UK COVID-19 INQUIRY

WITNESS STATEMENT OF BEN OSBORN

I, BEN OSBORN of Pfizer Limited, Ramsgate Road, Sandwich, Kent, CT13 9NJ, WILL SAY AS FOLLOWS

1. Since December 2023, I have held the position of President, International Commercial Office at Pfizer. I was previously Managing Director and UK Country Manager, Pfizer Limited from December 2018 to January 2022. From January 2022 to September 2022, I held the position of Regional President Hospital Business Unit – International Developed Markets. During my time as UK Country Manager, the role most relevant to the matters of interest to the COVID-19 Inquiry ("the Inquiry"), my responsibilities included leading Pfizer's UK biopharmaceuticals organisation overseeing key business and operational matters relating to Pfizer's medicines and vaccines business in the UK.

2. I am authorised to make this statement in response to the Rule 9 Request to Pfizer Limited dated 29 November 2023 (the "Request") in order to assist the Inquiry in its investigation of the topics set out in the Provisional Outline of Scope for Module 4.

3. The Request covers a wide range of matters, including some that are outside my direct knowledge and experience. In order to prepare for this statement, I have therefore spoken with colleagues and considered documents. To the extent that I do not have first-hand knowledge of events and where not otherwise immediately apparent, I have specified this in the statement.

4. This statement is provided on behalf of Pfizer Limited, the principal affiliate of Pfizer Inc in the UK, which operationalised the Pfizer Group's UK response to the COVID-19 pandemic. References to "Pfizer" in this statement are to the Pfizer Group.

5. Where I refer to documents in this statement, I reference them to the Schedule of Exhibits at Annex 2 in the format **[BO/Exhibit number – INQ number]**.

6. The statement is structured as follows:

A. The Vaccine

i. Structure, role, people and processes

ii. Key decisions, actions and documents

iii. Vaccine preparedness

iv. Development of the Vaccine

v. Authorisation process

vi. Vaccine delivery and prioritisation

vii. Vaccine safety

B. UK Vaccine Damage Payment Scheme

C. Lessons learned and preparing for a future pandemic

Annexes

Annex 1 - Glossary of acronyms

Annex 2 - Schedule of Exhibits provided to the Inquiry

Annex 3 - Tables showing key individuals and their roles

Annex 4 - Chronology setting out the main stages in the development, manufacture, procurement, authorisation and supply of the Vaccine

Annex 5 - UK Comirnaty Market Supply Steps

Annex 6 - Dates of publication of safety information in Comirnaty Product Information.

Annex 7 - Allocation of responsibilities between Pfizer and BioNTech

7. The COVID-19 vaccine supplied in the UK by Pfizer Limited ("Comirnaty" or "the Vaccine") was developed as a collaboration between Pfizer Inc and its business partner BioNTech SE ("BioNTech"). The development of the Vaccine principally took place outside the UK with very limited involvement by Pfizer Limited.

8. I am aware that BioNTech has also received a Rule 9 Request from the Inquiry and will be submitting a statement in response. The Inquiry has advised Pfizer Limited that, where particular matters may more appropriately be addressed by BioNTech, it is unnecessary for such issues to be duplicated in Pfizer Limited's response to the Request.

i. Structure, role, people and processes

Overview

9. Pfizer is a US headquartered, multinational, pharmaceutical and biotechnology company, which develops and produces medicines and vaccines in a wide range of therapeutic areas. Its UK affiliate, Pfizer Limited, was incorporated in 1953 and has sites at Sandwich, Walton Oaks, Marlow and Cambridge.

10. A list of the individuals who were the key decision makers in relation to Pfizer Limited's involvement in the development, procurement and authorisation of the Vaccine, together with their respective roles and time periods, are provided in Annex 3.

11. Pfizer started to consider development of a vaccine against COVID-19 in January 2020 when the SARS-CoV-2 virus was sequenced. Pfizer had been working with BioNTech since 2018, seeking to develop an influenza vaccine based on messenger ribonucleic acid ("mRNA")[1] technology. Once SARS-CoV-2 was sequenced, our focus pivoted to a potential vaccine against COVID-19. A collaboration with BioNTech was announced by Pfizer's CEO and was described in a press release issued by Pfizer Inc on 17 March 2020 **[BO/08 - INQ000507898]**. Clinical trials of vaccine candidates were commenced in April 2020 and initial investigations identified one candidate (BNT162b2, ultimately known as Comirnaty) as the most promising. Pfizer conducted the main large Phase 1/2/3 clinical trial which formed the basis for the initial authorisations. The trial was conducted at multiple sites globally, however none of the sites which participated in the pre-authorisation clinical trials were located in the UK.

12. Pfizer Limited was responsible for negotiating the arrangements for procurement, contracting and distribution of the Vaccine in the UK with Government and NHS bodies and for delivering supplies of the Vaccine to meet UK requirements. I participated in preliminary correspondence and discussions with representatives of the UK

[1] mRNA is a molecule that contains the instructions that direct individual cells to make a specific protein.

Government regarding potential supply of the Vaccine in the UK from April 2020. Following establishment of the new Vaccine Taskforce ("VTF") and the appointment of Kate Bingham in May 2020 to be its first chair, Pfizer Limited's interactions with the UK Government were principally conducted through the VTF, which co-ordinated and facilitated arrangements for the procurement, contracting, import and distribution of the Vaccine throughout the UK[2] and internationally[3]. VTF procedures and coordination enabled planning to support fast centralised supply readiness and inclusion of the Vaccine in the national vaccination programme following the temporary authorisation under Regulation 174 of the Human Medicines Regulations 2012 ("Regulation 174 Authorisation"), on 2 December 2020. Further information on the Regulation 174 Authorisation is contained in paragraph 81. Following the Regulation 174 Authorisation (and subsequently the Conditional Marketing Authorisation ("CMA") and then the standard Marketing Authorisation ("MA")), Pfizer Limited was responsible for the centralised supply of the Vaccine to the UK Government and liaised closely with the VTF with respect to UK requirements for supplies of the Vaccine and the timing and central locations for deliveries of the Vaccine.

13. Interactions with the Medicines and Healthcare products Regulatory Agency ("MHRA") in relation to the authorisation of the Vaccine and subsequent supervision of the various authorisations granted and/or applicable in the UK, were generally led by BioNTech (initially through Jenson, a regulatory consultancy, acting on their behalf[4]), although representatives of Pfizer Limited were present at most meetings. BioNTech submitted data to MHRA in relation to the Vaccine between October - December 2020, following which the sole role of both Pfizer and BioNTech was to respond to MHRA's questions or requests for further information. MHRA's assessment of the Vaccine, including the regulatory mechanisms used, was fully independent of both companies.

14. In parallel with submission of data to MHRA, on 27 November 2020, Pfizer Limited submitted a dossier with information regarding the Vaccine to the Joint Committee on Vaccination and Immunisation ("JCVI"), a standing advisory committee that advises UK health departments on immunisations. A presentation to the JCVI was made on 30 November 2020 and a decision by the JCVI was issued on 2 December 2020 to

[2] Including Crown dependencies and overseas territories

[3] For example through Covax arrangements

[4] Due to the fact that BioNTech had a small UK based team at that time, they contracted with Jenson to support their communications with MHRA.

recommend the Vaccine for an immunisation programme. Further submissions to the JCVI were provided when the authorisations for the Vaccine were extended to include additional patient groups or vaccination schedules and in response to requests for information.

15. Pfizer Limited also worked closely with Public Health England ("PHE") and subsequently with the UK Health Security Agency ("UKHSA") which replaced PHE from April 2021, in relation to the import, export, and logistical arrangements for centralised supply of the Vaccine and arrangements for the provision of Product Information (see paragraphs 99 - 100 below). We also had regular contact with NHS England to provide support for implementation of the vaccination programme.

16. Pfizer maintains a global safety database containing Adverse Events for the Vaccine. While therefore much of the safety monitoring and assessment of safety information took place at a global level outside the UK, Pfizer Limited was substantially involved in receiving and processing reports of Adverse Events, in the communication of safety information to MHRA and in discussions with MHRA regarding any actions required to provide safety information to healthcare professionals and vaccine recipients.

17. Pfizer's interactions with each group are described in more detail below.

Politicians and Government

18. In addition to regular, scheduled discussions with politicians and senior civil servants, there were occasional calls involving myself, others within Pfizer, the Prime Minister, Boris Johnson, and Senior Ministers in the UK Government. In March 2020, Pfizer's CEO wrote to Boris Johnson outlining a five point plan for addressing the pandemic, which included development of a vaccine **[BO/07 - INQ000507897]**. From April 2020, I, together with other Pfizer colleagues, commenced preliminary discussions with Ministers including Matt Hancock, who was Secretary of State for Health and Social Care up to 26 June 2021, Lord Bethell, Parliamentary Under-Secretary of State for Innovation at the Department of Health and Social Care and Alok Sharma, Secretary of State for Business, Energy and Industrial Strategy, regarding the potential supply of a vaccine. During subsequent months further meetings took place. The Ministers I met with varied, depending on the issue at hand at the relevant time, but they included Boris Johnson, Matt Hancock, Nadhim Zahawi, Minister for COVID Vaccine Deployment and, following his appointment as Secretary of State for Health and Social

Care, Sajid Javid. Pfizer's CEO was also present at the meetings with the Prime Minister. Others in attendance at these meetings (depending on the issue at hand) included Emily Lawson, National Director of Vaccine Deployment at NHS England and NHS Improvement, Chris Whitty, Chief Medical Officer, Jonathan Van-Tam Deputy Chief Medical Officer, Madelaine McTernan, Director General of the VTF and Ruth Todd, Programme Director, VTF.

Vaccine Task Force

19. The "VTF" was set up by the UK Government in April 2020 as a joint unit between what was then the Department for Business, Energy and Industrial Strategy ("BEIS") and the Department of Health and Social Care ("DHSC"). It was stated to have three main purposes: (a) to secure access to promising COVID-19 vaccines for the UK population as quickly as possible; (b) to make provision for international distribution of vaccines; and (c) to strengthen the UK's onshoring capacity and capability in vaccine development, manufacturing and supply chain to provide resilience for future pandemics. It was made up of civil servants, secondees from industry and contractors.

20. Pfizer Limited had regular contact with the VTF from the outset. In June 2020, shortly after Kate Bingham's appointment as VTF chair, we had a preliminary meeting regarding Pfizer's work in vaccine development and this subsequently progressed to more in depth discussions. From August 2020, scheduled meetings with various groups within the VTF took place on a weekly basis, increasing to daily contact from around November 2020, when activity was particularly intense. The individuals from Pfizer Limited and BioNTech who attended such meetings varied depending on the focus and agenda of the meetings. Examples of notes of meetings between Pfizer Limited and VTF members are provided at **BO/79a-BO/79e - INQ000519429 to INQ000519433]** and **[BO/80a-BO/80f - INQ000519436 to INQ000519448]**.

21. I, together with Pfizer colleagues, attended regular meetings with senior members of the VTF ("Senior Meetings") including, at various times, Madelaine McTernan, Ruth Todd, Steve Glass, VTF Programme Director and Phillipa Harvey, VTF Supply Director. Senior Meetings generally lasted between 30 minutes to one hour and addressed issues pertinent at that time. Therefore earlier Senior Meetings principally focused on contract negotiation, while meetings closer to and following authorisation of the Vaccine involved discussion of supply chain and delivery logistics. Over time, as the incidence of infections due to the virus began to decrease, the frequency of

meetings reduced and, by around Quarter 1 of 2022, the Senior Meetings were being held monthly.

22. In parallel with the Senior Meetings, my Pfizer Limited colleagues attended frequent operational meetings with other groups within the VTF, principally comprised of contractors whose roles focused on the details of the logistical operations relating to supply and delivery of the Vaccine ("Operational Meetings"). By way of example, an initial Operational Meeting took place on 18 August 2020 to discuss clinical trial progress, anticipated delivery of doses of the Vaccine and delivery locations, stability of the Vaccine and storage requirements including the types of refrigerators that would be suitable.

23. In addition, there were also monthly meetings between Pfizer Limited and VTF members, to monitor contract key performance indicators ("KPIs") ("Contract Meetings"). These meetings were usually attended by relevant personnel from Pfizer Limited and the VTF commercial leads. Contract Meetings continue to take place on a monthly basis.

24. At the height of the pandemic from mid 2020 to mid 2021, there were also frequent ad hoc meetings between Pfizer Limited colleagues and VTF members which sometimes took place multiple times per day.

Public Health England / UKHSA

25. PHE and, subsequently, UKHSA were responsible for the various warehouses which received delivery of supplies of the Vaccine from Pfizer Limited. It was therefore necessary for Pfizer Limited to maintain frequent communications with PHE/UKHSA contacts to ensure that appropriate supplies of the Vaccine, as determined by the VTF and notified to Pfizer Limited, were available at the relevant warehouse hubs in order to meet demand in the four UK nations.

26. Pfizer also had weekly calls with PHE/UKHSA regarding the arrangements for provision of information regarding the Vaccine for vaccine recipients. Following the Regulation 174 Authorisation, such information was provided as Regulation 174 Information for Vaccine Recipients and, once the Vaccine started to be supplied in accordance with the Great Britain CMA and, in Northern Ireland, in accordance with the EU CMA, as Patient Information Leaflets ("PILs"). The content of both Regulation

174 Information for Vaccine Recipients and PILs were approved by the MHRA or European Medicines Agency ("EMA") as appropriate before such documents were put into circulation and Pfizer Limited liaised with PHE/UKHSA in relation to printing and allocation so that appropriate quantities were delivered to the UKHSA to be made available with the Vaccine for use at vaccination centres.

JCVI

27. Pfizer Limited liaised with JCVI during the period leading up to Regulation 174 Authorisation of the Vaccine, ensuring that JCVI was fully informed as to the progress of development and the anticipated timelines. Pfizer Limited first met with JCVI to discuss the Vaccine on 1 October 2020 in order to provide a high level update on the clinical development plan. We made a substantive submission to the JCVI on a confidential basis through a secure portal on 27 November 2020 and presented the safety and efficacy data to the JCVI sub-committee on COVID-19 vaccines on 30 November 2020. Data relating to the Vaccine were therefore considered by JCVI in parallel with MHRA's review, so that recommendations by JCVI on use of the Vaccine within the UK vaccination programme, including the groups who should be prioritised for vaccination, could be issued as soon as possible following an MHRA decision on authorisation, assuming this was positive. JCVI is an independent scientific expert group and Pfizer Limited played no part in the JCVI's decision making, although we responded to requests for information and answered queries received from the JCVI secretariat. The medical team at Pfizer Limited, led by Dr Gillian Ellsbury, who was at material times, Medical Director, Vaccines UK & Ireland, was responsible for interactions with JCVI. The JCVI issued its initial recommendations on 2 December 2020, the same day that the Regulation 174 Authorisation was granted by the UK Licensing Authority.

28. Pfizer provided further updates to the JCVI on 8 March 2021, 11 June 2021, 22 November 2021 and 29 November 2021 and presented data relating to the safety, immunogenicity and efficacy of the Vaccine in children and adolescents aged 12-15 years at a meeting of JCVI on 20 May 2021 and in children aged 5-11 years, at a meeting of JCVI on 25 November 2021.

MHRA

29. As I have previously explained, interactions with MHRA in relation to the Vaccine were led by BioNTech, however a representative from Pfizer Limited was generally present. I understand that BioNTech will cover these meetings and communications in its statement to the Inquiry and, subject to the observations below. I do not duplicate such matters here.

30. While BioNTech led interactions with MHRA, they did not, at that time, have access to the MHRA's online portal and, therefore, data relating to the Vaccine were submitted to MHRA by Pfizer Limited colleagues.

31. Pfizer is responsible for the global safety database in relation to the Vaccine and, therefore, Pfizer Limited together with BioNTech participated in regular calls with the MHRA in relation to safety issues **[BO/81 - BO/81h INQ000519449 - INQ000519457]**. The frequency of these calls changed over time as determined by MHRA. Immediately after grant of the Regulation 174 Authorisation, such calls took place on a bi-weekly basis, but subsequently reduced to weekly, fortnightly and, later, monthly. During these calls the companies and the MHRA would share emerging safety data and discuss the status of safety signals. The calls, which were additional to standard pharmacovigilance reporting requirements, also provided an opportunity to discuss any questions raised by MHRA, such as requests for updates on the number of Adverse Event reports received by Pfizer, internal processing and reporting rates, information regarding the source of reporting data[5], queries about packaging and labelling and requests for data relating to booster doses.

Devolved Nations

32. Pfizer Limited also attended meetings with senior representatives from each of the devolved nations to provide updates on development of the Vaccine and there were frequent operational discussions with the health deployment teams in relation to logistical arrangements and expected timelines. Attendees at these meetings varied depending on the agenda but some meetings included Senior Ministers and Chief Medical Officers in the devolved nations.

ii. Key decisions, actions and documents

[5] E.g. from the Yellow Card system, from direct reports from vaccine recipients, from HCPs or from other regulatory authorities.

33. A Schedule of Exhibits referenced in this statement is provided at Annex 2.

34. A chronology of the main events in the development, manufacture, procurement, authorisation and supply of the Vaccine is provided at Annex 4.

iii. Vaccine preparedness

Pfizer's understanding of the preparedness of the United Kingdom for the rapid development of a 'Disease X' vaccine in early 2020

35. The UK has a number of long term strengths which it was able to deploy in support of rapid development of a vaccine against a "Disease X" in early 2020, including basic research[6] skills, together with robust intellectual property laws, strong regulation and agile institutions.

36. However, it is my understanding that pandemic preparedness by Government in the UK prior to COVID-19, principally focussed on a response to a potential influenza pandemic, rather than considering a previously unknown "Disease X". Elements of the pandemic strategy, as set out in "The UK Influenza Preparedness Strategy 2011" **[BO/61 - INQ000508009]**, were highly relevant to the organisational response to the COVID-19 pandemic, including:

- surveillance and modelling, to detect and assess the impact of a new virus and identify the groups most at risk of severe illness, hospitalisation and death;
- measures to reduce the risk of transmission, such as good infection prevention and control practices and provision of personal protective equipment for front-line health and social care staff, held in stockpiles;
- stockpiles of antibiotics to treat pneumonia and other complications of infection;
- the advanced purchase agreement approach to procurement, which allows Government to guarantee access to a vaccine before this has been authorised and provides some certainty to a vaccine manufacturer about volumes of stock that will be required.

[6] Basic research refers to the scientific investigation of theoretical questions for the sake of building knowledge and understanding of basic science which provides a foundation for subsequent applied science and applied research.

37. In addition, regulatory mechanisms, such as "rolling review", allowed MHRA to speed up the assessment of promising medicines or vaccines in the context of a public health emergency, by reviewing data as these became available from ongoing studies rather than requiring submission of a complete dossier before review commences. The Regulation 174 Authorisation procedure, which was already available, but underwent further development in the context of the COVID-19 pandemic, expedited decision-making by MHRA on the authorisation of new vaccines and antivirals.

38. However, the focus on an influenza pandemic, together with an assumption that a pandemic specific influenza vaccine based on existing influenza vaccines, could be made available within 4 - 6 months after the start of a pandemic, meant that there had been limited co-ordinated investment in development of vaccines against new viruses. At the start of the pandemic, there was no UK equivalent of the United States Biomedical Advanced Research and Development Authority ("BARDA") which focuses specifically on the development of medical countermeasures for public health emergencies including pandemics, with the result that the UK's preparedness for the rapid development of a Disease X vaccine in early 2020 was principally dependent on the work of independent academic centres.

39. This situation has now changed with the legislation, enacted in 2022, establishing the Advanced Research and Intervention Agency ("ARIA") with the purpose of funding research projects across the full spectrum of disciplines, approaches, and institutions. While ARIA has a substantially broader remit than BARDA, it aims to support high-risk, high-reward research with long-term impact, which could be used to support pandemic preparedness and response. Regardless of the specific agencies involved, prioritising funding for basic research, including the biology of bacterial and viral diseases, and innovative platform technologies will strengthen health research and development ecosystems. The scientific support provided through ARIA together with smooth and flexible collaboration between industry, academia and Government, is likely to facilitate pandemic preparedness and more rapid development of medical countermeasures.

40. The UK has consistently scored highly in terms of academic research and a number of centres are well recognised for their capabilities and achievements. The research conducted at the University of Oxford is one example. (Notably the University of Oxford received funding from the Coalition for Epidemic Preparedness Innovations ("CEPI") in 2018 to develop a vaccine against Middle East Respiratory Syndrome ("MERS")

coronavirus and to conduct research on vaccines against Lassa and Nipah viruses) **[BO/01 - INQ000507895]**.

41. The UK is also a world leader in genomic sequencing and, following the formation of the COVID-19 genomics UK consortium in April 2020, was able to exploit the pre-existing infrastructure and expertise of academic and public health partners to collect, sequence and analyse genomes of SARS-CoV-2 at scale, permitting companies such as Pfizer to respond to new virus variants **[BO/27 - INQ000507912]**.

Pfizer's view of the lessons learned from vaccine development by pharmaceutical companies or academia during previous epidemics and pandemics

42. The development of new platforms for vaccine development had been the subject of research for many years prior to the COVID-19 pandemic, in the context of previous epidemics and pandemics. While no vaccines against previously identified coronaviruses, SARS-CoV-1 or MERS, have been licensed, these epidemics stimulated vaccine research including in relation to use of both viral vector platforms and nucleic acid technologies which were previously investigated by researchers in relation to potential influenza, Ebola and Zika vaccines **[BO/88 - INQ000508027]**, **[BO/89 - INQ000503742]** and **[BO/90 - INQ000508029]**. These approaches to vaccine development have the advantage that vaccines can be developed using sequencing information alone and the associated research subsequently assisted in the development of vaccines against COVID-19.

43. Pfizer has significant experience developing vaccines. The company played a key role in the development of vaccines for smallpox and polio and more recently pneumococcal and meningococcal vaccines **[BO/33 - INQ000507918]**. In 2018, Pfizer started working with BioNTech on a programme investigating the use of mRNA vaccine technology in developing an influenza vaccine **[BO/34 - INQ000507919]**. This history meant that Pfizer was well placed to consider development of a vaccine against SARS-CoV-2, when the virus was sequenced in January 2020.

44. Pfizer's ability to react quickly to SARS-CoV-2 can be attributed to four main factors: (i) Pfizer's past experience developing vaccines; (ii) Pfizer's pre-existing relationship with BioNTech, which had developed deep expertise in mRNA technology; (iii) prioritisation of Pfizer's resources, particularly its global infrastructure and clinical trial experience, which enabled a large scale clinical trial to be conducted at pace and to high quality and then manufacturing to be scaled-up at speed; and (iv) the approach

of regulators, including EMA and MHRA, accepting data from pre-clinical and clinical trials under rolling review processes.

iv. Development of the Pfizer/BioNTech Vaccine

Messenger ribonucleic acid (mRNA) vaccines: background

45. Traditional vaccines introduce into the body an inactivated (dead) or attenuated (weakened) form of the relevant bacteria or virus. This prompts the immune system to mount a response, which is then triggered if the virus or bacterium is encountered again. mRNA vaccines work in a different way, by instructing the body to produce part of the virus protein rather than by directly injecting the virus. mRNA is a naturally occurring molecule, that contains the instructions for production of a specific protein by cells. mRNA vaccines are designed to code for a protein present on the target virus. Once the body starts to produce the protein, this results in an immune response against the virus. Once cells finish making a protein, the mRNA is broken up into multiple harmless pieces over a period of a few days.

45.1. mRNA from vaccines does not enter the nucleus of cells and does not have the ability to alter the genes of the vaccine recipient. It would therefore be incorrect to describe mRNA vaccines against infectious diseases as gene therapies. This position has been confirmed by the EMA:

> "A vaccine against an infectious disease is not considered a gene therapy, as it does not aim to restore, correct, or modify human genes. Therefore mRNA COVID-19 vaccines are not considered gene therapies"[7].

45.2. Following assessment of the Vaccine, including the organ and system upon which it exerts its effects and its mechanism of action, EMA assigned the following ATC Code to the Vaccine:

> "Pharmacotherapeutic group: vaccines, viral vaccines, ATC code: [07BN01]"

45.3. mRNA vaccines exert their intended effect by causing the body to produce a viral protein; they are not therefore prodrugs, defined as inactive compounds with little or

[7] European Medicines Agency: Covid 19 Vaccines: Key Facts

no pharmacological activity that metabolize inside the body and convert into pharmacologically active drug compounds.

Chronological overview of the key stages in the development, manufacture and procurement of the Vaccine

46. A chronological overview is attached as Annex 4 to this statement and summarised briefly below.

47. In March 2020, Pfizer and BioNTech entered into a collaboration agreement **[BO/77 - INQ000508019]** to develop a mRNA vaccine against COVID-19. BioNTech had conducted extensive research in relation to use of mRNA technology prior to the COVID-19 pandemic and, once the SARS-CoV-2 virus had been sequenced, they undertook early stage development of potential vaccine candidates. Pfizer participated to some extent in this pre-clinical work, but became substantially involved from April 2020, when the most promising vaccine candidate was selected and was responsible for the conduct of the majority of clinical trials involving the Vaccine. Data to support authorisation of the Vaccine were submitted to the MHRA via a rolling review process from October 2020, resulting in a Regulation 174 Authorisation granted by the UK Licensing Authority on 2 December 2020 **[BO/14 - INQ000470360]**.

48. Drug substance for the Vaccine supplied in the UK, including the lipid delivery vehicle required for successful administration of mRNA, were principally manufactured by BioNTech, with supplies of finished product manufactured in Pfizer's facilities in Puurs, Belgium. Consistent with quality requirements applicable to all vaccines, the Vaccine was manufactured in accordance with international standards of Good Manufacturing Practice ("GMP") and at sites which were the subject of manufacturer's authorisations granted by the authorities in the countries where they are located and inspected on a regular basis. Manufacturing and logistics solutions were developed in parallel to the clinical trial programme and prior to the grant of authorisations in the UK and EEA, so that stock would be available for use in national vaccination programmes as soon as required. Between 2019 and 2021, Pfizer increased its annual vaccine production output from 200 million doses to in excess of 2.5 billion doses, largely in response to the pandemic, with the result that, when the Regulation 174 Authorisation was granted, supplies of the Vaccine were available to be administered under the UK National COVID-19 Vaccination Programme, which commenced on 8 December 2020 **[BO/15 - INQ000237370]**.

49. Inevitably, in preparation for manufacture of any vaccine at large scale, some improvements to the manufacturing process of the Vaccine were required to adjust the scalability, robustness and productivity of the process. Two active substance processes were used during the development history of the Vaccine: Process 1 (clinical trial material) and Process 2 (commercial process)[8]. The two processes were assessed by comparability studies and characterisation testing demonstrating that the primary sequence and secondary structure of Vaccine active substance was comparable for all Process 1 and Process 2 batches. This testing was conducted for all manufacturing sites and submitted for review and approval to regulatory authorities.

50. Following assessment of the data relating to the Vaccine by the EMA, the European Commission granted a CMA on 21 December 2020 **[BO/69 - INQ000508014]**. In December 2020, EU medicines legislation was applicable in the UK, pursuant to transitional procedures implemented following the withdrawal of the UK from the EU, which meant that the CMA for the Vaccine, granted in the EU on 21 December 2020, was also effective in the UK. Following the end of the transition period on 31 December 2020, a Great Britain CMA ("GB CMA") was granted automatically on 1 January 2021, as part of the grandfathering of medicinal products authorised under the EU centralised procedure **[BO/48 - INQ000508001]**. Subsequent changes to the GB CMA reflected changes at EU level and did not occur simultaneously with similar updates to the Regulation 174 Authorisation.

51. The UK Licensing Authority extended the Regulation 174 Authorisation to cover use of the Vaccine in 12-15 year olds on 4 June 2021. The GB CMA was extended to cover use in 12-15 year olds on 9 July 2021 and use in 5-11 year olds on 22 December 2021.

52. Following the fulfilment of all conditions attached to the CMA, the UK Licensing Authority granted a standard Marketing Authorisation for the Vaccine on 9 November 2022.

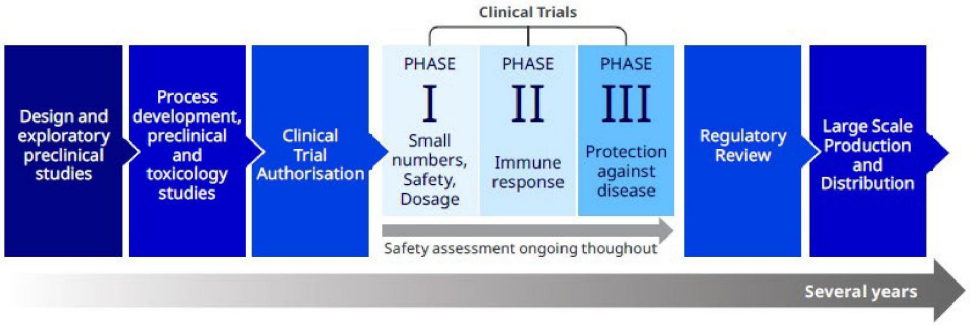
53. In summary, the Vaccine was developed and made available at speed, without compromising safety and without omitting or curtailing any of the stages required for vaccine development and authorisation under standard timelines. Instead the timelines were compressed, largely as a result of decisions by Pfizer and BioNTech to progress development of the Vaccine and upscale manufacture "at risk" and due to the fact that

[8] Process 2 was also used in Phase 3 of Study C4591001/BNT162-02 (described at paragraph 68.2).

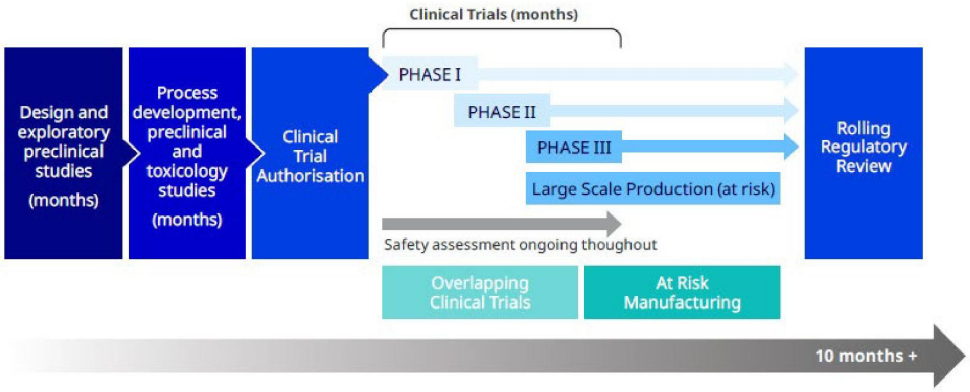
the MHRA used the rolling review procedure, described at paragraph 37, to assess the data as they became available rather than waiting for a complete dossier before commencing review. The strategies that allowed the Vaccine to be developed more quickly than is typically the case were illustrated in a presentation given by Dr Jonathan Van-Tam on 11 November 2020.

Figure 1: Vaccine Development Timelines

(a) Traditional vaccine development timeline[15]



(b) SARS-CoV-2 accelerated vaccine development timeline[15]



Taken from Coronavirus Data Briefing, J. Van-Tam, 11 November 2020.

Obstacles to development, manufacture, procurement and approval and innovations introduced to address these

54. The development of the Vaccine in the context of the pandemic inevitably required enormous investment by Pfizer and BioNTech. In 2020 alone, Pfizer invested more than $650 million "at risk" in capital and over $300 million in raw materials, in a situation

where there were no guarantees that clinical development of the Vaccine would be successful or that it would be authorised for use in vaccination programmes. The development of the Vaccine also required an extraordinary level of commitment by teams across the businesses. Inevitably this imposed substantial pressures on staff, despite increased recruitment.

55. In terms of development of the Vaccine, I am aware of no relevant obstacles during the clinical trial programme and, as explained above, the timelines were compressed in order to ensure that data were available as quickly as possible. One notable challenge faced during the C4591001 Study (see paragraph 68.2 below) arose post authorisation, when trial participants, understandably, wished to ensure that they received the Vaccine, which led to significant diminishment of the placebo group, limiting the amount of placebo-controlled data. However, participant follow up for this study continued post authorisation to collect long term data (further details provided at paragraph 129).

56. Interactions with MHRA in relation to the regulatory review of the Vaccine and subsequent authorisation by the UK Licensing Authority were led by BioNTech. However, so far as I and my regulatory colleagues at Pfizer Limited are aware, there were no major obstacles in the regulatory processes. The MHRA's use of rolling review procedures, which permitted submission and review of data as these became available, was highly efficient and allowed regulatory assessment of the Vaccine to be accelerated. Ultimately the UK was the first country globally to grant an authorisation for the Vaccine **[BO/14 - INQ000470360]**.

57. As indicated at paragraph 48 above, Pfizer commenced upscaling the manufacture of the Vaccine at its facility at Puurs, Belgium, "at risk", before authorisations were granted, to minimise delay in making the Vaccine available for use in national vaccination programmes. Improvements were made to the manufacturing process to adjust the scalability, robustness, and productivity in preparation for high volume manufacture.

58. Pfizer Limited was not involved in manufacture of the Vaccine, however I am aware that there was substantial pressure on stock during the period up to January 2021, which meant that Pfizer colleagues had to work around the clock to meet demand. In view of global requirements for supplies of the Vaccine in January 2021, Pfizer undertook certain modifications of its manufacturing facility in Puurs, in order to

increase production capabilities, including starting up new formulation suites to increase formulation capacity, increasing batch size and reducing manufacturing timelines. This work resulted in a temporary reduction in the number of doses produced by the Puurs site, but did not prevent Pfizer Limited from meeting its delivery commitments in full during the first quarter of 2021. The increased product capacity at Puurs resulted in a significant increase in production and delivery from the second quarter onwards.

59. On 29 January 2021, the European Commission imposed export controls on COVID-19 vaccines manufactured within the EU[9] **[BO/16 - INQ000507901]**. This threatened to cause a shortage of supply of the Vaccine in the UK, which relied on imported product. Ultimately the controls imposed, which fell short of a complete ban on exports, did not prevent supply of all contracted doses to the UK. Export controls were eventually lifted in December 2021[10]. There was also a proposal by the EU to trigger Article 16 of the Northern Ireland Protocol, which would have placed controls on COVID-19 vaccine exports from the EU into Northern Ireland, but ultimately the EU reversed its decision and the proposal was not implemented **[BO/30 - INQ000507915]**.

Pfizer's relationship with the VTF and support provided by the UK Government

60. The establishment of the VTF, with a clear central mission and the ability to unite partners across the whole UK healthcare system and act as a single contact point for engagement with industry, played a central role in the rapid development, procurement and distribution of the Vaccine in the UK.

61. The partnership between the VTF and companies such as Pfizer Limited was highly collaborative. The arrangements allowed industry to gain rapid co-ordinated access to decision-makers within Government and the NHS, with frequent operational reviews and communications in real-time, permitting progress towards decisions on authorisation and arrangements for supply to be made far more quickly than under standard "business as usual" procedures. Proactive information sharing on all sides regarding inventory status, delivery arrangements and levels of vaccine uptake meant that supply requirements throughout the country could be managed effectively. The key individuals at the VTF with whom Pfizer Limited interacted are listed at Annex 3.

[9] Commission Implementing Regulation 2021/111

[10] Commission Implementing Regulation 2021/1728

62. The view of Pfizer Limited's relationship with the VTF expressed by every colleague I have consulted was consistently positive, with accounts of individuals from both sides going beyond what would usually be expected of their roles, be that in working longer hours, being more readily contactable and adopting a flexible approach in the context of the overall challenges. There was very much a sense that we were all working for a common goal, which was to ensure that every UK citizen had access to a COVID-19 vaccine as quickly as possible, should one be authorised.

63. Pfizer did not request financial support from the UK Government (or any other government) in relation to the development of the Vaccine.

64. I am aware of the Vaccine Manufacturing Innovation Centre ("VMIC"), although this did not play a role in the manufacture of the Vaccine, which took place outside the UK. However, the manufacturing processes for vaccines and therapeutics depend on a complex global network and it is often not possible to source all materials in a single country. Therefore, policies that contribute to the efficient and effective global manufacture and delivery of countermeasures will support preparedness for a future pandemic. In these circumstances, governments should enable pro-market, pro-innovation policies that support sustainable investment in manufacturing. Taking steps to eliminate trade barriers such as tariffs and export restrictions will help facilitate secure, rapid access to countermeasures for the UK population.

Contractual arrangements

65. Negotiation of an Advanced Purchase Agreement for supply of the Vaccine was conducted by Pfizer Limited and the UK Government through the VTF, commencing in June 2020. At that stage the Vaccine had not been authorised and the results of the clinical trial programme were not known. The Advanced Purchase Agreement was signed by me on behalf of Pfizer Limited and Nick Elliot on behalf of the Secretary of State for Business, Energy and Industrial Strategy on 12 October 2020 ("APA").

66. The circumstances of proposed supply were unprecedented and a bespoke contracting process was required, albeit within the standard public procurement frameworks.

66.1. Under the APA, Pfizer Limited agreed to provide 40 million doses of the Vaccine to the UK Government, in four batches. However, in view of the fact that the Vaccine was not authorised at the time when the APA was signed, the agreement provided that

Pfizer would not be held liable for any failure or delay in development or authorisation of the Vaccine or delay in delivery of stock. Conversely, the UK Government had a right to terminate the agreement if the Vaccine was not authorised or specified timelines were not met. On 29 March 2021, the APA was amended to include an additional 40 million doses with an option to order a further 20 million doses.

66.2. The pandemic created a crisis situation where governments around the world wished to obtain vaccines that were being developed by manufacturers and approved by regulatory authorities on an expedited basis. The vaccines were then rapidly distributed to billions of individuals under governments' mass vaccination programs. These circumstances created a risk of unprecedented liability exposure for all persons involved in the development, production and use of the vaccine, including doctors, pharmacies, and manufacturers. Pfizer believes that appropriate indemnity and liability protections are therefore critical for manufacturers in such circumstances. Consequently, Pfizer sought indemnity and liability provisions from the UK Government to allow for a fair and equitable sharing of risk and provisions were included in the contracts agreed between Pfizer and the UK Government.

66.3. The second purchase agreement for supply of the Vaccine was signed on 10 August 2021 ("PA"). This was for supply of a further 35,001,720 doses, with an option for the UK Government to order an additional 75 million doses. The PA covers supply of the Vaccine to the UK Government up to the present time.

66.4. Both the APA and the PA (collectively the "Purchase Agreements") have been subject to various amendments to re-distribute dose allocations to adapt to fluctuating demand for the Vaccine.

66.5. On 7 April 2022, Pfizer Limited entered into a Donation and Resale Agreement with the UK Government, which updated the terms on which the UK was permitted to sell or donate surplus doses that it held in excess of national requirements.

67. As indicated at paragraph 23 above, Pfizer Limited attended monthly meetings with the VTF to assess whether key performance indicators ("KPIs") had been met. I can confirm that Pfizer Limited has met all of its obligations under the Purchase Agreements.

Clinical trials and regulatory assessment

In this section I provide an overview of the clinical trials and authorisation of the Vaccine, although details of the interactions with MHRA are described by BioNTech. Further information on the timeline for these matters and the overlap with the procurement and manufacturing of the Vaccine is also set out in the chronology at Annex 4.

Clinical trials

68. The two clinical trials[11] which formed the basis for the initial authorisation of the Vaccine were conducted outside the UK. These are described in detail in the UK Public Assessment Report ("UKPAR") at **[BO/45 - INQ000485963]** and summarised below.

68.1. Study BNT162-01 (also known as "Study 1") **[BO/91 - INQ000508030]**: a Phase1/2 clinical trial conducted in 60 adults aged 18-55 years (with immunogenicity data available up to one month after the second dose of the Vaccine). The trial was conducted by BioNTech at sites in Germany; and

68.2. Study C4591001/BNT162-02 (also known as "Study 2") **[BO/92 - INQ000508031]**: a Phase1/2/3 clinical trial conducted in adults and adolescents, aged 12 - 15 years, 16-55 years and over 55 years[12]. The study consisted of two parts: Phase 1: to identify preferred vaccine candidate(s) and dose level(s); and Phase 2/3: an expanded cohort and randomised controlled assessment of efficacy of the selected candidate. At the time of the initial authorisation the data from this study consisted of 43,651 first doses (21,823 involved the Vaccine and 21,828 involved placebo) and 41,102 second doses (20,566 involved the Vaccine and 20,536 involved placebo). The trial was conducted by Pfizer in the United States, Germany, South Africa, Turkey, Argentina, and Brazil. The results available at the time of the initial authorisation indicated that efficacy against confirmed COVID-19 infection occurring at least 7 days after Dose 2 was 95.0% (95% confidence intervals 90.0, 97.9), with 8 COVID-19 cases in the Vaccine group compared to 162 COVID-19 cases in the placebo group.

68.3. Among the almost 44,000 enrolled study subjects included in the safety database at the data cut-off date, the percentage withdrawn due to adverse effects was very small

[11] I have focused on the clinical trials included in the SmPC.

[12] The age groups evolved during the course of the study: Phase 1 included participants 18 to 55 years of age and 65 to 85 years of age; Phase 2/3 included participants ≥12 years of age [stratified as 12-15, 16-55 or >55 years of age]).

(0.2% in the Vaccine group and 0.1% in the placebo group). There were no reported deaths in study participants that were considered to be related to the Vaccine.

69. Comprehensive review of the conduct of the clinical trials confirmed compliance with international standards of Good Clinical Practice ("GCP"). All trial sites were available for inspection in accordance with regulatory requirements. MHRA carried out a remote GCP Inspection of Study BNT 162-02 and Study C4591001 on 7-9 December and 14-15 December 2020, covering project management, management of the investigational medicinal products, pharmacovigilance, data integrity and including a review of the Trial Master Files and associated documents.

70. Protocol amendments and further analyses of Study C4591001 conducted after grant of the Regulation 174 Authorisation are described in the SmPC for the Vaccine at **[BO/38a - BO/38m - INQ000507949 to INQ000507961]**.

70.1. Safety and efficacy in adolescents aged 12-15 years. While Study C4591001 was conducted in adults and adolescents over 12 years of age, at the time of the initial authorisation there were insufficient data to support an indication in the 12-15 years age group. However, a subsequent analysis of the data from adolescents 12 to 15 years of age (median follow-up duration of > 2 months after Dose 2) without evidence of prior infection, found no cases in 1005 participants who received the Vaccine and 16 cases out of 978 who received placebo. The point estimate for efficacy was 100% (95% confidence interval 75.3, 100.0). In participants with or without evidence of prior infection there were 0 cases in the 1119 who received the Vaccine and 18 cases in 1110 participants who received placebo. This also indicated a point estimate for efficacy of 100% (95% confidence interval 78.1, 100.0).

70.2. Immunogenicity in participants 18 years of age and older after booster dose. In a continuation of Study C4591001, a booster dose was administered 5 to 8 months (median 7 months) after the second dose in the primary series. Analyses of 50% neutralising antibody titres conducted one month after the booster dose compared to one month after the primary series in participants aged 18 - 55 years who had no serological or virological evidence of past SARS-CoV-2 infection up to 1 month after the booster vaccination, demonstrated that the immunogenicity of the booster was non-inferior to the primary series (using both geometric mean ratio (GMR) and difference in seroresponse rates).

70.3. Vaccine efficacy in participants 16 years of age and older after booster dose. Study 4 was a placebo-controlled booster study performed in approximately 10,000 participants, 16 years of age and older recruited from Study C4591001. This study, announced in February 2021, evaluated confirmed COVID-19 cases accrued from at least 7 days after booster vaccination up to a data cut-off date of 5 October 2021 (median 2.5 months post-booster follow-up). The booster dose was administered 5 to 13 months (median 11 months) after the second dose. Vaccine efficacy of the booster dose after the primary series relative to the placebo booster group who only received the primary series dose in participants with or without evidence of prior SARS-CoV-2 infection was 94.6% (95% confidence interval 88.5, 97.9).

70.4. Relative vaccine immunogenicity in participants > 55 years of age – after a booster dose of Comirnaty Original/Omicron BA.1 (fourth dose). This study, which comprised a subset of participants from Study 4, investigated the effects of a bivalent formulation of the Vaccine (Comirnaty Original/Omicron BA.1 (15/15 mcg)) designed to be effective against the Omicron variant of SARS-CoV-2 compared with the original formulation of the Vaccine in adults greater than 55 years of age who had completed a series of 3 doses of the original formulation of the Vaccine. The results indicated superiority of the bivalent formulation. Similar studies have been conducted in relation to later Omicron variants.

71. Further studies have included:

71.1. A Global Clinical Trial to Evaluate COVID-19 Vaccine in Pregnant Women. This study was announced in February 2021 **[BO/17 - INQ000507902]**, following a developmental and reproductive toxicity ("DART") study which showed no evidence of fertility or reproductive toxicity in animals **[BO/93 - INQ000508032]**. The study in pregnant women was commenced in the U.S., Canada, Argentina, Brazil, Chile, Mozambique, South Africa, U.K., and Spain and completed in July 2022 (see paragraph 108 below).

71.2. Study to Evaluate Safety, Tolerability & Immunogenicity of BNT162b2 in Immunocompromised Participants ≥2 Years.[13] This study was an open-label controlled study conducted in 539 participants (449 participants received the Vaccine and 90 were controls). The participants had either primary (n=90), or secondary immunodeficiency disorders due to human immunodeficiency virus infection (n=90),

[13] Bergman P et al. EBioMedicine. 2021 Dec;74:103705. doi: 10.1016/j.ebiom.2021.103705. Epub 2021 Nov 30. PMID: 34861491; PMCID: PMC8629680

allogeneic haematopoietic stem cell transplantation/CAR T cell therapy (n=90), solid organ transplantation (SOT) (n=89), or chronic lymphocytic leukaemia (CLL) (n=90). The primary endpoint was seroconversion rate two weeks after the second dose. The secondary endpoints were safety and documented SARS-CoV-2 infection. The results showed that the mRNA BNT162b vaccine had a favourable benefit-risk profile in this immunocompromised population.

71.3. Efficacy and immunogenicity in children 5 to 11 years of age (i.e. 5 to less than 12 years of age) – after 2 doses. Study 3 was a Phase 1/2/3 study comprising an open-label vaccine dose-finding portion (Phase 1) and a multicentre, multinational, randomised, saline placebo-controlled, observer-blind efficacy portion (Phase 2/3) carried out in children aged 6 months to 11 years. This analysis considered the data in children aged 5-11 years.

- Immunogenicity was investigated by assessing whether a comparison between 50% neutralising titres in a randomly selected subset of children in Study 3 with participants aged 16 to 25 years of age in Study 2 who had no serological or virological evidence of past SARS-CoV-2 infection up to 1 month after Dose 2, met prespecified immunobridging criteria for both the geometric mean ratio (GMR) and seroresponse. The GMR of 50% neutralising titres 1 month after Dose 2 in children 5 to 11 years compared with that of young adults 16 to 25 years of age was 1.04 (2-sided 95% CI: 0.93, 1.18). Among participants without prior evidence of SARS-CoV-2 infection up to 1 month after Dose 2, 99.2% of children 5 to 11 years of age and 99.2% of participants 16 to 25 years of age had a seroresponse at 1 month after Dose 2. The difference in proportions of participants who had seroresponse between the 2 age groups (children – young adult) was 0.0% (2-sided 95% CI: -2.0, 2.2).

- The efficacy analysis in children without evidence of prior infection found 10 cases in 2703 participants who received the Vaccine and 42 cases in 348 who received placebo. The point estimate for efficacy was 88.2% (95% confidence interval 76.2, 94.7) during the period when the Delta variant of SARS-CoV-2 was the predominant circulating strain. In participants with or without evidence of prior infection there were 12 cases in the 3,018 who received the Vaccine and 42 cases in 1, 511 participants who received placebo. The point estimate for efficacy was 85.7% (95% confidence intervals 72.4, 93.2).

71.4. Efficacy and immunogenicity of a 3-dose primary course in infants and children 6 months to 4 years of age. This study was a further analysis of Study 3 performed across the combined population of participants 6 months - 4 years of age based on cases confirmed among 873 participants in the Vaccine group and 381 participants in the placebo group (2:1 randomization ratio) who received all 3 doses of study intervention during the blinded follow-up period up to 17 June 2022, when the Omicron variant of SARS-CoV-2 (BA.2) was the predominant variant in circulation. Vaccine efficacy in participants with prior SARS-CoV-2 infection was similar to that in participants without prior infection. Severe COVID-19 criteria (as described in the protocol, based on FDA definition and modified for children) were fulfilled for 12 cases (8 Vaccine and 4 placebo) among participants 6 months to 4 years of age. Among participants 6 months - 23 months of age, severe COVID-19 criteria were fulfilled for 3 cases (2 Vaccine and 1 placebo).

The results of the pre-authorisation development programme have also been supported and confirmed by real world experience since the Vaccine received its first authorisation in the UK in December 2020.

Clinical Trials Overview

72. Clinical trials for the Vaccine were designed to high scientific standards and conducted in accordance with regulatory requirements, applicable to all vaccines, to ensure the quality of the resulting data.

73. The trials were organised with substantial collaboration between regulatory authorities, institutional review boards/ethics committees and investigators to ensure that administrative matters were addressed as efficiently as possible and to support recruitment. Very significant human and financial resources were devoted to these projects to minimise delays. This approach allowed individual trials to be completed more rapidly than might be the case outside the pandemic context, without adversely affecting the reliability of the safety and efficacy data. Pfizer and BioNTech therefore followed the same clinical trial processes as would be followed for any clinical trial of a vaccine. These processes included the following:

73.1. The principal pre-authorisation clinical trial (Study C4591001/BNT162-0, discussed below) as well as later clinical trials conducted in additional population groups, were randomised, placebo-controlled and blinded to reduce the possibility of bias. Race and ethnicity of enrolled participants were monitored in real time to ensure inclusion of a

diverse population. That this was effective is evidenced by the baseline demographic data presented in Table 1 of Polack FP et al Safety and Efficacy of the BNT162b2 mRNA Covid-19 Vaccine N Engl J Med 2020 Dec 31;383(27):2603-2615.

73.2. Adverse Events in all clinical trials involving the Vaccine were monitored rigorously and safety data were collected in real time by operational, data management and clinical (scientists and physicians) colleagues. Adverse Events that occurred during the trials were reported to regulatory authorities in accordance with regulatory requirements.

73.3. Comprehensive review of the conduct of the clinical trials confirmed compliance with international standards of good clinical practice, that study procedures were followed correctly and that data integrity was confirmed. All trial sites were available for inspection in accordance with regulatory requirements.

74. Once the safety and efficacy of the 30 µg dose of the Vaccine had been demonstrated in adults and adolescents, a study in children 6 months to <12 years was commenced, which included a dose-finding portion and a pivotal portion (see paragraphs 71.3 and 71.4). This study started on 24 March 2021, with pivotal data resulting in the first UK Marketing Authorisation being issued in December 2021.

75. Study C4591001/BNT162-0, which formed the basis for the initial authorisation of the 30 µg dose of the Vaccine permitted inclusion of individuals with stable comorbidities, defined as disease not requiring significant change in therapy or hospitalization for worsening disease during the 6 weeks before enrolment. Separate studies were conducted to evaluate the Vaccine in pregnant women (commenced on 16 February 2021) and immunocompromised individuals (see paragraphs 71.1 and 71.2). Recruitment for both these studies was challenging due to widespread recommendations for vaccination of these populations, based upon immunological principles and evidence from real world use (see paragraph 109 below).

Authorisation under regulation 174 Human Medicines Regulations 2021

76. A Scientific Advice Meeting ("SAM") and a Clarification Meeting involving Pfizer Limited, BioNTech and MHRA were held on 25 August 2020 and 2 October 2020 respectively and considered the materials which should be submitted in support of an application for authorisation. All such information available to Pfizer/ BioNTech

relevant to the quality, safety and efficacy of the Vaccine was submitted to MHRA on a rolling basis from 1 October 2020.

77. On 2 December 2020 the UK Licensing Authority granted BioNTech an authorisation for temporary supply of the Vaccine under Regulation 174 of the Human Medicines Regulations 2012 for the indication:

"*Active immunisation to prevent COVID-19 caused by SARS-CoV-2 virus in individuals 16 years of age and older.*

The use of COVID-19 mRNA Vaccine BNT 162b2 should be in accordance with official guidance".

78. The review of these data by the MHRA was supported by input from the Commission on Human Medicines ("CHM"), the independent expert scientific advisory body which advises ministers on the safety, efficacy, and quality of medicinal products. The COVID-19 Vaccine Benefit Risk Expert Working Group ("Vaccine BR EWG"), an expert advisory group to the CHM also met several times to discuss quality, safety and efficacy aspects in relation to batches of the Vaccine and gave advice to the CHM on 11 September, 8 October, 27 October, 28 November and 30 November 2020 **[BO/47 - INQ000508000]**. Pfizer Limited and BioNTech attended a meeting with the quality subgroup of the Vaccine BR EWG to review and discuss questions related to manufacture and quality control of the product.

79. BioNTech led discussions with MHRA on behalf of both companies in relation to the assessment of the dossier for the Vaccine. Pfizer was responsible for the development of labelling and packaging for the Vaccine and BioNTech led interactions with MHRA in relation to those topics.

80. The UK Public Assessment Report prepared by MHRA in relation to the Vaccine is exhibited to this statement at **[BO/45 - INQ000485963]** and states:

> "The requirements for quality, safety and efficacy were considered, taking into account the urgent public health need and risk to life, the pandemic situation and a lack of COVID-19 vaccines. As well as data on quality, safety and efficacy, specific mitigations and conditions on the product were discussed to ensure adequate standards of quality and safety are met."

The overall conclusion of the MHRA, following assessment of the Vaccine and consideration of advice from the CHM, was that: "the non-clinical and clinical data submitted have shown the positive benefit/risk of this product for active immunisation to prevent COVID-19 caused by SARS-CoV-2 virus….". Similar conclusions were also reached by the EMA, the US Food and Drug Administration ("FDA") and regulatory authorities around the world.

81. The Regulation 174 Authorisation was subject to detailed conditions imposed by the Licensing Authority and supervised by the MHRA. These conditions were amended on 30 December 2020, 28 January 2021, 30 March 2021, 19 May 2021, 4 June 2021, 29 July 2021, 9 September 2021 and 27 September 2021. They included obligations in relation to manufacture, pharmacovigilance, further clinical trials and supply and distribution of the Vaccine. Information regarding the Vaccine was provided in Regulation 174 Information for Healthcare Professionals and Regulation 174 Information for Vaccine Recipients (collectively referred to as Product Information and equivalent to the Summary of Product Characteristics ("SmPC") and Patient Information Leaflet ("PIL") for products which are the subject of marketing authorisations). The content of the Product Information was approved by the MHRA as consistent with contemporaneous scientific and medical information before it was placed into circulation. The Product Information issued at the time of the initial Regulation 174 Authorisation is exhibited to this statement as **BO/36 - BO/36m - INQ000507921 to INQ000507934]** and **BO/37a- BO/37n - INQ000507935 to INQ000507948]**.

82. When the Vaccine was initially authorised under Regulation 174, Pfizer understood that 6 doses of 30 micrograms of the Vaccine could be obtained from each vial, but had data to support only 5 doses per vial. In order to avoid delay in authorisation, and a potential delay to the public health pandemic response, the available data for 5 doses were submitted, but once data supporting 6 doses per vial became available, these were immediately provided to MHRA and other regulatory authorities globally.

82.1. The Product Information for the Vaccine was updated on 30 December 2020 to state:

> "Vial volume was optimized to reliably obtain 5 doses regardless of syringe type used as most syringe and needle combinations require withdrawal of excess volume in order to ensure the full 0.3 mL dose of vaccine can be administered. When low dead-volume syringes and/or needles are used, the amount remaining in the vial after 5 doses have been extracted may be sufficient for an additional (sixth) dose. Care should be taken to ensure a full 0.3 mL will be

administered to the subject and that all doses from a single prepared vial are administered within 6 hours of the time of dilution. Where a full 0.3 mL dose cannot be extracted the contents should be discarded." **[BO/36c - INQ000507924]**

82.2. A further update to the Product Information for the Vaccine was puiblished by MHRA on 26 January 2021 **[BO/36d - INQ000507925]**. This changed the number of doses per vial in section 2, from 5 to 6 and revised the wording at section 4.2 to read:

> "After dilution, vials of COVID-19 mRNA Vaccine BNT162b2 contain six doses of 0.3 mL of vaccine. In order to extract six doses from a single vial, low dead-volume syringes and/or needles should be used. If standard syringes and needles are used, there may not be sufficient volume to extract a sixth dose from a single vial."

The increase in the number of doses which could be obtained from each vial of the Vaccine was of fundamental importance in view of the need to ensure that all available vaccine supplies were utilised, so that as many people as possible could be vaccinated.

Conditional Marketing Authorisation and Standard Marketing Authorisation

83. The European Commission granted a CMA in respect of the Vaccine on 21 December 2020, following assessment by the EMA and its Committee for Medicinal Products for Human Use ("CHMP") **[BO/69 - INQ000508014]**; the EU CMA was held by BioNTech Manufacturing GmbH and was effective throughout the EEA/EU. The EU CMA resulted in the automatic grant of a GB CMA on 1 January 2021, following the end of the transition period after the withdrawal of the UK from the EU.

84. The Vaccine continued to be supplied in the UK in accordance with the Regulation 174 Authorisation up until 22 July 2021, with the agreement of MHRA. This was done in order to support continuity and pace of the vaccination programme, given the extent of the policies and procedures that would need to be updated by the NHS and UKHSA to support the transition to GB CMA stock (including new national protocols, patient group directions, clinical governance and digital updates to NHS IT systems for vaccine prescribing) in the lead up to 19 July 2021, by which time the UK Government aimed to ensure all adults in the UK had been offered a COVID-19 vaccine.

85. As stated at paragraph 52, the GB CMA was converted to a standard GB MA on 9 November 2022. At that time the CHM confirmed the positive benefit risk balance of the Vaccine and, in view of the fact that all specific obligations under the CMA had either been fulfilled or reclassified in the Risk Management Plan, considered that there were no grounds for the marketing authorisation to remain conditional. The standard GB MA for the Vaccine remains in effect.

86. In Northern Ireland, the Vaccine was supplied under the EU CMA from 9 July 2021 until 10 October 2022, when the EU CMA was converted by the European Commission to a standard EU MA. The Vaccine continues to be supplied in Northern Ireland under the EU MA in accordance with the Northern Ireland Protocol.

Variations and Extensions to the Authorisations

87. As explained at paragraph 47, while any updates to the Regulation 174 Authorisation were determined by MHRA, the GB CMA followed the European Commission Reliance Route and subsequent changes followed corresponding changes to the EU CMA. This meant that, in practice, any revisions to the Regulation 174 Authorisation were implemented before similar changes were made to the GB CMA. The Vaccine was not supplied in accordance with the Regulation 174 Authorisation after 22 July 2021 and, the final update to the Regulation 174 Information was published by MHRA on 24 December 2021. I refer below to certain of the more important variations and extensions to the authorisations for the Vaccine.

88. As stated at paragraph 51, the Regulation 174 Authorisation for the Vaccine was extended on 4 June 2021 to include use in adolescents aged 12-15 years **[BO/36h - INQ000507929]**. This decision was based on an analysis of long-term safety follow-up of over 2000 children from this age group in Study C4591001 (described at paragraph 70.1 above), together with advice from the CHM's Paediatric Medicines Expert Advisory Group and the Vaccine BR EWG.

89. On 9 September 2021, the UK Licensing Authority announced an extension of the Regulation 174 Authorisation to include a third dose of the Vaccine for severely immunocompromised individuals aged 12 years and older and a booster dose for individuals aged 12 years and older, based on further data from Study C4591001.

90. The UK Licensing Authority announced an update to the GB CMA for the Vaccine on 16 August 2022, following assessment of the immunogenicity, safety and efficacy of a

booster dose of the Vaccine in individuals 18 years of age and older who had received primary vaccination with another authorised COVID-19 vaccine, either another mRNA vaccine or an adenoviral vector vaccine (heterologous booster dose). The review by MHRA took into consideration:

90.1. immunogenicity data from an independent Phase 1/2 open-label clinical trial (NCT04889209) sponsored by the US National Institutes of Health ("NIH") which measured neutralising titres following a booster dose of the Vaccine in adults who had completed primary vaccination with an mRNA COVID-19 vaccine or an adenovirus vector COVID-19 vaccine; and

90.2. data from the independent CoV-BOOST study sponsored by the University of Southampton (EudraCT 2021-002175-19), a multicentre, randomised, controlled, Phase 2 trial of third dose booster vaccination against COVID-19, including administration of a booster dose of the Vaccine after primary vaccination with the AstraZeneca COVID-19 Vaccine.

91. The original formulation of the Vaccine was developed to be effective against the D614G strain of the virus, which was the dominant strain globally during the early phase of the pandemic. However SARS-CoV-2, like other viruses, undergoes rapid and frequent mutations and, by 2022, WHO and government entities such as the UK Government facility at Porton Down, had identified that COVID-19 vaccines developed to protect against the D614G strain were less effective against the Omicron BA.1, BA.4 and BA.4 BA.4-5 strains circulating at that time. Revised bivalent formulations of the Vaccine were therefore developed, which were effective against the D614G and either Omicron BA.1 or BA.4-5 strains of the virus. The D614G strain/ Omicron BA.1 bivalent formulation of the Vaccine was authorised by the UK Licensing Authority on 2 September 2022. A further bivalent formulation of the Vaccine, effective against D614G and Omicron strains BA.4 and BA.5 (BA.4-5) was authorised on 9 November 2022.

92. A formulation of the Vaccine for children aged 5 -11 years (providing a lower dose than the formulation used in individuals aged 12 and above (10 micrograms compared with 30 micrograms)) was authorised by the UK Licensing Authority on 22 December 2021 **[BO/26 - INQ000086634]** The authorisation was based on data from Study 3 (see paragraph 71.3) and followed the European Commission Reliance Route, which referenced the EU authorisation, reviewed by MHRA who reached its own conclusions on the quality, safety, and effectiveness of the Vaccine in this age group.

93. For completeness a formulation of the Vaccine for children aged 6 months to 4 years (providing a dose of 3 micrograms) was authorised by the UK Licensing Authority on 6 December 2022, based on further data from Study 3 (see paragraph 71.4), again following the European Commission Reliance Route. This formulation is licensed as a three dose course.

94. The Vaccine is not currently indicated for use in infants aged less than 6 months.

Innovations introduced in respect of clinical trials and authorisation process

95. The investigations conducted in relation to the Vaccine, including size of the clinical trials, the scope of the testing and the rigour applied to review of the data reflected the approach typically followed for any new vaccine.

96. Potential drug or vaccine candidates initially undergo iterative pre-clinical testing in the laboratory to investigate their effects, obtain information about safety and to determine a potential dosage. If the results of pre-clinical testing are favourable, the candidate will proceed to clinical testing in humans, divided into distinct phases.

96.1. Phase 1 vaccine trials involve a small group of adult participants and investigate safety, the immune response evoked by the investigational vaccine and the appropriate dose. Phase 1a trials investigate the vaccine in healthy adults and Phase 1b tests the vaccine in a more 'relevant' target population.

96.2. Phase 2 trials consider the safety and immune response (immunogenicity) of the vaccine, in a larger group of participants (usually the target group for the vaccine). The trial will be designed to provide data regarding the safety and efficacy of the vaccine (i.e. the percentage reduction of disease in a vaccinated group of people compared to an unvaccinated group) against artificial infection and clinical disease.

96.3. Phase 3 trials are conducted in larger groups (hundreds or thousands of participants) and investigate whether the vaccine induces a level of immunity that would prevent disease and provides evidence that the vaccine can reduce disease cases in a given population. The aim of Phase 3 trials is to obtain statistically significant safety and efficacy data which can be used to support an application to the relevant regulatory authority for a marketing authorisation.

96.4. Phase 4 trials may be conducted after a vaccine has been licensed and introduced into use. These trials collect data across populations of people that are using the vaccine, to detect rare adverse effects and assess long term safety and efficacy.

97. The pre-clinical testing of the Vaccine was principally conducted by BioNTech and I do not address it in this statement. However, the main Study C4591001 conducted by Pfizer involved a seamless phase 1/2/3 clinical trial, which was not standard and allowed the time-frame for the Vaccine's development to be significantly accelerated. This approach meant that the design and arrangements for subsequent phases of clinical investigation were put in place before the analysis of earlier testing was known and could be commenced without delay as soon as such data became available. (See diagram at paragraph 53). This saved substantial time but was associated with financial risk to Pfizer as the design of later phases might have had to be revised or the costs wasted if earlier phase investigations had been unsuccessful. Pfizer's research and development team in fact ensured that the design of the trials of the Vaccine were appropriate in circumstances where it was clear that acceleration of development of the Vaccine was essential in the context of the global crisis caused by the pandemic.

98. Once data from Study C4591001 became available, the use of regulatory flexibilities including, in particular, the rolling review procedure described at paragraph 37, permitted a rapid and efficient assessment by MHRA. This element of the process could usefully be applied to other products in the pandemic context and also as part of a standard procedure.

v. Vaccine delivery and prioritisation

Delivery of the Vaccine

99. Logistical arrangements for supply of the Vaccine were specified in the APA and the PA and the timelines for delivery, together with the associated volumes required for the UK vaccination programme, were kept under constant review and discussed frequently (at times on an almost daily basis) on operational calls with the VTF.

100. Management of the supply chain is complex. A diagram illustrating the current market supply steps is provided at Annex 5.

100.1. Around 30 days in advance of the expected delivery date, manufactured batches are allocated to meet the UK volume commitment.

100.2. EU permits for export of samples from the identified batches are obtained and the samples sent to the National Institute for Biological Standards and Control ("NIBSC") approximately 21 days in advance of shipment of the batch.

100.3. The samples of the Vaccine from the identified batches to be supplied in the UK undergo independent laboratory testing by NIBSC (batch release testing) to confirm that these meet expected standards of safety and quality. This testing may take up to 10 days. Following testing NIBSC produce a certificate, which is submitted to MHRA for approval to ship the relevant batches of the Vaccine to the UK. The stock remains at the Puurs facility until receipt of MHRA approval.

100.4. Once Pfizer receives MHRA approval, the stock allocated to the UK from the identified batches of the Vaccine is taken off "hold" and shipped to the UK. Pfizer aims to ship all released stock within 4 days to support continuity of supply.

100.5. Oversight of these steps requires robust processes to ensure that required stock is allocated and committed to the UK in sufficient time for the necessary processes to be completed. During the height of the pandemic this was particularly challenging, as the timing of manufacturing release of batches of the vaccine could be uncertain and, in those circumstances Pfizer would organise contingency batches to ensure continuity of supply.

101. The mRNA in the Vaccine is protected for the purposes of administration within a lipid envelope, which requires storage at ultra-low temperatures ranging from -60°C - -90°C. Shipments of the Vaccine therefore required specially designed packaging and were imported into the UK by Pfizer's logistics service provider ("LSP") Intramar, using lorries equipped with appropriate temperature control and monitoring. Stock was delivered to named Government contract warehouse locations, as directed by the VTF. From these hubs, supplies of the Vaccine would be delivered by the UKHSA LSP, Movianto and NHS LSP, Alliance, under the control of the NHS to vaccination centres across the UK.

102. Before supplies of the Vaccine were despatched, Pfizer organised a test run of dummy vials packed in dry ice to ensure that the process worked smoothly. The first shipment

of the Vaccine to the UK took place in late November 2020. Management of the supply chain requires detailed and careful organisation. It was necessary to ensure appropriate storage of the Vaccine throughout the process and to achieve delivery of the required volumes of the Vaccine at the relevant sites at the specified times. Security was also a priority and, particularly during the early period after grant of the Regulation 174 Authorisation, the Intramar lorries from Belgium would be escorted by security personnel in separate vehicles and in some cases police escort, so that supplies were not delayed or diverted due to the heightened risk of congestion, queueing and interference with trucks at Calais during the Brexit transition.

103. Pfizer is proud of the fact that it met all of its contractual commitments to the UK and was able to supply the Vaccine at unprecedented speed following grant of the Regulation 174 Authorisation.

Suitability of specific vaccines for particular groups

104. The Vaccine is currently authorised and was supplied for use in the following categories:

104.1. The 30 microgram/dose presentation for individuals over the age of 12

104.2. The 10 microgram/dose presentation currently for 5-11 year-olds

104.3. The 3 microgram/dose presentation currently for infants and children aged 6 months to 4 years

104.4. It is currently also authorised for all the above mentioned age group presentations in the Omircron XBB.1.5 formulation.

105. Authorisations were based on the assessment of data relating to the safety, quality and efficacy of the Vaccine by MHRA (or conversion of authorisations granted by the European Commission to authorisations effective in Great Britain). Recommendations on use of authorised vaccines within UK vaccination programmes (including use of vaccines in particular groups) are made by JCVI following its own independent separate assessment.

Vaccination of particular groups

Children and adolescents

106. The initial Regulation 174 Authorisation covered vaccination in individuals aged 16 and above. This was extended to include adolescents and children as further data became available as described at paragraph 70.1 above.

106.1. Following the success of the COVID-19 vaccination programme in adults over the age of 18 years, the DHSC requested the JCVI to consider an extension to the original programme to cover vaccination of children and young people. On 15 July 2021, JCVI issued a statement on vaccination of children and young people aged 12-17 years. JCVI stated that the principal factor in its assessment remained the potential benefits of vaccination in terms of reductions in hospitalisations and deaths in the population. However, it was also concerned regarding the impact of infection on education and weighed all these issues against the potential risks of vaccination. JCVI advised that children and young people aged 12 years and over with specific underlying health conditions, that put them at risk of serious COVID-19, should be offered vaccination. However, JCVI did not, at that time, recommend routine vaccination for all children and young people under the age of 18.

106.2. An updated statement was issued by JCVI on 4 August 2021, advising that all 16–17 year olds should be offered a first dose of the Vaccine. This recommendation was in addition to the existing offer of two doses of vaccine to 16–17 year olds who were in 'at-risk' groups.

106.3. JCVI issued advice on vaccination of children aged 5-11 years on 22 December 2021. Again, JCVI's assessment was based on the potential benefits and harms of vaccination to children and young people themselves and resulted in a recommendation for primary vaccination of children aged 5-11 years in a clinical risk group or a household contact of someone who is immunosuppressed. However JCVI also stated that further information had been requested, including data from DHSC and other Government Departments on the potential educational impacts of vaccination of children aged 5-11 years and that further advice would be issued in due course.

106.4. On 16 February 2022, JCVI issued a further statement recommending a non-urgent offer of two doses of the Vaccine to children aged 5-11 years who are not in a clinical risk group, on the basis that vaccination would prevent a relatively small number of hospitalisations, paediatric intensive care admissions and paediatric multisystem inflammatory syndrome. JCVI noted that the size of these benefits would depend on the timing and severity of any future wave of infection.

106.5. JCVI issued advice on vaccination of children aged 6 months to 4 years on 22 December 2022, recommending that children in a clinical risk group (as set out in the UKHSA's publication "Immunisation against Infectious Disease" ("the Green Book")) should be offered two 3-microgram doses of the Vaccine. JCVI did not at that time recommend COVID-19 vaccination of children aged 6 months to 4 years who are not in a clinical risk group.

Pregnant and breastfeeding women

107. The clinical trials which formed the basis for the initial Regulation 174 Authorisation did not include pregnant or breast feeding women, with the result that the initial Product Information stated that the safety and efficacy of the Vaccine in this group of women had not yet been established **[BO/36 - INQ000507921**[14]**]** and **[BO/37a - INQ000507935]**. On 30 December 2020, the Product Information for the Vaccine was updated to state that the Vaccine should be considered for use in pregnancy only where the potential benefits outweigh any potential risks for the mother and baby **[BO/36c - INQ000507924 and [BO/37d - INQ000507938]**. Women were advised to discuss the benefits and risks of having the Vaccine with their healthcare professional and to reach a joint decision based on individual circumstances.

108. In February 2021, Pfizer and BioNTech announced a global Phase 2/3 study to further evaluate the safety, tolerability, and immunogenicity of the Vaccine in preventing COVID-19 in pregnant women **[BO/17 - INQ000507902]** and **[BO/93 - INQ000508032]** (see paragraph 71.1 above). However, following recommendations for use of the Vaccine in pregnancy as described below, it was not possible to enrol participants for this trial as planned and enrolment was terminated.

109. On 16 April 2021, the JCVI considered real world evidence from the United States COVID-19 Vaccine Pregnancy Registry, which showed that around 90,000 pregnant women had been vaccinated, mainly with mRNA vaccines, without any safety concerns being raised. Following review of these data, the JCVI recommended that pregnant and breast feeding women in the UK should be offered an mRNA COVID-19 vaccine where available, on the basis that, while there was no evidence to suggest that other

[14] "Pregnancy - There are no or limited amount of data from the use of COVID-19 mRNA Vaccine BNT162b2. Animal reproductive toxicity studies have not been completed. COVID-19 mRNA Vaccine BNT162b2 is not recommended during pregnancy. For women of childbearing age, pregnancy should be excluded before vaccination. In addition, women of childbearing age should be advised to avoid pregnancy for at least 2 months after their second dose."

vaccines were unsafe for pregnant women, more research was needed. **[BO/62 - INQ000376222]**

110. The Product Information for the Vaccine was updated by the UK Licensing Authority on 25 March 2022, to add further information regarding administration of the Vaccine in pregnant women based on substantial observational data from pregnant women vaccinated during the second and third trimester as part of the UK vaccination programme, which showed no increase in adverse pregnancy outcomes. The new wording included in section 4.6 (Fertility, Pregnancy and Lactation) of the SmPC for the Vaccine stated:

> "A large amount of observational data from pregnant women vaccinated with Comirnaty during the second and third trimester have not shown an increase in adverse pregnancy outcomes. While data on pregnancy outcomes following vaccination during the first trimester are presently limited, no increased risk for miscarriage has been seen. Animal studies do not indicate direct or indirect harmful effects with respect to pregnancy, embryo/foetal development, parturition or post-natal development. Comirnaty can be used during pregnancy". **[BO/38h - INQ000507956]**

111. The SmPC stated in relation to administration of the Vaccine to breastfeeding women:

> "No effects on the breastfed newborn/infant are anticipated since the systemic exposure of breast-feeding woman to Comirnaty is negligible. Observational data from women who were breast-feeding after vaccination have not shown a risk for adverse effects in breastfed newborns/infants. Comirnaty can be used during breast-feeding". **[BO/38h - INQ000507956]**

Intervals between doses

112. The initial clinical trials carried out by Pfizer and submitted to MHRA were based on dosage intervals of 3 weeks; consequently the three week interval was recommended in the Regulation 174 Authorisation granted on 2 December 2020, reflecting the available clinical data.

113. However, on 30 December 2020 the JCVI and the DHSC published updated guidance for the NHS, recommending that the second dose of the Vaccine should be scheduled for between 3 and 12 weeks after the first dose, the basis for which was stated to be the high level of protection afforded by the first dose of vaccine and models suggesting

that vaccinating a greater number of people with a single dose would prevent more deaths and hospitalisations **[BO/57 - INQ000354469]**. While the proposal was discussed with Pfizer Limited during meetings with MHRA, the VTF, Jonathan Van-Tam and Matt Hancock, the recommendation to extend the period between doses did not reflect the clinical trial data available to Pfizer Limited and we were not involved in decision-making on this issue.

114. At that time, the four UK Chief Medical Officers stated:

"…Prioritising the first doses of vaccine for as many people as possible on the priority list will protect the greatest number of at risk people overall in the shortest possible time and will have the greatest impact on reducing mortality, severe disease and hospitalisations and in protecting the NHS and equivalent health services. Operationally this will mean that second doses of both vaccines will be administered towards the end of the recommended vaccine dosing schedule of 12 weeks." **[BO/58 - INQ000203969]**

115. Data from the initial clinical trials carried out by Pfizer, relating to the booster dose and submitted to MHRA for evaluation, were based on approximate dosage intervals of 6 months. However, decisions regarding spacing of doses within the UK vaccination programme are made by the JCVI. Their advice issued on 14 September 2021 also considered evidence from the COV-BOOST trial **[BO/66 – INQ000309656]**. The advice was for a booster vaccine dose to be offered to the groups prioritised for primary vaccination, no earlier than 6 months after completion of the primary vaccine course, "with operational flexibility exercised where appropriate to maximise delivery". Younger adults who were not in the prioritised groups would have received their second COVID-19 vaccine dose only in late summer or early autumn. Subsequent advice issued by JCVI on timing of booster doses stated that these "should be offered at least 3 months after the previous dose". **[BO/72 - INQ000508015]**

vi. Vaccine safety

Overview of pharmacovigilance procedures

116. Pfizer takes patient safety very seriously and safety data, based on experience globally, is subject to rigorous scrutiny by Pfizer and by regulatory authorities around the world.

117. As indicated in paragraph 13 above, BioNTech, as authorisation holder for the Vaccine, maintained primary responsibility for communications with MHRA including in relation to safety matters. However, although BioNTech would take the lead on calls, Pfizer Limited was invited and played an active role in the meetings because Pfizer has primary responsibility for the Vaccine safety database and is responsible for collection, reporting and analysis of safety data (known as pharmacovigilance).

118. Since the Vaccine was first authorised in December 2020, over 3 billion doses of the Vaccine have been administered globally and all Adverse Events of which Pfizer /BioNTech have become aware have been recorded, investigated and reported to regulatory authorities globally, including to the MHRA. An AE is an untoward medical occurrence associated with use of a medicinal product or vaccine which may or may not be causally related to that product. In view of the large numbers of people who received the Vaccine, it is inevitable that some people will experience AEs after administration, simply due to chance, without there being a causative relationship. However, all AEs associated with the Vaccine have been analysed independently by regulatory authorities and by Pfizer/ BioNTech to identify any new safety 'signal', i.e. new information on a new or known Adverse Event that may be caused by a medicine or a vaccine and requires further investigation.

119. Pharmacovigilance requirements applicable to medicinal products, including vaccines, supplied in Great Britain[15] are set out in the Human Medicines Regulations 2012 (as amended) **[BO/85 - INQ000508024]**. These are consistent with international procedures and require compliance with EU guidance on Good Pharmacovigilance Practice ("GVP"), save to the extent that such guidance has been excluded, modified or replaced by the UK Licensing Authority.

119.1. The Licensing Authority and marketing authorisation holders ("MAHs") for medicinal products and vaccines are required to operate pharmacovigilance systems, to fulfil their pharmacovigilance tasks and obligations. These systems are designed to monitor the safety of authorised products and detect any change to their benefit-risk balance. UK MAHs must maintain a pharmacovigilance system master file that describes the pharmacovigilance system applied to their UK authorised medicinal products and vaccines.

[15] EU law relating to pharmacovigilance continues to apply in Northern Ireland in accordance with the Northern Ireland Protocol.

119.2. A draft risk management plan ("RMP") must be submitted to the Licensing Authority with the application for a UK marketing authorisation; the Licensing Authority is responsible for the assessment of the draft RMP and the approved RMP forms part of the marketing authorisation. A RMP includes routine pharmacovigilance activities and may include additional pharmacovigilance activities included as conditions of the marketing authorisation.

119.3. Routine pharmacovigilance activities include a requirement for the MAH to record and investigate AEs of which it becomes aware and to report these to the Licensing Authority.

119.4. Additional pharmacovigilance activities, agreed with the regulatory authorities and included in an RMP, may include long-term follow-up of patients from the clinical trial population to provide further characterisation of the long-term safety of the medicinal product, post-authorisation safety studies, in which safety information is actively elicited from recipients of the medicinal product, and other studies.

119.5. Healthcare professionals and patients may report AEs to the MAH and/or directly to the Licensing Authority via its Yellow Card scheme. Where the Licensing Authority receives such reports directly it is required to investigate and share them with the MAH. The fact that reports of AEs may be made to the MAH or to regulatory authorities means that there will be a discrepancy between the number of AEs held by the various entities at any given time. This is addressed, as far as possible, through prompt sharing of AEs between the Licensing Authority and MAH and the routine periodic reports described further below.

119.6. MAHs are required to submit Periodic Safety Update Reports ("PSUR"s), providing an evaluation of the overall risk-benefit balance of a medicinal product, to the Licensing Authority, at defined time points following the authorisation of a medicinal product. PSURs include a summary of all data relevant to the risks and benefits associated with use of a medicinal product, including the results of all studies and consideration of the potential impact of the data on the authorisation, including in the context of volumes of sales and the estimated population exposed to the product. When a medicinal product is first authorised in the UK, PSURs are generally required to be submitted by the MAH every 6 months for the first two years after MA approval and launch, followed by annually for the following two years and subsequently every three years.

120. MAHs and the Licensing Authority continuously monitor medicinal products supplied in the UK to identify and assess safety signals (information on a new or known Adverse Event that may be caused by a medicine and requires further investigation) in order to establish whether these have a causal relationship with the relevant medicinal product or are attributable to some other factor. This process requires both qualitative and quantitative assessment of all available data relating to the medicinal product, including data from clinical trials and other studies, published scientific literature and AEs, for patterns that suggest new safety information.

Pharmacovigilance procedures followed in relation to the Vaccine

121. Pfizer operates a robust pharmacovigilance system applicable to the Vaccine, consistent with UK and international regulatory requirements, as described above and including participation by BioNTech.

122. All AEs observed during the clinical development programme for the Vaccine were considered and comprehensively analysed. Further details can be found in the UKPAR exhibited to this statement at **[BO/45 - INQ000485963]**. Safety information from clinical trials was considered by Pfizer and BioNTech at weekly meetings. Pfizer and BioNTech continued to follow up with participants in the clinical trials in order to collect long term safety data.

123. Following authorisation, the Vaccine has continued to be subject to intensive pharmacovigilance monitoring by the MHRA and by Pfizer/BioNTech. In particular, while the legislative provisions setting out the requirements for post authorisation monitoring of medicines are directed towards the "MAH" and the Regulation 174 Authorisation granted on 2 December 2020 was not a marketing authorisation, it included a condition that pharmacovigilance monitoring should be conducted in accordance with the requirements for medicinal products which have been granted a marketing authorisation.

124. Post-authorisation monitoring of the Vaccine therefore involves the collection, immediate investigation and assessment of AEs received from healthcare professionals, vaccine recipients and regulators, as well as consideration of information from multiple sources including follow-up of clinical trial participants, post authorisation studies and review of material from the published scientific literature. Such information is analysed both by Pfizer and independently by the MHRA and other

regulatory authorities around the world, in order to identify safety signals[16], which are then investigated and validated, including by comparing the incidence of reports in vaccinated individuals with the incidence in a similar unvaccinated population.

125. The safety of specific batches of the Vaccine are monitored routinely through review of Adverse Events (held within the Pfizer safety database) in association with product complaint data (held within the product quality complaints database), including trending analyses based on historical data. Any signals identified are further evaluated by internal Product Governance and Safety committees. As an additional supplement to the routine Adverse Event/product complaint reports, a regular country Adverse Event/batch lot report is generated and reviewed and provided to regulatory authorities.

126. AEs are reported to the MHRA via the MHRA Gateway. In the case of Serious Adverse events ("SAE"), these are reported within 15 days, and in the case of non-serious AEs, within 90 days. Between March 2021 and December 2021, as a result of the volume of AE reports from the UK and other countries, some AEs were not reported to MHRA within these timeframes. However, all AEs continued to be entered into Pfizer's safety database. Consequently, safety signals continued to be monitored in real time and all AEs continued to be captured. By May 2022 all AEs from this period had been reported to MHRA. Pfizer kept MHRA informed during regular calls, as described in paragraph 31. As explained above, MHRA also receives reports of Adverse Events via its Yellow Card scheme.

127. AEs are reported to regulatory authorities in other countries where the Vaccine is supplied in accordance with applicable requirements.

128. Pfizer also provided MHRA and other regulatory authorities with regular reports (such as PSURs) summarising the available safety data regarding the Vaccine. Reports in relation to the safety of the Vaccine were however provided to MHRA more frequently than the standard requirements set out at paragraph 119.6 above. Summary reports, which followed the general structure of PSURs were provided on a monthly basis for 11 months, followed by bimonthly reports for 6 months. Pfizer was then asked to submit abbreviated monthly reports. We are now subject to standard annual PSUR

[16] i.e., information on a new or known adverse event that may be caused by a medicine and may require further investigation.

reporting. Copies of PSURs are provided at **[BO/46a-BO/46c** - **INQ000519426 to INQ000519428]**.

129. While all new medicines are subject to close monitoring, the Vaccine and other COVID-19 vaccines have been subject to particularly high levels of scrutiny, including by Pfizer/ BioNTech and regulatory authorities in the UK and EU, in the context of the extent of usage of the vaccines, to ensure that new safety information is identified as quickly as possible and to maintain public confidence in the vaccination programmes. Pfizer committed to 10 post authorisation safety studies, investigating the incidence of Adverse Events of special interest, the long term safety of the Vaccine and its use in specific population groups, including pregnant women, immunocompromised people, frail people with comorbidities (such as chronic obstructive pulmonary disease) and co-administration with other vaccines. Two of the studies have been completed and submitted for publication, one has been completed and the final report is being prepared for publication, one study was terminated with the agreement of the EMA[17], four studies are ongoing and two are at the planning stage.

130. Pfizer, MHRA and regulatory authorities globally have independently analysed reports of AEs, both individually and in aggregate, together with information obtained from other sources for signals which may suggest associations between use of the Vaccine and possible new adverse effects.

130.1. In relation to the Vaccine, the numbers of AEs received by Pfizer and by regulatory authorities reflected the speed at which governments needed to rollout their vaccination programmes to large populations. It was inevitable therefore that many people would experience an adverse effect which was not caused by the Vaccine but rather was caused spontaneously by an underlying medical condition or an adverse effect that was coincidental. As with any other medicinal product or vaccine, many of the AEs received by Pfizer were incomplete. Follow-up investigations by Pfizer were therefore made to enable adequate assessment.

130.2. Pfizer also participated in regular, frequent communication with the MHRA and other regulatory authorities in their investigation and consideration of the data relating to the

[17] The study experienced significant operational challenges which affected access to the required study data, including delays and data quality concerns resulting from a migration to a new data platform. Delivery of the interim and final study reports per the planned milestone date was impacted by these factors, thereby reducing the scientific value of the study in the context of available data from multiple other studies with similar study endpoints.

Vaccine. The overall analysis of available safety data, emerging safety signals and monitoring of AE reporting metrics were key components of the biweekly meetings between MHRA, Pfizer Limited and BioNTech to discuss the safety of the Vaccine.

130.3. The MHRA conducted Good Pharmacovigilance Practice Inspections in relation to Pfizer's pharmacovigilance system applicable to the Vaccine in December 2020 and June 2021.

Safety information associated with the Vaccine

131. As with any vaccine, some recipients of the Vaccine experience AEs. At paragraph 118, I explain that an AE is an untoward medical occurance associated with the use of a medicinal product or vaccine which may or may not be causally related to that medicine or vaccine. The safety profile of the Vaccine is set out in the Product Information, which is kept under review and updated, as approved by MHRA, if new safety risks associated with the Vaccine are identified, as additional information becomes available.

132. A schedule of additional safety information added to the Product Information following initial authorisation is attached as Annex 6. However I provide below details of two examples of the process.

Anaphylaxis

133. Anaphylaxis was identified, shortly after the Regulation 174 Authorisation was granted, as an AE that may occur following administration of the Vaccine. A warning was added to the Regulation 174 Information for Healthcare Professionals, as published by MHRA on 10 December 2020 stating:

> "Anaphylaxis
>
> Any person with a history of immediate-onset anaphylaxis to a vaccine, medicine or food should not receive the COVID-19 mRNA Vaccine BNT162b2. A second dose of the COVID-19 mRNA Vaccine BNT162b2 should not be given to those who have experienced anaphylaxis to the first dose of COVID-19 mRNA Vaccine BNT162b2.

> As with all injectable vaccines, appropriate medical treatment and supervision should always be readily available in case of a rare anaphylactic event following the administration of the vaccine." [ ] **- INQ000507922]**

134. The SmPC for the Vaccine currently includes the following warning in relation to "hypersensitivity and anaphylaxis":

> "Events of anaphylaxis have been reported. Appropriate medical treatment and supervision should always be readily available in case of an anaphylactic reaction following the administration of the vaccine.
>
> Close observation for at least 15 minutes is recommended following vaccination. No further dose of the vaccine should be given to those who have experienced anaphylaxis after a prior dose of Comirnaty".

135. The frequency of anaphylaxis cannot be estimated from the available data.

136. Anaphylaxis was also added to the RMP for the Vaccine as a safety concern.

Myocarditis and pericarditis

137. The first reports of myocarditis and pericarditis emerged from safety surveillance in Israel[18], where formal studies were set up with intensive follow up of vaccine recipients **[BO/19 - INQ000507904]** and were discussed at a meeting between MHRA and Pfizer/ BioNTech on 26 April 2021. At that stage no signal had been validated based on the data available to Pfizer/ BioNTech and no other regulator had raised any similar concerns. The data were discussed with the Israeli Ministry of Health who were, at that time, performing a review of all myocarditis cases, but had not decided whether to confirm the presence of a safety signal. In particular, it was unclear whether the cases in Israel related to genetic factors in the Israeli population. The interpretation of these data was challenging because of inconsistent reporting of clinical signs and inconsistent case definitions and the fact that the initial cases from Israel stimulated further reports which did not fulfill appropriate diagnostic criteria. Similar data were subsequently reported by the US Centre for Disease Control ("CDC") in May 2021

[18] The first reports of pericarditis and myocarditis received by Pfizer/ BioNTech following administration of the Vaccine were received from Israel on 28 December 2020 and 10 January 2021 respectively. These individual reports were investigated, notified to the authorities and included in the safety database.

[BO/22 - INQ000507907]. We worked to determine the relevant background rates for myocarditis and pericarditis and performed an "observed versus expected" analysis which compared the background rate in the appropriate population group (the expected rate) with the rate observed in vaccine recipients (the observed rate), in order to assess whether this was higher than anticipated. We liaised closely with MHRA in relation to these analyses. Based on the emerging data from these sources and case reports from vaccination programmes, MHRA requested Pfizer to put together an analysis of all the available data, which was provided to them on 22 June 2021[19]. As a result of this information the Regulation 174 Information for Healthcare Professionals and the Regulation 174 Information for Vaccine Recipients were updated, as published by MHRA on 25 June 2021 **[BO/36i - INQ000507930]** and **[BO/37i - INQ000507943]**. The warning in the Regulation 174 Information for Healthcare Professionals stated:

> "Myocarditis and pericarditis
>
> There have been very rare reports of myocarditis and pericarditis occurring after vaccination with COVID-19 mRNA Vaccine BNT162b2 often in younger men and shortly after the second dose of the vaccine. These are typically mild cases and individuals tend to recover within a short time following standard treatment and rest.
>
> Healthcare professionals should be alert to the signs and symptoms of myocarditis and pericarditis. Vaccinated individuals should also seek immediate medical attention should they experience new onset of chest pain, shortness of breath, palpitations or arrhythmias".
>
> **[BO/36i - INQ000507930]**

At that stage the frequency of myocarditis or pericarditis in recipients of the Vaccine was stated to be "not known (cannot be estimated from the available data)".

138. Updated Product Information, published by MHRA on 14 March 2022, stated that available data indicates that the risk of myocarditis and pericarditis is "*very rare (< 1/10,000)*".

[19] This analysis was led by Pfizer's Global Safety team and was provided to regulators worldwide.

139. A further update to the Product Information in relation to the risk of myocarditis and pericarditis after a third dose of the Vaccine and in children age 5-11 years was published by MHRA on 9 November 2022 **[BO/40g - INQ000507981] and [BO/42i - INQ000507992]**.

140. Myocarditis and pericarditis were also added to the RMP for the Vaccine.

Information and communication about the Vaccine

141. Pfizer Limited did not carry out any promotional campaigns in relation to the Vaccine. The Regulation 174 Authorisation was not an MA and therefore did not permit advertising of the Vaccine. In addition, promotion of prescription only medicines to members of the public is generally prohibited and, while vaccination campaigns approved by Ministers provides an exception to this rule, no such campaigns were run by Pfizer Limited.

142. However, while Pfizer Limited did not carry out any promotional campaigns, we liased closely with the UK Government and the NHS to ensure they had access to up-to-date non-promotional information and materials, about vaccination as approved by MHRA. Pfizer Limited provided informational materials to the NHS to support storage of the Vaccine and assist healthcare professionals, educational posters for vaccination centres, as well as providing factual information on a designated website and for social media platforms. The materials provided by Pfizer Limited were distributed by the NHS as it considered appropriate. Examples of the materials are exhibited to this statement as **[BO/95 - 95e] INQ000508034 to INQ000508039]**.

143. Pfizer Limited has always endeavoured to ensure that clear and accurate information is available to the public in order to combat misinformation about the Vaccine. One purpose for the educational material provided by Pfizer Limited in relation to the Vaccine, was to correct the misinformation regarding COVID-19 vaccines published on the internet. We also have a page on our global website dedicated to tackling misinformation about the Vaccine and the company's pandemic response **[BO/35 - INQ000507920]**. Pfizer Limited has sought to engage with all communities across the UK to combat misinformation and explain the rigorous processes behind vaccine development **[BO/21 - INQ000507906]**.

Relationship with the MHRA

144. Pfizer Limited has a constructive and collaborative relationship with MHRA. Our experience in the context of the Vaccine has been extremely positive and it is clear that MHRA went to great lengths to ensure that COVID-19 vaccines underwent an independent assessment, as rapidly, thoroughly and efficiently as possible, without compromising established regulatory standards or patient safety.

145. Like other pharmaceutical companies, Pfizer Limited is required to make payments to the MHRA for the services it provides. Such fees are stated transparently and published by Government. Pfizer Limited has no other financial relationship with the MHRA.

Yellow Card reporting

146. The Yellow Card reporting system (the "Platform") was set up by the MHRA to provide a platform for patients and healthcare professionals to report suspected adverse effects from medicines, vaccines, e-cigarettes, medical device incidents, defective or falsified products to the MHRA to ensure safe and effective use **[BO/96 - INQ000508040]**. In the context of the pandemic, MHRA set up a designated "Coronavirus Yellow Card" reporting site to facilitate reporting of AEs in relation to medicines, vaccines, medical device and test kit incidents used in coronavirus testing and treatment. Summaries of Yellow Card reports relating to COVID-19 vaccines were published weekly between 9 December 2020 and 23 November 2022. They were then reduced to monthly reports.

147. The Platform provides a direct and easily accessible route for healthcare professionals and vaccinated subjects to report side effects of the Vaccine to the MHRA. It can be accessed online via the Yellow Card website or via the Yellow Card App. The form which the Platform requires users to complete is very thorough, aiming to ensure that good quality data are collected.

148. The Platform is designed to provide data to the MHRA, rather than pharmaceutical companies. Pfizer receives the report after MHRA has completed its operational steps to create a case and is reliant on the MHRA passing on the data collected by the Platform; it is not automatically shared.

149. During the pandemic, quick access to safety reports was more important than ever, however the time lag between the data being shared via the Platform and being passed on to Pfizer meant that Pfizer did not have immediate awareness of that portion of UK

Adverse Events which were available to MHRA, unless the reporter reported in parallel to both Pfizer and MHRA. In particular, as acknowledged by the Commission on Human Medicines Expert Working Group on COVID-19 vaccine safety surveillance report published on 5 February 2021, during a pandemic, with many millions of doses of one or more new vaccines administered across the UK over a relatively short time period, vigilance needs to be continuous, proactive and as near real-time as is possible. Going forward, Pfizer would recommend development of a more efficient process for passing on the Yellow Card reports to the relevant manufacturer. Ways to speed up processing of safety reports might include, for example, investment in technology or putting in place arrangements so that more personnel may be drafted in to help process reports more quickly. Also, in circumstances where patients, care givers and healthcare professionals generally have internet access, MHRA may issue strong encouragement for electronic, rather than paper submission of suspected adverse reaction reports, especially during a pandemic, to increase the efficiency of the reporting process.

vii. UK Vaccine Damage Payment Scheme

150. As demonstrated by experience during the recent pandemic, the benefits of an effective vaccination programme accrue to society generally. However, for vaccination programmes to be successful, it is clearly necessary for public confidence in vaccines to be maintained and this requires the availability of appropriate remedies in the rare situations where a vaccinated individual experiences an adverse effect that is significant and/or long lasting. Pfizer Limited therefore supports the provision of appropriate compensation for vaccine recipients who experience such effects.

151. In view of the public health benefits of vaccination and where any requirement that manufacturers should provide compensation for injured vaccine recipients, would be likely to act as a deterrent to vaccine development and supply, it is Pfizer Limited's strong view that compensation arrangements should be determined and funded by Government.

viii. Lessons learned and preparing for a future pandemic

152. There is clearly an opportunity now to ensure that the approaches which resulted in success in the context of the recent COVID-19 pandemic, including highly effective public-private collaborations, regulatory flexibilities and new approaches to

procurement, are not lost, but are developed and embedded both for future pandemic preparedness and also in other areas of healthcare.

153. Certain efforts have been made to achieve this, such as establishment of the COVID-19 Vaccines Unit ("CVU"), as a replacement for the VTF, within UKHSA. However, in many areas, including recent challenges for UK clinical trials and limitations on UK patient access to medicines, the UK is falling behind other comparable countries.

153.1. Recruitment to industry trials in the UK fell to a low of 36,722 in 2021/22, a 37% reduction from the 58,048 participants in 2017/18. In 2022, the UK remained 10th in the world for industry Phase 3 trials initiated, falling from 4th in 2017 and far behind comparators such as Spain. Pfizer fully supports the recommendations of the 2023 Lord O'Shaughnessy review[20] and the substantial cross-sector effort to implement them.

153.2. The Government's own indicators[21] show that UK patients face lower and slower access to new medicines than many comparator countries. A study by the European Federation of Pharmaceutical Industry Associations (EFPIA)[22] indicate that only 56% of all new medicines approved by the European Commission following assessment by the European Medicines Agency (EMA) are available to patients in England and only 54% in Scotland. This compares with 88% in Germany and 77% in Italy. Lack of access for UK patients is also clear in specific areas such as cancer, where even where new treatments are recommended by NICE far fewer patients in the UK gain access compared wuth comparable countries. A study conducted by the US industry body PhRMA found that, for every 100 patients receiving NICE-recommended new cancer medicines in the US, Germany, and France, in the UK only 8, 44 and 49 patients respectively obtain access to treatment[23]. Addressing this situation appears to require action across the system, from ensuring that assessment by NICE and similar bodies, captures the full value of innovation, to a focus on supporting rapid adoption across the health system following a positive recommendation for NHS use.

---

[20] Commercial clinical trials in the UK: the Lord O'Shaughnessy review, 26 May 2023

[21] Government Life Sciences Competitiveness Indicators 2024: summary, published 11 July 2024 **[BO/99 - INQ000519460]**

[22] EFPIA (2024). EPFIA Patients W.A.I.T. Indicator 2023 Survey **[BO/98 - INQ000519459]**

[23] PhRMA; Analysis of Access Restrictions for New Medicines in the United Kingdom; Nov 2023 **[BO/97 - INQ000519458]**

154. In September 2022, Pfizer Limited issued a 10 point plan, "Breakthrough Nation II" **[BO/29 - INQ000507914]**, which built on experience during the pandemic, to set out a suggested agenda, for prevention, innovation and investment in life sciences in the UK and those proposals are relevant to the questions currently asked by the Inquiry.

155. A proactive vaccinology approach, which leverages the common antigenic regions within a virus family, with a view to developing a vaccine that may protect against all viruses within the family, including potential viruses that have yet to emerge, is likely to be important in the context of a future pandemic. One example of such an approach is the potential pan-sarbecovirus vaccine being developed by the University of Cambridge[24], that may protect against SARS-CoV-2 and other related current and potential future sarbecoviruses. A central requirement of any proactive vaccinology approach is up to date information regarding virus dynamics. An important step the UK could take is therefore continued support for local genomic surveillance centres. Maintenance of this important data source, together with artificial intelligence (AI)/ machine learning (ML) tools that may help predict future virus evolution, may guide future vaccine designs that may be more broadly protective than current vaccines.

156. I have referred above to the benefits resulting from the mission-led approach adopted during the pandemic and, specifically, the example of the VTF, which we believe serves as a potential future model for the engagement between UK Government and its partners in the advancement of life sciences innovation for UK society. This was recognised in the Government's review of the VTF, which cites one causal factor in the success of the VTF against its objectives as 'dealing with suppliers in a different, more collaborative way to identify and quickly solve problems'. This included frequent senior meetings between Government officials and industry leaders to proactively address issues; daily delivery meetings over critical periods; the establishment of joint working level 'virtual teams'; and adopting greater transparency in data sharing to facilitate a shared understanding of information.

157. In any future pandemic or major epidemic, it will be essential to adopt a similar model to ensure the broadest and fastest access to industry pipelines. However, Pfizer Limited believes that there are learnings that should also be adopted for the day to day functioning of Government and the healthcare service. Close coordination with

[24] Cambridge University press release

industry, combined with flexible procurement systems, would ensure that the public have access to the best medicines and vaccines.

158. Pfizer Limited believes that there is currently a risk that these are areas where ways of working have slipped back since the pandemic, which are causing challenges, both for patients and the wider healthcare system. By way of example, the introduction of specific strategic partnerships between Government and other organisations, while generally beneficial in terms of pandemic preparedness, risks taking an uneven approach across industry; the next lifesaving vaccine could come from anywhere in the UK's deep and prospering life sciences industry, and the UK Government would benefit from continuing close engagement across the breadth of this. It is important to note that the Pfizer/ BioNTech COVID-19 vaccine, which was the first vaccine to market, and delivered approximately 100m doses consistent with schedules, was manufactured globally across many different sites. We believe that this shows that onshore manufacturing is not a prerequisite for future pandemic preparedness. If onshoring is prioritised over other elements of manufacturer performance and reliability, this may fail to increase both the speed of supply and the security of supply in a future pandemic, and could potentially increase costs to taxpayers.

159. To best prepare for future pandemic threats, UK policy should have the aim of strengthening the overall research and development ("R&D") ecosystem by valuing and incentivising innovation from any source. This requires the ability to rapidly take tailored and differentiated approaches with partners of different sizes and global locations, as was demonstrated in the approach taken by the UK Vaccine Taskforce, which supported both push and pull incentives including funding for UK scientific infrastructure as well as measures such as advance purchase agreements. Bilateral partnerships between Government and other organisations (industry, academia or others) form part of this mix, but should be transparent and seen in the context of a whole-system approach that enables UK access to beneficial innovation wherever this may arise.

160. Likewise, the Government's current model for funding and procuring vaccines has not consistently learned the lessons of the Covid-19 pandemic. The UK must ensure that neither funding nor procurement issues result in bottlenecks to the supply of innovative new vaccines and testing facilities and infection surveillance must be maintained. There is also evidence **[BO/31 - INQ000507916]** that routine vaccination rates in the UK have declined since the pandemic, possibly reflecting vaccine hesitancy or fatigue.

More should be done to combat this, in order to protect the health care system to minimise the impact of another pandemic or serious epidemic.

161. In terms of regulation, the flexibilities used during the pandemic, specifically in terms of rolling review of data, should be maintained beyond the emergency situation. The regulatory framework needs to develop to accommodate the evolution of science, for example in areas such as artificial intelligence ("AI").

162. Finally, it is essential that the UK maintains strong protections for intellectual property, strengthens supply chain resilience and takes steps to achieve faster patient access to new medicines. At present the use of new medicines in the UK is materially delayed relative to our neighbours in Europe. This results in worse health outcomes for the population generally and contributes to greater inequalities between the richer and poorer sections of society. The UK can address this by introducing pro-innovation policies to protect IP, strengthen supply chain resilience and support faster, secure, unhindered access to medicines and vaccines for patients in the UK and globally.

162.1. IP rights are fundamental to enable life sciences companies to make the long-term, high risk investments in R&D. Companies must be confident that their inventions will be protected, if they are to develop new medicines and vaccines, and enter vital collaborations. The UK has traditionally been a strong supporter of pro-innovation IP systems; it now has an opportunity to build on this by continuing to strengthen domestic IP protections, and champion robust IP systems globally.

162.2. Life sciences manufacturing and supply depend on a complex global network – it is often impossible to source all materials for a vaccine or medicine in a single country. Building supply chain resilience often means securing multiple suppliers from different regions, optimising use of data, and flexibly deploying inventory, so unexpected events do not interrupt supply. It is therefore essential that unnecessary barriers to trade are eliminated from tariffs and export restrictions through to duplicative regulatory requirements in order to facilitate improved UK and global access to these products.

162.3. As described at paragraph 153 above, evidence demonstrates that availability and adoption of new medicines in the UK trails significantly behind comparator countries. I have explained that, if this is to be addressed, action across the system is required. Immediate opportunities include ensuring the live review of the NHS commercial framework delivers an ambitious outcome, with a priority being expanding eligibility for

indication-based pricing, at the current NICE evaluation thresholds (not requiring additional discounts to secure flexibility), to support more patients to access innovative medicines. The Government should also consider building on the NHS vaccination strategy to deliver a comprehensive, cross-system vaccination strategy from R&D through to access, with adequate funding to accelerate access to new cost-effective programmes across the UK.

163. In conclusion, Pfizer is deeply proud of our partnership with the UK to address the COVID-19 pandemic – where we saw that the nation could act differently and align all parts of the system to achieve a common aim across society becoming, in December 2020[i], the first country in the world to begin rolling out vaccines to its general population. As part of this partnership, Pfizer demonstrated the ability to move quickly, while maintaining scientific rigour, to develop, manufacture, and distribute a vaccine – applying our scientific expertise and global scale to directly support the UK's pandemic response.

164. Building on this experience, Pfizer is committed to working with the UK Government, health system and wider partners, now and in the future, to identify mutually sustainable opportunities for collaboration to support pandemic preparedness, strengthen health security, and ensure that a thriving life sciences sector drives wider UK priorities.

165. There are two areas, in particular, where we see significant opportunities:

165.1. Firstly, by embedding the positive aspects of collaboration achieved through the UK's Vaccine Taskforce so that these may be drawn upon in the future, including in support of the UK Government's national missions:

- A clear central mission with the power to unite partners across the whole UK healthcare system and act as a 'single front door' for industry. This included operational structures which enabled rapid decision making across distinct government departments and agencies.
- Unparalleled partnership between public and private sectors, with industry 'at the table'. This included the ability to draw on expertise wherever this resided

– including bringing in experts from industry and academia to work as part of the VTF 'team'. A portfolio approach helped provide optionality, with multiple collaborative commercial partnerships.

- An end-to-end approach to innovation and risk sharing, including the use of advanced purchasing agreements at an early stage. Importantly, this included the ability to take tailored and differentiated actions with industry partners of different sizes and locations, for example balancing needs to make targeted investment into UK science capabilities and deploy advanced purchase agreements with global partners developing candidate vaccines.

165.2. Secondly, by taking steps to foster an ecosystem that builds on UK strengths to support ongoing health security and preparedness. Here we see opportunities to:

- Nurture an R&D ecosystem that values and incentivises innovation and R&D for pathogens with pandemic potential: including championing intellectual property rights which, as explained above, are fundamental to enable companies to make risky, long-term investments in R&D and enter collaborations knowing inventions are protected; maintaining strong disease surveillance systems and sharing information on pathogens rapidly and efficiently with the scientific community; and facilitating smooth R&D collaborations between industry, academia and government.

- Strengthen supply chain networks and trade policies: life sciences manufacturing and supply depends on a complex global network – it is often impossible to source all materials for a vaccine or medicine in a single country. To build resilience and preparedness, the UK should outline a trade strategy for the life sciences sector that prioritises removal of restrictions and tariffs and supports international regulatory coordination with mutual recognition agreements.

- Improve systems that enable delivery of countermeasures, including strong life course approaches to vaccination: a strong routine health system that can rapidly pivot in an emergency will support preparedness for future pandemics. As part of this, it is critical that the UK maintains and strengthens the system for life course vaccination, prioritising measures to ensure high uptake of national immunisation programmes, supporting broad and aligned recommendations for future programmes that maximise their societal impact. With recent analysis identifying that adult vaccination programmes can return

up to 19 times their initial investment to society, doing so can also enable health and socioeconomic benefits in non-pandemic periods.

166. It is Pfizer's firm belief that effective collaboration in these areas will substantially strengthen the position of the UK both in the context of any future pandemic and generally, to respond to health challenges impacting the population.

Statement of Truth

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

Signed: Personal Data **Dated**: 3 December 2024

Ben Osborn

ANNEX 1

GLOSSARY OF ACRONYMS

AE	**Adverse Event(s)** - An untoward medical occurrence after exposure to a medicine, which is not necessarily caused by that medicine.
APA	**Advanced Purchase Agreement –** In the context of a vaccine, means a contract for the purchase of the vaccine prior this becoming available, which ensures that the buyer will secure the doses it requires and gives the manufacturer some certainty about the quantities of the vaccine it will be asked to supply.
ARIA	**Advanced Research and Intervention Agency** - An executive non-departmental public body, sponsored by the Department for Science, Innovation and Technology with the aim of supporting projects with potential to produce transformative technological change, or a paradigm shift in an area of science.
BARDA	**Biomedical Advanced Research and Development Authority –** A US Department of Health and Human Services office responsible for the development and procurement of medical countermeasures against bioterrorism, including chemical, biological, radiological and nuclear (CBRN) threats as well as pandemic influenza, and emerging diseases.
BEIS	**Department of Business, Energy and Industrial Strategy** – BEIS was a UK Government department set up in July 2016 to replace the Department for Business, Innovation and Skills and the Department of Energy and Climate Change. During the pandemic, its primary objectives included (i) helping UK businesses tackle the impact of COVID-19 (ii) supporting a safe return to the workplace and (iii) accelerating the development and manufacture of a vaccine. Along with the Department of Health and Social Care (DHSC), it was responsible for the Vaccine Taskforce (VTF). In February 2023, BEIS was replaced by the Department for Business and Trade, the Department for Energy Security and Net Zero and the Department for Science, Innovation and Technology.
CDC	**Centers for Disease Control and Prevention –** Part of the United States' Department of Health and Human Services, which focuses on protection against health, safety and security threats, both foreign and domestic.

CEPI	**Coalition for Epidemic Preparedness Innovations** - CEPI is a global partnership which aims to accelerate the development of vaccines and other biologic countermeasures against epidemic and pandemic threats.
CHM	**Commission on Human Medicines** - The CHM advises UK government ministers on the safety, efficacy and quality of medicinal products. CHM is an advisory non-departmental public body, sponsored by the DHSC.
CHMP	**Committee for Medicinal Products for Human Use** – The CHMP is the European Medicines Agency's (EMA) committee responsible for human medicines.
CMA	**Conditional Marketing Authorisation** – A CMA may be granted, for certain medicines (including vaccines) in the interests of public health based on less comprehensive clinical data than normally required, where the benefit of immediate availability of the medicine outweighs the risk inherent in the fact that additional data are still required. The following criteria must be met (i) the benefit-risk balance of the medicine is positive (ii) it is likely that the applicant will be able to provide comprehensive data post-authorisation (iii) the medicine fulfils an unmet medical need and (iv) the benefit of the medicine's immediate availability to patients is greater than the risk inherent in the fact that additional data are still required. A CMA is valid for one year and can be renewed annually. Once a CMA has been granted, the marketing authorisation holder must fulfil specific obligations within defined timelines. A CMA may be converted to a standard Marketing Authorisation (MA) once the marketing authorisation holder fulfils the obligations imposed and the complete data confirm that the medicine's benefits continue to outweigh its risks.
CVU	**COVID-19 Vaccines Unit –** The CVU works to ensure that adequate doses of vaccines are available for all eligible cohorts at the right time, based on the advice of the JCVI. The CVU was previously part of the VTF. It became part of UKHSA in October 2022.
DART	**Development and Reproductive Toxicology study** - Prenatal developmental toxicity studies identify substances that may pose a risk to the developing foetus if pregnant women are exposed. Regulatory agencies use the results of well-conducted animal studies to help set human exposure guidelines.

DHSC	**Department of Health and Social Care** – DHSC is the UK Government's department responsible for the UK's health and social care policy.
EC	**European Commission** - The European Commission is the EU's politically independent executive arm. It is responsible for drawing up proposals for new European legislation and implementing the decisions of the European Parliament and the Council of the EU.
EMA	**European Medicines Agency** - The EMA is a decentralised agency of the European Union (EU). It is responsible for the scientific evaluation, supervision and safety monitoring of medicines throughout the EU.
EPAR	**European Public Assessment Report** - A scientific report explaining the CHMP's assessment of the evidence relating to a medicinal product authorised under the EU centralised procedure for the purposes of regulatory decision making by the European Commission.
FDA	**U.S. Food and Drug Administration** - The FDA is the US agency responsible for the safety, efficacy, and security of human and veterinary drugs, biological products, medical devices in the United States. The agency is also responsible for the regulation of tobacco, foods, cosmetics, and products that emit radiation
HMR	**Human Medicines Regulations 2012** - Regulations which consolidate the law of the United Kingdom in relation to the manufacture, authorisation, sale and supply of medicinal products for human use and certain related topics. The regulations were amended in 2020 by the Human Medicines (Coronavirus and Influenza) (Amendment) Regulations 2020, in response to the COVID-19 pandemic.
GVP	**Good Pharmacovigilance Practice –** A set of measures drawn up to facilitate the performance of pharmacovigilance. GVP is the minimum standard for monitoring the safety of medicines in the UK.
JCVI	**Joint Committee on Vaccination and Immunisation** – JCVI is an independent expert advisory committee which advises the UK health departments on vaccination and immunisation and makes recommendations concerning vaccination schedules and vaccine safety.

KPI	**Key Performance Indicators –** KPIs are contractual targets used to measure performance of a specific objective
LSP	**Logistics Service Provider –** A third party company that provides supply chain management services including transportation, warehousing or distribution services.
MA / MAH	**Marketing Authorisation** - Marketing authorisation (MA) is an authorisation to market a medicine, based on an assessment of safety, efficacy and quality. An MA may be granted on a standard or a conditional basis. When a marketing authorisation is granted on a conditional basis it is referred to as a CMA. The holder of an MA is known as the Marketing Authorisation Holder (MAH).
GB MA/ GB CMA	**Great Britain Marketing Authorisation** –. The approval needed to place a medicinal product on the market in Great Britain (England Scotland and Wales). It sets out the medical conditions for which the product is indicated, patient population and dosage for which the product is authorised as well as any conditions imposed on the holder of the marketing authorisation. As a result of the Northern Ireland Protocol, Northern Ireland continues to be aligned to EU legislation in relation to medicines and authorisations granted by the European Commission under the centralised procedure, which are effective throughout the EU are also applicable in Northern Ireland.
MERS	**Middle East respiratory syndrome -** (also known as MERS or MERS-CoV) is a rare but potentially severe respiratory illness. The virus was first identified in Saudi Arabia in 2012. It is a zoonotic virus, meaning it is transmitted between animals and people, and it is contractable through direct or indirect contact with infected animals.
MHRA	**Medicines and Healthcare products Regulatory Agency** – MHRA is the UK regulatory authority for medicines (including vaccines), medical devices and blood components for transfusion. It is an executive agency of the DHSC.
mRNA /RNA	**Messenger Ribonucleic Acid** — mRNA is a molecule that contains the instructions that directs the cells to make a protein using its natural machinery.

NHS/ NHSE	**National Health Service / National Health Service England** - The National Health Service is the publicly funded healthcare system in England, and one of the four National Health Service systems in the United Kingdom.
NIBSC	**National Institute for Biological Standards and Controls** - The NIBSC is part of the MHRA, it is responsible for the standardisation and control of biological medicines (including vaccines) in the UK.
PHE	**Public Health England** – PHE was an executive agency of the DHSC in England which began operating in April 2013 to protect and improve health and wellbeing and reduce health inequalities. It was replaced by UK Health Security Agency (UKHSA) and the Office for Health Improvement and Disparities in October 2021.
PIL	**Patient Information Leaflet** - A PIL is a document included in every packet of medicines approved for use in the UK containing written information about the medicine for the patient or user. The type of information included in a PIL is prescribed by legislation and the content must be approved by the MHRA as accurately reflecting the current state of scientific and medical knowledge before it is put into circulation.
PSUR	**Periodic safety update reports** - PSURs are pharmacovigilance documents intended to provide an evaluation of the risk-benefit balance of a medicinal product at defined time points after its authorisation. The objective of the PSUR is to present a comprehensive and critical analysis of the risk-benefit balance of the product, taking into account new or emerging safety information in the context of cumulative information on risk and benefits.
RMP	**Risk Management Plan** – An RMP provides information on a vaccine's safety profile, describes the activities of the MAH further to characterise the safety profile during post-marketing (pharmacovigilance activities), and explains the measures that are taken in order to prevent or minimise the risks of the vaccine in patients (risk minimisation measures)
SAE	**Serious adverse event** - any untoward medical occurrence, after exposure to a medicine, which is not necessarily caused by that medicine that, at any dose, results in death, hospitalisation or prolongation of

	existing hospitalisation, persistent or significant disability/incapacity or a congenital anomaly or birth defect. Any adverse event that does not meet the definition of SAE is classified as "non-serious".
SARS-CoV-2	**Severe acute respiratory syndrome coronavirus 2** – SARS-CoV-2 is the virus that causes COVID-19. It is a highly transmissible coronavirus that emerged in 2019 and was sequenced in January 2020. It is the virus responsible for causing the COVID-19 pandemic. Most people infected with the virus will experience mild to moderate respiratory illness and recover without requiring special treatment. However, some will become seriously ill and require medical attention.
SMPC	**Summary of Product Characteristics** - The SmPC is a document describing the properties and the officially approved conditions of use of a medicinal product, which forms the basis of information for healthcare professionals on appropriate use of the medicine. The SmPC forms part of the marketing authorisation for a medicinal product. The type of information included in an SmPC is prescribed by legislation and the content must be approved by the MHRA as accurately reflecting the current state of scientific and medical knowledge before it is put into circulation.
UKHSA	**United Kingdom Health Security Agency** - UKHSA is the UK Government's department responsible for protecting communities from the impact of infectious diseases, chemical, biological, radiological and nuclear incidents and other health threats. It provides intellectual, scientific and operational leadership at national and local level, as well as on the globally.
UKPAR	**United Kingdom Public Assessment Reports** – A scientific report explaining the assessment of the evidence relating to a medicinal product for the purposes of regulatory decision making by MHRA.
Vaccine BR EWG	**The COVID-19 Vaccine Benefit Risk Expert Working Group** – An expert group advising the Commission of Human Medicines (CMH) in relation to the quality, safety and efficacy of COVID-19 vaccine candidates.
VMIC	**Vaccine Manufacturing and Innovation Centre** – VMIC is a vaccine research and manufacturing facility that was developed in collaboration

	with Imperial College London, the London School of Hygiene and Tropical Medicine, and Oxford University and received funding from the UK government. It was sold to Catalent Biotherapeutics in April 2022.
VTF	**Vaccine Taskforce** - The VTF was founded in April 2020 by the UK Government to oversee the development and production of a coronavirus vaccine in the UK. It was a joint unit of BEIS and DHSC. Its members consisted of civil servants, external secondees from industry, and contractors. The Vaccine Taskforce was stood down in October 2022. Its vaccine supply responsibilities have moved to the UKHSA.
WHO	**The World Health Organisation** – WHO is a specialised agency of the United Nations which has responsibility for international public health.

ANNEX 2

SCHEDULE OF EXHIBITS PROVIDED TO INQUIRY

INQ000474685

ANNEX 3

KEY INDIVIDUALS AND THEIR ROLES[25]

Key individuals at Pfizer Limited and their roles

Name	Job Title
Ben Osborn	Managing Director and UK Country Manager: December 2018 – January 2022 Regional President Hospital Business Unit – International Developed Markets: January 2022- September 2022
Susan Rienow	Head Hospital Business Unit: December 2018 – June 2021 Head Vaccines Business Unit: July 2021 – March 2022 UK Country Manager: March 2022 to date
Dr Berkeley Phillips	UK Medical Director: 2010 to date Vice President: 2022 to date
Dr Gillian Ellsbury	Medical Director - Vaccines UK & Ireland: September 2019 – November 2022 Medical Director – Vaccines and Antivirals: November 2022 to date

[25] Please note that the lists in Annex 3 are limited to the key individuals and are not intended to be exhaustive lists

Key UK Government and non-government figures with whom Pfizer Limited interacted

Name	Job Title
VTF	
Dame Kate Bingham	Chair of the Vaccine Taskforce: May 2020 – December 2020
Sir Richard Sykes	Chair of the Vaccine Taskforce: June 2021 – September 2022
Madelaine McTernan	Director General of the UK Vaccine Taskforce: December 2020 – September 2022
Ruth Todd	Programme Director of the UK Vaccine Taskforce: June 2020 – July 2021
Steve Glass	Programme Director of the UK Vaccine Taskforce: December 2020 – August 2022
Kate Hilyard	Assays Workstream Lead, Senior VTF Team
Suzanne Sadler	Senior VTF Team
David Edwards	Senior VTF Team
Marc Haywood	Senior VTF Team
Chris Neame	Commercial Lead, Senior VTF Team
Steve Bagshaw	Senior VTF Team
Sue Williams	VTF Supply Chain Lead, Senior VTF Team
Emmanuel Agoro	VTF Supply Chain Lead
PHE/ UKHSA	
Phillipa Harvey	Supply Director of the UK Vaccine Taskforce, BEIS: May 2022 – October 2022 Director of Covid Vaccines Unit, UKHSA: October 2022 to date
NR	PHE Head of Vaccine Operations
Mary Ramsay	Consultant Epidemiologist and Head of the Immunisation, Hepatitis and Blood Safety department
JCVI	
Sir Andrew Pollard	Chair of the JCVI: 2013 - date

Name	Job Title
Prof Wei Shen Lim	Chair of the JCVI COVID-19 subcommittee: September 2020 - July 2021 Chair of the JCVI COVID-19 main committee: July 2021 - date
UK Government	
Boris Johnson	Prime Minister: 24 July 2019 – 6 September 2022
Jeremy Hunt	Chair Health Select Committee: February 2020 - October 2022
Matt Hancock	Secretary of State for Health and Social Care: 9 July 2018 - 26 June 2021
Nadhim Zahawi	Parliamentary Under Secretary of State (Minister for COVID Vaccine Deployment): 28 November 2020 - 15 September 2022
Sajid Javid	Secretary of State for Health and Social Care: 26 June 2021 - 5 July 2022
Sir Alok Sharma	Secretary of State for Business, Energy and Industrial Strategy: 2020 to 2021
Lord Bethell	Parliamentary Under-Secretary of State for Innovation at the Department of Health and Social Care: 9 March 2020 - 17 September 2021
Senior Civil Servants	
Sir Patrick Valance	Government Chief Scientific Advisor: April 2018 - April 2023
Sir Chris Whitty	Chief Medical Officer since 2019
Sir Jonathan Van-Tam	Deputy Chief Medical Officer: October 2017 - March 2022
NHS England	
Dr Emily Lawson	Chief Commercial Officer for NHS England: February 2020 – August 2021 SRO Vaccine Deployment Programme: November 2020 – August 2021
NIBSC	

Name	Job Title
Christian Schneider	Director of NIBSC
Nicola Rose	Principal Scientist NIBSC
MHRA	
Dame June Raine	Chief Executive of MHRA
Siu Ping Lam	Director of Licensing
NR	Core Team
NR	Core Team
NR	Core Team
NR	Core Team

ANNEX 4

CHRONOLOGY

INQ000474684

ANNEX 5

UK COMIRNATY MARKET SUPPLY STEPS

INQ000474683

ANNEX 6

DATES OF PUBLICATION OF SAFETY INFORMATION IN COMIRNATY PRODUCT INFORMATION

INQ000474687

ANNEX 7

ALLOCATION OF RESPONSIBILITIES BETWEEN PFIZER AND BIONTECH

INQ000474686