Witness Name:
Martin McKee
Statement No.: 3
Exhibits:
Dated: 29th
December 2024

**UK COVID-19 INQUIRY**

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**WITNESS STATEMENT OF MARTIN MCKEE**

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I, Martin McKee, will say as follows: -

**Qualifications, career history, professional expertise and major publications relative to TTI.**

1. My relevant qualifications are as follows: MB BCh BAO Queen's University of Belfast 1979; MRCP (UK) 1982; MSc in Community Medicine, University of London 1986; MFPH 1988; Specialist accreditation in community medicine May 1989; MD 1990; DSc 2006

2. Regarding my career history, my main post is Professor of European Public Health at the London School of Hygiene and Tropical Medicine (LSHTM) (which I have held since 1997). I was previously a senior lecturer and later reader at LSHTM 1990-1997 and held training posts in internal and public health medicine before that. My other current roles are as an Honorary Consultant at University College London Hospital NHS Trust and as a Research Director at the European Observatory on Health Systems and Policies (a partnership posted by WHO). During the relevant period covered by Module 7, I was the Medical Director at LSHTM (2014-2024), a member of the EU Expert Panel on Effective Ways of Investing in Health (2013-2022), and President of the British Medical Association (July 2022 – July 2023).

3. Regarding my professional expertise, I trained in internal medicine and public health medicine. Since 1990, I have led a major work programme on the health impact of large-scale social, economic, and political change. This began with the collapse of communism in Europe and continued with the 2008 global financial

crisis and then the COVID-19 pandemic. I have also made major contributions to health systems research, including (with Ellen Nolte) developing the measure of avoidable mortality used by the Global Burden of Disease study, OECD, and the Commonwealth Fund in the US, among others. As I research complex topics, my work is transdisciplinary, integrating different perspectives and using multiple methods. I have published over 1,500 papers in peer-reviewed journals and am in the top 1% of scientists worldwide measured by citations (Clarviate). My contributions have been recognised by, among others, a CBE, seven honorary doctorates, election to the UK Academy of Medical Sciences, Academia Europaea, and the US National Academy of Medicine, and honorary fellowships of the UK Faculty of Public Health, Royal College of General Practitioners, and Royal Society of Medicine.

4. During the pandemic. I was a member of Independent SAGE and, as a member of the EU Expert Panel on Effective Ways of Investing in Health, have contributed to a series of reports for the European Commission. These include reports on the resilience of health systems, protecting the mental health of health workers during the pandemic, and public procurement (which included a major section on procurement during the pandemic), on which I was the co-rapporteur. In my role as Research Director of the European Observatory, I was jointly responsible for the COVID-19 Health System Response Monitor Exhibit MMK/01 [INQ000574996] (https://eurohealthobservatory.who.int/monitors/hsrm/), a resource that has collated information on national responses to COVID-19, run in partnership with WHO and the European Commission. As health adviser to the WHO Regional Director for Europe, I served as a member and chair of the Scientific Advisory Committee of the Pan-European Commission on Health and Sustainable Development in the Light of the Pandemic, chaired by Professor Mario Monti. In that role, I drafted the report and wrote the evidence review that underpinned it.

5. My publications that relate to test, trace, and isolate (TTI) in the UK are as follows:

    a. Chung SC, Marlow S, Tobias N, Alogna A, Alogna I, You SL, Khunti K, McKee M, Michie S, Pillay D. Lessons from countries implementing find, test, trace, isolation and support policies in the rapid response of the COVID-19 pandemic: a systematic review. BMJ Open. 2021; 11(7):e047832. Exhibit MMK/02 [INQ000535919]

b. Crozier A, Rajan S, Buchan I, McKee M. Put to the test: use of rapid testing technologies for covid-19. BMJ. 2021 Feb 3;372:n208. doi: 10.1136/bmj.n208. PMID: 33536228. Exhibit MMK/03 [INQ000488611]

c. Rajan S, D Cylus J, Mckee M. What must countries do to implement effective 'find, test, trace, isolate and support' systems? J R Soc Med. 2020 Jul;113(7):245-250. Exhibit MMK/04 [INQ00053917]

d. Crozier A, Rajan S, McKee M. Fixing England's COVID-19 response: learning from international experience. J Roy Soc Med 2020; 113: 422-427 Exhibit MMK/05 [INQ000535928]

6. In addition, I have co-authored several papers that describe the COVID-19 response in other countries and which discuss TTI policies that they adopted:

a. Boccia S, Ricciardi W, McKee M, Cascini F. How the Italian NHS is fighting against the COVID-19 emergency. Frontiers Public Health 2020; 8: 167 Exhibit MMK/06 [INQ000535929]

b. Legido-Quigley H, Mateos-Garcia JT, Regulez Campos V, Gea-Sanchez M, Muntaner C, McKee M. The resilience of the Spanish health system against the COVID-19 pandemic. Lancet Publ Health 2020: 5: e251-e252167 Exhibit MMK/07 [INQ000535934]

c. Han E, Chiou ST, McKee M, Legido-Quigley H. The resilience of Taiwan's health system to address the COVID-19 pandemic. EClinicalMedicine. 2020 Jun 27:100437. Exhibit MMK/08 [INQ000535935]

d. Han E, Tan MMJ, Turk E, Sridhar D, Leung GM, Shibuya K, Asgari N, Oh J, García-Basteiro AL, Hanefeld J, Cook AR, Hsu LY, Teo YY, Heymann D, Clark H, McKee M, Legido-Quigley H. Lessons learnt from easing COVID-19 restrictions: an analysis of countries in Asia Pacific and Europe. Lancet 2020: 396: 1525-1534 Exhibit MMK/09 [INQ000151267]

e. Rajan S, McKee M, Hernández-Quevedo C, Karanikolos M, Richardson E, Webb E, Cylus J, What have European countries done to prevent the spread of COVID-19? Lessons from the COVID-19 Health System Response Monitor. Health Policy 2022; 126: 355–361 Exhibit MMK/10 [INQ000535918]

f. Lazarus JV, Karim SA, Abu Raddar LJ, Almeida G, Baptista Leite R, Barocas J, Barreto M, Bar-Yam Y, Bassat Q, Batista C, Bazilian M, Chiou S-T, del Rio C, Dore G, Gao G, Gostin LO, Hellard M, Jimenez JL, Kang C, Kopka C, Lee N, Matičič M, McKee M, Nsanzimana S, Oliu-Barton M, Pradelski B, Pyzik O, Rabin K, Raina S, Rashid S, Rathe M, Saenz R, Romero D, Singh S, Trock-Hempler M, Villapol S, Yap P, Binagwaho A, Kamarulzaman A, El-Mohandes A, on behalf of the COVID-19 Consensus Statement panel. A multinational Delphi consensus to end the COVID-19 public health threat. Nature 2022; 611: 332-345 Exhibit MMK/10a [INQ000130648]

g. De Foo C, Haldane V, Jung AS, Grépin KA, Wu S, Singh S, Perera N, Miranda JJ, McKee M, Legido-Quigley H. Isolation facilities for covid-19: towards a person centred approach. BMJ. 2022 Jul 26;378:e069558. Exhibit MMK/10b [INQ000574989]

7. Finally, I have written about aspects of TTI in several blogs for the British Medical Journal. One, "Will Boris Johnson's "Moonshot" become lost in space?" Exhibit MMK/11 [INQ000535931] published on 10th September 2020, expressed scepticism about the documents describing proposals for a Moonshot programme of mass testing. A second, published on 7th December 2020, asked: "Could Slovakia's mass testing programme work in England?" Exhibit MMK/12 [INQ000535939] This praised the Slovakian mass testing initiative, although with reservations about the rigour of evidence of its effectiveness. However, it highlighted several reasons that questioned whether its experience could be transferred to the UK. This was because of questions about the accuracy of data on the population in the UK, the scale of Slovakia's testing enterprise, and the sanctions imposed.

**My role as a member of Independent SAGE**

8. You asked me about my membership in SAGE. However, I was at no time a member. As noted above, I have been a member of Independent SAGE since its inception. Independent SAGE conducted 139 public briefings between May 2020 and December 2023. I participated in most of them. We produced 17 statements or reports that, in whole or in part, addressed aspects of TTI, all of which I contributed to in some way.

9. My involvement with Independent SAGE began on 3rd May 2020 when I was invited to participate in a public briefing chaired by Sir David King to be held the following day, on 4th May. I was told that the reason that I was asked was to provide an international perspective. In preparation for that live briefing, I was asked a series of questions: "How can testing and tracing be successfully achieved?"

10. My reply was, "This is a really good question. I think we have to be honest and accept that the 2012 NHS act seriously damaged the public health function, damage that was exacerbated by year-on-year cuts subsequently. There is real concern among public health departments and local government that they are being excluded from ongoing discussions. We actually have a lot to learn from African countries, and particularly those that have experienced Ebola. Local engagement is key. We need to look at how to support existing environmental health and public health departments and local government, basing our scale of activity on them. I strongly suspect that there was an acceptance within government that these functions have been weakened far too much. This may have explained why PHE reversed its earlier policy on tracing. There may have been a sense that it was just not going to be possible with the resources available."

11. Following the public briefing on 4th May 2020, it was decided that Independent SAGE would produce an initial report. I was asked for possible issues to include. In my response, I referred to TTI as follows: *"Can we take a whole systems approach to understanding tracking and tracing? See the attached papers on cancer screening. Also, see Chapter 3 in our recent book on immunisation in Europe.* https://eurohealthobservatory.who.int/publications/i/the-organization-and-delivery-of-vaccination-services-in-the-european-union-study Exhibit MMK/13 [INQ000474967] *Essentially, we are arguing for someone to map out all of the functions that need to be in place, from accurate population registers to quality control of tests, and with a particular focus on the boots on the ground, which I would argue will have to be in local authority public health and environmental health departments. Once you have all the functions listed and the ways in which they must connect and coordinate, you can start to populate your diagram with organisations that can do them. Inevitably, you will find that the Deloittes of this world don't feature very prominently".* The attached papers I referred to were Turnbull E, Priaulx J, de Kok IMCM, Lansdorp-Vogelaar I, Anttila A, Sarkeala T,

Senore C, Segnan N, Csanádi M, Pitter J, Novak Mlakar D, Ivanus U, Veerus P, de Koning HJ, McKee M. Results of a health systems approach to identify barriers to population-based cervical and colorectal cancer screening programmes in six European countries. Health Policy. 2018 Nov;122(11):1206-1211. Exhibit MMK/14 [INQ000535900] Turnbull E, Priaulx J, van Ravesteyn NT, Heinävaara S, Siljander I, Senore C, Segnan N, Vokó Z, Hagymásy J, Jarm K, Veerus P, de Koning HJ, McKee M. A health systems approach to identifying barriers to breast cancer screening programmes. Methodology and application in six European countries. Health Policy. 2018 Nov;122(11):1198-1205. Exhibit MMK/14a [INQ000474978]

12. I subsequently developed these points in a Blog written for the British Medical Journal Exhibit MMK/15 [INQ000535902] and published on 6th May. The relevant section is as follows: *"Finally, what system will be put in place to get us out of the lockdown? Commentators accept that much more will be needed than organisations to manage testing or contact tracing. But what? So far, the government's approach has been to rely on centralised initiatives, handing testing to an accountancy firm and now, it is rumoured, contact tracing to an outsourcing company. This is the approach that has been tried and has failed over many decades in poorer countries. Accounts of the failures of the testing programme* Exhibit MMK/16 [INQ000535901] *should have been no surprise. But this is not all that we can learn from poorer countries, especially those that have confronted Ebola. Despite their lack of resources, some, such as Rwanda* Exhibit MMK/17 [INQ000535903] *, seem to be responding effectively to the pandemic as they have well trained local infection control teams in place, embedded in and with the trust of the communities they serve. Trust is too often undervalued. It is not encouraged by giving contracts to companies mired in controversy* Exhibit MMK/18 [INQ000535904]. *The least the government can do is to provide a diagram setting out all the functions needed to implement a test, trace, and isolate strategy and then overlay it with every organisation necessary to make it happen, with clear lines of communication and accountability. If this does not include a strong role for local government and, especially, its public and environmental health departments, it will fail. "*

13. In the following sections, I will summarise the most important reports, statements, and position papers that we published that relate to TTI. On 12th May 2020, Independent SAGE published its first report, "COVID-19: what are the options for

the UK? Recommendations for government based on an open and transparent examination of the scientific evidence" Exhibit MMK/19 [INQ000249693] . The report had undergone multiple edits within the group, and I took responsibility for the final edits. It included a 3-page "Test, Trace, Isolate, Support, Integrate" section. This section expressed several concerns. We were concerned about the lack of testing capacity, fragmentation of the testing and tracing regime, and a sense that testing was not seen as only one stage in a process. We also expressed concern about an apparent focus on the number of tests undertaken. On tracing, we expressed concern that the implemented systems bypassed local public health teams. On isolation, we questioned the shorter (7-day) recommendation in the UK compared to WHO's 14-day advice. On support, we expressed concern that many people would require help if they were to self-isolate, referencing an earlier paper that I had co-authored that, while fully endorsing the imposition of movement restrictions to interrupt disease transmission, set out in detail the many facets of life that would be affected and where support would be needed: Douglas M, Katikireddi SV, Taulbut M, McKee M, McCartney G. Mitigating the broader health effects of covid-19 pandemic response. BMJ 2020; 369: m1557 Exhibit MMK/20 [INQ000535905] . In addressing integration, we proposed that all systems involved should work together much more effectively. Finally, we argued for the importance of trust and questioned whether this would be helped by giving large contracts to organisations without experience in these areas.

14. On 11th September 2020, we published a report entitled "Testing for COVID-19: the why, the who and the how" Exhibit MMK/21 [INQ000249681]. In summary, we emphasised that controlling COVID-19, especially without widespread immunity, requires an integrated approach involving expanded testing, rapid contact tracing, and effective isolation measures. The goal is to achieve minimal transmission rates, thereby avoiding damaging lockdowns. Testing is seen as a comprehensive pathway that begins with identifying individuals for testing and leads to actionable public health interventions. We criticised the UK testing system, NHS Test and Trace (T&T), for focusing on volume rather than effectiveness.

15. We noted that testing has three core purposes: diagnosing symptomatic individuals, identifying infections in close contacts, and detecting community-level

transmission. These objectives aim to mitigate the spread of the virus, support clinical management, and inform public health interventions.

16. We discussed PCR tests, which are sensitive and critical for detecting viral genomes, and antigen tests, which detect virus components. Antibody tests, while helpful for identifying past infections, are less reliable over time due to declining antibody levels. We warned against overselling technologies like "immune passports" and emphasised the need for rigorous validation of new testing methods before implementation.

17. A key element of our critique was the reliance on private sector contracts for testing expansion and the exclusion of existing public health infrastructures. We argued that this had created inefficiencies and disconnections in data and operational flows. Furthermore, we deemed ambitious plans like the "Moonshot" initiative for mass population testing overly costly and poorly justified.

18. We outlined practical recommendations for improvement, including integrating testing within NHS frameworks, strengthening support for isolation, and ensuring public trust through transparent communication. Testing must be accessible, with clear pathways leading to clinical or public health interventions. We advocated measures to ensure rapid results, with local engagement and innovative approaches, such as sewage testing for early community detection.

19. Lastly, we highlighted the importance of human behaviour in achieving success. Clear communication, destigmatisation, and support for affected individuals are essential to foster participation and compliance. Testing, while pivotal, must be part of a broader strategy involving behavioural changes, social distancing, and other public health measures.

20. On 16th October 2020, we published a report entitled " Emergency Plan for stopping the spread of COVID-19 in England" Exhibit MMK/22 [INQ000535908]. In summary, we proposed a short "circuit breaker" lockdown of two to three weeks, mirroring late May 2020 restrictions, to rapidly lower transmission rates. Key measures include closing schools during the half-term break, banning indoor household mixing, shutting down non-essential businesses, and mandating remote work. Alongside these restrictions, we advocated financial support akin to the original furlough scheme to mitigate economic and social impacts.

21. Simultaneously, we called for major reforms to the testing and tracing infrastructure. We argued for restructuring testing logistics, enhancing contact tracing, and providing comprehensive support for those in isolation. What we termed a Find, Test, Trace, Isolate, and Support (FTTIS) system was envisioned as the cornerstone for controlling outbreaks, with local teams equipped to identify and respond to hotspots swiftly. We argued that testing must be accessible, tracing rapid and thorough, and support systems robust enough to ensure compliance with isolation guidelines.

22. We emphasised the need for clear communication, with a reset of government messaging to explain the necessity of COVID-19 measures, foster public cooperation, and avoid blame. Once again, we recommended engaging local authorities and organisations in crafting and delivering messages to build trust and compliance. We saw our proposed FTTIS approach as key to controlling infections while opening society up.

23. On 14th January 2021, we published a report entitled "Halting geographic spread of COVID-19" Exhibit MMK/23 [INQ000535909]. While not primarily about TTI, this report contained some relevant material. We stressed the critical role of controlling travel to prevent the importation of new COVID-19 cases. We noted that the UK had relied heavily on voluntary self-isolation for incoming travellers, which may not be sufficient to prevent the spread of the virus, including new variants. This implied a need for more robust case finding and testing at borders to identify and isolate cases before they spread within the community. Within communities, we suggested limiting interpersonal interactions, indirectly supporting case-finding and tracing efforts by reducing potential transmission opportunities. We also mentioned the need for local authorities to have the power to enforce travel restrictions and allocate resources during localised outbreaks, which would aid in tracing contacts and controlling the spread of the virus. We then acknowledged the challenge posed by asymptomatic individuals who can unknowingly carry and spread the virus. This underscored the importance of widespread testing and effective tracing to identify and isolate these cases, even when symptoms are absent. Finally, we argued that new variants have highlighted gaps in the UK's response, particularly regarding international travel. We called for a comprehensive border control policy, which would likely include enhanced testing and tracing measures to prevent the introduction and spread of new variants. Thus, while this report did not provide detailed strategies for case

finding, testing, and tracing, it emphasised the importance of these processes in conjunction with travel restrictions and community measures to control the spread of COVID-19.

24. On 16th October 2020, we published a report entitled "Blueprint to achieve an excellent Find, Test, Trace, Isolate and Support System" Exhibit MMK/24 [INQ000145926]. In this paper, we critically evaluated the TTI system in England, identifying significant shortcomings that necessitated urgent reform. We argued that it was failing, leading to repeated lockdowns and severe economic disruptions. In contrast, countries like South Korea suppressed the virus with minimal financial damage, demonstrating the potential benefits of a well-functioning system.

25. We emphasised the need for a system rooted in local communities, integrated with the NHS, and led by local Directors of Public Health. We argued that the current private sector-run 'NHS' Test and Trace system should be replaced with a more effective model that leverages local knowledge and resources. We were aware of the actions taken by the Director of Public Health in Leicester Exhibit MMK/24a [INQ000574992], subsequently emulated by his counterpart in Sandwell and others, that had proven very successful in overcoming the significant weaknesses in the national system. We called for establishing a national COVID testing consortium under NHS oversight to enhance laboratory capacity.

26. We argued for backward contact tracing as a promising approach to improve the system's effectiveness. By identifying clusters from super-spreaders, backward tracing could potentially double the effectiveness of the NHS Test and Trace system. This method focuses on linking new cases to the events or places where they were initially infected, thereby identifying and isolating clusters of infections. Once again, we stressed the importance of supported isolation, suggesting that self-isolation should be replaced with a system that provides financial and domestic assistance to those in need. This approach would ensure that individuals can effectively isolate without facing undue hardship. As we had done previously, we also underscored the importance of public engagement and the role of local networks in raising awareness about the programme's benefits. We drew attention to public disengagement, which stemmed from confusion, distrust, and language barriers, and we advocated for a collaborative approach involving community organisations to co-create solutions acceptable to diverse groups

within society. Overall, we called for a comprehensive reform of the FTTIS system, emphasising the need for local integration, backward tracing, supported isolation, and community engagement.

27. On 30th October 2020, we followed up on the previous report with a statement entitled "Statement on the Management of NHS Test and Trace" Exhibit MMK/25 [INQ000535911]. We said that NHS Test and Trace was failing and referred to concerns expressed at a high level, including a call for a leadership change. We reiterated our call for a major change along the lines that we had proposed earlier that month.

28. On 22nd March 2021, we published a position paper entitled "Why supported isolation is crucial to break community transmission" Exhibit MMK/26 [INQ000535912]. In that report, we again emphasised the critical role of case finding, testing, and tracing in controlling the spread of infections. We highlighted that the effectiveness of these measures depended significantly on the speed and efficiency with which they were implemented. We noted that individuals suspected of being infected or exposed to the virus must be tested promptly, with results delivered within 24 hours. This rapid turnaround ensured that those who tested positive could begin isolation immediately, reducing the risk of further transmission.

29. Our analysis underscored the importance of both forward and backward tracing. Forward tracing involved identifying individuals whom a confirmed case might have infected, while backward tracing focused on determining who might have transmitted the infection to the confirmed case. Both approaches were crucial for a comprehensive tracing strategy. We observed that the success of testing and tracing efforts was contingent upon the effective isolation of positive cases and their close contacts. However, fewer than 30% of those required to isolate adhered fully to the guidelines. This lack of adherence was partly attributed to inadequate financial support, as individuals with lower incomes or savings were less likely to self-isolate effectively.

30. We also highlighted the need for ministers to focus not just on the number of tests conducted but also on the speed of reporting results, the completeness of tracing efforts, and the effectiveness of isolation measures. We pointed out that countries with low death rates had successfully implemented these strategies. I drew upon the work I had been undertaking with colleagues elsewhere to highlight

international examples, such as South Korea and China, where rapid testing, efficient tracing, and comprehensive support for isolation, including financial aid and employment protection, were implemented successfully.

31. On 3rd June 2021, we published a report entitled "From managed to support quarantine: the current system in the UK & key questions for the future" Exhibit MMK/27 [INQ000535913]. In summary, we argued for a managed quarantine system to prevent the importation of Covid-19 cases from overseas. Rather than the then-current system, which only required testing of those from "red list" countries, we argued that all returning travellers should be required to take two COVID-19 tests on the second and eighth day after arrival. This testing protocol would be part of the managed quarantine system and crucial for identifying and isolating positive cases to prevent further transmission. We identified several challenges in the implementation of the quarantine and testing system. These included issues related to the cost and organisation of the system and the standards of accommodation and support for those in quarantine. We also expressed concerns about the training and support for staff working in quarantine facilities and the cleanliness and infection control measures in place. We noted that the costs associated with managed quarantine and testing were significant, and we called for a fee waiver for those on low incomes returning for essential purposes. We noted that while there was an alternative payment scheme, it only deferred payment rather than reducing it, which could be a barrier for some travellers.

32. On June 18th 2021, we published a report entitled "Continuing need for support measures" Exhibit MMK/28 [INQ000535914]. We covered much of the same ground as in earlier reports. Once again, we emphasised the critical role of case finding, testing, and tracing in managing the spread of COVID-19. We highlighted the necessity for continuous support measures to ensure these processes were effective. We urged the government to maintain support systems even after the formal restrictions were lifted, as these were essential for sustaining public health behaviours that were being encouraged, such as getting tested and vaccinated.

33. While important, we noted that the emphasis on personal responsibility could not replace the need for governmental support. The public was encouraged to get tested twice a week for free, which was a part of the broader strategy to identify and isolate cases promptly. This approach was crucial in preventing further transmission of the virus. We also discussed the importance of providing

resources to facilitate testing and self-isolation. For instance, full pay for parents who needed to self-isolate due to their children being affected was suggested, as well as funding for local mutual aid groups that played a key role in supporting those in isolation. This support was vital because one's financial situation and access to resources often influenced the ability to adhere to testing and isolation guidelines.

34. We addressed the need for vaccination centres to be accessible, with extended hours and provisions for paid time off work for vaccination and recovery from its effects. This was part of a comprehensive strategy to ensure a robust vaccination campaign complemented by testing and tracing efforts. In summary, we underscored that while individual responsibility was important, the government must provide the necessary support systems to enable effective case finding, testing, and tracing. We argued that this dual approach was essential to manage the pandemic effectively and prevent future outbreaks.

35. On 22nd October 2021, we issued a statement entitled "Statement on COVID-19 testing at Immensa Health Clinic (Dante Laboratories)" Exhibit MMK/29 [INQ000535915]. We began by noting that we had previously expressed concerns about outsourcing the TTI programme despite the availability of NHS, public health, veterinary, and academic laboratories. Here, we documented the series of events and issues surrounding the failure of the Immensa Health Clinic laboratory. We highlighted several critical areas that required attention and action.

36. First, we scrutinised the role of the UK Health Security Agency (UKHSA) in awarding and monitoring outsourced laboratory contracts. We noted that the UKHSA had a significant role in these processes, yet gaps in oversight and quality assurance contributed to the laboratory failure. We detailed the clinical, public health, and governance responses to the laboratory failure. We emphasised the potential need for retesting original stored samples and enhancing surveillance in affected communities to mitigate the impact of the erroneous test results. We expressed serious concern about the contradiction between the UKHSA's announcement of the laboratory's accreditation and the UK Accreditation Service's (UKAS) statement, which revealed that the lab was not fully accredited. This discrepancy underscored the need for transparency and rigorous quality assurance processes. We also addressed the broader context of COVID-19 testing in the UK, criticising the outsourcing approach that bypassed

regular evaluation and due diligence procedures. We argued that the existing network of NHS, public health, and academic laboratories could have provided high-quality testing within an integrated, cost-effective framework.

37. We included a timeline of the incident, noting that the UKHSA took approximately five weeks to halt testing at the Immensa Health Clinic after the problem began. This delay resulted in an estimated 43,000 people receiving incorrect negative test results, potentially contributing to a surge in infections in the Southwest of England. Finally, we made recommendations for urgent actions, including the rapid publication of the UKHSA review process, the decision-making process for awarding the contract to Immensa, and the original contract details, including oversight of quality and accreditation. In summary, we called for reconsidering the COVID testing environment. We emphasised the need for improved quality assurance and integration with local public health structures to prevent similar incidents in the future.

38. Finally, on 18th February 2022, we issued an "Ending of free tests statement" Exhibit MMK/29a [INQ000574991]. We aligned with NHS leaders who strongly opposed the Government's reported decision to end free COVID-19 tests and financial support for self-isolation in England. While we were initially sceptical about lateral flow tests due to inadequate financial backing for isolation, combining these tests with PCR testing likely helped mitigate infection peaks.

39. We had several reasons to express concern. We warned of increased risks of COVID-19 spread, especially with Omicron and potential new variants, which could lead to heightened illness, deaths, NHS strain, and the emergence of new variants. Vulnerable and disadvantaged groups, including those in public-facing jobs, would be disproportionately affected, with reduced ability to isolate safely and a higher likelihood of exposure. We also highlighted the loss of critical benefits of lateral flow tests, including reassurance for safe social interactions, the ability to confirm infections and self-isolate, and the ability to determine when someone is no longer infectious. Removing free tests could hinder early diagnosis for administering antiviral treatments, limit access to extended COVID care, reduce the genetic sequencing of samples for variant tracking, and impair monitoring of the pandemic's progression. Additionally, we warned of exacerbated inequalities, as only those who can afford tests would maintain access, leaving low-income individuals without. Clinically vulnerable people would face increased challenges in safely engaging with society. We emphasised the

need for transparency, calling on the Government to immediately release the scientific evidence and risk assessments behind this decision. Finally, we urged devolved administrations to resist following suit until robust evidence of safety existed.

**My role as Co-Director of the European Observatory on Health Systems and Policies**

40. The European Observatory on Health Systems and Policies is a collaborative initiative that provides authoritative and comparative information on healthcare systems and policies across Europe. It is a partnership managed by the World Health Organisation. It includes universities (London School of Hygiene & Tropical Medicine and London School of Economics), international agencies (WHO and the European Commission), governments (Austria, Belgium, Finland, Ireland, Netherlands, Norway, Slovenia, Spain, Sweden, Switzerland, and the United Kingdom) and others (Health Foundation, Caisse Nationale de l'Assurance Maladie, Veneto Region). It was created in 1997, and I have been the Research Director and later Co-Director since then. Our primary aim is to support evidence-based decision-making by analysing healthcare systems, identifying challenges, and sharing solutions to improve health outcomes and system efficiency.

41. During the COVID-19 pandemic, we launched the COVID-19 Health System Response Monitor (HSRM) to track and analyse how European countries responded to the crisis. This tool collected real-time data on healthcare delivery, financing, governance, public health strategies, and vaccination efforts. By offering a centralised and comparative resource, the HSRM supported policymakers, researchers, and healthcare professionals in understanding the diverse approaches across countries and facilitated learning from best practices and lessons during the pandemic. In the Monitor, we published summaries of policies adopted and implemented in European countries. These were factual descriptions of legislation and guidelines. The first item on the United Kingdom page on testing was on 22nd September, with further updates until April 2021. Our comparator page https://eurohealthobservatory.who.int/monitors/hsrm/compare Exhibit MMK/30 [INQ000474969] allows users to select an issue, such as testing, and compare up to four countries at a time.

42. In addition, we published two papers that drew on the Monitor. One synthesised international experience and offered a framework for approaching TTI: Rajan S, D Cylus J, Mckee M. What must countries do to implement effective 'find, test, trace, isolate and support' systems? J R Soc Med. 2020 Jul;113(7):245-250 Exhibit MMK/04 [INQ000535917] . A second drew broader lessons: Rajan S, McKee M, Hernández-Quevedo C, Karanikolos M, Richardson E, Webb E, Cylus J, What have European countries done to prevent the spread of COVID-19? Lessons from the COVID-19 Health System Response Monitor. Health Policy 2022; 126: 355–361 Exhibit MMK/10 [INQ000535918] .

43. In the first paper, we asked what countries needed to do to implement effective 'find, test, trace, isolate, and support' systems during the COVID-19 pandemic. We identified several critical components. Countries that entered the pandemic with robust public health systems and governance structures were better positioned to manage the crisis. We illustrated our thinking with an image of the board game Snakes and Ladders. Those nations that could more effectively implement measures to enhance their ability to find, test, trace, isolate, and support cases, akin to landing on ladders, while avoiding setbacks due to insufficient capacity, which we likened to encountering snakes.

44. A key aspect of success was strengthening the laboratory's capacity to analyse samples and report results rapidly. This capability allowed for quick initiation of contact tracing, reducing the risk of further transmission. Countries like Belgium, Estonia, Iceland, Turkey, and Lithuania exemplified this approach by delivering test results within hours, thereby increasing the likelihood that suspected cases would agree to isolate while awaiting results.

45. Contact tracing requires a well-resourced public health infrastructure and a trained workforce. Despite the use of digital technologies, manual contact tracing remained essential. Countries with decentralised systems and a strong connection to local services were more successful in detecting clusters and complex outbreaks early. These included:

    a. South Korea, which used a highly digitalised approach, integrating GPS data, credit card transactions, and CCTV footage to trace contacts rapidly. It also combined manual contact tracing with digital tools to identify transmission chains quickly. Local health teams were

well-trained and engaged with the communities in which they were embedded.

b. Taiwan used integrated digital contact tracing, cross-referencing travel and health records. It contacted exposed individuals within hours and imposed strict isolation measures. Public trust and compliance were high due to clear communication and government transparency.

c. Germany relied on local public health teams rather than outsourcing, ensuring direct engagement with communities. It used retrospective (backward) tracing to find the original source of infections, which increased efficiency. It benefitted from decentralized public health structures coupled with strong central scientific expertise at the Robert Koch Institute.

d. New Zealand quickly scaled up manual contact tracing with trained personnel. It developed a national contact tracing app with high public uptake and provided financial support to encourage compliance with isolation.

e. Denmark delivered the highest number of tests per confirmed case in Europe.

f. Vietnam implemented aggressive contact tracing from the early stages of the pandemic. It used community health workers to trace contacts at all levels, combining door-to-door health checks with rapid isolation measures.

46. Supporting individuals in isolation was another critical component. Without adequate support, the risk of transmission increases. Many countries developed innovative measures to boost capacity rapidly. Still, the focus needed to remain on the outcomes of the find, test, trace, isolate, and support process rather than the sheer volume of activity. Delays at any stage could allow cases to spread undetected, emphasising the need for coordination, flexibility, and preparedness to exit lockdowns successfully. Ultimately, the success of these systems depended on having adequate capacity across various areas of the public health system. The resources required for each step were significant, and setbacks could occur at any stage. However, with careful planning and execution, some

countries were able to manage the pandemic effectively and minimise the risk of a second wave spiralling out of control. These included:

a. South Korea, which provided comprehensive support for people in isolation, including financial aid and employment protection. This ensured compliance and reduced transmission;

b. Taiwan, which used digital tracking to monitor compliance with isolation and provided social and financial support to those affected;

c. Germany and Belgium, which had strong sick leave policies that ensured financial protection, making it easier for individuals to isolate without economic hardship.

47. In the second paper on the European response to the COVID-19 pandemic, we identified several critical aspects of case finding, testing, and tracing. At the onset of the pandemic, most countries lacked the necessary testing capacity to identify and manage COVID-19 cases effectively. This deficiency was a significant barrier to controlling the spread of the virus. Initially, testing was primarily conducted using RT-PCR, which is considered the World Health Organization (WHO) gold standard for detecting the virus. However, as the pandemic progressed, rapid antigen tests became more widely available and were used to complement PCR testing. These tests offered the advantage of speed and lower cost, although they were less sensitive, especially when administered by inexperienced individuals. Integrating testing within a more extensive system was crucial for identifying cases and interrupting transmission. This system required several elements, including rigorous contact tracing and effective isolation of cases. Without these complementary measures, testing alone was insufficient to curb the spread of the virus.

48. As testing capacity increased, the scope of testing expanded. Initially, testing was limited to symptomatic travellers from high-risk areas and their contacts. Over time, as community spread became evident, testing criteria were broadened to include people with severe symptoms, healthcare workers, and eventually, other groups such as those in long-term care institutions and frontline workers. Despite the expansion of testing, challenges remained. The logistics of resourcing tests and training staff were time-consuming and resource-intensive. Additionally, there were concerns about the accessibility of rapid antigen tests for disadvantaged

groups, which could exacerbate existing inequalities. We concluded by arguing that while testing was a critical component of the public health response, it needed to be part of a comprehensive strategy that included contact tracing and support for isolation. This holistic approach was necessary to manage and prevent the spread of COVID-19 effectively.

**Advisor to the World Health Organisation Regional Office for Europe**

49. I have been an advisor to the Regional Director, Dr Hans Kluge, since he was elected in 2020. In this role, I have provided him with *ad hoc* advice on many topics, including COVID-19, but not specifically on the UK's TTI programme. At his request, I became a Commissioner at the Pan-European Commission on Health and Sustainable Development, chaired by Professor Mario Monti. I also chaired its Scientific Advisory Committee and drafted the Commission Report and an accompanying evidence review. Beyond briefly explaining the importance of testing and tracing, the report did not directly address TTI.

50. I did, however, note the emphasis placed on trust by a core participant during the Preliminary Hearing for this module so the Inquiry may be interested in the extensive work that I have undertaken on this topic with WHO and the European Observatory, in large part reflecting the prominence of this issue during the pandemic. This included a major conference held in Tallinn, Estonia, in December 2023 and a book that I co-authored entitled Trust, the Foundation of Health Systems Exhibit MMK/30c [INQ000574994].

**Membership of the European Commission's Expert Panel on Effective Ways of Investing in Health**

51. I served for three terms (i.e. throughout its entire life) as a Commission's Expert Panel member. One report, entitled "The organisation of resilient health and social care following the COVID-19 pandemic" Exhibit MMK/31 [INQ000535920], mentioned testing and tracing but only that it was an important part of any pandemic response. I was a member of the writing group on this report, which was also summarised in a paper in an academic journal: Rogers HL, Barros PP, Maeseneer JD, Lehtonen L, Lionis C, McKee M, Siciliani L, Stahl D, Zaletel J, Kringos D. Resilience Testing of Health Systems: How Can It Be Done? Int J Environ Res Public Health 2021, 18, 4742 Exhibit MMK/32 [INQ000535921]

52. A report on Public Procurement in Healthcare Systems Exhibit MMK/33 [INQ000535922], for which I was co-rapporteur, examined the application of the EU rules on procurement. While this report is relevant to the procurement of elements of TTI in the UK, which was subject to EU law, it did not deal with TTI specifically. The exception was a mention in a box on procurement failures, drawn from several member states, that cited the following example: *"The UK government was offered 2 million Coronavirus antibody tests by Chinese companies at a price of €18 million (Kirkpatrick and Bradley, 2020). The money had to be paid in advance and the UK government would have to arrange their collection. The Prime Minister described them as "as simple as a pregnancy test" and promised they would be a "game changer". However, when they arrived it was found that they did no work" (p67)*. However, other sections explored issues that applied to the COVID-19 response, such as *"the dramatic increase in demand for glassware, transport media, and reagents for testing for the presence of coronavirus. In this case, many of the challenges involved in procuring pharmaceuticals are similar. There is an additional, although related, issue of interoperability, where consumables design for one piece of equipment may not work with another"* (p50). A summary of the report was published in an academic journal: García-Altés A, McKee M. Siciliani L, Pita Barros P, Lehtonen L, Rogers H, Kringos D, Zaletel J, De Maeseneer J. Understanding public procurement within the health sector: a priority in a post-COVID-19 world. Health Econ Pol Law 2023; 18: 172–185 Exhibit MMK/33 [INQ000535922]

**Other contributions**

53. As noted above, I have co-authored several other papers relevant to TTI. The first is: Chung SC, Marlow S, Tobias N, Alogna A, Alogna I, You SL, Khunti K, McKee M, Michie S, Pillay D. Lessons from countries implementing find, test, trace, isolation and support policies in the rapid response of the COVID-19 pandemic: a systematic review. BMJ Open. 2021 Jun 29;11(7):e047832 . Exhibit MMK/02 [INQ000535919]

54. We aimed to systematically learn from the experiences of countries that implemented the find, test, trace, isolate, and support (FTTIS) strategies during the first wave of the COVID-19 pandemic. Our search spanned from May 2019 to January 2021, and we included studies published in English that evaluated contact tracing, testing, self-isolation, and quarantine measures. We identified

118 relevant studies that provided insights into the FTTIS strategies employed by various countries.

55. Our review highlighted several key components of an effective FTTIS system. We found that early border controls, restricted entry, and comprehensive case finding were crucial in reducing the spread of COVID-19. Repeated testing was necessary to minimise false-negative results, and pooled testing was recommended in resource-limited settings. The use of digital tools for contact tracing and self-isolation proved beneficial, although challenges in uptake and effectiveness were noted. Examples of particular good practice included Singapore and Austria, with early use of apps that capture proximity to other enabled mobile devices via Bluetooth to facilitate contact tracing, while South Korea, Taiwan, and Poland (as did the UK) used apps to record daily symptoms, while China implemented a Quick Response (QR) code system for entry or exit at key locations. South Korea linked digital databases, including electronic health records and phone-based GPS, to facilitate contact tracing, although this raised public concerns about data protection and privacy Additionally, support for individuals undergoing self-isolation or quarantine was essential to ensure public cooperation and adherence to regulations.

56. We observed that rapid testing strategies, including point-of-care testing and serologic assays, were implemented to confirm outbreaks and detect asymptomatic cases. The accuracy of testing was influenced by sampling methods and kit performance, necessitating repeated testing in some instances. Timely identification of contacts was critical to curbing transmission, and digital tools were employed to enhance the efficiency of contact tracing efforts. Mobile geopositioning data facilitated rapid contact identification, reducing the burden on health authorities for manual tracing.

57. We identified public cooperation as a vital factor in the success of FTTIS strategies. High public acceptability of contact tracing apps was observed, with trust playing a crucial role in their uptake. Legal frameworks were established to ensure non-discriminatory enforcement of quarantine measures, and financial support was provided to assist individuals and businesses during the pandemic. Open discussions on privacy and freedom were essential to foster public collaboration and adherence to FTTIS measures. We concluded that the core elements of an effective FTTIS system needed to interrupt the spread of COVID-

19 included border controls, repeated testing, and the use of digital tools for contact tracing.

58. Support for individuals in isolation was crucial for a comprehensive response. Here, we highlighted Singapore's proactive contact tracing and cluster identification, whereby the Ministry of Health collaborated with hotels to develop quarantine sites and used closed-circuit television footage to track cases. Singapore also provided financial support to individuals complying with self-isolation, offering US$100 per day to self-employed persons and businesses with employees undergoing self-isolation or quarantine. This was facilitated by Singapore's Infectious Diseases Act and Taiwan's Communicable Disease Control Act provided a legal basis for enforcing compliance with COVID-19 control measures. The second is: Crozier A, Rajan S, Buchan I, McKee M. Put to the test: use of rapid testing technologies for COVID-19. BMJ. 2021 Feb 3;372:n208. doi: 10.1136/bmj.n208. PMID: 33536228 Exhibit MMK/03 [INQ000488611]. In this paper, we considered the potential of rapid testing technologies to support different testing strategies, particularly in high-risk settings. We recognised the importance of accurately interpreting test results, which requires understanding the tests' sensitivity, specificity, and pre-test probability. We noted that technical issues during sample collection could lead to false results, especially false negatives, which are more likely when untrained individuals perform self-swabbing. While highly sensitive, PCR tests can detect viral shedding long after the infectious period, leading to unnecessary quarantines. Therefore, effective communication about test results and their implications is crucial for proper usage.

59. We argued that frequent testing was essential for detecting high viral shedding cases, particularly around the onset of symptoms. Lateral flow tests provide rapid results and could facilitate the timely isolation of infectious individuals. Although these tests were (at that time) believed to be less sensitive than PCR, they aligned with the viral shedding quantities observed during the first week of symptoms. We emphasised that test sensitivity is operator-dependent, and improvements in operating procedures and training can enhance the accuracy of lateral flow tests. We also examined different testing strategies, highlighting the need for system-wide practicalities, including accessibility and turnaround times, to guide test adoption and implementation. We discussed mass testing efforts in

countries like China and Slovakia, which successfully identified undetected cases but required significant resources.

60. We commended the SMART strategy (noting that one of the co-authors was involved in its design), implemented in Liverpool, that combined focused transmission reduction with specific testing schemes. This approach involved continuous monitoring of benefits and risks and adapting the program as needed. Testing in high-risk environments, such as workplaces, helped maintain essential services and reduce transmission. We stressed the importance of effective local engagement for large-scale testing initiatives.

61. We concluded that rapid tests could enable early detection and isolation of infectious individuals, but they must be integrated into broader transmission control strategies. A comprehensive program, co-created with communities, is essential for sustainable recovery from the COVID-19 pandemic. Integrating testing with effective contact tracing and support is crucial for managing the pandemic effectively.

62. The third is Crozier A, Rajan S, McKee M. Fixing England's COVID-19 response: learning from international experience. J Roy Soc Med 2020; 113: 422-427 Exhibit MMK/05 [INQ000535928] In that paper, we identified several critical areas for improvement, particularly in testing, tracing, and isolation strategies. Our focus was on learning from international experiences to enhance the effectiveness of these measures. Initially, testing in England was prioritised based on risk, primarily targeting symptomatic individuals. Regular asymptomatic testing for care home staff and residents began in July, but access to tests remained a challenge for many, with care home testing being unreliable until mid-August. Laboratories struggled to report results promptly, with less than 40% of tests returned the next day, leading to significant delays. This underreporting suggested that the actual number of new cases was much higher than reported, with estimates indicating around 9,600 new cases daily.

63. We recognised that all individuals, whether symptomatic, asymptomatic, or presymptomatic, could be infectious. However, the reverse transcriptase PCR tests used could not differentiate between infectious and non-infectious cases, and false negatives were a notable issue, especially with self-swabbing methods. We recommended investing in local laboratory capacity and employing pooled testing for surveillance to address these challenges. Additionally, we advocated

for the validation of novel assays and emphasised the importance of clear testing criteria to build public trust in testing methods.

64. Our recommendations for improving tracing included co-designing new contact tracing systems with public health teams and increasing resources for identifying clusters through retrospective tracing. We stressed the importance of publishing detailed weekly reports on contact tracing outputs and providing clear, evidence-based guidance to prevent outbreaks. Public health communications needed to be improved to promote hygiene and isolation advice, and regular support for those self-isolating was deemed crucial. We also suggested swabbing isolating contacts after seven days to reduce quarantine duration. While mass population testing was proposed, concerns about false negatives were raised. Pooled testing was highlighted as a method to increase capacity, especially when positivity rates were low, as countries like China and New Zealand demonstrated. We also called for wastewater testing as an early warning system for outbreaks. While the intention to adhere to isolation behaviours was high, actual adherence was significantly lower, particularly among low-income individuals. The UK's statutory sick pay was one of the lowest in Europe, underscoring the need for paid sick leave to ensure effective isolation during health crises. We recommended support for isolation, including daily check-ins and provision of essentials, to enhance adherence. A £500 support scheme for low-income individuals was introduced to aid isolation efforts, but enforcement policies risked discouraging testing and undermining collective action.

65. In summary, in this paper, we offered what we considered evidence-based recommendations to improve testing, tracing, and isolation measures in England. By implementing these recommendations, we believed that the impact of the pandemic could be significantly reduced, drawing on successful strategies from other countries to inform our approach. Notable features of these responses included:

    a. South Korea, which suppressed the virus with minimal economic damage, using well-resourced local public health teams and digital contact tracing;

    b. Taiwan, at least initially, which rapidly integrated public health strategies;

c. Germany, which applied extensive testing and contact tracing strategies early in the pandemic;

d. Belgium, Estonia, Iceland, Turkey, and Lithuania, which delivered test results within hours, increasing the likelihood of compliance with isolation measures.

66. Finally, although less directly relevant, we looked at international experiences in providing person-centred isolation facilities, asking how the adverse effects of isolation could be mitigated: De Foo C, Haldane V, Jung AS, Grépin KA, Wu S, Singh S, Perera N, Miranda JJ, McKee M, Legido-Quigley H. Isolation facilities for covid-19: towards a person centred approach. BMJ. 2022 Jul 26;378:e069558 Exhibit MMK/10b [INQ000574989]. Drawing on experience in South and East Asia, New Zealand, Canada, and Peru, we argued that isolation facilities were a feasible alternative when self-isolation was not possible, but reports of inequitable and unfair requirements regarding mandatory isolation had surfaced. They must be staffed by a trained, protected, and well-equipped interdisciplinary workforce and oriented to person-centred care and are but one component of a comprehensive public health strategy.

**Assessment of the UK's response**

67. You asked me to comment on several aspects of the UK's response as it relates to TTI. Specifically, you asked about testing technologies and modelling. While I have some understanding of both of these, I do not feel that I have sufficient expertise to comment other than as discussed in the previous sections, where, in almost all cases, I was co-authoring papers with colleagues who do have such expertise. Rather, I propose to focus on the TTI strategies that you ask about. However, I must note that while you asked me about how different government decision-makers considered strategies, as I was not a party to those discussions, I do not feel able to comment.

68. The exception is the BMJ blog mentioned above, on the Moonshot concept for mass testing. I was commenting on a leaked presentation prepared by a consulting company. I questioned the analogy being drawn, noting that those who designed and operated the Saturn V rockets knew with certainty where their target, the moon, would be when they launched it. Our knowledge of the moon's movement was vastly better characterised than the course of the pandemic.

Second, I found the diagrams used indecipherable, with entities floating in space and no mention of existing structures. This lack of detail contrasted starkly with a detailed timetable that envisaged a forum that would meet each day, from 11.20 to 12.00, seemingly regardless of what else was happening. I also cited an expert on the evaluation of testing strategies who described the relevant section of the report as displaying "complete ignorance".

69. While I cannot otherwise comment on decision making within government, the reports, statements, and papers in peer-reviewed journals described in previous sections set out many concerns that I had. Before looking at them individually, I would argue that there was one overarching problem that had implications for every aspect of TTI. This was the failure to engage with those who were affected by decisions, either as implementers or intended beneficiaries. I have set this out in more detail in a short paper for the UK Ethics Accelerator, entitled "Beyond "following the science": value judgements and transparency in pandemic decision-making" Exhibit MMK/35 [INQ000535932]

70. In brief, while recognising the remarkable strength of the UK in science, and the high quality of many of those who advised the government via SAGE, I echoed previous criticisms of governance in the UK, most notably in the book "The Blunders of our Governments", where the authors, Anthony King and Ivor Crewe, wrote *"One reason that today's British Government screw up so often is that ministers are reluctant to engage fully with others and to see them as active participants in the policy making process."* However, the system in place did not give ministers sufficient contextual information or insights into the reality on the ground. I then compiled a long list of people who should have been consulted about the pandemic response. Those relevant to TTI included foreigners, laboratory scientists, local public health teams, essential workers, care home workers, and procurement experts.

71. I am particularly concerned about the limited extent to which the UK Government drew on international experience. I note the following passage in the minutes of the Thirty-second SAGE meeting on Covid-19, 1 May 2020: " FCO/Cabinet Office international group (Alex Ellis) to produce a paper for SAGE by 7 May comparing international test and trace strategies - including time to test of index case; time to case isolation; whether contacts are isolated after index case tests positive or based on reported symptoms; and protocols for contact release if index case tests negative - and including summaries for key countries such as South Korea

and Germany". However, I have reviewed the minutes of SAGE meetings up to and including 6th June and can find no mention of such a report or of international experience being considered. Overall, I have seen very little evidence of what the FCDO contributed. The few exceptions that I have found include a report on "Lessons learnt from a review of test, trace and isolate systems used in 15 other countries", carried out in association with the Joint Intelligence Organisation in October 2020 and referenced in the National Audit Office's interim report on TTI. There is also a report from FCDO on "Key International COVID-19 Science Issues" Exhibit MMK/36 [INQ000535933], written for SAGE on 27 January 2021. This provides extensive information on the burden of COVID-19 internationally but, in my view, relatively little that could inform SAGE on the policies being adopted elsewhere or their effectiveness.

72. This is also an issue that we addressed in the first paper on how Independent SAGE operated, which contains a major section on the literature on scientific advice for policy: McKee M, Altmann D, Costello A, Friston K, Haque Z, Khunti K, Michie S, Oni T, Pagel C, Pillay D, Reicher S, Salisbury H, Scally G, Yates K, Bauld L, Bear L, Drury J, Parker M, Phoenix A, Stokoe E, West R. Open science communication: The first year of the UK's Independent Scientific Advisory Group for Emergencies. Health Policy. 2022 Mar;126(3):234-244. Exhibit MMK/37 [INQ000249753]

**What are the key elements required to achieve an effective test, trace, and isolate system?**

73. Based on the reports and papers described above, my view, which draws especially on my research undertaking systems analysis in the analogous but distinct field of cancer screening, is that an effective TTI system should have the following elements and characteristics:

    a. The existence of accurate and reliable tests is a sine qua non. These tests should have a high sensitivity and specificity and should be able to detect the presence of infection early, and ideally prior to the development of symptoms. Tests should be widely available, ideally free of charge or, if not, easily affordable, with provision for those with limited resources. If they are not "free" they should at least be free at the point of receipt or use to those in need. Testing centres should be strategically located, with mobile units deployed to underserved or high-risk areas. Siting of locations should be informed by local

knowledge. Monitoring should be built into the testing regime from the beginning to identify any groups that are being excluded from testing. In some cases, this will be obvious, for example, homeless people, or informed by local knowledge from community leaders, local public health departments, etc. This will be much easier if there are accurate and up-to-date population registers. The tests should have rapid turnaround times, with results from lateral flow tests available at once and from PCR tests within 24 hours to enable immediate action on positive cases. There should be a mix of diagnostic (PCR) and rapid antigen tests should be employed to balance accuracy and speed, while antibody testing can help in understanding population-level immunity.

b. Contact tracing is essential for identifying individuals who may have been exposed to the infectious agent. This requires a well-trained workforce. This is definitely not a role for individuals with minimal training working off a checklist or flow diagram. Contact tracing is a highly skilled occupation, often involving asking questions about intimate personal details. They must be skilled in communication, cultural sensitivity, and data privacy to ensure trust and compliance. Apps and digital platforms can supplement manual tracing efforts by using technology to identify potential contacts while respecting privacy laws quickly. Here, the experience in countries such as Korea offers lessons. Comprehensive data integration with systems must ensure that data from testing, tracing, and public health interventions are seamlessly connected to track cases and contacts effectively.

c. Isolation is key to preventing further spread but requires significant support to ensure compliance. This includes clear guidelines that can be communicated in multiple languages to diverse audiences and which take full account of the circumstances in which people live. There is no point in asking people to act in ways that are practically impossible for them. This requires a much greater understanding of the lived reality of the many different communities within the population. Public health authorities must provide clear and consistent messaging about isolation requirements and durations. This must be backed up with financial and logistical support, including assistance with food delivery, accommodation for those unable to isolate at home, and compensation for lost income (recognising the circumstances of the self-employed and those whose businesses are adversely affected by other

countermeasures). There should be systems to enable regular check-ins and encouragement, either through calls, texts, or community health workers, all of which help individuals to feel supported during their quarantine period.

d. Community engagement and trust is essential. A successful TTI system relies heavily on public cooperation. To foster this, authorities should share clear, accurate, and timely information about the importance of testing, tracing, and isolation. They must proactively identify and counter misinformation and build trust in the health system. Measures must include all communities, especially marginalised or distrustful groups, ensuring cultural and linguistic accessibility.

e. Equity is a cornerstone of an effective TTI system. Efforts must be made to address disparities in access to healthcare and digital tools, ensuring that no community is left behind. This includes targeted outreach, proactively reaching vulnerable populations, including those in low-income or rural areas, homeless people, certain ethnic minorities (noting cultural issues such as gendered roles within families) and individuals with disabilities. Materials and communications should be available in multiple languages and adapted to cultural norms.

f. Given the unpredictable nature of a pandemic, the TTI system must be scalable and adaptable to changing circumstances. It must incorporate preparedness for surges, providing adequate resources and personnel to enable measures to be scaled up when needed. There should be effective feedback loops, with continuous evaluation and improvement of protocols ensuring that the system remains effective as the situation evolves.

g. Legal and ethical safeguards are needed to sustain public trust and ensure compliance. These must include strict safeguards to protect personal data collected during testing and tracing and avoidance of punitive approaches to non-compliance, focusing instead on education and support.

74. An effective TTI system is not just a technical or logistical challenge; it is a social and ethical commitment to collective health and safety. Success depends on the integration of efficient processes, compassionate policies, and active collaboration between governments, health authorities, and the public. In the following paragraphs, I will suggest some of the ways that the NHS Test & Trace

(NHST&T) programme struggled to demonstrate these characteristics. My concerns largely relate to what appears to have been repeated failures to engage with those who could have contributed positively to TTI.

**Weaknesses in the model adopted by NHS Test & Trace**

75. In the preceding section, I argued that contact tracing is a highly skilled role, requiring individuals with a detailed understanding of modes of transmission of the microorganism in question and the skills to interrogate index cases and possible contacts about the nature, in some cases intimate, of their interactions. I concede that the scale of the pandemic was such that the existing contact tracing workforce in local authorities would have been overwhelmed. However, I cannot understand why these individuals were excluded from the TTI programme. In this context I note that the National Audit Office (NAO) has commented on this decision, saying in its December 2020 Interim Report Exhibit MMK/37a [INQ000510827] that "We have not seen evidence that they considered whether to make use of local authority capacity for call handling" (p17, para 1.7). Similarly, I note that while PHE did create a design working group that included representatives from local government, *"the Local Government Association (LGA) and the Association of Directors of Public Health (ADPH) told us that central bodies and their contractors had not engaged sufficiently with local government and public health experts on key decisions about the design of test and trace services or the practicalities of implementing these services"* (pp 17-18, para 1.8). While NHS Test & Trace (NHST&T) did create a network of 11 local authorities to develop good practice, as the NAO Interim Report notes, *"However, members of this network were unclear about how their views had informed policies and decisions"* (p31, para 1.23). My concerns are supported by the final sentence in para 1.18 , which reads "The ADPH raised a specific concern about excessive focus on achieving high volumes of tests and tracing calls at the expense of poor clarity about the purpose of testing and the establishment of an effective infection control system". The involvement of local authority public health teams would seem to have been particularly important, given that they are likely to have knowledge of the local context, in particular in relation to communities that may lack trust in the authorities, and where there may be existing communication channels, for example with community leaders, in place. These problems were raised by SPI-B in May 2020 Exhibit MMK/38 [INQ000197096], when it said *"certain communities may regard such enquiries as sinister; i.e. as having ulterior*

*motives, e.g. detecting illegal immigrants, information on OCG networks and associates in extremist groups. Some may launch social media campaigns or otherwise spread rumours undermining contact tracing for these reasons or simply to exploit public unease over privacy issues"* (p5).

76. Similarly, the task of ensuring that data flows freely through the system is one that requires a high level of technical skills and expertise in what is already in place. As the NAO Interim Report notes, *"Seamless exchanges of information are necessary both to meet public expectations of a single user journey and to ensure that all necessary experts and officials have accurate and timely data on which to take action and make decisions. NHS Digital, which was not involved in the initial set-up of the test and trace programme, was asked in early summer to review the service's end-to-end design and find opportunities for service integration and improvement. It found that NHST&T had been created rapidly to serve an immediate need by bringing together existing and new services"* (p24, para 1.18 ). It is not clear why HNS Digital was not involved from the start.

77. I noted the importance of ease of access to testing sites. The NAO Interim Report notes that "The LGA felt that lack of consultation with local areas had led, for instance, to test centres being set up in places that many people had difficulty getting to" p32, para 1.24). There were many accounts in the media of failings of the system delivered by G4S, such as a report from the Greater Manchester area Exhibit MMK/39 [INQ000535943] of mobile units not turning up, or deploying during daylight hours to locations with large numbers of night workers. An article in the Local Government Chronicle Exhibit MMK/40 [INQ000535944] described how "Councils have reported delays in getting testing units in place, poor communications about where and when they would be arriving and struggles to get them operating for the necessary hours. However, complaints to DHSC appear to have fallen on deaf ears".

78. I have already mentioned the Independent SAGE statement on the Immensa Laboratory. This, in my view, exemplifies the failure by those in authority to listen to others. Public Health Wales raised concerns with NHST&T in February 2021 but was reassured Exhibit MMK/41 [INQ000535947] that there were no problems. As concerning, a community group in Gloucestershire Exhibit MMK/42 [INQ000535946] noticed that individuals testing positive on Lateral Flow Tests were receiving negative PCR results. The group collated extensive evidence of the problems but were ignored by UKHSA. My colleague Dr Kit Yates has spoken

to the Guardian Exhibit MMK/43 [INQ000535945] about why the problem should have been picked up sooner if those raising the alarm had been listened to. It has been estimated that over 20 deaths could be attributed to this failure.

79. As I have indicated earlier in my witness statement, I continue to be puzzled by the apparent lack of learning from experience in other countries. In his book "Spike, The virus vs the people", the inside story Sir Jeremy Farrar wrote *"I wish SAGE had drawn on a wider group of experts with first-hand insights from China and the surrounding region".* The view expressed by one of the Deputy Chief Medical Officers that WHO guidance on testing was not appropriate for the UK, with its *"well-developed public health system"* has attracted adverse comment in foreign media Exhibit MMK/43a [INQ000535950]. This is even more surprising given that some of those advising the UK government did draw on international evidence, and no doubt the Inquiry will wish to explore if and how such advice was used. An example is the Royal Society's DELVE Report of 18th May 2020 Exhibit MMK/44 [INQ000194035]. Although referring to non-pharmacological interventions rather that TTI, the comment in a report issued jointly by the Commons' Health and Social Care, and Science and Technology Committees Exhibit MMK/45 [INQ000180828] that the UK government's "unwillingness to consider seriously and act on the approach being taken in Taiwan, Singapore or Korea was a serious error" supports this view.

80. In my comments on the ideal model for TTI, I emphasised the importance of monitoring equity. This is true of any major public health programme, and I was especially concerned about it here because of my work on cancer screening, which I have mentioned previously. I note the comment in the NAO's Progress Report Exhibit MMK/46 [INQ000287601] on Test & Trace from 21 June 2021 that *"NHST&T has made very limited use of its data to assess whether differences exist in access to test and trace services for groups at higher risk of COVID-19 infection, and whether these might contribute to inequalities in outcomes"* (p12, Key Findings 18).

81. Finally, as noted above, I consider isolation to be a key element of a pandemic control strategy and, in the UK, a weak link. I and others have discussed this elsewhere Exhibit MMK/05 [INQ000535928]. In August 2020 it was estimated that fewer than 20% of individuals fully adhered to isolation requirements Exhibit MMK/47 [INQ000474968]. Although 76% of people expressed willingness to share contacts, actual adherence rates were significantly lower. Financial

vulnerability exacerbated the problem; individuals earning less than £20,000 annually or with savings under £100 were three times less likely to self-isolate Exhibit MMK/48 [INQ000535952]. Compounding this, the UK provided only 29% Exhibit MMK/49 [INQ000280347] of wages through statutory sick pay, far below countries like Germany and Belgium, leaving many without adequate financial protection. An OECD review Exhibit **MMK/48** [INQ000535952] highlighted the critical role of paid sick leave in supporting public health and economic stability during pandemics. All of this would have been clear if there had been serious engagement with those marginalised and disadvantaged communities. In my view, what was needed was comprehensive support systems, such as daily check-ins, provision of essential goods, and employment protection, to foster solidarity and compliance.

82. I have not commented on other aspects of TTI/NHST&T as I believe that others giving evidence to the Inquiry have more relevant and detailed expertise than I have.

**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**: 3rd February 2025