Witness Name: Professor Kamlesh Khunti

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UK COVID-19 INQUIRY

WITNESS STATEMENT OF PROFESSOR KAMLESH KHUNTI

I, **PROFESSOR KAMLESH KHUNTI**, of the University of Leicester, University Road, Leicester LE1 7RH, will say as follows: -

1. Introduction:

1.1. I make this statement pursuant to the Covid-19 Inquiry's Rule 9 request of 6 April 2023.

1.2. The matters I set out within this statement are within my own knowledge save where I state otherwise. Where I refer to facts that are not within my own knowledge, I will give the source of my knowledge of those facts. The contents of this statement are true to the best of my knowledge and belief.

Background:

1.3. I am Professor of Primary Care Diabetes and Vascular Medicine and Co-Director for the Leicester Diabetes Centre at the University of Leicester, UK. I am also Director of the UK National Institute for Health Research (NIHR) in Applied Research Collaborations (ARC), East Midlands, Director of the Centre for Ethnic Health Research and Director of The Real-World Evidence Unit. I have published over 1200 peer-reviewed articles. I am also Honorary Visiting Professorial Fellow with the Department of General Practice, University of Melbourne. I am named as

the top Type 2 diabetes researcher globally by Expertscape. I was awarded the CBE in the 2022 New Year's Honour's List for services to health.

1.4. I was a participant in SAGE from 24 September 2020 to 10 February 2022, and chair of the SAGE Ethnicity sub-group from 28 August 2020 to 23 March 2021.

1.5. I participated in Independent SAGE from June 2020 to May 2021, as I was a primary care researcher with an interest in ethnic minority research, although I think the main reason I was invited to join was because of my role as a GP. My role was to provide a clinical perspective on Covid-19 generally, particularly on its impact on patient outcomes, as I was the clinician on Independent SAGE. This work was not interrelated with that of SAGE, where my work was focused on ethnic disparities in Covid-19 outcomes and which is detailed below in Section 2. I left the group in May 2021 due to extensive work commitments and a lack of available time to commit to contributing to the group.

2. Covid-19 disparities

2.1. It has been put to me that there are disparities in health outcomes from Covid-19 in relation to age, ethnicity, disability, deprivation and comorbidities; however, I confine my response throughout this statement to ethnicity as that is my area of particular expertise.

2.2. I was one of the first to highlight a possible increased risk of Covid-19 in Ethnic Minority populations in a tweet on 01 April 2020 [KK/1 – INQ000223026]. Initially this was based on anecdotal observations by colleagues on the ground, as referenced in the 01 April 2020 tweet, which prompted me to solicit further observations and begin gathering data.

2.3. Following this, I highlighted the disparities in Covid-19 mortality by ethnic group from a report by the Intensive Care National Audit and Research Centre on 4th April 2020 [KK/2 – INQ000223037].

2.4. Immediately following this Professor Sir Nilesh Samani and I sent an email to Professor Chris Whitty on 04 April 2020 and highlighted the disproportionate deaths in ethnic minority communities [KK/3 – INQ000223048]; he replied on 05 April 2020 and noted the importance of the issue, as well as the uncertainty as to the factors driving the data, and offered to take the matter forward through the NIHR [KK/3A - INQ000236611]. Along with other colleagues I then wrote the first Editorial on this topic in the BMJ, and with University of Leicester and University

Hospitals of Leicester colleagues also highlighted very early the association of comorbidities with Covid-19 mortality.

2.5. Early evidence on disparities in outcomes for a range of ethnic groups were generated from a range of cross-sectional and cohort work by a variety of teams including Public Health England ("**PHE**"), the Office for National Statistics ("**ONS**") and OpenSafely. These findings have since been replicated in numerous studies globally [KK/4 – INQ000223060, KK/5 - INQ000223071, KK/6 – INQ000223072, KK/7 – INQ000223073, KK/8 – INQ000223074, KK/9 – INQ000223075, KK/10 – INQ000223027]. The reasons why ethnic minorities are at higher risk of COVID-19 is complex but could arise through six pathways: (1) differential exposure to the virus; (2) differential vulnerability to infection/disease; (3) differential health consequences of the disease; (4) differential social consequences of the disease; (5) differential effectiveness of pandemic control measures and (6) differential adverse consequences of control measures.The appendices to this statement will offer something of a chronology of the development of our understanding in this area, however as set out at paragraph 2.6 below, there remains much uncertainty.

2.6. All minority ethnic groups, as compared to White ethnic groups, were at greater risk of hospitalisation and mortality following Covid-19 infection in the first wave, and this risk remained elevated for Pakistani and Bangladeshi ethnic groups in the second wave, but not for Black or Indian ethnic groups. The reason for this variance between different minority ethnic groups is not well understood. There are gaps in current evidence, and research to date has been hampered by a lack of theoretical understanding of the meaning of 'ethnicity' and the potential pathways leading to inequalities [KK/5 – INQ000223071, KK/6 – INQ000223072, KK/11 – INQ000223028, KK/12 – INQ000223029, KK/13 – INQ000223030, KK/14 – INQ000223031].

2.7. It is also not well understood how much of the increased risk of poorer Covid-19 outcomes is due to modifiable or non-modifiable factors that may differ between ethnic groups. Certain ethnic minority groups may face disadvantages due to their living conditions in poorer socioeconomic environments or because of their occupations, which increase their risk of infection and worse outcomes. For example, they may live in overcrowded multigenerational households or work in occupations that involve a high level of public contact. Biological factors, such as obesity and long-term health conditions (e.g., diabetes), which are more prevalent

in some ethnic minority groups, may also contribute to this risk [KK/15 – INQ000223032, KK/16 – INQ000223033].

Ethnicity SAGE

2.8. Sir Patrick Vallance and the GO-Science secretariat personally invited me to be a participant of SAGE and the chair of the SAGE ethnicity subgroup. This was following a Zoom call and discussion on 05 August 2020. I do not know the circumstances resulting in the creation of the sub-group however. I became chair of this sub-group at the first meeting on 28th August 2020, and details on membership are publicly available [KK/17 – INQ000223034]. Details on the scope of the sub-group, and the responsibility of the chair position can be found in the Terms of Reference which are also publicly available [KK/18 – INQ000223035]. By way of summary, the subgroup, reporting directly to SAGE, advised on the risk and impact of Covid-19 on ethnic minority groups. As Chair I was responsible for liaising with SAGE, representing the subgroup, chairing meetings and moderating discussions and signing-off on the subgroup's advice.

2.9. The SAGE Ethnicity sub-group was the first group that SAGE established to specifically consider issues of ethnicity and disparity with regard to Covid-19, and this was its sole focus. I do not know why a sub-group was not established earlier, and also cannot comment on whether such a sub-group should have been established earlier. This is because I was approached in August 2020 quite shortly after the data on disproportionate impact on ethnic minority groups, first highlighted in April 2020 [KK/2 – INQ000223023037, KK/4 – INQ000223060] was confirmed by sunsequent analysis in May [KK/7 – INQ000223073], July [KK/5 – INQ000223071] and August [KK/19A - INQ000101218].

2.10. I have been asked to comment on the extent to which SAGE envisaged potential disparities in its work in pandemic planning. This seems to misunderstand the role of SAGE; it is convened in response to an emergency situation, and therefore would have no role in pandemic planning. However, it would be true to say that nobody had envisaged ethnic disparities in relation to Covid-19.

2.11. That being said, inequalities in health outcomes and access to care by ethnic group were well evidenced prior to the pandemic, as were wider social inequalities. This made the likelihood of disparities in risks and outcomes as a consequence of Covid-19 infection somewhat foreseeable, though the scale of the pandemic was

not expected and therefore the related ethnic disparities not fully considered from the outset.

2.12. A number of suggestions were made from across the ethnicity sub-group, following analyses of data on occupation, household occupancy and vaccine hesitancy. See the Appendix for more detail.

2.13. Research on disparities in Covid-19 outcomes began as soon as the first major epidemiological studies were published in Spring/Summer 2020. I have collaborated with groups nationally and internationally including the ONS to conduct work in this area, although I did not myself commission research.

2.14. Reports were published by PHE on Covid-19 disparities in June 2020 (the "**PHE Reports**") [KK/19 – **INQ000268359**, KK/20 – INQ000223038]. The PHE Reports were welcome in that they shone a light on disparities in risks and outcomes from Covid-19 by ethnicity. Nevertheless, I have previously described the PHE Reports as a missed opportunity to address significant inequalities in ethnic minority communities and we discussed in our BMJ editorial that there were limitations to the PHE Reports [KK/21 – INQ000223039]. In particular, the later report could have been improved by setting out clear actions and timeframes for addressing the greater risk for ethnic minority communities – who will be implementing and accountable, and when will they be delivered. In addition, it would have been useful for PHE to outline commitments to addressing the underlying social determinants of health, which may have driven the increased risk for ethnic minority populations. This should still be a priority and last year we made recommendations to address these on behalf of the South Asian Health Foundation [KK/22- INQ000223040]. We also criticised the failure to make ethnicity a routine reporting characteristic in the deceased, which gives rise to challenges in data collection and I return to this point at paragraph 2.21.

2.15. I have previously opined that universal occupational risk assessments should be provided along with risk reduction strategies to address the disparity of outcomes with regard to ethnic minority workers in healthcare. I did not provide advice on this to SAGE however. I was instead asked directly by NHS England ("**NHSE**") to chair a group to develop a Risk Reduction Framework [KK/23 – INQ000223041]. This was then conducted entirely through NHSE, with SAGE having no role in implementation; for that reason I am not certain of the extent to which this was put into place however I understand, based on what I have been told by colleagues,

that this was implemented in most clinical commissioning groups and hospitals but not all, and implementation has been varied.

2.16. Higher instances of comorbidities among certain ethnic minority populations were evidenced through studies we had conducted including the development of the QCOVID Risk Score with Oxford University, a model designed to estimate a person's risk of hospitalisation or death following Covid-19 infection. These comorbidities included cardiovascular disease, kidney disease, diabetes and obesity.These higher instances of comorbidities were evidenced to SAGE and endorsed at SAGE 40 on 04 June 2020 [KK/24 – INQ00023042]. The papers considered included reports from the CO-CIN study, the ONS, PHE, and UK Biobank [KK/7 – INQ000223073, KK/9 – INQ000223075, KK/19 – **INQ000268359** KK/25 – INQ000223043].

2.17. The SAGE ethnicity sub-group proposed a series of recommendations that are outlined in the Appendix to this statement. I am not sure on the extent to which they were implemented by UK Government as, being a member of SAGE, I had no exposure to policy making or the implementation of scientific advice, although there were a number of campaigns to get all at risk vaccinated and this may have been prompted or guided by our advice [KK/26 – INQ000223044].

2.18. I have been asked to comment on the allocation of resources to address Covid-19 disparities. I do not have sufficient knowledge on deployment of resources and funding to be able to comment, as this is a question of health economics and this is not my area of expertise. That said, greater efforts could have been made to: implement priority testing for ethnic minority healthcare workers (and their households) across the NHS, implement mandatory occupational risk assessment for NHS and non-NHS staff, with a particular focus on protecting the most vulnerable such as ethnic minority populations. In addition, access to personal protective equipment (PPE) was limited, particularly in the early phase of the pandemic, and high quality equipment such as FFP masks were not widely available to health care workers such as general practitioners.

2.19. I have also been asked whether the UK Government adequately took into consideration issues relating to vulnerable groups, and whether they took adequate steps to reduce Covid-19 disparities. Not having been party to the decision making process I am unable to comment on the extent to which the UK Government took these issues into consideration, but I do think more could have been done to

prioritise ethnic minority groups (particularly front-line workers) for vaccination, to implement culturally tailored Covid-19 vaccine messaging and wider Covid-19 prevention messaging. In addition, there was a need to implement culturally tailored occupational risk assessment more widely, to align 'Test, Trace, and Isolate ("**TTI**") with the particular needs of each distinct ethnic minority community, and for TTI to be well embedded within existing local infrastructure. For example, the system could have been tailored to offer greater protection for those in high-risk occupations, healthcare workers and those in multi-generational households. I am a general practitioner and it was evident early on that TTI was not implemented well in the early part of the pandemic (although delivery did improve markedly, as I discuss further below at paragraph 2.36). Furthermore access to high quality PPE was not available to all frontline workers and this will have had a major impact on high risk health care workers and their exposure to COVID-19. A particular area which requires further attention from government to prevent ethnic disparities in future pandemics is to address wider socioeconomic inequalities and deprivation.

Government Communications

2.20. UK Government communications were largely generic and could have been more effective if they were culturally adapted. Our Centre for Ethnic Health Research provided expertise to the national vaccination programme via the national clinical research network. In addition, we made recommendations (and produced translated infographics) relating to culturally tailored messaging relating to religious festivals, funerals, vaccination, long covid etc. for the South Asian Health Foundation [KK/22 – INQ000223040, KK/27 – INQ000223045].

Data

2.21. We highlighted in scientific publications early on, in April 2020 and later in June 2020, that few Covid-19 publications were collecting or reporting ethnicity, or disaggregating ethnic groups to sufficient granularity [KK/28 – INQ000223046, KK/29 – INQ000223047]. The data existed, but were at a very high level with ethnic categories such as 'Asian' 'Black' 'White' and 'Other' while greater granularity would include, for example, Indian, Bangladeshi and Pakistani groups. This was likely due to the difficulty in collecting ethnicity data, the lack of standardised data collection protocols, lack of ethnicity reporting standards, the poor quality of

ethnicity data coding in electronic health records, and the fact that in the UK mortality reporting did not require information on ethnicity.

2.22. That said, there was sufficient data to establish the existence of Covid-19 disparities during the pandemic through the ONS and the Intensive Care National Audit and Research Centre. There was no unified, national system of data capture however as different organisations would draw upon their own repository of data. For example, the ONS drew on census data and at the beginning of the Covid-19 pandemic the most recent census data available were the 2011 data.

2.23. There were no barriers to sharing such data outputs between groups, with our advice flowing through SAGE to the Cabinet, and we further dessiminated our findings through lectures and social media and we held teach-in sessions with the Cabinet Office. However, there were barriers to capturing such data inasmuch as it was (and is) particularly challenging to identify the drivers of these disparities. The drivers are multifactorial, and as we cannot logistically or ethically conduct trials, we have to rely on observational study designs and constructing statistical models to identify possible causal pathways. This is challenging as it is difficult to measure some of these such as housing occupancy, or structural inequality [KK/15 – INQ000223032].

2.24. The uncertainty this created limited the amount of advice SAGE was able to give on this topic, and SAGE noted that the quality and granularity of data was an issue [KK/24 – INQ000223042].

2.25. In order to rectify this, efforts were made via both PHE and our team to retroactively collect data on Covid-19 disparities through national and ONS datasets [KK/6 – INQ000223072].

2.26. I cannot comment on how or indeed whether this impacted upon the ability of core decision-makers to respond to the pandemic or to Covid-19, as I was not a party to the core decision-making process. It has been put to me that there may have been a broader failure of UK government agencies to address structural racism and inequalities in healthcare. It is difficult to opine on this due to the complexity of the issues and the inherent difficulties accessing and interrogating relevant data. Inequalities may have been structural but this is impossible to quantify. Furthermore the factors at work, such as housing, occupations, working conditions and socioeconomic issues are all interrelated.

2.27. I have been asked to set out whether core decision-makers made any specific policy decisions based on limited data on Covid-19 disparities. I am not aware of any policy decisions that were made on the basis of data on Covid-19 disparities, limited or otherwise, but that is not necessarily to say that such policy decisions were not taken. I do not have knowledge of the basis on which decisions were made since, as a member of SAGE, I only ever provided advice and was not a party to decision-making.

SAGE and its subgroups

2.28. As Chair of the SAGE ethnicity subgroup I attended every SAGE meeting and all contributions from the subgroup would be reported and minuted, so to that extent the suggestions of the subgroup were consistently incorporated into SAGE outputs. This would also be the case for other subgroups, who would also collaborate to produce materials for consideration by SAGE.

2.29. The consistently high quality of such materials speaks to the effectiveness of the working arrangements within and between SAGE subgroups and its structure, which also allowed it to adapt in the face of an evolving situation.

2.30. I understand there has been a suggestion that the work of SAGE and its subgroups was not sufficiently challenged, and/or that there may have been an element of 'groupthink'. As Chair of the SAGE Ethnicity subgroup I was responsible for moderating discussion and, by extension, encouraging dissenting voices. There were also members of the subgroup who were not members of the main SAGE group who were able to offer their own perspective. As for SAGE itself, I observed a plurality of views and perspectives and indeed was myself subject to challenge about my findings.

2.31. As regards the composition of SAGE and its subgroups, a balance must inevitably be struck between, on the one hand, ensuring a plurality of perspectives in terms of academic discipline, background, front line input, nationality and ethnicity and, on the other, ensuring these groups do not become so large as to be unmanageable. As Chair of the SAGE Ethnicity subgroup I tried to strike this balance for the subgroup. As I noted at paragraph 2.30 there was a mix of views and perspectives/ SAGE itself was composed of a good mix of experts in their field, all subgroups fed into SAGE and these subgroups had the flexibility bring in individuals who were not members of SAGE as and when the need arose.

2.32. SAGE provides its advice on the basis of consensus arrived at among its members. It is difficult to appraise the strengths of weaknesses of this approach without a clear alternative, however I would observe that SAGE consistently provided high-quality advice and its members worked exceptionally hard to produce this advice so the approach would seem to be an effective one.

2.33. SAGE was provided with a secretariat through GO-Science. The secretariat was fantastic and provided us with whatever we needed whenever we needed it. Additional researchers would also have been helpful.

2.34. It has been put to me that it was common for SAGE scientists to publicly express views dissenting from SAGE's consensus advice. I am not aware of how common this was, and I do not have a view about its appropriateness per se. People are entitled to their opinions, and I wouldn't necessarily object to their being expressed publicly provided those are expressed as being personal to the individual in question and not being made on behalf of SAGE.

2.35. I set out some further recommendations below.

Recommendations

2.36. I have noted elsewhere issues and obstacles that emerged particularly in relation to data the limitations on research that can be carried out. There were things that worked well, however. The UK developed world class data architecture through linkage of platforms such as ONS, Open Safely, ISARIC, PHOSP, BHF etc. via trusted research environments. Furthermore, I noted at paragraph 2.19 that TTI was not implemented well in the early stages of the pandemic; however, eventually it was rolled out well and it was extremely easy for whoever wanted one to obtain a test. I am currently investigating whether there may have been potential disparities in relation to access to testing for certain groups but preliminary findings suggest outcomes were not worse for these groups in that respect.

2.37. I have been asked what lessons can be learned from any challenges encountered in relation to data and for my suggestions as to how to improve the sharing of information and data, though as set out above at paragraph 2.23 I do not regard the sharing of data to have been a problem. But the quality of data and how they were collected has been an issue for some of the projects.

2.38. That said, we really need to invest in maintaining and further developing the data architecture referred to at paragraph 2.36 in future to help improve future pandemic

response efforts and the UK's science-policy advisory mechanisms more generally.

2.39. We also need to have better collection of ethnicity data in routine databases, ensuring consistency in complete recording at the higher level ethnicity coding and to train staff appropriately to collect these data.

2.40. Furthermore, we can improve data sharing through national agencies and cross-government departments. We ran online workshop sessions on some pertinent topics such as possible reasons for increased risk and vaccine hesitancy. I would encourage such collaborative events in future.

2.41. I would also make the following more general recommendations on ethnic health disparities by way of lessons learned from the pandemic and my work in this area more generally:

(1) From a national expert working group to address educational inequalities related to the pandemic (and pre-existing socially graded educational inequalities).

(2) Address educational inequalities: fund catch-up tuition/increased loan of laptops and other school equipment.

(3) Tackle food poverty: extend free school meal provision, increase funding for food banks.

(4) Tackle unemployment.

(5) Policy level intervention to reduce the high level of precarious or lower quality employment in ethnic minority communities.

(6) Ethnic minority-specific national strategy should be developed to identify and remove barriers that constrain entry to higher income occupations; address bias in the recruitment process, and in promotion and pay decisions; report on income and employment inequalities by ethnicity; and provide clear career pathways and development opportunities.

(7) To protect the most vulnerable members of society, many of whom are ethnic minorities, the government should ensure Universal Credit, benefit systems and housing allowances adequately provide for the most vulnerable families and their needs.

(8) For disadvantaged communities and ethnic minority populations there is a need for increased investment in new and existing affordable housing and social housing, as well as improvements in health and social care screening for chronic conditions and multiple long-term conditions as I have set out in a previous report [KK/22 – INQ000223040].

3. Long Covid

3.1. I am the Chair of the National Long Covid Research Working Group (the "**RWG**") which was formed at the request of the Chief Medical Officer (the "**CMO**"), via an email received on March 6th 2021. The group first met on Thursday 11th March 2021, and continues to meet as of the date of this statement. Core membership includes representatives from 9 major Long Covid epidemiological studies in the UK:

(1) the post-hospitalisation Covid-19 study ("**PHOSP-COVID**") (NR NR),

(2) Therapies for Long Covid (the TLC study) (Name Redacted)

(3) National Core Studies and CONVALESCENCE (Name Redacted)

(4) Children and young people with Long Covid (the CLoCk study) (NR Name Redacted Name Redacted)

(5) Symptoms, Trajectory, Inequalitites and Management: Understanding Long COVID to Address and Transform Existing Integrated Care Pathways (STIMULATE-ICP) (Name Redacted)

(6) OpenPROMPT (Name Redacted)

(7) ONS Coronavirus Infection Survey (CIS) (Name Redacted)

(8) Real-time Assessment of Community Transmission (REACT) (NR NR)

(9) Additional members include Name Redacted and Name Redacted who assist with the coordination of the group and arising scientific papers.

(10) Other members who have attended on an ad-hoc basis include Prof Chris Brightling, Prof Sir Ian Diamond, Name Redacted, Prof Nishi Chaturvedi, Name Redacted, NR and NR

3.2. As Chair I convene the meeting and feedback group discussions to the CMO. The aim of the group is to share and discuss key findings from the various study groups, discuss methodologies for conducting these studies and promote rapid knowledge exchange and efficient, timely research. It does not provide policy advice and is not a SAGE subgroup. The group have published three scientific papers, including a systematic review of the long-term health effects of Long Covid [KK/30 – INQ000223050, KK/31 – INQ000236612, KK/32 – INQ000223052].

3.3. There was no formal relationship between the Long Covid RWG and the Secretary of State for the Department of Health and Social Care's Long-Covid Task Force or the Long Covid Oversight Board. Prof Chris Brightling and **NR** are members of the RWG and Chief Investigator and Lead Co-Investigator of PHOSP-COVID. I have been asked to comment on what worked well and what did not, along with any challenges faced, with respect to the relationships between the RWG and the other Long Covid initiatives. This is difficult to answer as there was no formal relationship, however the RWG itself is succeeding in its key aims as set out in paragraph 3.2 due to our ability to share data between researchers, our willingness to learn from methodologies and the collaborative approach between different researchers. There are challenges innate to the subject matter such as the lack of an objective biomarker for Long Covid and the significant number of reported symptoms, but the members of the RWG are learning together and producing high-quality outputs.

3.4. Awareness on the risk of long-term health effects from Covid-19 began to become apparent in the UK throughout late Spring and early Summer 2020, with various anecdotal reports of persistent symptoms published in the mainstream media and peer-reviewed scientific publications. This awareness led to efforts to study the longer-term effects of the disease. In July 2020 PHOSP-COVID secured £8.4 million from UK Research and Innovation ("**UKRI**"), to understand and improve long-term outcomes for people who survive hospitalisation with Covid-19 [KK/33 – INQ000223053].

3.5. By August 2020, understanding was sufficient for guidance on management of "post-acute Covid" (as the longer-term effects of Covid-19 were then termed) to be published in the British Medical Journal [KK/34 – INQ000223054].

3.6. Further research was commissioned when NIHR launched two UK calls for work on long-term physical and mental health effects of Covid-19 in November 2020 and March 2021. In October 2020 NIHR published a living review on the evidence on persistent Covid-19 symptoms, and the first systematic review on the topic was published as a pre-print in May 2021 [KK/35 – INQ000223055].

3.7. In terms of definitions, NICE published definitions on the long-term effects of Covid-19 in December 2020, the Centre for Disease Control and Prevention in the United States in July 2021, and the WHO a clinical case definition in December 2021.

3.8. In July 2021 SAGE requested members of the RWG to produce a report on Long Covid to answer key questions including on definitions, prevalence, demographics, vaccination, and risk factors and this was considered at SAGE 94 on 22 July 2021 [KK/36 – INQ000223056]. No recommendations were made as it was far too early to do so given the level of uncertainty surrounding it, which is noted in the minutes. Indeed, even today little is understood about Long Covid, particularly the mechanisms and disease trajectories.

3.9. While post-viral syndromes following other acute infections have been documented, the wider understanding of these syndromes were not and are not well understood by the medical and scientific community. Long Covid is a new condition which like other post-viral syndromes does not have an objective biomarker, instead relying on self-report and subjective symptom reporting making the formation of a diagnostic definition difficult. There are more than 50 symptoms reported in the scientific literature.

3.10. I am not aware of how the risk of Long Covid altered or impacted SAGE's approach, but data on Long Covid was presented to SAGE [KK/36 – INQ000223056]. As I pointed out at paragraph 3.8, it would have been difficult to make any recommendations given the level of uncertainty surrounding Long Covid.

3.11. Similarly, I am not aware of what, if any, advice and briefings may have been provided to core decision-makers on the impact of any emergency response measures might be on those suffering from Long Covid.

3.12. Population prevalence data were collected in representative community surveys from 2020 via the Covid-19 infection survey (CIS) and the REACT study from 2021, which was expanded to study Long Covid (REACT-LC) in February 2021. Data on

Long Covid were not available for the first few months of the pandemic as Long Covid had not yet been identified, and therefore nobody was collecting data on it.

3.13. The Long Covid RWG encompasses 9 major UK epidemiological studies, as described above, and these have published a large volume of data related to Long Covid. The RWG have separately collaborated on three papers, which are detailed above. It was not involved in any assessment of how emergency response measures, including Non-Pharmaceutical Interventions would impact on long-term health effects. It is possible that one of the SAGE subgroups considered this, but I am not aware that they did.

3.14. In July 2021 SAGE requested members of the RWG to produce a report on Long Covid to answer key questions including on definitions, prevalence, demographics, vaccination, and risk factors [KK/36 – INQ000223056].

3.15. I have also authored/co-authored a number of papers relating to Long Covid [KK/37 – INQ000223051, KK/38 – INQ000223058, KK/39 – INQ000223059, KK/40 – INQ00023061, KK/41 – INQ000223062, KK/42 – INQ000223063, KK/43 – INQ000223064, KK/44 – INQ000223065, KK/45 – INQ000223066, KK/46 – INQ000223067, KK/47 – INQ000223068, KK/48 **- INQ000223069,** KK/49 – INQ000223070].

3.16. I have been asked to comment on the extent to which the understanding of SAGE and the RWG of Long Covid fed into core decision making, however I am not aware that it was. The RWG did not provide advice to the UK Government, and policy advice is not among its aims as set out in paragraph 3.2.

3.17. All minutes from the RWG meetings were sent to the CMO. As noted above at paragraph 3.10, data on Long Covid was presented to SAGE.

3.18. Further work is required on the mechanisms underlying Long Covid, to be able to inform treatment and care. Further work is also required to support primary care with the knowledge and skills to be able to manage patients with a complex new condition such as Long Covid. Greater investment in specialist Long Covid clinics is warranted in future, and collection of symptom data on representative community samples should be conducted from the outset of any future viral pandemics, to be able to gauge longer-term effects.

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

Dated: 14th August, 2023