Professor T J Evans

Statement for Module 2A of the COVID Inquiry

Part A - Sources of advice; medical and scientific expertise, data, and modelling

1 I am Professor of Molecular Microbiology in the University of Glasgow and a Consultant in Infectious Diseases and General Medicine for Greater Glasgow and Clyde Health Board. I have wide experience of Infectious Diseases, including viral diseases. I also have expert knowledge in the field of Immunology having published many scientific papers on the host response to infection. I am chair of the Advisory Committee on Dangerous Pathogens (ACDP) and also co-chair of the High Consequence Infectious Diseases subgroup of the Scottish Health prevention Network. In both these roles I have experience of risk evaluation of specific infections and planning system wide responses. In my clinical work I have seen patients with previously described coronavirus infections, but these are typically extremely mild. SARS-CoV-2 is a novel human pathogen with features similar to allied viruses that cause SARS and Middle East Respiratory Syndrome (MERS). I have not seen patients with either of these infections, but I am very familiar with them as I have on numerous occasions had to risk assess patients for these infections who had possibly acquired them abroad. During the pandemic, I worked extensively as a front-line clinician and saw and treated hundreds of patients with COVID-19. This experience and expertise I brought to all my roles in providing scientific advice for the Scottish Government.

2. The ACDP had advised on the hazard group classification of the pathogens that causes SARS (SARS-CoV) and MERS (MERS-CoV); both these viruses are similar to SARS-CoV2 and were classified in Hazard Group 3. This classification dictates the necessary precautions required for healthcare and laboratory workers when potentially exposed to these pathogens. Other coronaviruses do not cause significant disease. It is important to note that ACDP was never asked specifically regarding pandemic preparedness. ACDP always has an invited observer from all of the devolved nations and our minutes are published on a public website. ACDP did not play a major role in the pandemic response. We met on 10 occasions during the pandemic period to provide advice on issues such as laboratory handling of SARS-CoV2 specimens, appropriate personal protective equipment, and potential animal vectors of SARS-CoV2 that might transmit the infection.

3 The HCID network was tasked with developing plans for management of a HCID brought into Scotland. This involved consideration of the pathogens which were defined as causes of a HCID. It was not responsible, nor did it ever consider plans for an infectious disease pandemic. However, our work did inform more generally the requirements for managing HCIDs which played a part in the initial response to COVID-19 when it was initially classified as a HCID. The subgroup did not play a part in the pandemic response within Scotland.

4 In my role as a member of the Scottish Government COVID-19 Advisory Group (SGCAG), I provided into scientific advice given by the group to the Scottish Government. The policy decisions they took were not my responsibility and as I understood it, factored in many other considerations. The details of how scientific advice influenced those policy decisions should be sought from the responsible government ministers and their officials. I never heard the phrase 'following the science' from representatives of the Scottish Government. In my work with SGCAG I felt very strongly that our views were considered very carefully, and we were on many occasions thanked for our input and assured our advice was extremely helpful. I felt that our scientific advice was valued and played a part in shaping subsequent policy decisions.

5 All meetings of the SGCAG were formally constituted and minuted. Recordings of meetings were made to aid minute taking and then destroyed as far as I am aware. The minutes were always circulated to the group in advance of publication, and I am confident are an accurate representation of our discussions. The group maintained a Slack channel in addition to our regular meetings. The SGCAG routinely used Slack to share information and to enable members to provide individual comments in response to requests for advice before the group agreed its final advice. The Slack exchanges informed subsequent discussion and the preparation of advice. Once formal advice had been produced, those exchanges were routinely deleted. There were no other informal fora.

6 As I noted above, the scientific advice provided by the SGCAG was one of many different strands of advice used by Scottish Government in making its policy decisions. The details of the sources of this additional advice and how it affected policy decisions should be sought from Scottish Government Ministers and their officials. Within the SGCAG, we were very aware of the Government 4 harms policy, and this definitely informed our discussions and advice. On occasions, our meetings did receive input from those expert in other areas such as economic effects of the pandemic and social care, and this was of considerable benefit in helping us frame our advice. Within SGCAG I felt we did have the necessary expertise in clinical advice, virology, and immunology. In particular, I could provide first-hand advice on clinical aspects of COVID-19, and in addition the Scottish Government has a range of specialist clinical advisers both directly employed in government and as external advisers, who also provided valuable clinical input. SGCAG was formed early in the pandemic, and I do not feel could have been formed any earlier.

7 The nosocomial subgroup I believe played an important role in managing and mitigating outbreaks of COVOD-19 in healthcare facilities. The public health subgroup was principally concerned with advice regarding vaccination. I believe both were effective sources of scientific advice. Both groups were formed to address these ongoing issues. The nosocomial subgroup worked closely with Public Health Scotland (PHS); PHS were able to fund a number of ongoing studies such as wastewater sampling and sequencing of SARS-CoV2 isolates which were extremely helpful in our work. At that time, I do not think further research initiatives for these

groups were required. For both these groups, I was aware that their advice did help frame policy, but further details should be sought from Government ministers and their officials.

8 SGCAG provided scientific advice that I believe helped a number of public bodies within Scotland. The group worked very closely with Public Health Scotland (PHS) and there were key members of that body who were part of the SGCAG. In my clinical work, I chaired the Scottish Government COVID-19 clinical cell, which provided national guidance for a variety of issues relating to COVID-19 clinical management during the pandemic; this included territorial health boards, primary healthcare services, and NHS out of hours services. For other interactions with public bodies, Government ministers and their officials should be consulted. PHS formed very early in the pandemic, but I do not feel this impacted on the national response.

9 Papers for consideration by the SGCAG were prepared by the secretariat of the group and were circulated well in advance. The topics were brought forward by the chair in response to specific requests from government and on occasion suggestions by group members. Further details on the commissioning process should be sought from the chair of the SGCAG. The relations within the group and with government officials was excellent – which was not to say there were not differences of opinion on occasion, but these stimulated discussion and I believe led to better framing of advice. As I set out above, the advice we provided was one element for policy makers to consider. Members of the SGCAG did not participate in cabinet meetings, the SGoRR or the 4 harms group but I know our advice was always considered by these groups.

10 Materials from the COVID-19 Advisory Group, including minutes, papers, and advice have been provided to the Inquiry by the Covid-19 Advisory Group Secretariat. These can be found in the following return: Scottish Inquiry - Tranche 6 - Scottish Government COVID-19 Advisory Group. S21 notice no: second. Group no: 1. Website: https://www.gov.scot/groups/scottish-government-covid-19-advisory-group/.

11 I believe the SGCAG was an effective group that provided useful advice to government during the pandemic. The group members included the chief scientific advisors for health and science, as well as the CMO and DCMOs. The National Clinical Director also attended on occasion. The chair always encouraged debate and discission was very granular. If there were differences of opinion these were captured by the chair and recorded. I think policy makers had to consider a huge amount of information - but I do not feel this was overload. Advice from the group was communicated to ministers by the civil service secretariat. We did receive feedback on how advice had been considered. I cannot comment on the CMO's advice to cabinet as I was not present at such meetings. The reported focus on the centre ground seems to me personally sensible. There was in my opinion clear communication of strategy and policy directives that allowed advice to be framed appropriately (and for different views to be communicated).

12 The deep dive sessions provided by the SGCAG were to provide government ministers an opportunity to ask the group directly about specific issues. The key points covered are detailed in the minutes of the group as set out above.

13 The information available from the UK and Scottish COVID-19 dash boards was extremely helpful and allowed advice to be made in view of the very latest state of the pandemic, as the data was updated daily. The SGCAG advice did address specific policy options under consideration but was not limited to those areas. There was never any consideration given to limiting our advice to areas which might be thought palatable to policy makers. We strove to make our advice as clear as possible and to be understood without reference to detailed technical knowledge. I was continually impressed by the knowledge and grasp of key principles shown by senior Scottish civil servants during this period. If Ministers wished clarification on specific points this was communicated to the group – they did not play a role in 'challenging' advice. As set out above, items for discussion by the group were communicated to the Chair and from time to time suggested by the group members. I do not think the group's advice was too dominated by one discipline. Epidemiology and modelling played a very important role in developing advice.

14 Any areas of disagreement were captured by the chair of the group and communicated appropriately – importantly, we also made clear where there was insufficient information to provide. There was no external assessment of the group's work at the time, and given the pace of the pandemic this would have hindered rather than helped the response. Overall policy decisions made by Government integrated advice from many different sources. I was not aware of any instance where a specific piece of advice was not considered. The group always considered the 4 harms principles in its deliberations and advice that was given.

15 Clinical input was an important part of the SGCAG's work. I worked as a front-line clinician during the pandemic and treated 100s of patients with this infection. In addition, clinical specialty advisers also contributed for different areas, such as intensive care, emergency medicine, and primary care. Public perceptions were provided to the group by the Scottish Government, who carried out a variety of surveys during the period. Patient groups were not specifically identified, mainly because during the lockdown they did not have any opportunity to form. The expertise within the group covered all the significant areas required and where additional expertise was needed, specific advice was sought from appropriate experts.

16 Data played an important role in the formulation of advice made by the SGCAG. It was provided principally by PHS and Scottish Government. I was not aware of any occasion where access to data was significantly delayed. Modelling was carried out within Scottish Government and provided to the group. In addition, we received input from SAGE as well as Professor Mark Woolhouse as a member of our group and a member of SPI-M. Other members of the group

were also actively involved in data analysis and modelling. These contributions were comprehensive and invaluable.

17 SGCAG always noted carefully the advice provided by SAGE, and a member of our group was invited to the SAGE meetings and reported back to the whole group. In addition, we had regular updates concerning the advice provided by SPI-M, SPI-B and NERVTAG. All this information helped the group formulate the advice we gave to Scottish Government – I cannot recall any occasion where the group specifically disagreed with advice from SAGE or other bodies, but we used this information to formulate advice specific to Scotland. If there were issues the group felt should be considered by SAGE or the other groups, this was forwarded by the chair of the group or the CMO. Behavioural science input was important in the group (provided by Professor Steve Reicher), and we received and gave input into considerations by SPI-M. On occasion, there were changes in public health policies from PHE (and subsequently UKHSA) for which we had to my knowledge no prior warning – this included exact times for patient isolation in hospital, exact case definitions, and information that required framing for the Scottish NHS (as health is devolved). Although sometimes frustrating, these did not significantly impact on our COVID-19 response and reflected the very rapid pace of change in the pandemic. I am not sure how easy it would be in a future pandemic to avoid these situations, as the likely pace of a pandemic will be very rapid. A better appreciation more generally that health care delivery is different in the devolved nations would certainly be helpful in the future.

18 Perspectives gained from international experiences were very helpful to the SGCAG and its subgroups. These were provided by our knowledge from international medical and scientific publications, knowledge from WHO, as well as occasional online meetings with invited experts such as Sir Jeremy Farrar. Certainly, I feel earlier and more general meetings with international experts in public health would be helpful in a future pandemic.

19 Significant allocation of resources both in personnel and funding were made available during the pandemic. There was no impact in my view from any matters resulting from the devolution settlement.

20 Local government played an important role in the pandemic, and considerations of their role entered into the advice provided by the SGCAG. Government ministers and their advisers can advise as to how they liaised with local government during this period.

21 Overall, I believe that the work of the SGCAG provided useful advice to policy makers during this period. The work of such advisory bodies in a future pandemic will also, I believe, be important. The key point for the future is to ensure the necessary expertise is supported and that channels for effective communication with government – at all levels – are maintained. As I alluded to above, external scrutiny of such groups during a pandemic will be challenging given the need for

rapid decisions, but certainly openness of discussions and naming of those giving advice (as was the case for the SGCAG from the start) is crucial to maintain public confidence. As far as the response in Scotland is concerned, I had no concerns regarding any minister or any government official in their response to the pandemic as regards their understanding and appropriate use of scientific advice. Indeed, I was impressed by the rapid understanding evidenced by civil servants of complex scientific issues, and also the interest and understanding shown by the First Minister and other Scottish ministers. I had considerable dealings with scientists and clinicians working in Public Health England and subsequently UKHSA during the pandemic. I was always impressed with their dedication, professionalism, and openness. I had no dealings with any Westminster politicians during this period and thus I cannot comment personally on their actions.

B Initial understanding and responses to Covid-19 in the period from January to March 2020

22 I first became aware of COVID-19 9 (novel coronavirus at the time) in very early January 2020 through alerts from the WHO and other public health bodies that I receive routinely as part of my clinical work. As an Infectious Disease physician, it is essential for me to be aware of any novel infections recorded elsewhere in the world as this might influence our clinical actions within Scotland. It is helpful to see the initial WHO alert published on 9/1/20:

"WHO Statement Regarding Cluster of Pneumonia Cases in Wuhan, China.
Chinese authorities have made a preliminary determination of a novel (or new) coronavirus, identified in a hospitalized person with pneumonia in Wuhan. Chinese investigators conducted gene sequencing of the virus, using an isolate from one positive patient sample. Preliminary identification of a novel virus in a short period of time is a notable achievement and demonstrates China's increased capacity to manage new outbreaks. Initial information about the cases of pneumonia in Wuhan provided by Chinese authorities last week – including the occupation, location and symptom profile of the people affected – pointed to a coronavirus as a possible pathogen causing this cluster. Chinese authorities subsequently reported that laboratory tests ruled out SARS-CoV, MERS-CoV, influenza, avian influenza, adenovirus, and other common respiratory pathogens. According to Chinese authorities, the virus in question can cause severe illness in some patients and does not transmit readily between people. China has strong public health capacities and resources to respond and manage respiratory disease outbreaks. In addition to treating the patients in care and isolating new cases as they may be identified, public health officials remain focused on continued contact tracing, conducting environmental assessments at the seafood market, and investigations to identify the pathogen causing the outbreak. In the coming weeks, more comprehensive information is required to understand the current status and epidemiology of the outbreak, and the clinical picture. Further investigations are also required to determine the source, modes of transmission, extent of infection and countermeasures implemented. WHO continues to monitor the situation closely and, together with its partners, is ready to provide technical support to China to investigate and respond to this outbreak. The preliminary determination of a novel virus will assist authorities in other countries to conduct disease detection and response. Over the past week,

people with symptoms of pneumonia and reported travel history to Wuhan have been identified at international airports. WHO does not recommend any specific measures for travellers. WHO advises against the application of any travel or trade restrictions on China based on the information currently available."

Although much of this information proved to be not the case as more information became available, it was very clear that this infection had potential to spread more widely, and I was in constant discussion with PHS regarding the situation and responses that might be required. Very rapidly more information became available from China and elsewhere. By mid-February it was clear that the infection was spreading rapidly within China, and by early March a number of papers had independently confirmed that community transmission was common with almost all transmission occurring within households or with close contact indoors. Estimates of the proportion of asymptomatic cases were also available at about this time from outbreaks on the *Diamond Princess* cruise ship and community studies within China. Initial estimates were variable but for example the study published in early March from data obtained from the *Diamond Princess* outbreak found about 20% of cases were truly asymptomatic and that the infection had an incubation period of about 6 days. Other studies showed that viral loads in asymptomatic patients were as high as those infected and that transmission from asymptomatic individuals could occur. The relative transmission rate from asymptomatic versus symptomatic individuals was not clear (and still is not in my view) but it was evident that the main risk came from exposures with crowded indoor environments. As with many infectious diseases, it was also evident at this time that a small proportion of cases were responsible for most transmissions – so-called 'superspreader' events. Growth and spread of the pandemic indicated that it was growing exponentially (even in February this was clear) and thus the R_0 was > 1. More accurate estimations of R_0 using more data gave an estimate of ~ 2 -3 by early April 2020. Severity of disease and mortality were calculated early in the pandemic. It is important to distinguish case fatality ratio (CFR) (i.e., those who die as proportion of all symptomatic infections) from infection fatality ratio (IFR) (those who die as a proportion of all infected individuals). Given that a significant number of infections are asymptomatic (probably up to 1/3), the IFR is always lower than the CFR. Very early estimates form China found a CFR of about 2% from studies published in February 2020, while further data obtained when testing of all exposed was available (e.g., the *Diamond Princess* outbreak) gave an IFR of about 1%. At this stage, it was difficult to extrapolate these figures to a UK population, as the age range tested and underlying medical conditions present were not always clear. More extensive testing in a variety of different countries in late Spring 2020 found that IFR rates converged to about 1%. Despite these initial uncertainties, it was evident that IFR and CFR increased sharply with increasing age and that a variety of medical conditions that impacted on host immunity also worsened outcome. – this was always considered theoretically very early on in the pandemic. Duration of infectivity was difficult initially to measure, as viral culture results were not available routinely until later in 2020 and initial studies had a relatively small number of participants. By June 2020 data showed it was very rare to detect viable virus beyond 14 days

after symptom onset, although PCR detection (being very sensitive) could detect virus for often significant periods beyond that. Subsequent analyses much later in the pandemic suggested transmission of infection was very unlikely 5-7 days after symptom onset.

23 Pre-pandemic responses considered a number of different factors. It must be remembered that initial information on this novel infection was limited. All through January 2020 I participated in a number of meetings with both PHS and PHE to consider responses that might be required as the situation evolved. This took into account information supplied by the WHO. A whole variety of measures were put in place prior to the national lockdown, including closure of schools and hospitality venues. These were precautionary and based on the evidence available at the time that transmission was highest in indoor crowded environments. In my view these measures were proportionate at the time. Subsequent data showed that transmission outside was very unusual. The issue of transmission in schools has subsequently also been made clearer – and is more complex than just transmission between children. Indeed, children are not major amplifiers of the disease (unlike flu). They can be infected, but typically exhibit limited symptoms and transmit rather poorly. School closures, however, have many other effects – for example they will limit contact between adults taking children to school and also will limit the ability of adults to go to their workplace as they will need to be at home to provide childcare. This also will limit the spread of infection. Testing was a vital part of the response to COVID-19. However, in the early stages of the pandemic, our ability to test individual in large numbers was very limited and thus to have an effective test and trace system not possible. In addition, the evolving evidence that asymptomatic transmission contributed to the spread of the disease made a policy of containment untenable. In addition, experience of previous large scale infectious disease outbreaks/pandemics made a 'second wave' of infections likely, so that planning for such a future possibility sensible. Details of the extent to which the Scottish Government engaged in such planning at that time should be sought from Government Ministers and their officials.

24 Initially, SARS-CoV-2 was classified as a High Consequence Infectious Disease (HCID). This was a term that was defined as follows:

- acute infectious disease
- typically has a high case-fatality rate
- may not have effective prophylaxis or treatment
- often difficult to recognise and detect rapidly
- ability to spread in the community and within healthcare settings
- requires an enhanced individual, population, and system response to ensure it is managed effectively, efficiently and safely

The inquiry raised the question as to why ACDP classified COVID-19 as no longer a "highly infectious disease" at that time. Please note that is not the case – the deliberation was entirely around its classification as a HCID; manifestly it was a highly infectious disease. The HCID term is used in a very technical sense – obviously COVID-19 was of high consequence in a more

general sense. Policy for HCIDs in England at the time was that all HCIDs should be transported to a specialised centre. The development of these HCID policies were not for a pandemic response but for containing rare incursions of imported HCIDs such as Ebola. They were never part of a pandemic response. The reason ACDP advised that they no longer felt it was a HCID at that time was because its overall case fatality rate was about 1%, and the majority of those infected did not require specialist care or hospital admission. In addition, at that time community transmission was already well established in many countries and continuing designation of COVID-19 as an HCID would not prevent such transmission within the community.

25 Herd immunity is a well-known concept in infectious disease epidemiology. Initial spread of a novel infectious agent will infect large numbers of the population, but if they develop protective immunity this will prevent subsequent infections. If enough of the population (the 'herd') are protected against infection, even those who have not encountered the infection will also be protected as their chances of encountering a potentially infectious individual are very low. Immunisation can of course replace natural infection as a means of providing herd immunity. The level of protection required will depend on the R number of the infection, and the effectiveness of previous infection or immunisation in limiting infection. Government ministers and their officials can address the question as to how far considerations of herd immunity influenced their policy decisions and whether adherence to NPIs influenced this.

26 A number of larger scale events took place immediately prior to the national lockdown. PHS carried out an investigation into the potential community spread of COVID19 following the NIKE conference in February 2020. Their investigation showed clearly that there was little onward spread from this event and no general community transmission resulted – indeed that specific viral strain was not detected in Scotland after April 2020. Whether significant transmission occurred at large sporting events, such as International rugby matches at that time is unknown. Outdoor transmission is rare, but transmission could have occurred during transport to events, and indeed many would gather indoors in pubs to watch such games. Whether stopping such events at the time would have limited transmission is unknown, but given that other societal restrictions were not in place at the time, I doubt whether stopping such events at that time would have made much difference.

C Testing

27 Testing and the Test and Protect scheme were highly important in limiting transmission of COVID-19. It was evident even in January 2020 that testing was going to be vital in our response to the pandemic. SGCAG provided advice regarding testing to policy makers and a separate testing subgroup was instituted (I was not a member). Their advice to Scottish Government is contained within the minutes and papers of meetings already given to the Inquiry as outlined above. There was a real limit on our capacity to test for infection in the early phase of the

pandemic, and this limited the ability to identify individuals and to provide contact tracing. In hospitals too, we were limited to who we could offer tests and thus those with atypical or asymptomatic infection were almost certainly not identified. This was simply an issue of capacity in existing testing laboratories. As the pandemic progressed more facilities became available through the Lighthouse and other schemes, which vastly increased capacity.

D Non-Pharmaceutical Interventions (NPIs)

28 A range of NPIs were put into place in Scotland, and the SGCAG provided advice on many of these issues as detailed in the minutes and papers of our meetings. Government also considered input from other groups that, *inter alia,* evaluated compliance and effects on the economy. The effects of such measures were evaluated on real time data on the R number available from modelling at SAGE and within Scottish Government. The relative importance of any one individual measure is hard to evaluate, as they were typically introduced in combinations. Overall, they certainly reduced the R number and hence interrupted transmission. Longer term impacts on healthcare, mental health and well-being, and the Scottish economy are not yet, in my view, completely clear, but undoubtedly have had significant adverse consequences. Balancing the different harms of COVID was certainly central to the 4 harms approach taken by government. On the whole, I feel the measures taken were mostly appropriate. Of areas where effects were likely much less effective, I felt the regional restrictions unlikely to be of benefit and little evidence that they proved effective. Compliance was actually very high in general to these measures and the public changed their behaviours to a great extent according to the restrictions in place. Scotland does not have any independent ability to regulate national borders. Border restrictions on their own may delay spread but inevitably borders are porous and lockdown cannot continue indefinitely.

29 The various NPIs imposed took account of a number of factors. Very early on Scotland in line with the rest of the UK gave advice to those considered most vulnerable – the 'shielded' group. The NPIs were designed to reduce transmission and hence would also reduce post-infectious consequences such as Long Covid. Face coverings for the general public were not initially considered by SAGE as likely effective, but increasing (although low-quality) evidence led to their adoption across the population. Advice on this issue from SGCAG is contained in the minutes and papers. I feel the government's response was proportionate and timely - I think we had to accept that definitive evidence of the potential benefit of face coverings would likely never emerge, but as a simple precautionary measure I felt their policy was reasonable. NHS capacity and management of infected patients was not a direct concern of the SGCAG but considered within NHS Scotland. School closures were considered by an Education subgroup of the SGCAG

(of which I was not a member) and their advice is contained in the minutes and papers of the group.

30 A number of different groups are more affected by COVID-19. Our understanding of these more vulnerable groups has evolved over time as more data on hospitalisation rates and mortality have accumulated. At the beginning of the pandemic this information was not available, but inequalities in health within the UK have been recognised for many years as set out in the Black Report of 1980 and subsequent studies, such as the Marmot report of 2010. These reports found that ill health and death were more frequent in lower socioeconomic groups. Therefore, it was not unexpected that a similar worse impact in this group would be experienced from Covid-19. Evidence also accumulated that non-Caucasian ethnic groups had higher rates on infection and adverse outcomes than Caucasian groups. This reflected likely increased exposure through occupations which involve more contact with the public, access to healthcare, as well as possible genetic influences, although given the genetic diversity involved this is challenging to ascertain. How these structural differences in different ethnic and socioeconomic groups influenced government policy I cannot directly answer – evidence should be sought from government ministers and their officials. Some advice was given by the SGCAG, as set out in our minutes and papers, in particular advice regarding support that should be offered for households self-isolating. Such targeted support for ethnic minorities in particular will need to be key feature of a future pandemic response.

31 A number of pre-existing medical conditions lead to worse outcomes from COVID-19. Initially these groups were identified based on likelihood of their being in some way immunodeficient. As more data accumulated, there was a more refined and evidence-based strategy in identifying such individuals. Through my work with the Clinical Cell, we provided input initially into identifying at risk groups. This helped develop the Government's shielding strategy. I believe that the strategy developed was proportionate and timely given the information available at the time. It developed over time as more information became available, with some groups no longer advised to shield and newer groups incorporated. As far as possible, the groups identified were aligned with the groups identified within the other 4 nations.

E Decisions Relating to the First Lockdown

32 The national lockdown imposed in March 2020 was in response to the threat of a novel infection that was spreading rapidly in Scotland and the rest of the UK. Credible estimates from Professor Neil Ferguson's group at Imperial London of the likely effect of the infection if unchecked across the UK were of a total of about 0.5 million deaths from COVID-19. On that basis I believe the decision to initiate a national lockdown was appropriate and proportional. It did achieve its goal of reducing R eventually below 1. A key point here is that this saved lives at that time while awaiting development of vaccines and/or better treatment. I do not think any alternative strategy

short of a full lockdown would have been effective without increasing the number of excess deaths. Reduction of transmission required interrupting person to person transmission – voluntary isolation was a help but given the extent of asymptomatic infection self-isolation alone would not in my view have reduced the spread of infection even if universally adopted. It would have been difficult for Scotland to deviate from the rest of the UK at that time. SGCAG had only just formed at that time. Government ministers and their officials should be able to provide details of what advice was taken at that time and what exit strategy was considered then. It is easy in hindsight to consider that earlier action could have been taken – however, a national lockdown was unprecedented and its effects on the whole of society were likely to be highly significant. Between January and September 2020 considerable global efforts went into developing a vaccine for COVID-19 and developing therapies. My initial feeling was that it would be huge challenge to develop an effective vaccine within a year – thankfully I was wrong, and the efficacy of the vaccines that were developed was surprisingly good – especially the mRNA-based vaccines, which was a largely untested platform for vaccine delivery. I had confidence that a national programme of vaccine delivery could be instituted as our ability to deliver vaccines at population level in Scotland and the UK is excellent. In addition, numerous trials of potential therapies were in place, but my expectation was that their likely benefit would be low. Again, I was thankfully wrong; the RECOVERY trial showed a highly significant reduction in mortality for patients receiving respiratory support who were given glucocorticoid treatment, reported in preprint from in June 2020. This was adopted as standard treatment shortly thereafter. Further incremental improvements in treatment were develop throughout the pandemic.

33 The restrictions introduced to reduce the spread of COVID worked and by the summer of 2020 levels of COVID-19 infection were very low. However, I never believed that a policy of zero COVID was likely work. By that time, it was clear that re-infection and thus waning immunity to infection was not uncommon. Unless strict lockdown remained in place, reintroduction and spread was always going to occur. The SGCAG were asked for advice on phasing of restrictions after the passing of the first wave as set out in the minutes and papers. This helped shape policy for the phased changes, with additional input from other areas as outlined previously. The stated aims of the government at this time – "to suppress the virus so that the R-number remained below 1, demands on the NHS did not exceed capacity and people were able to return to some semblance of normality" - was I believe reasonable based on the available evidence. Importantly, the phased approach allowed direct measurement of the effects on COVID spread through direct data analysis. Given the nature of exponential growth, relaxing too quickly without knowing the actual effects could lead to a large number of cases very rapidly.

34 During the first lockdown, the direct effects of the virus on older people in particular were very evident and I will forever remember the large numbers of older people admitted to hospital that I saw who would not survive the infection. The compliance of the general population with the NPIs instituted was remarkable.

F Decisions relating to easing the first lockdown in the period from 29 May 2020 to 7 September 2020

35 The SGCAG provided advice to government on the phased reduction in restrictions during this period. The group supported the proposed phased reductions in restrictions as proportionate and unlikely to lead to marked increase in infection rates. We were not involved in decisions around the Eat out to Help Out scheme. By the summer of 2020 the level of infection in Scotland was indeed very low but not zero, as evidenced by the national household survey. The group always emphasised that infection could return, and exponential growth would mean numbers could increase very rapidly. During this period, a cautious reduction in restrictions was largely successful but mass vaccination was not yet in place and thus a large percentage of the population remained susceptible should infection rates increase.

G Decisions relating to the period between 7 September 2020 and the end of 2020

36 In September 2020 rates on infection began to rise with the return of University students and the end of the school holidays. This coincided with the spread of the alpha variant which was more transmissible and had a slightly greater ability to cause severe disease. This was evidenced by a number of papers published at that time, notably by the Imperial group. This variant became dominant towards the end of the year. The SGCAG had good knowledge of the spread of the alpha variant through the monitoring mechanisms in place. The group gave advice on the general measures that might be considered to slow the spread of infection, but detailed decisions were made by government. The five-tiered COVID-19 system received some input from the SGCAG, although the details were made by Government. In general, I thought the tiered restrictions were proportionate. I did not however feel that imposing them by local authority was justified. Increased rates of transmission occurred in often highly circumscribed areas, where focussed and targeted interventions were more likely to be effective. Also, there was inevitable mixing across borders. As rates increased a further lockdown was proposed and enacted. This was discussed in the SGCAG. I argued that with effective test and trace and limited restrictions short of a full lockdown, transmission could be reduced. However, this was not the view of the whole groups which I entirely respect. At that time the available resource for the Test and Protect programme was stretched beyond its ability to cope. Clearly, the advent of new variants was likely to lead to further waves of infection in the future.

H Decisions relating to the second lockdown (January 2021 to 2 April 2021)

37 The spread and impact of the alpha variant through December 2020 and into new Year 2021 led to reintroduction of lockdown restrictions as outlined above. The SGCAG were not involved in detailed advice relating to lifting of restrictions around Christmas Day 2020. Details on the policy

decisions at that time should be addressed to Government ministers and their officials. However, the subsequent restrictions were based on the increased number of COVID-19 infections and a rise in the R number. Vaccination programmes had just begun but their effect would not be felt for some time. Reluctantly, I felt that further lockdown at this stage would allow reduction of COVID-19 cases while awaiting the impact of the vaccination programme. SGCAG provided advice around general measures that would be effective but detailed policy decisions were taken by government. In my view at that time the lockdown was required.

38 There was significant opposition to lockdowns in some countries and amongst some scientists. These views are captured by the Great Barrington Declaration. I think it presents some well-argued points on the adverse consequences of lockdowns and their likely impact. It does stress that lockdowns do not eradicate an infection, which is of course true. However, they do allow a temporary respite during which time vaccine delivery could continue. For that reason, I supported the second lockdown. To that end, the second lockdown did achieve its purpose. In fact, the number of deaths around the period of the second lockdown was probably a little higher than in the first wave. However, vaccination delivery was now accelerating rapidly. Again, the public accepted the return of the restrictions with little complaint. I felt the messaging around the need for these added restrictions was well made and scientifically sound.

I Decisions relating to the period between April 2021 and April 2022

39 From April 2021 onward restrictions were gradually lifted throughout 2021 according to the principles previously enunciated and discussed by the SGCAG. The details of these policy changes were made by government but were in my view commensurate with the scientific evidence available at that time. In particular, there was now in place robust surveys of infection rates amongst the general population provided by the Office for National Statistics, this provided excellent information on actual infection rates (symptomatic and asymptomatic) across all 4 nations. At the end of August 2021 this showed about 1 in 140 people had COVID-19. Importantly too the effects of vaccination were now evident, with a much lower rate of hospitalisation and death resulting from infection becoming apparent. I have discussed the use of regional restrictions above. The impact of introduction of infection from returning travellers at this stage I felt was unlikely to be significant at all. A COVID variant could emerge anywhere and the likelihood that testing of travellers would prevent such a variant being introduced minimal. The COP summit was not risk free but suitable precautions were in place and in the event, it did not result in large scale increased transmission.

40 The advent of the Omicron variant necessitated additional changes to restrictions. We were aware of the Omicron variant in November 2021 when it appeared in South Africa though international data sharing. It was clear it spread very rapidly and quickly became the dominant variant within South Africa and spread to the UK at speed as well, becoming the dominant variant by the end of the year. However, data from South Africa showed that its severity seemed reduced

compared to previous variants and this was also supported by experimental evidence in tissue culture models. Exactly how this would affect the Scottish population was therefore not entirely clear until the variant arrived, but there was support to the view that its impact would be less, and that vaccination would avoid serious disease although not impacting infection to the same degree. Thus, there was not a case for further lockdown restrictions. The SGCAG had already provided guidance on measures likely to reduce transmission but the exact details on implantation of various policies were taken by government. The changes enacted were largely precautionary given that there was some uncertainty how Omicron infection would affect people in Scotland. In the event, the impact of omicron was much less than previous variants – there were large numbers of infections, but the rate of hospitalisation remined low. Vaccination I am sure played the biggest part here, but the intrinsic pathogenicity of omicron was likely less as well. Thus, despite changes in the virus that allow it to escape some of our immune response and cause infection, there would appear to be longer lasting immunity that protects against severe disease even in these new variants. Thus, there is cautious optimism that this will be the case should new variants significantly different from omicron arise. Because of the observed low hospitalisation rate, restrictions could be lifted through Spring 2022. The SGCAG group contributed to these discussions and reviewed and advised on evidence of the effects of the omicron variant.

J Care Homes and Social Care

41 The details of the Scottish Government's strategy in regard to Care Homes should be sought from Government officials and their officials. A separate Care Home group was established by Scottish Government that was separate from the SGCAG. Sadly, it became obvious very early in the first wave of infection that care home residents were disproportionately affected by COVID-19 and given their typical age experienced a high mortality. Much has been made of the possible introduction of infection by patients transferred to care home settings from hospital without testing. I was not party to these decisions, but as I described above the availability of testing at that stage in the pandemic was very limited. There were also many other potential routes of transmission of infection into care homes. The risks of transmission from staff working in multiple care homes were revealed through 2020 from DNA sequencing which could show clear instances of transfer of a specific strain of virus from one care home to another. The intimate nursing care given by care home staff and the prolonged periods of contact with residents increased the chances of onward transmission. Asymptomatic infection also would mean potentially infected but well staff would continue to work. Care home staff are in my experience very dedicated and provide remarkable care to residents in their last years of life. However, they are not part of the NHS and the understanding and training in infection prevention and control is more limited than would be the case in an NHS facility.

42 The rationale of the announcement made by the cabinet secretary for health on 21 April was in my opinion in response to the spread and impact of COVID-19 in care homes and was proportionate to the risk. Further details should be sought from the cabinet secretary at the time. Clearly, the expectation that care home residents would be protected from COVID-19 did not prove to be true, both in Scotland, the rest of the UK and elsewhere. It is for government to decide how to mitigate this risk in the future. My personal view is that bringing care homes in some way into the NHS would establish more robust infection prevention and control measures as uniform across the sector. Staff would then receive standard education and training delivered by NHS specialists. While testing is not available, movement of staff from home to home should be prevented. These measures would likely provide more protection to residents in a future pandemic.

K Borders

43 Scotland is not in control of national borders and could not change decisions taken by UK government. As I set out above, I did not think regional restrictions during the pandemic were particularly effective during the pandemic for the reasons I set out above.

L COVID19 Public Health Communications

44 The SGCAG provided into public health communications as set out in the minutes and papers, but the details were provided by PHS and Scottish Government. The views of the SGCAG were listened to by government and I believe helped form policy in this area. I believe that in general the public messaging was very effective, coherent, and rational. In particular, I felt the messaging to the public led by the National Clinical Director was admirably clear and trustworthy. The only issue I had with the messaging was the adoption of the FACTS acronym as an aide memoire for the precautions the public should take. In my view this was too complicated and a simpler scheme of just 3 key precautions would have been better.

45 There were a number of egregious examples of breaching of COIVID rules in Scotland and elsewhere. Although highly publicised, these did not seem to impact on the public adherence to restrictions. The resignation of Catherine Calderwood came as blow I think to healthcare staff, but I think many understood this was a time of extreme pressure. I do not think the First Minister's temporary removal of her face mask at a wake made any lasting effect on public confidence. The actions of Margaret Ferrier were reprehensible but again seemed to have little effect on public confidence. For the future, it will be important to maintain the expertise and experience gained in the pandemic and for there to be greater public involvement in decision making.

M Public health and coronavirus legislation and regulations

46 The SGCAG did give advice on legislative measures that were likely to be effective in managing the pandemic, as set out in our minutes and papers. The key point was to ensure the public were kept informed as much as possible and the rationale for such measures explained. I believe this helped policy in this area, although policy implementation was a government responsibility. The polices developed were largely identical across all 4 nations. I do believe policing works by consent and my personal view of how Police Scotland acted on the COVID legislation was that this was proportionate and based on advice and persuasion rather than invoking arrests and fines.

N Key Challenges and Lessons Learnt

47 The COVID19 pandemic was a global challenge on an unprecedented scale. We were faced with a novel infectious agent with potential to transmit readily and likely to cause a large number of deaths if left to proceed unchecked. These challenges required a raft of policy decisions across many different areas of government, as set out above. I believe the scientific advice provided by the SGCAG was useful in informing such policy decisions, and at the time the feedback we received was very positive. I found my experience as a member of the SGCAG very fulfilling, and I was very glad to have been selected to be a part of the group and would certainly participate in such a group again if asked.

48 The SGCAG worked very well a team and we had access to all relevant data and through interactions with senior civil servants as part of the group, I was confident that our advice reached all relevant areas of government. When differences in opinion within the group occurred, these were well handled by the Chair, and the advice given always reflected disparate views. In terms of improvements that could be made, in retrospect I feel that earlier and more extensive engagement with international experts in public health would have been beneficial. In more general terms, there were deficiencies in the pre-pandemic planning that affected the response to the pandemic in Scotland, as much as in the UK. The planning was really only geared towards a pandemic of a novel influenza virus, with no consideration of other potential agents. Although SARS-CoV2 was of course a respiratory pathogen with some characteristics shared with influenza, in many ways it differed significantly. There was no planning around provision of testing and ability to provide this at large scale. This seriously hampered the early response to the pandemic. There had been little consideration of how care homes might be affected by such an infection.

49 There have been many lessons learned following the pandemic and these are part of future work in Scotland as part of the Standing Committee on Pandemic Preparedness which will report by the end of this year, with many helpful suggestions for improvement. There has also been work led by the UK Department of Health and Social care in formulating a Review of Emergency Preparedness Countermeasures, which will be published imminently. This addresses many of

the shortcomings I have highlighted here, and presents plans to deal with a variety of different potential pandemic agents (not just influenza), what drugs and vaccines need to be stockpiled, what PPE should be available, and how testing capability needs to be maintained in the event of a future pandemic.

50 I have not given evidence to any parliamentary committee on the performance of government during the pandemic. Although members of the SGCAG were not asked to participate in any lessons learned exercises, our views were sought at the end of the pandemic and fed back informally.

51 I believe I have answered all the questions posed in my responses. There was significant overlap in some of the questions which have been addressed, which have been answered all together. Some questions requesting information did not require an answer as there were no documents or comments to make.

52 I do not have any additional documents to provide, other than those already supplied to the Inquiry in my first response to the previous request.

Statement of Truth

The contents of my response are true and accurate to the best of my knowledge and belief.

Signed

Personal Data

November 14th 2023