/2020	20200828 draft CMO TAC Briefing v0.1	**INQ000477073**
04/09/2020	20200904 draft CMO TAC Briefing v0.1	INQ000471129

11/09/2020	20200913 CMO TAC Briefing v1.0 RJL_BC_FB	INQ000473996
18/09/2020	20200920 CMO TAC Briefing	INQ000412131
25/09/2020	20200925 Internal TAC Briefing v1.0	INQ000412090
02/10/2020	20201002 Internal TAC briefing - v3.0	INQ000412105
09/10/2020	20201009 Internal TAC Briefing - v1.0	INQ000412115
16/10/2020	20201016 Internal TAC Briefing	INQ000474023
23/10/2020	20201023 Internal TAC Brief	INQ000473923
30/10/2020	20201030 Internal TAC Brief - v1	INQ000473959
06/11/2020	20201106 Internal TAC Brief	INQ000474013
13/11/2020	20201113 Internal TAC Brief	INQ000474007
20/11/2020	20201120 Internal TAC Brief	INQ000412137
27/11/2020	20201127 Internal TAC Brief - Final	INQ000412118
04/12/2020	20201204 Internal TAC Brief - Final	INQ000473998
11/12/2020	20201211 Internal TAC Brief	INQ000473941
23/12/2020	20201223 Internal TAC Brief - Final	INQ000473950
08/01/2021	20210108 Internal TAC Brief - Final	INQ000350161
14/01/2021	2021014 Internal TAC Brief - Final	INQ000313416
22/01/2021	20210122 Internal TAC Brief - Final	INQ000313350
25/01/2021	20210125 Advice to CMO Boarder infection control v0.2 HB_FB	INQ000472032
29/01/2021	20210129 Internal TAC Brief - Final	INQ000472033
07/02/2021	20210207 Internal TAC Brief	INQ000313385
15/02/2021	20210215 Internal TAC Brief	INQ000471998
22/02/2021	20210222 Internal TAC Brief	INQ000472075
03/03/2021	20210303 Internal TAC Brief - Final	INQ000472071
08/03/2021	20210308 TAC Advice - Question from Cabinet on the risk of a third wave	INQ000386500
09/03/2021	20210309 Internal TAC Brief - Final	INQ000472082
12/03/2021	20210312 Internal TAC Brief - Final	INQ000472085
19/03/2021	20210319 Internal TAC Brief	INQ000473987
26/03/2021	20210326 Internal TAC Brief DRAFT	INQ000472090
02/04/2021	20210402 Internal TAC brief - FINAL v2.0	INQ000473986
09/04/2021	20210409 Internal TAC brief	INQ000472045
14/04/2021	20210414 TAG Advice 22 April restriction review copy	INQ000472010
16/04/2021	20210416 Internal TAC brief	INQ000472102
23/04/2021	20210423 Internal TAC brief	INQ000473977
30/04/2021	20210430 Internal TAC brief copy	INQ000473972
07/05/2021	20210507 Internal TAC brief	INQ000310822
14/05/2021	20210514 Internal TAC Brief	INQ000472056
21/05/2021	20210521 Internal TAC Brief	INQ000473968
01/06/2021	20210621 TAC internal brief	INQ000313398
04/06/2021	20210608 Internal TAC Brief	INQ000472065
14/06/2021	20210615 Internal TAC Brief	INQ000313422
22/06/2021	20210622 Internal TAC Brief	INQ000472069
02/07/2021	20210702 Internal TAC Brief	INQ000474031
23/07/2021	20210723 Internal TAC Brief	INQ000057838

06/08/2021	20210806 Internal TAC Brief - Final	INQ000387546
10/09/2021	20210910 Internal TAC Brief	INQ000472012
14/09/2021	20210914 (C) TAC advice on vaccine passports 20210914	INQ000472043
24/09/2021	20210924 Internal TAC Brief	INQ000387786
07/10/2021	20211007 7 October TAC CSA-H 21 day review advice INTERNAL	INQ000311904
15/10/2021	20211015 Internal TAC Brief	INQ000350437
26/10/2021	20211026 PHW CMO and TAC briefing on infection location (ad hoc briefing)	INQ000311905
05/11/2021	20211105 Internal TAC Brief WIP	INQ000311906
19/11/2021	20211119 Internal TAC Brief	INQ000312361
24/11/2021	20211124 (C) TAC 21 Day review advice - Covid Pass	INQ000311908
10/12/2021	20211210 Internal TAC Brief v1.0	INQ000312361
15/12/2021	20211215 (C) TAG CSA-H advice - Omicron 1.0 - version for publication	INQ000311909
16/12/2021	20211216 TAG CSA-H advice - Omicron 1.1 (updated version post-cabinet)	INQ000311910
17/12/2021	20211217 TAG UKHSA Variant Technical Briefing Note (write up of verbal and digital advice)	INQ000311911
07/01/2022	20220107 TAC Brief (Internal)	INQ000312459
21/01/2022	20220126 TAC Brief (Internal) V2	INQ000312428
10/02/2022	20220211 TAC Brief (Internal)	INQ000313409
04/03/2022	20220302 TAC Brief	INQ000312443
10/03/2022	20220310 Internal TAC Epi Update	INQ000311915
16/03/2022	20220316 Internal TAC Update	INQ000311916
01/06/2022	20220601 TAC Brief	INQ000311921
15/07/2022	20220715 TAC Brief	INQ000311923
22/07/2022	20220722 TAC Brief	INQ000311924
29/07/2022	20220729 TAC Brief	INQ000311929
12/08/2022	20220812 TAC Brief	INQ000311934
26/08/2022	20220826 TAC Brief	INQ000311939

Appendix 2

Chief Medical Officer - 21 Day Advice/Restrictions Advice

Date	Name of document	INQ reference
16/04/20	Doc 1: Statement from the Chief Medical Officer (CMO)	INQ000227591
06/05/20	Doc 1: Chief Medical Officer Advice on 21 Day Review	INQ000227590
28/05/20	DOC 1: Chief Medical Officer Statement on 21 Day Review: 28 May 2020	INQ000227589
18/06/20	Deputy Chief Medical Officer Advice on 21 Day Review	(DCMO) - INQ000471990
08/07/20	CMO advice on review of Lockdown Arrangements	INQ000349683
23/07/20	CMO advice on Review of Lockdown Arrangements	INQ000353094
10/09/20	Chief Medical Officer Advice on 21 Day Review	(DCMO) - INQ000281839
01/10/20	No separate CMO advice	Advice used from 10 September
19/10/20	Chief Medical Officer Advice on a firebreak lockdown	INQ000410002
28/10/20	CMO Advice21 Day Covid-19 Review22 October 2021	INQ000057930
29/10/20	Official - Sensitive: Cabinet Agenda and Papers - Thursday 29 October, 15:00	Verbal advice at Cabinet INQ000227551
19/11/20	DOC 1 - cmo statement 2020 11 18	INQ000350011
02/12/20	CMO Advice on Pre-Festive Restrictions	INQ000410140
08/12/20	Chief Medical Officer Advice on Management of the Pre-Festive Period	INQ000048917
15/12/20	Chief Medical Officer Statement	INQ000472044
07/01/21	Chief Medical Officer statement on retentions of health protection regulations: January 2020	INQ000048761
28/01/21	Chief Medical Officer Statement Retentions of Health Protection Regulations: 28 January 2021	INQ000048762
19/02/21	Chief Medical Officer Statement on 21 Day Review (February 2021)	INQ000410096
12/03/21	CMO Advice on 21 Day Review March 2021	INQ000410138
01/04/21	Chief Medical Officer statement: changes to the Health Protection Regulations April 2021	INQ000048765
22/04/21	CMO statement on the changes to the Health Protection Regulations	INQ000048766
05/10/21	Deputy Chief Medical Officer statement 21 Day COVID-19 review: 5 October 2021	(DCMO) – INQ000048772

18/11/21	Statement by the Deputy Chief Medical Officer COVID-19 review, 21 days:18 November 2021	(DCMO) – INQ000048773
09/12/21	Statement by the Chief Medical Officer COVID-19 Review, 21 days: 9 December 2021	INQ000048774
22/12/21	Statement by the Chief Medical Officer COVID-19 Review, 21 Days: 22December 2021	INQ000048775