Witness Name: Russ Latham

Statement No.: 1

Exhibits: 4

Dated: 22 April 2025

UK COVID-19 INQUIRY

WITNESS STATEMENT OF RUSS LATHAM

I, Russ Latham, will say as follows: -

1. I am currently the Lead Client Partner for Healthcare and Life Sciences in the IBM Consulting division of IBM United Kingdom Limited ("**IBM UK**"). For the duration of IBM UK's involvement in helping the UK Government respond to Covid-19, I was an Executive Partner (Lead Delivery Partner) in IBM UK's Healthcare practice. In that capacity, I had oversight of all of IBM UK's Covid-related workstreams.

2. The Covid-19 Inquiry has requested that IBM UK provide a witness statement outlining its role in relation to Module 7, the Test, Trace and Isolate system ("**TTI**") and reflecting on the Government's approach to TTI between 1 January 2020 and 28 June 2022 (the "**Relevant Period**"). I make this statement based on my personal knowledge and having refreshed my recollection by considering certain documents available on IBM UK's systems. Many documents created or received by IBM UK personnel during the Relevant Period were stored only on Government systems and are therefore not available to me or IBM UK.

A. Background

Overview of IBM UK's role in relation to TTI

3. UK Government organisations engaged IBM UK to provide a range of services in relation to TTI. For simplicity, I have grouped these into three main categories, however there was significant overlap between the programmes that IBM UK worked on and I will provide more detail regarding each of these programmes in Part C of this statement:

   a. Integrated Tracing Service ("**ITS**") – IBM UK designed and built a new strategic tracing platform, which had a set of core capabilities and was intended to replace a legacy contact tracing platform (as I will explain in Part B below). The initial service that was developed on ITS was intended to enable citizens who had tested positive for Covid-19 and their close, recent contacts to be identified and receive notifications that they should self-isolate. Other services were developed on the platform as the pandemic and the Government's reaction to it evolved;

   b. Real Time Test Service ("**RTTS**") – IBM UK designed and built an integrated system to deliver Covid-19 test results rapidly from the point that a test result was produced to all of the different systems that made use of this data, e.g., for tracing, analysis and reporting; and

   c. Other data architecture, data governance and technical support services.

4. At the start of the pandemic, Test and Trace and the Joint Biosecurity Centre ("**JBC**") had developed separate data platforms. IBM UK's involvement with TTI began in June 2020 when we were asked to assess these two data platforms from an information infrastructure perspective and recommend a new target data platform that was secure, scalable and came within expected data quality thresholds. This project came to be known as the 'Data Platform Review'. I will provide more detail about this work in Part C of this statement.

5. The first major TTI programme that IBM UK was involved in was ITS, which commenced when IBM UK won a competitive tender in August 2020 to develop a new strategic tracing platform. The other major TTI programme that IBM UK was involved in, RTTS, began in October 2020. The work required under the ITS and RTTS programmes expanded over time and our

involvement largely ended in November 2021 after the development and maintenance of the 'trace' services portfolio was re-tendered and the work was transferred to other suppliers. Further information on IBM UK's role in relation to TTI is contained in **Exhibit RL/01 [INQ000516725]**, 'IBM & NHS Test and Trace Reference' dated November 2021.

6. At the height of our work on TTI (which was in and around the first quarter of 2021), I believe about 250 employees of IBM UK were working on the various programmes, although the extent of our involvement in TTI varied significantly over time. I led and coordinated our work, reporting to Simon Rew (IBM UK Consulting Public Sector Lead, who has since left IBM UK). Two key members of my leadership team were Simon Barcessat (Executive Delivery Partner), who led the ITS team and Andrew Doggett (Executive Delivery Partner), who led the RTTS team. The roles and expertise of other IBM UK colleagues who worked on the delivery (including designing, building and testing) and ongoing support and maintenance of TTI systems are described throughout this witness statement, particularly at paragraph 18 below.

B. TTI Infrastructure and Capacity

Existing TTI technology

7. Through our work on ITS, we learned that prior to the emergence of the Covid-19 pandemic, Public Health England ("**PHE**") already had a legacy contact tracing platform in place called the Contact Tracing and Advisory Service ("**CTAS**"). The aim of the ITS platform was initially to replace CTAS with a new case and contact tracing service ("**ITS Tracing**") designed from the ground up to meet the demands of a large-scale, complex pandemic such as Covid-19. As IBM UK did not work on CTAS, I have no first-hand knowledge of how it operated or its capacity for contact tracing. However, the limited information I came to learn about CTAS is outlined below and some further information regarding CTAS and the background for developing ITS Tracing to replace it is contained in RL/2 INQ000587709 'Further Competition for Integrated Contact Tracing Solution for the NHS Test and Trace Service Contract'.

8. I understood that CTAS was a relatively old platform that had been designed for limited outbreaks of disease, for example in one town. It had not been intended for use at scale on a national level or thought to be flexible enough to

meet Government requirements during a pandemic like Covid-19. However, I believe that at the start of the pandemic, PHE engaged a supplier (a software company called Kainos) to expand CTAS so that it could handle many more cases and users and add new functionality. This work started months before IBM UK became involved in the TTI programme and continued in parallel to IBM UK's development of ITS Tracing, without any involvement from IBM UK. I understand that the development of CTAS continued extremely rapidly during the pandemic, such that the Department of Health and Social Care ("**DHSC**") determined that CTAS, as it developed, was largely able to meet the Government's contact tracing requirements as they evolved (with some exceptions, which I will outline in Part C). IBM UK cannot confirm the reasons for the Government's decision to continue developing CTAS, as this was not a decision in which we were involved. I understood that the Government wanted to develop CTAS and ITS Tracing in parallel to leverage the existing CTAS system while preparing to transition to ITS Tracing at an appropriate time. Halting the development of CTAS would have meant that in the period before ITS Tracing went live, the version of CTAS that was in use would not have evolved sufficiently to keep pace with the changing conditions of the pandemic.

9. The ITS platform quickly became operational in November 2020, worked as intended and had a number of advantages over CTAS. As I will describe in Part C, certain functionalities developed on the ITS platform were integrated with CTAS. However, ITS Tracing did not fully replace CTAS as the UK's single tracing system before IBM UK's work ended in November 2021, after the 'trace' services portfolio was re-tendered in line with Government procurement rules and the work was transferred to other suppliers. The considerable head start that CTAS had before the ITS programme began and the rapid pace of its development meant that DHSC decided to continue to use CTAS for tracing given that it was a working contact tracing platform in operation from the early stages of the pandemic, which became increasingly sophisticated over time.

C. Involvement in TTI

IBM UK's expertise

10. IBM UK provided services to TTI through its Consulting division. IBM Consulting delivers business transformation, technology consulting and application operations applied with industry expertise and leveraging hybrid

cloud and AI technologies. We work with strategic partners and wider IBM divisions as part of this.

IBM UK's role

Integrated Tracing Service (ITS)

11. In August 2020, IBM UK won a competitive tender to build a new strategic integrated tracing services platform (ITS) based on specific requirements set by DHSC (see **Exhibit RL/02**, 'Further Competition for Integrated Contact Tracing Solution for the NHS Test and Trace Service Contract'). Starting in September 2020, we built the ITS platform to those specifications within three months and subsequently developed additional services on the platform as the pandemic evolved. The first service developed for ITS was ITS Tracing, which had two functions – case tracing and contact tracing:

    a. Case tracing – When a citizen generated a positive Covid-19 test result, that result and their personal information were collected, analysed and added to a queue of daily positive cases. The citizen was sent an email or SMS asking them to complete a questionnaire. If the questionnaire was not completed within a predefined time period or if the citizen did not have an email address or mobile phone number, an agent would call them on a landline, ask them about their close contacts and notify them that they needed to self-isolate.

    b. Contact tracing – Similarly, when someone was identified as a contact of a citizen who had tested positive for Covid-19, that information was analysed and the contact was sent an email or SMS asking them to complete a questionnaire, otherwise an agent would call them on a landline regarding self-isolation.

12. From a technical perspective, ITS Tracing was complex but it had three main elements:

    a. The Salesforce platform that provided the workflow capability and rules to take a case or a contact through the tracing process, which was extensively developed and configured by IBM UK's software engineers. Salesforce is a leading, industry-standard 'customer relationship management' ("**CRM**") system that helps manage customer data by keeping contact details up to

date, tracking interactions and managing customer accounts. Salesforce was already being used in several other countries as a platform for Covid-19 contact tracing, which was another reason why IBM UK chose it for ITS Tracing;

b. Integration with Amazon Connect, which worked together with the Salesforce platform to provide telephony capability for agents to call citizens; and

c. Integration with numerous other external systems, for example the systems bringing in test results data and citizen information and the systems generating reporting and dashboards for Government organisations (note that IBM UK did not produce these dashboards and I do not recall having sight of them).

13. In simple terms, when a positive test result was generated, it flowed through to ITS and an email or SMS was sent to the relevant citizen asking them to log in to an NHS account and complete an electronic form, which included questions relating to how they had caught Covid-19 and people with whom they had recent contact. A simpler form was provided to people who were contacts rather than cases. If the citizen did not have an email address or mobile phone number, or did not complete the form within a certain period, a tracing agent who was logged in to ITS called them on a landline to ask the same questions as those on the electronic form. Either way, the citizen was told to self-isolate. Call centre agents also followed up periodically by telephone with citizens who had been told to self-isolate to confirm that they were doing so and, if that could not be confirmed, they were visited in person by local authority representatives. Individuals who could not be contacted initially also required follow-up, either by further telephone calls or through visits by local authority representatives. ITS Tracing enabled all of these processes to take place.

14. ITS Tracing integrated with a number of external systems, each of which had a different purpose and operated in different ways, making integration with ITS Tracing complex. These external systems included:

a. PHE's eligibility checker – at the end of the tracing process, citizens who had been told to self-isolate were provided with a unique reference number

allowing them to submit an application to receive a 'self-isolation payment' via their local council's website, which was verified by local authority agents;

b. EDGE – which was one of DHSC's data analytics platforms;

c. GOV.UK Notify – which is the centralised government platform for government to send citizens emails, text messages and letters;

d. The NHS Covid-19 mobile phone app – which detected proximity to citizens who subsequently tested positive for Covid-19 and then prompted those citizens to complete a form; and

e. CTAS – to facilitate migration from CTAS to ITS.

15. Under the direction of Test and Trace Product Managers who specified priority features for IBM UK to deliver, we prioritised making the case and contact tracing processes as simple as possible for citizens and call centre agents, including by placing 'user researchers' into the teams to conduct research and testing of ITS's features, which informed how they were prioritised and built. Importantly, ITS Tracing also had to be optimised for the approximately 25,000 agents employed by Test and Trace. Therefore, IBM UK worked extensively on performance tuning (so that the system ran quickly) and security (so that each agent only had access to the necessary data of the citizens they were going to contact). Implementing stringent data security and privacy protocols and integrating ITS Tracing with external systems were especially complex.

16. In the time that it took to develop the 'Minimum Viable Product' ("**MVP**") specified by DHSC (described in RL/2 INQ000587709 Further Competition for Integrated Contact Tracing Solution for the NHS Test and Trace Service Contract'), both the pandemic and the Government's requirements had evolved and CTAS had also been developed to add new functionality that was not included in the original specification of ITS Tracing. That triggered further enhancements to ITS Tracing to try to achieve what was known as 'functional parity' with CTAS, so that ITS Tracing could replace CTAS as the UK's contact tracing platform. In addition, a phased approach to training agents to use ITS Tracing was needed, which started with an internal trial of 10 agents using a version of ITS Tracing that was not running 'live' data to obtain their feedback.

17. The planned transition from CTAS to ITS Tracing had five key stages:

    a. Dealing with 'orphaned contacts' – individuals who had tested positive for Covid-19 but where the person who had transmitted it to them could not be determined. People who had been in close proximity to those infected individuals were then identified and notified. This aspect of ITS Tracing was built and went live in April 2021, with approximately 1,000 call centre agents being trained to use ITS Tracing. This functionality was eventually integrated into CTAS.

    b. All contact data processing and functionality would be transferred to ITS Tracing – this work was completed in June 2021 but DHSC decided to continue to use CTAS for this functionality.

    c. Case tracing data processing and functionality in England would be incrementally transferred to ITS Tracing on a region-by-region basis – this was not completed while IBM UK worked on ITS.

    d. Case tracing data processing and functionality would be scaled up – this was not completed while IBM UK worked on ITS.

    e. All case tracing data processing and functionality would be transferred to ITS Tracing – this was not completed while IBM UK worked on ITS.

18. Over 100 personnel from IBM UK worked on ITS. These included platform architects (who designed the overall systems and their integration), software engineers and developers, testers and quality assurance personnel, business analysts (who elaborated requirements with users), service designers (who optimised the user experience for citizens and agents), visual designers (who designed the user interfaces), data governance experts, data security experts, project managers and IBM's global Chief Health Officer, Dr Mark Davies (who prepared a brief report on clinical safety issues, including potential harm to citizens and mitigation steps).

19. ITS had a number of important advantages compared to CTAS, including that:

    a. The ITS platform was highly configurable, enabling new services to be delivered and adapted rapidly in response to policy requirements – including international arrivals and quarantine ("**IAQ**") (see paragraphs 23-

26 below) and enquiries, feedback and complaints ("**EFC**") (see paragraphs 21-22 below);

b. ITS was flexible, being easily extendable to new user groups (for example enabling local authorities to be onboarded) and scalable to handle a higher number of cases;

c. ITS was resilient and secure, while CTAS had issues regarding security controls in terms of access to customer or personal data (IBM UK had no detailed knowledge of CTAS, however RL/2 INQ000587709 Further Competition for Integrated Contact Tracing Solution for the NHS Test and Trace Service Contract', for example, refers to limitations and risks around privacy in terms of potential personal data leaks and phishing);

d. ITS Tracing was easier to use for call centre agents, improving the efficiency of their work. The Salesforce CRM platform provided a more detailed and intuitive interface for call centre agents to use, giving them more functionality in a single system and greater control of the contact tracing data collection than was available through CTAS. For example, ITS Tracing reduced the number of questions for agents to ask by tailoring the contact tracing script to the particular circumstances of the citizen that they were calling;

e. ITS was driven by a 'citizen-centric' data model, with case and contact tracing, IAQ and EFC data brought together in a single database, enabling agents to tailor their communications to the individual they were dealing with; and

f. ITS was built on Salesforce, an industry-standard solution, so the skills needed to develop it were widely available; on the other hand, CTAS was a bespoke platform that needed specialist software engineers.

20. In the summer of 2021, the Government decided that a full tracing system was no longer required, as vaccines had been rolled out and Covid-19 was becoming less widespread. In addition, the development and maintenance of 'trace' services, including ITS and RTTS, were re-tendered as required by Government procurement rules. Two other companies (Deloitte and Accenture) won the contract and took over the development of ITS, as I will outline in the RTTS section below. As per the standard Government

procurement process, we were informed of our overall scores compared to those of the winning suppliers and were provided with feedback on our responses to the individual tender questions but did not receive a comparison between our responses and those of the winning suppliers (except for our ranking in terms of the bid price we submitted).

Enquiries, Feedback and Complaints

21. IBM UK built the EFC service using the ITS platform starting in November 2020 and it quickly went live. This enabled citizens to submit questions, feedback and complaints through a guided set of forms on a Government webpage or by email. If citizens contacted call centre agents by telephone, the information they provided would also be fed into the system. I do not have data regarding how many citizens used the EFC service. Relevant topics changed frequently in line with the Government's response to the pandemic and the measures that it put in place, but some examples of how citizens could use it were:

    a. To submit enquiries in relation to topics such as the documentation required for international or domestic travel, financial support for businesses, 'stay at home' rules when testing positive for Covid-19, and rules applicable to key workers. The webpage also provided links to other websites containing more detailed information on the Government's current regulations and guidance;

    b. To provide feedback in free text form on the webpage regarding a variety of subjects that citizens could select; and

    c. To raise complaints in relation to topics such as international travel, test centres or testing kits, regulations or procedures applying to workplaces or care homes, and 'stay at home' rules and guidance.

22. A team of agents who had logged into the system then triaged and handled this information – responding to enquiries, delivering feedback to the appropriate place and actioning complaints and informing citizens how those had been dealt with. In addition, the EFC system included case management, reporting and analytics functionality.

International Arrivals and Quarantine

23. IBM UK built the IAQ service using the ITS platform, starting in November 2020. Policies in relation to international travel were constantly evolving at an extremely fast pace. IBM developed a scalable, agile system to handle passengers arriving at the UK border – managing quarantine, compliance, enforcement and data analytics for over 20 million international arrivals into the UK from December 2020 to November 2021 (when IBM UK's involvement in TTI ended, although the IAQ service continued to be used) and reducing the risk of variants of concern being transmitted throughout the country.

24. Initially, this service involved IBM providing integration between ITS and the Home Office database containing Passenger Locator Form data and capability for travellers to be sent text messages containing self-isolation advice on days 2, 5 and 8 after arrival. As Government measures changed frequently (for example introducing a 'test to release' scheme for people who were self-isolating, managed quarantine hotels, a traffic light system for categorising countries, different vaccination requirements and specific exemptions from the restrictions), IBM UK worked rapidly to implement these changes into the IAQ service. This included delivering:

    a. A digital solution for hotel quarantine and compliance capability at the border for travellers arriving from Red List countries within nine working days of the policy being announced;

    b. Capability to manage arrivals from Amber List countries who were not fully vaccinated and were required to quarantine at home or in another person's home;

    c. Digital capability to manage Green List and fully vaccinated international arrival journeys based on a distinct isolation and compliance policy to enable safe opening of the UK border within 10 working days of the policy being announced;

    d. Capability to prevent travellers from receiving duplicate calls which improved agent efficiency by 15%; and

e. Initial capability to recognise travellers receiving UK-administered vaccines, which was scaled to recognise seven different vaccines administered in over 130 countries.

25. From May 2021, the processing of passengers arriving from outside the UK depended on whether they were travelling from a Red, Amber or Green List country and their vaccination status. For someone arriving from a Red List country, for example, the IAQ service enabled the following processes to take place:

a. Before arriving in the UK, the traveller had to complete a Passenger Locator Form online through the GOV.UK website. The information from that form was transferred through the Home Office Passenger Locator Form Store into ITS, adding to a list of expected international arrivals.

b. The traveller was sent Government guidance for international arrivals and was required to book a managed quarantine hotel and Covid-19 test package through a Government portal. That data was sent to test providers and hotel staff to organise test kits and make accommodation arrangements.

c. On arrival, the traveller was escorted to their hotel, received their test kits and took daily calls from contact centre agents to ask them questions and remind them to take a Covid-19 test on days 2 and 8. IAQ provided agents with a list of the travellers they needed to call and the questions they were to ask and captured the information they received.

d. If the traveller had two negative tests, they were allowed to leave quarantine after day 10. Any positive Covid-19 test results were also recorded and flowed through RTTS for subsequent contact tracing.

26. IBM UK was also involved in the International Arrivals Digital Delivery Programme that was responsible for end-to-end management of the numerous systems and organisations that were required to handle international arrivals, including the Passenger Locator Form, the customer travel management service that allowed hotels and tests to be booked, the ITS and RTTS platforms and the reporting produced for DHSC. IBM UK worked closely with the Home Office, NHS Digital, PHE, DHSC and numerous other partners, including during daily and weekly governance calls in relation to each of the

workstreams that formed part of the International Arrivals Digital Delivery Programme.

Contain CRM (FOLK)

27. Test and Trace sought a way to better record central-to-local government Covid-19-related communications and establish a central record of key decisions that could otherwise only be found in individuals' emails and private correspondence. IBM UK worked with DHSC to refine and prioritise its requirements for this new system. We were requested to provide a customer relationship management (CRM) solution built on the ITS platform called 'FOLK' that established a clear and accessible audit trail focused on:

    a. Recording the activity of certain staff at Contain (the organisation in Test and Trace that worked primarily on local lockdowns), the National Covid-19 Response Centre (NCRC), JBC, PHE response teams and local authorities (note that these staff were not selected by IBM UK); and

    b. Managing local authority events, such as tracking tier status changes when local lockdowns were implemented, lockdown details and assistance (including financial support) that was offered and/or accepted and enabling the audit of decisions that were made.

28. FOLK also enhanced information-sharing between the bodies listed above to promote a single way of working across multiple teams and avoid siloed working across teams and regions. It provided about 270 users from the organisations referred to above with access to data through dashboards and reporting that could be easily shared and analysed for faster decision-making. FOLK also contained data such as:

    a. Contact details of key contacts within regional teams and local authorities (for example, health officers);

    b. Local Covid alert levels, including the reason behind status changes and decision makers; and

    c. Details of funding offered to and accepted by local authorities, including amounts and dates of payments.

29. The system went live in December 2020 and was expanded by adding case management functionality in February 2021, recording interactions involving the staff described above and decisions (for example relating to implementing local lockdowns, applying restrictions on activities such as re-opening restaurants or offering funding to a local authority) and enabling information-sharing and collaboration. IBM UK's work also included testing the system and training and onboarding users. FOLK continued to be used throughout IBM UK's involvement in TTI.

Level 2 Support

30. IBM UK was tasked with providing technical support for the ITS and RTTS platforms, incorporating coverage for additional services as they went live. Starting in October 2020, this was built and implemented in less than two months.

31. Issues that users reported with the platforms were logged by a Level 1 service desk and passed to Level 2 for resolution. A team of support technicians and managers normally provided Level 2 support for 24 hours per day (or 12 hours per day – this varied during the Relevant Period), seven days per week and were on-call for severe incidents at all times. This workstream started soon after the ITS programme commenced and continued until after the end of the Relevant Period.

32. Level 2 support included the technical triage and investigation of incidents and the subsequent use of scripted operational procedures to resolve them, alongside any 'business as usual' maintenance activities (such as security patching) and the deployment of approved releases and changes. An important activity for the support team was service acceptance, which involved working with the ITS and RTTS development teams to understand new releases, reviewing and testing operational procedures for each new release, engaging in release rehearsals and other preparation activity, and assuring and accepting readiness of the release for operational support.

33. In addition, the Level 2 support team: monitored the platforms and applications using health checks and monitoring tools; ensured that system backups were completed; monitored software licence and certificate usage and initiated renewal processes before they were due to expire; engaged with third party

software providers such as Salesforce to resolve incidents or conduct maintenance; interfaced with DHSC service managers to prioritise and resolve issues; identified and promoted continual service improvements; and produced monthly service reports.

Real Time Test Service (RTTS)

34. In October 2020, DHSC engaged IBM UK to deliver a strategic integration platform to significantly reduce the time needed to process Covid-19 test results, which was known as RTTS. Prior to our involvement, I understand that test results from laboratories were being transferred using Microsoft Excel, but version compatibility issues caused some rows to be truncated. I understand that the trigger for RTTS to be developed was that approximately 16,000 Covid-19 test results were lost as a result of this Excel truncation issue. DHSC therefore requested that IBM UK build a reliable messaging hub that could integrate and distribute test results at speed.

35. The overall objective of RTTS was to move the testing service to a more resilient architecture that could scale to much larger volumes, could handle near-real-time results, would be easy to monitor and to identify issues, and would allow rapid investigation into 'missing results'. IBM UK built RTTS using the Salesforce MuleSoft Anypoint platform, a solution that enables the secure development, deployment and management of Application Programming Interface ("**API**") software (which allows different software applications to communicate with each other to exchange data, features and functionality) and integrations at scale in one platform.

36. Over the course of four weeks, IBM UK designed and planned the development of the RTTS platform. For a three-month period starting in November 2020, IBM then refined the integration services required by RTTS, updated the functional and technical solution architecture, developed the RTTS integration services, tested these integrations and specified the transition architecture and approach to production deployments. Over the course of IBM UK's work on RTTS, there were seven major RTTS releases:

    a. Base platform launch: By the first week of January 2021, the first version of RTTS went live. It took us only a matter of weeks to launch RTTS. Despite changing priorities and requirements, we met all key

deadlines. Andrew Doggett, who led the RTTS programme, and I are of the view that RTTS was the fastest programme delivery of this scale and type that either of us has worked on in the IT sector.

i. With the base platform launch, Covid-19 test results were routed from laboratories across the country to flow through RTTS and be delivered into CTAS. Prior to RTTS, test result data was routed from the National Pathology Exchange ("**NPeX**") (the system that collected test results from the laboratories) to the Second Generation Surveillance System ("**SGSS**") (the system that delivered these test results to various output destinations). SGSS processed test results in batches, which caused delays of several hours in delivering them to CTAS. As a result of the base platform launch, results were passed from NPeX through RTTS to CTAS, before being processed by SGSS. Furthermore, Pillar 2 data (which came from private laboratory swab testing available to the wider population) and test results from lateral flow devices were onboarded and also routed straight from NPeX to CTAS through RTTS, bypassing SGSS. The time taken for test results to reach CTAS from the laboratory reduced from hours to minutes.

ii. The base platform launch also introduced test result traceability to ensure that data was tracked from entry (e.g., from laboratories) to output (e.g., contact tracing).

b. Lateral flow matching to PCRs: By early March 2021, RTTS enabled lateral flow test results to be matched with PCR tests before data was sent to CTAS. This facilitated more accurate contact tracing, as lateral flow tests were less accurate than PCR tests and enabled key workers to be released from isolation and return to work.

c. Private testing: By mid-April 2021, RTTS was expanded to enable private test suppliers to upload test results. This allowed a greater number of private test suppliers to enter the market, creating greater competition and increased national testing capacity.

d. Passenger Locator Form: By May 2021, RTTS enabled data from UK Passenger Locator Forms to be ingested and enriched with test results, which supported the resumption of international travel.

e. Variants of concern: By May 2021, RTTS enabled test results of interest to be flagged and routed these to CTAS with more urgency, which enabled targeted localised actions to be taken for specific variants.

f. Quarantine exemption: By July 2021, RTTS enabled the vaccination status of travellers coming into the UK to be incorporated, allowing for quarantine exemptions and simplifying travel.

g. Isolation exemption: By September 2021, RTTS enabled contacts who had tested positive but were fully vaccinated to be identified, which removed the self-isolation requirement for those contacts.

37. By August 2021, we had further developed RTTS and provided significant added value through the following functionalities:

a. RTTS enabled significantly faster contact tracing by introducing efficiencies in the routing of test data, such as routing Pillar 2 data to bypass SGSS (see paragraph 36(a) above). The time taken for test results to reach CTAS eventually fell from 8 hours to 16 minutes.

b. RTTS was developed to allow new flows for test results across the Test and Trace programme, including lateral flow devices, private test results and international arrivals.

c. RTTS had auditable test results traceability.

d. RTTS reduced the need for time-consuming and costly manual intervention to correct records.

e. RTTS allowed all private testing laboratory results to be transferred onto RTTS through an API that connected to the private testing providers' systems or through a portal that allowed both bulk test result data uploads and individual test result uploads through a webform.

f. RTTS allowed Covid-19 variants of concern to be tracked.

g. RTTS introduced new user surveying capability through "Voice of the Customer", which enabled partial test result records to be sent to Qualtrics, a third-party survey solution provider, who in turn would request survey participation from a sample of subjects who had recently received their test results. RTTS enabled the routing of test result data to Qualtrics but was not used to conduct the survey or collate any survey results.

h. RTTS enabled operational and analytical reporting for DHSC, contact centre suppliers and other national associations.

38. By the end of the project, RTTS ingested, enriched and routed all UK Covid-19 test results from PCR and lateral flow test results produced by a range of different sources, including Government test laboratories, hospitals and clinics and private test laboratories. This data fed into clinical surveillance, contact tracing, the text message notification gateway and analytics.

39. I am incredibly proud of what IBM achieved with RTTS. The speed at which the Government and scientists received accurate Covid-19 test data enabled better decisions to be made. Every day, citizens were also able to obtain and provide evidence of their Covid-19 status, increasing public confidence in the testing system and paving the way for pandemic restrictions to ease.

40. Following a re-tender process pursuant to Government procurement rules, in October 2021, DHSC awarded the ongoing delivery of the 'trace' services portfolio, which included ITS and RTTS, to Deloitte and Accenture. IBM developed a structured transition approach, which involved providing intensive 'knowledge transfer' sessions to those companies, with emphasis on transparent presentation of all aspects of ITS and RTTS. By the end of November 2021, IBM had ended its involvement in the ITS and RTTS delivery programmes.

Data Platform Review

41. The data platform review project arose from Test and Trace and JBC having developed and started using independent data platforms. Test and Trace used a platform called the Environment for Data Gathering and Engineering ("**EDGE**"). I understand that this was built in the early days of the pandemic to

deal with Covid-19 reporting data. At the same time, JBC had developed its own data platform called the Data Science Hub ("**DaSH**").

42. Although there was some commonality between the two platforms, they were completely independent platforms built by different companies. EDGE collected data from various sources across the Test and Trace programme to report on a range of metrics, for instance the number of Covid-19 test kits sent out or sold or the number of vaccine doses delivered. EDGE also had a dashboard to present this data. On the other hand, DaSH collected similar data from similar (though fewer) sources as EDGE but notably allowed data scientists within JBC to access the underlying raw data to analyse and work with it so as to produce findings such as trends in Covid-19 rates. DaSH essentially centred around data science capabilities and allowed data scientists to create their own workspaces on which to conduct their analyses.

43. In June 2020, DHSC engaged IBM UK to advise on how to make the best use of these two platforms and avoid inefficiencies. In particular, IBM UK was asked to focus on: (i) programme delivery organisation and governance in order to ensure alignment with the wider governance and agile delivery cadence of the Test and Trace Chief Technology Officer; and (ii) data architecture and data governance in order to develop a framework that could underpin the strategic delivery roadmap of the Data Platform programme.

44. The IBM team gathered requirements and provided the high-level architecture for the Test and Trace Data and Analytics Platform to combine the EDGE and DaSH solutions under a single platform. This single strategic data platform was intended to support breaking the chains of Covid-19 transmissions and support national health protection by allowing key stakeholders using EDGE and DaSH to access cleansed, quality data with relevant data governance and to enable expert analysis and insights in a secure, timely manner. Ultimately, DHSC decided not to merge the DaSH capability into the EDGE platform in order to minimise disruption and avoid additional work for the EDGE and DaSH delivery teams.

Joint Biosecurity Centre and Chief Data Officer Support

45. I discuss the JBC and Chief Data Officer ("**CDO**") support workstreams in the same section since our role was very similar, which was to supply specialist

personnel to the two organisations. In September 2020, the JBC commissioned advisory support to provide data and analytics skills within the JBC and later the newly established CDO. The initial team comprised 16 full time equivalent employees (10 assigned to the CDO and six assigned to the JBC), but this was expanded to 32 (26 assigned to the CDO and six assigned to the JBC) as the CDO had a growing need for high quality data and analysis support.

46. The JBC provided evidence-based objective analysis to inform local and national decision-making in response to Covid-19 outbreaks. The support IBM UK provided to the JBC included subject matter experts with skills in data science, data engineering and delivery/project management.

    a. Data science work included profiling and analysing datasets to identify insightful data for others at the JBC to utilise, including for analysis by scientists and Government reports on Covid-19 statistics.

    b. Data engineers worked on building and maintaining data pipelines to provide data to JBC analysts and external organisations.

    c. Delivery/project managers had data backgrounds and had delivery responsibility for a number of teams supporting the JBC.

47. The CDO was the strategic office within Test and Trace that ensured data was stored and used consistently, fairly and lawfully. The support IBM UK provided to the CDO included subject matter experts with skills in data governance, data management, data policy, data standards, data architecture and data analytics. This built on the work done in the Data Platform Review workstream:

    a. Data governance work focused on establishing policies, processes and standards in relation to data availability, useability, consistency, integrity and security to ensure effective data management throughout the programme.

    b. Data architecture and data management work reviewed the existing data architecture, assessed whether it was fit for purpose to respond to the Covid-19 pandemic, recommended what it should look like in future, documented and maintained data flows and established processes around data quality, profiling, thresholds, processing and storage. This

helped to identify data risks and ensure consistent and high-quality data across the programme, which improved reporting and analytics for the pandemic response. Data architecture describes how data is managed and flows, from collection to transformation, distribution and consumption.

c. Data standards and data policy work included establishing appropriate standards and policies around the handling of data in terms of data security, sharing and retention in line with relevant law and government policy.

d. Data analytics work operationalised the best scientific analysis and models from the public sector, academia and industry to build and run models relating to (for example) demand for Covid-19 tests, local authority isolation payments and managing Covid-19 restrictions in workplaces.

48. For these workstreams, IBM UK personnel were fully integrated within the existing JBC and CDO organisational structures, working alongside JBC and CDO employees and personnel supplied by other companies. As a result, their work was wholly guided by DHSC.

GDPR Support

49. In September 2020, DHSC tasked Promontory, an IBM UK company, to advise Test and Trace ahead of the Information Commissioner's Office ("**ICO**") audit scheduled for December 2020 in relation to compliance with the General Data Protection Regulation ("**GDPR**"). This required Promontory to conduct a rapid GDPR gap analysis and deliver remediation activities and Record of Processing Activity enhancements to address the identified GDPR gaps, prepare for the ICO audit and produce a roadmap for enhanced GDPR compliance.

50. To help Test and Trace prepare for the ICO audit, Promontory prepared and collected 170 deliverables. It then reviewed the responses to be sent to the ICO, assisted DHSC in preparing response documents and provided initial analysis of the ICO's draft report.

Advisory System

51. A great deal of the work that IBM UK did as part of TTI was a result of the science-led approach taken by the Government in responding to Covid-19. To the best of my recollection, I do not believe that IBM UK received advice from medical or other experts outside the information technology field which we were required to implement directly or that we worked closely with such experts (apart from our global Chief Health Officer, as I mentioned above in the ITS programme).

52. I and other senior IBM UK staff attended meetings regarding various programmes, at some of which scientific and medical experts conveyed their advice. We participated in regular meetings such as steering groups, programme boards, weekly reviews and daily stand-ups; I cannot recall exactly in which meetings scientific and medical advice was provided or what advice was conveyed. Calendar invitations and meeting minutes were stored on Government systems. However, this advice was carried through to our work via the instructions of our Government clients, sometimes with our Chief Health Officer assisting us in understanding those requirements and the medical reasons for them so that we could implement them effectively. Part of our role was ultimately to 'translate' such scientific and clinical advice into digital systems supporting the Government's response to Covid-19.

Learning from Previous Pandemics

53. Due to the unprecedented nature of Covid-19, I do not recall that IBM UK's work was influenced by previous endemics, pandemics or pandemic exercises. We were required to design and build new, bespoke systems for Covid-19 that fulfilled Government requirements.

54. To a limited extent, IBM UK was able to apply the experience of Covid-19 from other countries to its work. The State of Rhode Island in the United States implemented a contact tracing process during the early stages of the pandemic based on the Salesforce platform, which is designed to record interactions and relationships between individuals. A U.S. IBM employee worked on that project. This experience provided a reference point for us in how to configure ITS quickly to handle a high volume of cases and in such a way that a large number of call centre agents would be able to use it easily after receiving

training. We also applied some lessons from that project with respect to the benefits of using a platform that was designed to capture complex relationship and interaction data (which could be applied to contact tracing), had powerful reporting and analytics capabilities, and had security features built-in (which also made the user experience smoother, for example by allowing one-time passwords to be sent to users' email addresses rather than requiring them to remember their passwords). The UK Government's requirements for ITS were ultimately very different from those of the Rhode Island State Government in terms of the platform's scale and complexity, but the Rhode Island example provided us with a proof of concept for the Salesforce platform.

Policy and Strategy

55. To my knowledge, IBM UK had no role in formulating or advising on the policies and strategies that were developed and deployed in relation to TTI. We had very limited contact with Government Ministers or civil servants who I would consider to be policymakers. In simplistic terms, the relevant Government organisation that was our 'client' (such as DHSC, PHE or UKHSA) decided what it wanted IBM UK to do, we worked with them to elaborate on those requirements and we then put all our resources and expertise into delivering a technology solution.

56. Further, IBM UK only had responsibility for decision-making at a 'micro' level within the scope of executing our work, such as decisions relating to the detail of the design of a particular aspect of ITS or RTTS. Any significant operational decisions regarding each TTI programme were taken by the Government client or (for the larger programmes) steering committees or programme boards led by Government representatives at which IBM UK was present. We worked closely with those bodies to provide advice and make recommendations regarding technical implementation, such as whether a particular technical solution was feasible or whether improvements could be made to data governance.

Partnerships and Cooperation

Private Sector

57. IBM UK worked closely with private sector companies on our TTI programmes, both with companies that contracted through us and numerous other

companies that did not. DHSC set up so-called 'rainbow teams' for many projects whereby Government staff and personnel from private sector companies worked together with little reference to who their employers were. I cannot provide an accurate list of the many companies that did not contract through us, but by way of example regarding the Data Platform Review workstream, these included BAE Systems (which provided the EDGE platform) and Niaxo (which provided the DaSH platform).

58. The key companies that contracted through us and their roles are listed below:

    a. Salesforce: Salesforce provided the Cloud software that IBM UK engineers configured (known as Salesforce for ITS and MuleSoft for RTTS), as well as technical subject matter experts who supported the projects.

    b. Mission Labs: For ITS, Mission Labs implemented the Amazon Connect telephony product used by call centre tracing agents.

    c. OwnBackup: OwnBackup provided data backups for ITS.

    d. QA Ltd: In partnership with Salesforce, QA trained and provided some personnel for the Level 2 Support operations described earlier.

    e. The Social Kinetic: The Social Kinetic provided user insight to guide the design of TTI systems in order to make them more user-friendly for citizens with accessibility needs.

    f. Conga: For FOLK, Conga provided a plug-in to support the management of documents.

59. From my perspective, IBM UK worked effectively in partnership with these companies in exceptionally difficult circumstances. It would not have been possible for the Government to deliver these programmes without the expertise and resources of major private sector companies like IBM UK and smaller companies providing specialist skills. The amount of work, its complexity and the short timelines meant that we had large numbers of staff working at maximum capacity for much of our involvement in TTI. I do not believe it would be possible for the Government to have these resources available internally.

Public Sector

60. As mentioned above, IBM UK employees formed part of 'rainbow teams' with Government and private sector employees working on each programme. In my experience, there was a very high level of cooperation and coordination which broke down barriers between organisations.

61. In relation to ITS and RTTS, the primary public sector bodies that IBM UK worked with were DHSC, PHE (an agency of DHSC), NHS Test and Trace and UKHSA (when it took over PHE's health protection functions and NHS Test and Trace). These public sector bodies drove the policy response to Covid-19 and, as IBM UK's clients, decided goals and requirements for each programme. IBM UK personnel worked very closely with staff at all levels from these organisations on a daily basis. In addition, each programme had a weekly or bi-weekly meeting attended by more senior personnel from IBM UK and public sector organisations to coordinate work and discuss progress, issues and actions.

62. During the data platform review workstream, IBM UK also worked closely with Test and Trace and JBC, as described above. For the workstreams where IBM UK was supplying personnel to the CDO and JBC, our employees were essentially fully integrated with those organisations, as described above.

Local Authorities

63. I am not aware that we had any significant interactions with local authorities in respect of TTI; however, it is possible that our staff had some contact with local authorities in the course of their work. By way of example, the FOLK system was designed to interface with local authorities in relation to local lockdown events. I do not recall whether we provided training to staff from local authorities, but it is likely that we did so. Ultimately, IBM UK's work was focused on the design and build of nation-wide systems, which were implemented and managed locally by different parties within Test and Trace. I am unable to comment on the impact of the centralisation of the National Testing Programme and TTI more broadly, as IBM UK was a technology development partner and was therefore not involved in setting strategy or reviewing the outcomes of that strategy.

Robustness of TTI Infrastructure and Systems

Quality Assurance

64. IBM UK focused a great deal of time and effort on the robustness and effectiveness of the TTI systems in which it was involved, particularly in terms of performance, scalability and security. This was fundamental to each programme at all stages, despite the time pressure we were under. We built quality into our TTI solutions, enabling our efforts to be focused on delivering change as the pandemic led to new requirements. Ultimately, the TTI systems were required to reliably handle the volume of cases and results that were coming through and were required to work without interruption to ensure that the TTI systems would be of use during the pandemic. To be clear, our work included ingesting and routing Covid-19 test result data and ensuring that this was shared accurately and quickly with relevant systems and organisations, but we were not involved in the supply of test kits or access to testing. As I mentioned above, IBM UK also leveraged our experience developing a contact tracing process for the state of Rhode Island.

65. The aim of the data platform and data architecture review workstreams that I have described above was essentially to ensure that those systems were robust and effective from a data governance and data architecture perspective. Further, the Level 2 support workstream played an important role in detecting and resolving issues that arose regarding the 'trace' services. However, I cannot comment on the robustness or quality of the data collection, use, modelling or analysis that took place 'on the ground' during Covid-19, as IBM UK was not directly involved with this work.

66. In developing ITS and RTTS as I outlined previously, IBM UK's approach to quality assurance had several pillars:

    a. Our teams followed quality assurance plans and had a pervasive focus on quality. ITS and RTTS had quality assurance leads with teams reporting to them. We also deployed subject matter experts for particular areas of software development and brought in Chris Hay, the Chief Technology Officer of the IBM iX division and one of the best software engineers at IBM.

    b. We implemented a culture of continuous improvement and continuous delivery through DevOps, a methodology that integrates and automates the

work of software development and IT operations. Automated triggers (such as automatic deployment to development or test environments upon code changes) were backed up by a comprehensive code review process and enforcement of 'merge' criteria. The four DORA (DevOps Research and Assessment) metrics – frequency of deployments, lead time for changes, change failure rate and time to restore service – were used to monitor the performance of the delivery process, identify pain points, define resolutions and track improvement.

c. Extensive manual and automated testing was carried out at every stage. Before any new releases or changes were deployed, they were tested exhaustively to ensure that they would work the first time, every time. For example, for RTTS, a suite of over 120,000 tests were run daily in less than one hour, driving speed and quality into delivery whilst saving cost. Reconciliation testing was carried out for RTTS, which involved taking live data in the existing system and proving that each data element was correctly flowing through the updated system so that it would produce the same result or that any differences could be justified. Integration testing ensured that the various systems (including those developed by other suppliers) worked correctly with each other so that the overall ecosystem functioned from end to end.

d. For each system that we developed, IBM UK also had to meet a number of 'non-functional requirements' or 'quality attributes' that specified how well the system should perform (not just functional requirements that defined what it should do). There were non-functional requirements relating to criteria such as speed, scalability, reliability, availability and security. For example, ITS had to enable about 160,000 text messages per minute to be sent at peak times, from a starting point of 3,000 texts per minute.

e. Ultimately, I believe that IBM UK's comprehensive approach to quality assurance was a key feature of our work that meant that we were a significant private sector partner in the Test and Trace programme. We contributed highly qualified, experienced and hard-working professionals with remarkably low staff turnover to the 'rainbow teams' established by DHSC, where we worked in close collaboration with numerous partners to develop robust and effective TTI systems.

D. Vulnerabilities and Inequalities Considerations

67. To the best of my knowledge, IBM UK was not specifically asked by the Government to have regard to vulnerabilities and inequalities issues. However, IBM UK was contractually required to adhere to standards such as the Technology Code of Practice RL/3 INQ000587711 (which includes the principle that systems should be accessible and inclusive), as is usual with any government procurement. Furthermore, I understand that DHSC is required to adhere to the Government Design Principles **RL/4 INQ000587710** which include requirements around accessibility. Given that the work IBM UK was doing was for DHSC, we were also expected to adhere to these Principles.

68. Given the nature of the work I have described, there were few instances where IBM UK developed user interfaces that would necessitate considerations regarding vulnerabilities and inequalities. Two notable exceptions were: (i) ITS, where we had to consider end users (particularly call centre agents) who might be visually impaired when designing the user interface; and (ii) EFC, where we had to take into account the full range of sight, motor, sound, cognitive and socio-economic accessibility factors within the general public in the design of the forms. IBM UK partnered with a consultancy called The Social Kinetic to assess the best approach to support the accessible design of 'trace' services in order to reach what were known as 'hard to reach communities', including those who were affected by sensory, cognitive or socio-economic accessibility factors or digital exclusion. I understand that this work took place in the context of a wider user research programme focused on Trace activities, most of which did not involve IBM UK. To my knowledge, The Social Kinetic team contributed research services to augment IBM UK's service design work and this research was communicated to DHSC and contributors to the Test and Trace programme, but I am not aware of the specific extent to which it was used to inform further service design or user experience design. Apart from the two user interfaces mentioned above, IBM UK's work related to the technology systems and infrastructure which were situated a step away from the 'front line' of Covid-19 involving the general public.

E. Compliance

69. To the best of my knowledge, IBM UK did not have any role in relation to public compliance to ensure that the TTI processes were effective or in compliance with health protection regulations relating to notifiable diseases. Those matters were outside the scope of our work and expertise.

F. Lessons for the Future

70. IBM UK teams delivered the work I have described at an incredibly rapid pace, in an unprecedented environment that changed on a daily – sometimes even hourly – basis. This meant that, although I am not aware that there were any formalised 'lessons learned' exercises or reviews, that kind of learning happened constantly. Our work was subject to considerable and continuous scrutiny both internally (as described in the quality assurance section above) and externally (at weekly or bi-weekly meetings involving our Government clients).

71. With the benefit of hindsight, it is possible to identify things that could have been done differently in the Government's response to the Covid-19 pandemic with respect to TTI if it had been developed in a reasonably stable and predictable external environment. However, the Government, IBM UK and our partners were operating in a context where our understanding of Covid-19 and its impacts on the global and UK population were constantly changing. In my experience, people at IBM UK and the Government ultimately tried their very hardest to make the best decisions they could with the information they had.

72. At times, the speed of decision-making and the prioritisation of various programmes were affected by rapidly changing policies and requirements, often announced with little or no warning, as well as staff turnover in Government organisations, such as in the role of Tracing Divisional Director. However, I believe that this was understandable in the context of the conditions during the pandemic. Although these challenges inevitably caused some inefficiencies in the design and delivery of our technology solutions, these were mitigated to a significant degree by the flexibility of the ITS and RTTS platforms, which allowed us to be reactive and quickly add or modify functionalities as needed.

73. I am incredibly proud (and from my role I am aware that the IBM team involved were also very proud) of IBM UK's contribution to the Covid-19 TTI response and the speed at which our staff worked under extremely challenging circumstances. I think it important to emphasise how hard the IBM UK teams worked during the pandemic: often upwards of 12-hour days, seven days a week. Considering what we were able to deliver in the circumstances, including the rapid change in requirements and the immense time pressure, I believe IBM UK provided good value for money.

74. TTI enabled effective case and contact tracing for millions of citizens, fast and accurate transmittal of test results, safe handling of incoming travellers and fully integrated technology systems. As a result, the Government may wish to make TTI an element of its response to any future pandemic and both ITS and RTTS would be invaluable elements of TTI. ITS and RTTS are modular platforms, which means that they can be configured to meet the requirements of a future pandemic. However, I understand that they have largely been decommissioned since the trace contracts were re-tendered.

75. One legacy of IBM UK's involvement with TTI is our more recent work on a new health protection and surveillance data platform for UKHSA, which was informed by our experience from the Covid-19 pandemic. This new platform is secure, effective and reliable, and gives UKHSA a single data platform with the right data analytics tooling to help to protect the UK from health hazards. The development of large-scale system and software integrations brought about by the needs of the Covid-19 pandemic enabled us to design and build this new UKHSA data platform. Ultimately, I believe that should another pandemic occur in the future, the UK is now in a better position than it was before Covid-19.

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: PD

Dated: 22 April 2025