Witness Name: Dr Lisa Ritchie

Statement No.: 1

Exhibits: LR/001 – LR/099

Dated: 23 July 2024

**UK COVID 19 INQUIRY**

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**FIRST WITNESS STATEMENT OF DR LISA RITCHIE**

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CONTENTS

I, Dr Lisa Ritchie, National Deputy Director of Infection Prevention and Control at NHS England of Wellington House, 133-135 Waterloo Road, London, SE1 8UG, will say as follows:

## STATEMENT OVERVIEW

1. I make this statement in response to the UK Covid-19 Inquiry's Rule 9 request to me dated 14 May 2024 in relation to Module 3 of the Inquiry ("**the Rule 9 Request**"), which focuses on the impact of the Covid-19 pandemic on healthcare systems in the four nations of the UK between 1 March 2020 and 28 June 2022 ("**the Relevant Period**").

2. This statement is structured as follows:

    a. **Section 1** provides an overview of my professional background.

    b. **Section 2** outlines my roles during the Relevant Period at Health Protection Scotland ("**HPS**") and NHS England.

    c. **Section 3** introduces Infection Prevention Control ("**IPC**") by way of background.

    d. **Section 4** sets out my understanding of the key characteristics, from an IPC perspective, of the SARS-CoV-2 virus and Covid-19.

    e. **Section 5** details my involvement in respect of IPC guidance.

3. Throughout this statement I have set out my reflections and the challenges that we faced.

4. This witness statement does not seek to duplicate the related evidence provided to the Inquiry in:

    a. NHS England's First Module 3 Statement signed by NHS England's Chief Executive Officer;

    b. NHS England's Second Module 3 Statement signed by NHS England's Chief Executive Officer;

    c. NHS England's Third Module 3 Statement signed by NHS England's National Medical Director; and

d. NHS England's Fourth Module 3 Statement signed by NHS England's National Medical Director.

5. I have adopted certain definitions and approaches used in NHS England's Second Module 3 Statement, including:

a. definitions of the waves of the pandemic:

| **Wave and dominant variant** | **Dates (approx.)** |
|---|---|
| Wave 1 – Wuhan variant. | February – May 2020 |
| Wave 2 – emergence of Alpha variant. | September 2020 to January 2021 |
| Wave 2 - reducing and the emergence of Delta variant. | February 2021 to September 2021 |
| Wave 3 – emergence of Omicron variant. | September 2021 to end of the Relevant Period. |

b. referring to the Department of Health and Social Care ("**DHSC**") and the Secretary of State for Health and Social Care ("**SSHSC**") in accordance with how they are structured today, but such references include all predecessor organisations and roles as the context may require; and

c. collectively referring to NHS Trusts and NHS Foundation Trusts as "**Trusts**" unless otherwise stated.

6. References to the NHS England IPC Cell, are references to an IPC cell that was established together with other subject specific Cells, as part of NHS England's Emergency Preparedness Resilience and Response ("**EPRR**") to the pandemic. References to the UK IPC Cell are references to the evolution of the NHS England IPC Cell to encompass a four nations approach as described in Section 5 below.

7. When referring to a Chief Nursing Officer ("**CNO**") or Deputy Chief Nursing Officer ("**DCNO**"), Chief Medical Officer ("**CMO**") or Deputy Chief Medical Officer ("**DCMO**"), I will reference the relevant nation as England ("**E**"), Northern Ireland ("**NI**"), Scotland ("**S**") or Wales ("**W**") after their role, e.g. the CMO for England is "CMO(E)"

## SECTION 1: MY PROFESSIONAL BACKGROUND

8. I am the National Deputy Director of Infection Prevention and Control ("**DDIPC**") for NHS England and have held this role since April 2020. I was previously employed as the Head of IPC until my title changed on 1 April 2024, following the NHS England restructure.

9. As DDIPC, I am part of the Nursing Directorate led by the CNO(E). The structure of NHS England's Nursing Directorate is set out at Annex 2.

10. It is my responsibility to lead the National IPC team in NHS England, establishing robust links with Trusts in England through the creation of regional IPC leads to support consistent infection prevention, incident preparedness, infection detection and incident management across England **[LR/001] [INQ000489969]**.

11. I studied for a BA(Hons) Nursing Studies at Glasgow Polytechnic, graduating and qualifying as a Registered General Nurse in 1992. In 1998 I completed an MPhil in Social Science Research, and in 1999 a Post-graduate Diploma in Infection Control Nursing, both at the University of Glasgow. In 2017, I completed my PhD at Glasgow Caledonian University, which examined the effectiveness of admission risk assessment and pre-emptive patient cohorting in the control of Meticillin-resistant *Staphylococcus aureus* (MRSA) transmission.

12. Following qualification in 1992, I commenced my career in NHS Dumfries and Galloway. In 2009 I was appointed to the role of Nurse Consultant in IPC in the Antimicrobial and Healthcare Associated Infections ("**ARHAI**") Group at HPS[1] in Glasgow. In this role I was responsible for the clinical leadership of NHS Scotland's National IPC Policy, Guidance and Outbreak ("**NPGO**") Programme in the "ARHAI" Group **[LR/002] [INQ000489960]**. My career history is set out at Annex 1.

13. During my employment at HPS, I supported many local (NHS Board)[2] infection outbreaks and national infection incidents. These included the HPS incident response to the H1N1 (Swine flu) pandemic in 2009/10 and Ebola in 2014/15.

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[1] On 1 April 2020 HPS became Public Health Scotland (PHS). At this time ARHAI Scotland became a separate body to PHS. ARHAI Scotland is a clinical service providing national expertise for IPC, antimicrobial resistance (AMR) and healthcare associated infection (HAI) for Scotland. ARHAI Scotland, along with Health Facilities Scotland (HFS), is part of NHS Scotland Assure. NHS Scotland Assure sits within the Procurement, Commissioning and Facilities Strategic Business Unit of NHS National Services Scotland (NSS).

[2] NHS Scotland is structured by way of 14 regional/territorial boards responsible for providing healthcare services in their respective areas, managing hospitals, district nursing, and healthcare planning. There

## SECTION 2: MY ROLE DURING THE RELEVANT PERIOD

14. Over the course of the pandemic, and with specific reference to the Relevant Period, I held roles at HPS and NHS England. This section sets out my role in those organisations as well as my interactions with other organisations from across the wider health sector.

15. It is important to note that:

    a. health is a devolved matter and therefore the structure and size of the health and care system in Scotland is not directly comparable to that in England; and

    b. in HPS my role was in an organisation that was responsible for public health in its widest sense, whereas in NHS England my role is focussed specifically on matters of IPC in the NHS in England, not within other environments.

### Role at HPS during the Relevant Period

16. From 1 January 2020, I was leading on IPC advice and guidance in support of the HPS response to the situation in Wuhan. Prior to the inception of the UK IPC Cell, I contributed to several guidance documents, including guidance for primary care settings **[LR/060][INQ000492302]**.[3] Advice for primary care settings was included in the final draft of the revised DHSC pandemic influenza guidance for healthcare settings (December 2019) and included in the early Covid-19 guidance (January 2020), which was adapted from the pandemic influenza guidance (2019). As is stated in the minutes of the NERVTAG meeting on 28 January 2020, I reported that the approach recommended for primary care in Scotland at that time was to identify and isolate any suspected Covid-19 cases and inform the local Health Protection Team.

17. From 28 January 2020, I became a co-opted member of NERVTAG. I was invited to the 28 January 2020 meeting by NERVTAG secretariat in response to the evolving

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are a further seven special and non-territorial boards that provide specialist and national services beyond regional boundaries, such as specific medical conditions or public health initiatives. Public Health Scotland supports both territorial and special boards, focusing on public health, epidemiology, and health improvement. Each board is accountable to Scottish Ministers, who oversee health and social care policy and funding. The Scottish Government Health and Social Care Directorates manage the overall system. Healthcare policy in Scotland is devolved to the Scottish Parliament, meaning decisions are made within Scotland rather than at the UK level.

[3] To clarify my use of the acronym RPE in exhibit LR/060: On 22 January 2020, Covid-19 was classified as an HCID by the Four Nations Public Health HCID Group, and there were no confirmed cases in Scotland that I recall. In drafting guidance for primary care practitioners, I noted that providing FFP3 respirators was impractical due to the need for fit testing. Therefore, I recommended using FRSM along with other PPE to support GP triaging i.e., identification and isolation of suspected cases, and to inform the local Health Protection Team for advice. I acknowledge that referring to FRSM as RPE was/is inaccurate.

situation in relation to the Wuhan novel coronavirus. Ahead of this meeting I was requested to provide a short biography and declare any conflicts of interest as set out in the NERVTAG Code of Practice. I believe this invitation to be a co-opted member was because of the IPC programme of work I was leading at HPS, my previous interactions with NERVTAG, and the recently revised DHSC *Pandemic Influenza Guidance for IPC in Healthcare Settings (2019)*. My role as a co-opted member of NERVTAG was/is to support the development of mitigation advice and recommendations based on the appraisal of the available evidence, reflecting current good practice and expert opinion specifically related to IPC **[LR/061][INQ000492303] [LR/062][INQ000101108]**.

18. In February 2020, I was invited, along with other IPC colleagues from HPS by NHS England's then Head of IPC to join the daily NHS England IPC Cell meetings, and I attended my first meeting on 27 February 2020. At this time, HPS was developing IPC guidance and reviewing public health guidance for Scotland in the context of the emerging situation in Wuhan **[LR/063][INQ000492307] [LR/064][INQ000492308]**.

19. Due to my notice period and annual leave, I was only employed at HPS for 12 days of the Relevant Period (1 March to 12 March 2020). However, my work during this period, in my view, was in anticipation of the ongoing support that I would provide once I had taken up my new position at NHS England.

20. During the early stages of the pandemic, NERVTAG was receiving questions with tight deadlines from the Scientific Advisory Group for Emergencies ("**SAGE**") regarding the Wuhan Novel Coronavirus **[LR/065][INQ000492305] [LR/066][INQ000492306]**. Of those questions that were related to IPC, specifically to Respiratory Protective Equipment ("**RPE**") and Aerosol Generating Procedures ("**AGPs**"), NERVTAG did not have time to formally review the evidence but was able to utilise the literature reviews and evidence synthesis that had previously been conducted by HPS to inform the National Infection Prevention and Control Manual ("**NIPCM**") Scotland and the revised DHSC *Pandemic Influenza Guidance for IPC in Healthcare Settings (2019)* **[LR/003][INQ000489973] [LR/004][INQ000489974]**.

21. Following the NERVTAG meeting on 20 March 2020 **[LR/005][INQ000119619]**, I was contacted via email by a colleague in Countermeasures Supply and Operations at PHE in relation to the following question which had been posed to NERVTAG:

*Whether there is a health setting for COVID19 treatment that N95 respirators could be worn? We are being offered significant volumes for purchase if they could be used?*.

My position was that Health and Safety Executive ("**HSE**") colleagues were the decision makers in relation to this query (I understood that HSE had also been contacted separately). This was on the basis that it was my understanding that N95 respirators did not meet UK legal standards for use in healthcare. The collective opinion of those NERVTAG colleagues asked, was that the decision had to be that of the HSE, but that they (the N95/FFP2 respirators) should probably be purchased in the event of an FFP3 shortage. **[LR/067][INQ000269674]**

22. In March 2020, following the declassification of Covid-19 as an HCID (see Section 4 below), I was asked by a DCMO(E), Professor Jonathan Van-Tam, to adapt the *Pandemic Influenza Guidance for IPC in healthcare settings (2019)* to *Covid-19: Guidance for IPC in healthcare settings* for review by IPC/public health colleagues in HPS and the other three nations and for sign-off by the DHSC/CMO(E)'s Office **[LR/006][INQ000489975][LR/007][INQ000489976] [LR/008][INQ000381176] [LR/009][INQ000224003]**.

Engagement whilst at HPS

23. During the Relevant Period, while employed at HPS, I engaged with the following individuals and organisations:

    a. CMO(S)/DCMO(S) through telephone/email discussions and meetings in which IPC advice was being sought and guidance being drafted e.g., regarding mass gatherings and PPE recommendations.

    b. DCMO(E), Professor Jonathan Van-Tam, via email regarding Covid-19 IPC guidance for secondary care (adaption of the then recently revised DHSC pandemic influenza guidance for Covid-19).[4] This related to discussions which were being undertaken at NERVTAG.

    c. National infection incident meetings e.g., HPS representation on UK/PHE-led Incident Management Team meetings.

[4] The emerging evidence base on Covid-19 was rapidly evolving, and therefore the document stated that further updates may be made guidance as new detail/evidence emerges.

d. NHS England IPC Cell meetings by invitation from the then Head of IPC at NHS England.

e. The IPC Leads from PHE, Public Health Wales ("**PHW**") and Public Health Agency Northern Ireland ("**PHA**") via the NHS England IPC Cell meetings.

24. The ARHAI Group at HPS was/is nurse led and sits within the CNO Directorate of the Scottish Government. A Healthcare Associated Infection ("**HCAI**") Policy Adviser, seconded from the ARHAI Group, was the main point of contact for the IPC Nurse Consultants for all routine business with the CNO Directorate. My working relationship with the then CNO(S), and all employed within the CNO Directorate, was good and mutually respectful, with effective communication and collaboration, and a shared commitment to national priorities.

25. While at HPS my interaction with the four nation CNOs was via the CNO(S) Directorate.

26. During my employment with HPS, prior to the Relevant Period, I interacted with professional bodies representing the interests of healthcare workers, including the Royal Colleges and professional societies. My interactions with these professional bodies were effective in relation to the programme of work that I was leading for the HPS NPGO Health Protection Programme. The HPS NPGO Programme had/has an NIPCM Communications strategy including stakeholder involvement and consultation.

**Role at NHS England during the Relevant Period**

27. I joined NHS England on 1 April 2020. My role during the Relevant Period was to provide technical knowledge and leadership on IPC matters for NHS England. In practice, I also led on preparing drafts of operational guidance that reflected my own consideration of the issues and that of other IPC specialists.

28. During the Relevant Period (from 1 April 2020) I do not recall having any specific interaction with the CEOs or the National Medical Director of NHS England outside of meetings where we were in attendance together. Communications were typically via the CNO(E) or the DCNO(E) for Professional & System Leadership (April 2020 to July 2021) or DCNO(E) for International Nurse Delivery and Nursing Workforce (from August 2021) as IPC is part of the Nursing Directorate.

29. Similarly, any interactions with the CMO(E)/DCMO(E) were typically via the CNO(E) or the DCNO(E) for Professional & System Leadership or DCNO(E) for International Nurse Delivery and Nursing Workforce.

30. I met with the CNO(E), DCNO(E) for Professional & System Leadership or DCNO(E) for International Nurse Delivery and Nursing Workforce, Medical Adviser on IPC to the CNO(E)/National Clinical Director for IPC and Antimicrobial Resistance (AMR), and Director of Prevention most days to discuss the pandemic response. Interactions with the other UK nation CNOs/DCNOs was generally through the CNO(E) or the DCNO(E) for Professional & System Leadership or DCNO(E) for International Nurse Delivery and Nursing Workforce.

31. In addition to my connections with public health bodies through the UK IPC Cell, my interactions with:

    a. UKHSA were predominantly via the IPC Leads for the Covid-19 response;

    b. PHS were predominantly via the IPC Nurse Consultants of ARHAI; and

    c. PHW and PHA were mainly with IPC lead colleagues from these organisations.

32. I had (and continue to have) good working relationships with colleagues at PHW, PHE/UKHSA, and ARHAI/PHS while employed at HPS, and within the Relevant Period in NHS England.

33. I also met with representatives of professional bodies including the Academy of Medical Royal Colleges (AoMRC), the Royal College of Nursing (RCN), the Healthcare Infection Society (HIS) and the Infection Prevention Society (IPS) throughout the course of the pandemic to discuss the pandemic response, the UK IPC guidance, and the future programme of work of the newly formed NHS England National IPC Team.

34. During the Relevant Period I was appointed to the following groups:

    a. I am a co-opted member of NERVTAG (since 28 January 2020). NERVTAG is an expert committee of the DHSC, which advises the CMO(E) and, through the CMO(E), ministers, the DHSC and other government departments. It provides scientific risk assessment and mitigation advice on the threat posed by new and emerging respiratory viruses and on options for their management. My contribution to NERVTAG was/is specifically on the human IPC aspects of Covid-19 and new and emerging respiratory viruses.

b. From February 2020, I was a member of what became known as the UK IPC Cell. I led the NHS England IPC Cell from June 2020 (prior to that, the previous Head of IPC for NHS England was the IPC Cell Lead).

c. I chaired the UK IPC Cell from June 2020 to 31 March 2021, after which Dr Eleri Davies, Deputy Medical Director, PHW, became the chair. I interacted with PHE/UKHSA, ARHAI, PHW and the PHA through this Cell. Further information about the UK IPC Cell is set out at Section 5 below.

d. I was a member of the Hospital Onset Covid-19 Infection Working Group ("**HOCI WG**"), where I represented the UK IPC Cell (although all four nation IPC leads were also invited to attend all meetings). The HOCI WG was originally established at the request of SAGE on 3 April 2020 to provide an overview of possible nosocomial transmission of Covid-19 in hospitals and to review the scientific evidence in relation to nosocomial infections **[LR/010][INQ000489982]**. The group was initially co-chaired by the Director of the National Infection Service at PHE and the CNO(E). From 16 May 2020, co-chairing duties were shared between the CNO(E) and NHS England's Medical Advisor for IPC.

35. I attended other groups on an ad hoc basis when invited, for example:

a. I attended the UK Senior Clinicians' Group (set up by the CMO(E)) once on 28 July 2020 to discuss a final draft of the Covid-19 Guidance for the Remobilisation of Services within Healthcare: IPC recommendations (July 2020).

b. I attended the Social Partnership Forum (SPF) Strategic Group[5] on 14 July 2021 when PHE/UKHSA led a discussion on the UK IPC guidance review in the context of lifting pandemic restrictions from 19 July 2021 **[LR/011][INQ000489987] [LR/012][INQ000489997]**. I also attended an SPF workshop on 6 October 2021 with two of my team colleagues to present and discuss the revised draft content of the UK IPC guidance **[LR/013][INQ000489989] [LR/014][INQ000118412] [LR/015][INQ000489991] [LR/016][INQ000067197]**. In preparation for managing Autumn/Winter infection risks, including Covid-19, the UK IPC guidance had been updated to prevent transmission of seasonal respiratory

[5] The SPF brings together NHS employers, NHS trade unions, NHSE and DHSC to contribute to the development and implementation of policy that impacts on the health workforce.

viral infections, including Covid-19, in health and care settings while continuing to support the recovery of healthcare services **[LR/017][INQ000257936]**. This guidance superseded the Covid-19: Guidance for maintaining services within health and care settings IPC recommendations (V1.2 June 2021).

## SECTION 3: INTRODUCTION TO IPC

36. IPC is defined by the World Health Organization ("**WHO**") as:

> *a practical, evidence-based approach preventing patients and health workers from being harmed by avoidable infections. Effective IPC requires constant action at all levels of the health system, including policymakers, facility managers, health workers and those who access health services. IPC is unique in the field of patient safety and quality of care, as it is universally relevant to every health worker and patient, at every health care interaction. Defective IPC causes harm and can kill. Without effective IPC it is impossible to achieve quality health care delivery.*
>
> *Infection prevention and control effects all aspects of health care, including hand hygiene, surgical site infections, injection safety, antimicrobial resistance and how hospitals operate during and outside of emergencies.*

37. IPC measures are necessary to reduce the risk of infection transmission. For such measures to be optimally effective, it is paramount that they are used continuously by all healthcare workers, in all care settings, and notably when interacting with patients, other healthcare workers and visitors at all times, for all patients.

### Modes of transmission

38. There are three established modes of transmission in which a respiratory virus can spread: contact, droplet, and airborne (short-range and long-range). This section considers each of these modes.

39. Where there is transmission within a hospital, healthcare associated infections (HCAIs or nosocomial infections) can occur. Nosocomial infection concerns infections transmitted between patients and/or staff in hospitals. See paragraphs 127 to 131 below for further details on nosocomial infections and Covid-19.

40. Effective IPC guidance must be broadly applicable. IPC strategies are not specific to any one pathogen and generally apply to all routes of transmission.

Contact transmission

41. Contact transmission is the most common route of infection transmission and consists of two types: direct and indirect contact:

    a. Direct contact transmission may happen when infectious agents are transferred directly from one person to another. Examples include body fluids from an infected person entering another person's body through mucous membranes, cuts, or abrasions. This also includes shaking the hand of an infected person allowing pathogens to be transferred directly from one person to another when there is physical contact.

    b. Indirect contact transmission may occur when infectious agents are passed from an infected person to another individual via a contaminated person or an object (also referred to as a 'fomite'). Examples in healthcare settings include shared patient care equipment not being correctly cleaned between uses, contaminated items such as toys, and inadequately sterilised surgical instruments.

Droplet transmission

42. Droplet transmission involves droplets (5µm to about 200µm in diameter)[6] from an infected person's respiratory tract reaching the eyes, nose, or mouth of another person.

43. Large droplets (>20µm) typically fall to the ground or surfaces within a 1 metre (c.3 foot) range from the source, which is considered the highest risk area for potential transmission. However, how long droplets remain suspended in the air depends on factors such as particle size, settling velocity, temperature, humidity, and airflow. Large droplets fall to the ground within seconds, while smaller droplets (5µm to 20µm) can stay airborne for several minutes before settling.

44. Droplets are produced by talking, coughing, or sneezing, and can also be generated during healthcare procedures that cause splashing or spraying of body fluids, such as open suctioning, endotracheal intubation, and cough induction by chest physiotherapy.

45. Infectious agents transmitted via droplets include *Bordetella pertussis* (whooping cough), influenza virus, adenovirus, rhinovirus (most frequent cause of the common

[6] µm is a micrometre or 'micron', it is one millionth of a metre (0.000001m) or one thousandth of a millimetre (0.001mm).

cold), *Mycoplasma pneumoniae*, coronavirus (those which cause the common cold and those associated with more severe disease such as Severe Acute Respiratory Syndrome (SARS)), and *Neisseria meningitidis* (which can cause meningitis).

Airborne transmission

46. Airborne transmission involves infectious particles or droplet nuclei (aerosols) in the respirable size range that can remain suspended in the air for long periods and be dispersed by air currents over distances greater than 1 metre.

47. Short-range aerosol transmission involves tiny respiratory droplets (less than 10μm in diameter) that can spread over short distances (less than 2 metres). This is more likely in poorly ventilated indoor spaces where these aerosols can accumulate e.g., in a crowded room or during specific activities that produce more aerosols such as singing or shouting.

48. Long-range aerosol transmission refers to the spread of pathogens through very small particles that remain suspended in the air for long periods and can travel longer distances, potentially spreading between different rooms or even through building ventilation systems. This is typically associated with highly infectious diseases that can stay viable in the air for extended periods, like measles or tuberculosis.

49. It is my view that the distinction between a respiratory aerosol and droplet in terms of size (micrometres) is an academic consideration that cannot be usefully applied in national guidance or by healthcare workers in 'real' clinical environments. This is because:

    a. Patients are often diagnosed based on medical criteria, not confirmed pathology (laboratory testing).

    b. Devices to measure particle size are not widely available in clinical environments, and would require specialised training, which could delay patient care.

    c. Measuring particle size does not confirm the presence of a viable virus - particle size is only one of several considerations related to communicable disease transmission.

50. While there is a difference in transmission related to particle size and viral load, from an IPC perspective, both aerosols and droplets represent a risk. Therefore, mitigation

is based on clinical judgement and risk assessment. As outlined in this statement, transmission likely results from a combination of factors.

51. Contact, droplet, and aerosol transmission rarely function in isolation. The reality is that the transmission of infection can occur via a combination of routes which depends on the pathogen, patient population, and a plethora of other considerations; hence IPC responses to outbreak control and management (at any level and involving any number of patients) are always multi-interventional.

52. Effective IPC responses are designed to address and mitigate multiple modes of transmission simultaneously (see section below on IPC measures to counteract transmission). IPC measures are divided into two main categories: Standard Infection Control Precautions (SICPs) and Transmission Based Precautions (TBPs).

53. The established modes of transmission as defined prior to the pandemic are unlikely to be as delineated as previously described (i.e., with specific particle size cut-offs) as infectious respiratory particles may be emitted along a spectrum of sizes. The definitions provided within this statement are those that existed at the beginning of the pandemic. Specific particle sizes were removed from modes of transmission definitions/not included within the UK IPC guidance for seasonal respiratory infections in healthcare settings (including SARS-CoV-2) for Winter 2021-22, published 22 November 2021 to align with the changing evidence. Specifically, that understanding of the routes of transmission of Covid-19 was developing, as set out in paragraphs 114 to 118, and the inclusion of particle sizes was deemed to have limited utility in clinical practice as set out in paragraph 49. Furthermore, the guidance covered all seasonal respiratory viruses for winter 2021 to 2022, during service recovery, which included the introduction of local Covid-19 pathways. Therefore, to support local implementation, the guidance continued to recommend the application of local risk assessments, allowing a multifactorial assessment of risk, as set out in paragraph 63.

**IPC measures to counteract transmission**

54. There are two broad categories into which IPC mitigations can be fully categorised. These are Standard Infection Control Precautions ("**SICPs**") and Transmission Based Precautions ("**TBPs**").

55. SICPs should be used whether infection is known to be present or not to ensure the safety of those being cared for, healthcare workers, and visitors in the care environment. SICPs are IPC measures necessary to reduce the risk of transmitting infectious agents from both recognised and unrecognised sources of infection.

Sources of (potential) infection include blood and other body fluids, secretions, or excretions (excluding sweat), non-intact skin or mucous membranes and any equipment or items in the care environment that could have become contaminated.

56. To protect effectively against infection risks, SICPs must be used consistently by all healthcare workers i.e., these are precautions that everyone in every hospital, GP surgery, or any healthcare setting should be taking all the time. Ongoing implementation monitoring of SICPs is necessary to ensure compliance with safe practices. There are 10 elements of SICPs, these are patient placement, hand hygiene, respiratory and cough hygiene, PPE, safe management of equipment and the care environment, safe management of linen, management of blood and body fluid spillages, safe disposal of waste (including sharps), and occupational safety: prevention of exposure.

57. SICPs may be insufficient to prevent cross transmission of specific infectious agents and additional precautions called TBPs may be required when caring for patients with known/ suspected infection or colonisation. TBPs are categorised by the route of transmission of infectious agents. Clinical judgement and decisions should be made by healthcare workers on what additional precautions are required and these will be based on the suspected/known infectious agent; severity of the illness caused; transmission route of the infectious agent; and the care setting and procedures undertaken.

58. There are three categories of TBPs which are essentially adopted globally in IPC:

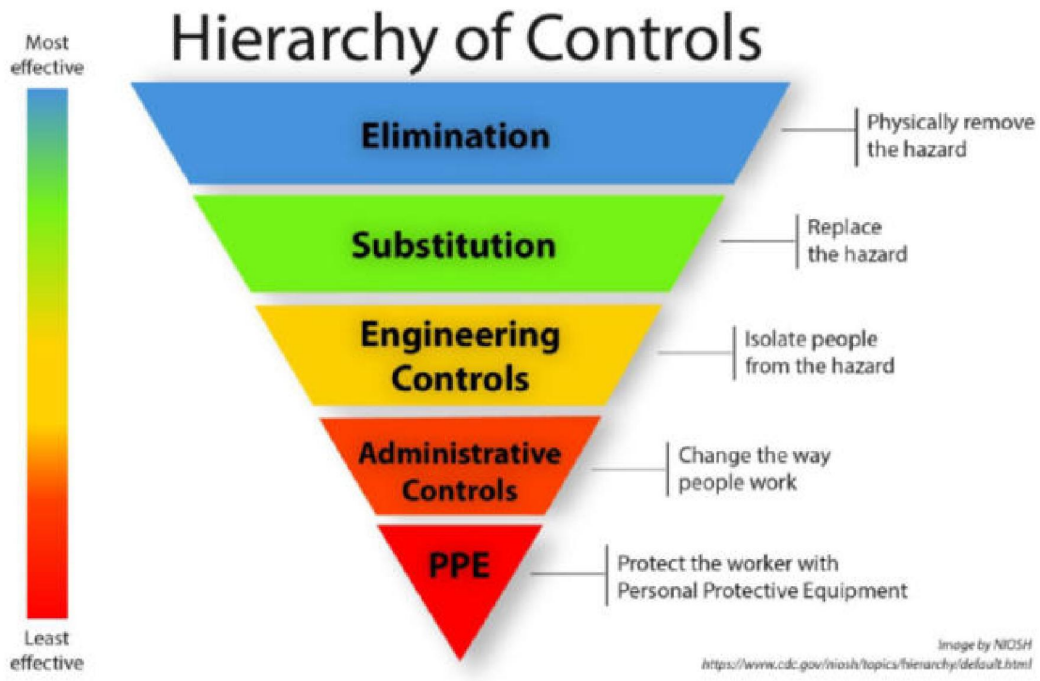
    a. Contact precautions: Used to prevent and control infections that spread via direct contact with the patient or indirectly from the patient's immediate care environment (including care equipment). This is the most common route of cross-infection (transmission). Examples include patient placement in a single room, provision of dedicated patient care equipment, more frequent equipment cleaning and environmental decontamination, and limiting the movement of the patient(s) from their room.

    b. Droplet precautions: Measures used to prevent and control infections spread over short distances (at least 1 metre) via droplets from the respiratory tract of one individual directly onto a mucosal surface or conjunctivae of another individual. As an example, during the pandemic increased physical distancing (2 metres) was introduced as an additional droplet precaution.

c. Airborne precautions: Measures used to prevent and control infection spread without necessarily having close patient contact via aerosols from the respiratory tract of one individual directly onto a mucosal surface or conjunctivae of another individual. The established modes of transmission for respiratory infectious agents as defined before the pandemic are unlikely to be as delineated as is described in the scientific literature, i.e. droplet or airborne transmission and the application of TBPs may differ depending on the setting and the known or suspected infectious agent. Examples of airborne precautions include patient placement in a negative pressure isolation room to prevent contaminated air from flowing to other areas, ensuring good ventilation to reduce the concentration of airborne pathogens, and more frequent decontamination of equipment and the environment that may become contaminated with airborne pathogens.

59. TBPs are intended to be used in addition to SICPs to mitigate where a risk is known. In relation to the pandemic, Covid-19 IPC guidance and the NIPCM (as well as health and safety legislation) stipulated that all staff must be trained in and provided with PPE that they might reasonably be expected to wear in the course of their duties.

60. The application of TBPs should be considered within the framework of the hierarchy of controls, a system used to eliminate or reduce exposure to risks relating to substances hazardous to health in the workplace:



61. It is important to emphasise that PPE including RPE, is one part of a comprehensive set of IPC measures to limit the spread of an infectious agent; and that application of the hierarchy of controls requires a multidisciplinary approach. Other IPC measures are critical to preventing both acquisition and transmission of infection, including hand hygiene before and after contact with the patient and their environment, not touching one's own mucous membranes (e.g., mouth and nose), respiratory and cough hygiene and maintaining physical distancing (2 metres). This is in addition to changes in primary and secondary care clinical pathways, use of telemedicine (elimination), mechanical ventilation (engineering controls), screening, triaging, testing, contact tracing, isolation or cohorting of patients and healthcare workers, including social distancing (administrative controls).

62. HSE guidance states that:

*You should only select and use RPE:*

- *where an inhalation exposure risk remains after you have put in place other reasonable controls (residual risk);*

- *while you are putting in place other control measures (interim measures);*

- *for emergency work or temporary failure of controls where other means of control are not reasonably practicable…*

*Under the law, RPE is the last line of protection. Remember, RPE can protect only the wearer and if it is used incorrectly, or is poorly maintained, it is unlikely to provide the required protection. Note also that RPE can be uncomfortable to wear and may interfere with work, which can lead to incorrect use.* **[LR/068][INQ000492301]**

63. The UK IPC guidance had, and the NIPCM England has, clinical risk assessment at its core, that is: decisions regarding the application of IPC measures/mitigations should be guided by a comprehensive multifactorial assessment of risk related to the patient (including past medical history and infectious status), likely or anticipated exposure, duration of exposure, location, risk to the healthcare worker (including vaccination status and past medical history), the intervention, as well as local considerations. The pandemic response highlighted that contextualising risk using the hierarchy of controls was not familiar in the healthcare environment i.e., healthcare workers were familiar with clinical assessment and application of SICPs and TBPs, but many were not familiar with the formal risk assessment that brought together the wider elements of the hierarchy of controls. Consequently, the NHS England IPC

Team developed and published hierarchy of controls resources for primary care, community, and outpatient settings; acute inpatient settings; and primary and community dental care settings **[LR/095][INQ000493480] [LR/096][INQ000493481]**.

64. In summary, respiratory viruses can spread through three established modes: contact, droplet, and airborne transmission. In hospitals, infections transmitted between patients and staff are known as HCAIs or nosocomial infections. Effective IPC strategies must be broad and applicable to all transmission routes, relying on clinical judgment and risk assessments rather than specific particle size measurements, which are impractical in clinical settings. IPC measures include SICPs and TBPS aiming to mitigate multiple transmission modes simultaneously. Understanding of transmission routes, especially for Covid-19, evolved, leading to updated guidance that emphasised local risk assessments over fixed particle size definitions.

**PPE/RPE**

65. Although PPE is considered a final mitigation of the hierarchy of controls it is still a significant method to reduce infection risk for healthcare workers and patients during an outbreak of an infectious disease. It includes equipment such as aprons, gowns, gloves, face shields, goggles, Fluid Resistant Surgical Facemasks ("**FRSMs**") and RPE.

66. PPE is defined in Regulation 2 of the Personal Protective Equipment at Work Regulations 1992, which states that:

*unless the context otherwise requires, "personal protective equipment" means all equipment (including clothing affording protection against the weather) which is intended to be worn or held by a person at work and which protects the person against one or more risks to that person's health or safety, and any addition or accessory designed to meet that objective.*

67. RPE is a particular type of PPE designed to protect the wearer from breathing in harmful substances. In healthcare settings the term respirator most commonly refers to the filtering half face piece ("**FFP**") which covers the nose and mouth and requires the wearer to be fit tested. There are three categories of FFP: FFP1; FFP2 (roughly equivalent to an N95 respirator) and FFP3 (roughly equivalent to an N99 respirator). The FFP3 respirator offers the highest level of protection. Although most of the evidence base supporting the use of FFP respirators in the prevention of airborne transmission of infection is based upon N95/FFP2 devices, FFP3 is the only FFP

class acceptable to HSE for use against infectious aerosols in healthcare in the UK. In the USA and several other countries, N95/FFP2 is acceptable for use against aerosols in healthcare settings.

68. Surgical face masks, including FRSMs were originally designed for use during surgeries to keep the area sterile. As outlined below, IPC guidance does not recommend that FRSMs are used as RPE. However, they are considered a component of PPE, and have been used for a long time to protect healthcare workers from infected patients. Today, surgical masks serve three main purposes:

    a. Protecting patients during sterile procedures – surgical masks are designed and tested to provide a reduction in respiratory particles being expelled into the environment from the wearer.

    b. Protecting healthcare workers by acting as a barrier against respiratory secretions and splashes.

    c. Limiting infection spread by preventing spread from coughing and sneezing patients.

69. An additional benefit is that FRSMs remind healthcare workers not to touch their face.

70. Therefore, as well as being used as source control, FRSMs are used for protection against droplet splash or spray in healthcare settings and are required to meet standards for bacterial filtration efficiency, breathing resistance and splash resistance (BS EN 14683:2019). FRSMs fall into the definition of PPE as above and their use as PPE has been described in national (NIPCM) and international (CDC, WHO, ECDC) IPC guidance both before the pandemic and to date. In addition to their use as protection against droplets in the context of certain respiratory pathogens, FRSMs are also recommended for protection against splash or spray of blood or body fluids when applying SICPs. IPC guidance does not recommend that FRSMs are used as RPE. However, FRSMs are an element of PPE that are used in healthcare settings to protect the nose and mouth of a healthcare worker from potentially infectious body fluids.

**Aerosol generating procedures**

71. AGPs are medical procedures that can result in the release of aerosols from the respiratory tract. The criteria for an AGP are a high risk of aerosol generation and increased risk of transmission of infectious agents from patients with a known or suspected respiratory infection.

72. The AGP list was developed over time based on an increased risk of aerosol generation associated with specific procedures. Exposure from bio-aerosol (aerosol particles of biological origin) associated with other types of care delivery should be based on an assessment of risk and then TBPs applied as appropriate.

73. The medical procedures considered to be aerosol generating and associated with an increased risk of respiratory transmission are:

a. awake* bronchoscopy (including awake tracheal intubation);

b. awake* ear, nose, and throat airway procedures that involve respiratory suctioning;

c. awake* upper gastro-intestinal endoscopy;

d. dental procedures (using high speed or high frequency devices, for example ultrasonic scalers/high speed drills);

e. induction of sputum;

f. respiratory tract suctioning**;

g. surgery or post-mortem procedures (like high speed cutting / drilling) likely to produce aerosol from the respiratory tract (upper or lower) or sinuses; and

h. tracheostomy procedures (insertion or removal).

*Awake including 'conscious' sedation (excluding anaesthetised patients with secured airway).

** The available evidence relating to respiratory tract suctioning is associated with ventilation. In line with a precautionary approach, open suctioning of the respiratory tract regardless of association with ventilation has been incorporated into the current AGP list. Only open suctioning beyond the oro-pharynx (middle part of the throat behind the mouth) is currently considered an AGP. Oral/pharyngeal suctioning is not considered an AGP.

74. Cardiopulmonary Resuscitation ("**CPR**") is not listed separately on the AGP list because it is a sequence of procedures, including some that generate aerosols which are already included on the list **[LR/018][INQ000489983]**. CPR involves chest compressions, manual ventilation, defibrillation, and Advanced Cardiac Life Support (ACLS), such as advanced airway management. As explained below, aerosol

production varies depending on the procedure, technique, and whether the patient is awake. Procedures like intubation, extubating, and bronchoscopy create higher aerosol levels than coughing if a patient is awake, and therefore, healthcare workers involved in these procedures may require additional PPE, including RPE. When the patient is unconscious or under anaesthesia, the risk of aerosol generation from these procedures is typically lower.

75. The relative quantity of infectious aerosols generated by AGPs compared to an infected person coughing, breathing, or speaking can vary significantly. My understanding is that:

a. Breathing generates a relatively low volume of aerosols. The particles produced are generally smaller and fewer in quantity compared to other activities.

b. Speaking increases the volume of aerosols produced compared to breathing, with louder speech generating more aerosols.

c. Coughing produces a larger volume of aerosols than both breathing and speaking. The particles generated are often larger and can carry more infectious agents.

d. AGPs can produce a significantly higher volume of aerosols compared to breathing, speaking, or coughing. The aerosols generated during AGPs can be very fine and stay suspended in the air for longer periods, increasing the risk of airborne transmission of infections.

76. The exact aerosol quantities can vary depending on the specific procedure, the technique used, and the patient's condition, that is, whether or not the patient's airway is controlled e.g. while under anaesthesia, or uncontrolled i.e. when the patient is awake. Studies indicate that certain AGPs, like intubation, extubating, and bronchoscopy, can generate aerosols at levels several times higher than those produced by coughing. Healthcare workers performing or present during these procedures may require different PPE, including RPE, to mitigate the increased risk of infection **[LR/097][INQ000257952]**.

77. The interpretation and application of the AGP list and guidance was/is ultimately decided at local level where there was/is a better understanding of the specific exposures/risk. The purpose of local risk assessment includes assessing the likelihood and severity of infection risks associated with different activities,

procedures, and settings in order to effect risk based and proportionate application of mitigating measures. If local risk assessment deemed the use of RPE necessary for CPR then appropriate RPE should have been available to healthcare workers.

**National Infection Prevention and Control Manuals**

78. Prior to the pandemic, I led a multidisciplinary team in the development, delivery, and maintenance of the NIPCM using improvement methodology and collaborating with IPC leaders across Scotland to support and optimise implementation. I was the lead author of the NIPCM Scotland for 10 years (2010-2020).

79. My aim for the NIPCM Scotland was to produce a single document that codified IPC guidance (using an evidence-based approach), replacing all other existing guidance and enabling the Health Boards in Scotland to establish a consistent approach to IPC.

80. An evidence-based approach in healthcare offers many benefits, not least standardised care practices, improved patient outcomes and consistent treatment protocols across different care settings **[LR/019] [INQ000489979]**.

81. The NHS Scotland NIPCM was first published on 13 January 2012 and all NHS Boards in Scotland were required to adopt, implement, and monitor compliance with the NIPCM as part of their Healthcare Environment Inspections.

82. Wales subsequently adopted (and adapted as appropriate) the Scottish NIPCM in 2018.

83. When I arrived to start my role in NHS England, there was no NIPCM for England and no National NHS England IPC Team. Therefore, the formation of what became known as the UK IPC Cell was dependent on the existing evidence reviews underpinning the NIPCM in Scotland.

84. By Spring 2022, NHS England had published a NIPCM for England, an evidence-based manual for use by all those involved in care provision in England. On 27 May 2022, UKHSA archived the Covid-19 UK IPC Guidance, replacing it with Covid-19 specific advice for health and care professionals, which complemented the NIPCM. This signalled a definitive move towards managing Covid-19 as one of many acute respiratory diseases experienced and managed in the UK **[LR/020] [INQ000421222] [LR/021] [INQ000330932] [LR/022] [INQ000489998]**.

85. The overarching IPC principles (not pathogen specific) used to inform the pandemic response were drawn from the NHS Scotland NIPCM and supporting systematic literature reviews, and the revised DHSC *Pandemic Influenza Guidance for IPC in Healthcare* (December 2019).

86. The NHS England NIPCM has been updated ten times and systematic literature reviews and tools directly informed by pandemic learning have been published or are underway.

**Review of 2009 pandemic influenza guidance**

87. In October 2017, I emailed a DCMO(E), Professor Johanthan Van-Tam, and suggested, following my discussions with IPC colleagues in PHE, PHW, and PHA, that a UK IPC Leads collaboration could be the way to address the IPC guidance requirements regarding pandemic influenza preparedness **[LR/023] [INQ000489959]**.

88. In September 2018, HPS were formally commissioned by DHSC (following a NERVTAG meeting on 21 June 2018) to review the 2009 pandemic influenza control guidance. I led and chaired this review. Within this, two targeted reviews on specific questions related to influenza transmission modes and optimal patient placement were completed. This highlighted that despite its widespread presence, there was surprisingly little influenza-specific evidence in the literature regarding transmission, and in the context of pandemic planning, the lack of robust evidence was and has become more noticeable. Consequently, the IPC policies for influenza are based on existing knowledge about transmission and reasonable inferences from epidemiological studies, outbreak reports, and information on other respiratory viruses. A final draft of this IPC guidance was presented to NERVTAG on 17 December 2019 **[LR/024] [INQ000489961] [LR/025] [INQ000489962] [LR/026] [INQ000489963] [LR/027] [INQ000489964] [LR/028] [INQ000489965] [LR/029] [INQ000489966] [LR/030] [INQ000489967] [LR/031] [INQ000489968] [LR/032][INQ000489971] [LR/033][INQ000489970] [LR/034][INQ000216851]**.

89. The conclusion and recommendations of the four nations guidance review group was that a thorough understanding of how influenza is transmitted is crucial for selecting the most appropriate and effective non-pharmaceutical interventions (NPIs) including IPC measures. A further conclusion was that during a pandemic, supplies of RPE and PPE may become scarce, making it essential to avoid unnecessary or inappropriate use. We reiterated that there was an urgent need for robust research studies to determine which IPC measures are most effective in various settings.

90. The supply of PPE did not influence the IPC advice provided by the UK IPC Cell during the relevant period. The availability of PPE did not affect the IPC guidance, as the sourcing, distribution, and supply of PPE were outside the remit of the UK IPC Cell.

## SECTION 4: STATUS OF COVID-19

### Covid-19 as an HCID

91. Covid-19 was classified as an HCID on 16 January 2020 by the four nations Public Health HCID Group on a precautionary basis as it was a novel virus that was potentially similar to SARS and Middle East Respiratory Syndrome (MERS). At the time of classification there were uncertainties as to whether Covid-19 met the HCID criteria (set out in exhibit **[LR/035] [INQ000119498]**).

92. I understand that on 13 January 2020 NERVTAG was briefed that the novel coronavirus had been reviewed by the four nations Public Health Agencies who had recommended its classification as an interim airborne HCID, however, I was not at that meeting or a member of NERVTAG at that point **[LR/036][INQ000023107]**.

93. I was not a member of the four nations Public Health HCID Group, or the Advisory Committee on Dangerous Pathogens and I had no role in the decision to classify or declassify Covid-19 as an HCID.

94. As set out in NHS England's First Module 3 Statement an HCID is defined according to the following criteria:

    a. acute infectious disease;

    b. typically has a high case-fatality rate;

    c. may not have effective prophylaxis or treatment;

    d. often difficult to recognise and detect rapidly;

    e. ability to spread in the community and within healthcare settings; and

    f. requires an enhanced individual, population and system response to ensure it is managed effectively, efficiently and safely.

95. HCIDs are further divided into contact and airborne groups:

a. Contact HCIDs are usually spread by direct contact with an infected patient or infected fluids, tissues and other materials, or by indirect contact with contaminated materials and fomites.

b. Airborne HCIDs are spread by respiratory droplets or aerosol transmission, in addition to contact routes of transmission.

96. It is important to highlight, firstly, that the mode of transmission is not a consideration in the HCID classification criteria. Secondly, RPE is recommended for any HCID whether it is classed as an 'airborne' or 'contact 'HCID' because either the mode of transmission is unknown and therefore the highest level of PPE/RPE is advised, and/or it is likely that AGPs will be required, and it may not be possible to change into enhanced PPE in a timely way that does not increase the risk of self-contamination for the attending healthcare worker(s).

97. PPE requirements for managing patients with suspected or known HCIDs (contact or airborne) were available to NHS Scotland in the NIPCM Scotland. NHS England's Second Module 3 Statement and NHS England's Third Module 3 Statement set out details regarding HCID protocols for England.

98. I was at the NERVTAG meeting on 13 March 2020 where members discussed the interim classification of Covid-19 as an HCID, noting NERVTAG was informed that "*HCID status was discussed at the ACDP meeting and the committee were unanimous in supporting the declassification of COVID-19 as a HCID.*" **[LR/037][INQ000212195]**

99. On 16 March 2020, the four nations Public Health HCID Group stated:

*"Having reviewed the criteria and having considered all information, taken together, the members of the Group were unanimous in their recommendation to remove COVID-19 from the list of Airborne HCIDs."* (**[LR/035] [INQ000119498]**)

100. On 19 March 2020, the Government announced that Covid-19 was no longer classified as an HCID **[LR/038] [INQ000087332]**, following consideration by the UK public health bodies and a recommendation from the Advisory Committee on Dangerous Pathogens (**[LR/039] [INQ000223384] [LR/040] [INQ000115534] [LR/041] [INQ000226885]**):

*"Now that more is known about COVID-19, the public health bodies in the UK have reviewed the most up to date information about COVID-19 against the UK HCID*

*criteria. They have determined that several features have now changed; in particular, more information is available about mortality rates (low overall), and there is now greater clinical awareness and a specific and sensitive laboratory test, the availability of which continues to increase."*

101. As stated at paragraph 96, since the mode of transmission is not one of the HCID criteria, the declassification of Covid-19 was not a shift away from a belief that the predominant mode of transmission was airborne (with respect to the HCID definition of airborne).

**Position following the declassification of Covid-19 as an HCID**

102. As set out in NHS England's Third Module 3 Statement, the declassification meant that Covid-19 patients could be cared for in non-HCID settings and staff used different types of PPE depending on the type of treatment being undertaken (as HCID PPE standards were no longer the default requirement).

103. Only diseases which are designated as HCIDs (by the Four Nations Public Health HCID Group) are managed through HCID protocols (which set out the required PPE). There are many infectious diseases which cause serious illness and fatalities which are not classified as an HCID, for example, influenza (commonly known as flu) can lead to a viral pneumonia or a secondary bacterial pneumonia (an infection that inflames the air sacs in one or both lungs), *Clostridiodes difficile* (C. diff) can cause severe diarrhoea and colitis; MRSA infections can lead to serious skin infections, pneumonia, and bloodstream infections; Vancomycin-resistant *Enterococci* can cause infections in the bloodstream, urinary tract, and wounds; Norovirus, known for causing outbreaks of gastroenteritis, is highly contagious, can causes severe vomiting and diarrhoea and is associated with outbreaks in healthcare settings that cause severe disruption to care services; Legionnaires' Disease (*Legionella pneumophila*) can cause severe pneumonia, especially in susceptible individuals, and Pseudomonas aeruginosa can cause severe infections, particularly in immunocompromised patients. These infectious diseases pose serious risks to patients and healthcare workers, and require appropriate IPC measures, but they do not meet the specific criteria for HCID classification.

104. Following the declassification, Covid-19 Guidance for IPC in healthcare settings (adapted from Pandemic Influenza: Guidance for IPC in healthcare settings 2019) was presented and discussed at the NERVTAG meeting on 25 March 2020. This document outlined the IPC advice for healthcare workers involved in receiving,

assessing, and caring for patients suspected or confirmed with Covid-19. It was based on the evidence available from previous pandemic and inter-pandemic periods, and on the reasonable assumption that the transmission characteristics of Covid-19 were similar to those of the 2003 SARS outbreak, primarily occurring through respiratory droplets and contact with contaminated surfaces. During AGPs, there is a risk of airborne transmission, necessitating airborne precautions. It was therefore recommended that:

a. Airborne precautions should be used at all times in high-risk areas like Intensive Care Units and High Dependency Units managing Covid-19 patients, unless the patient is in a negative pressure isolation room or single room.

b. FRSMs be worn by general ward staff, community, ambulance, and social care staff for close patient contact (within 1 metre), unless performing AGPs.

c. During AGPs, healthcare workers should wear an FFP3 respirator, eye protection, a disposable long-sleeved gown, and gloves.

105. Limiting the transmission of Covid-19 in the healthcare setting required/s a range of IPC measures, considered as a hierarchy of controls, which as I have explained above in Section 3, form a package of measures with no one measure being a failsafe. As an aside, this is why detecting the root cause or failure which leads to nosocomial infection in health and care settings is difficult.

106. Local risk assessment was set out in the IPC guidance from first publication by PHE in March 2020. In preventing and controlling Covid-19 it included:

- Early recognition/reporting of cases
- Early assessment/triaging of cases
- Control measures such as:
    - Separating suspected and confirmed Covid-19 patients
    - Educating healthcare workers, patients, and visitors about infection control
    - Promptly implementing TBPs to limit transmission
    - Restricting access for ill visitors to healthcare facilities

The guidance stated that healthcare organisations should prepare and test their response plans for different pandemic phases. This preparation included:

- Assessing current facility capabilities
- Evaluating the ability to deliver care and implement control measures during high patient admissions and reduced staff numbers

- Collaborating with leaders, engineers, and clinical staff to plan patient segregation and create isolation rooms
- Identifying areas that could be quickly converted with minimal changes
- Defining necessary engineering, administrative, and personnel requirements for a pandemic response.

107. Individual organisations/Trusts are responsible for safe systems of work at all times, including managing the risk associated with infectious agents through the completion of risk assessments (outlined in Control of Substances Hazardous to Health (COSHH) Regulations 2002).

108. Local risk assessments are essential for creating a safe healthcare environment by ensuring that IPC measures are relevant, effective, and responsive to specific local risks, conditions and needs. Trusts and clinicians have the right to decide what is appropriate and works best for them based on local risk assessments that:

- Allow for IPC measures to be specifically tailored to the unique needs and circumstances of a particular healthcare setting, considering factors such as patient population, facility layout, and available resources.
- Help identify specific infection risks that may not be apparent at a broader level. This includes local outbreaks, prevalent pathogens, and specific practices that could increase infection risk.
- Ensures resources, including PPE and cleaning supplies, are appropriately allocated where they are most needed to prevent infections.
- Help in monitoring and ensuring compliance with IPC guidelines. They allow for real-time adjustments and interventions to improve adherence to protocols and highlight areas where staff training and awareness need improvement.

109. In Summary:

a. Covid-19 was classified as an HCID on January 16 2020, as a precaution due to its novel nature and potential similarity to SARS and MERS. The classification was based on limited information and uncertainties regarding Covid-19 meeting HCID criteria (including high fatality rate, lack of effective treatment, difficulty in rapid detection, community and healthcare spread, and need for enhanced response).

b. On March 16, 2020, Covid-19 was removed from the HCID list based on more information about its lower mortality rate and improved clinical awareness.

The declassification allowed for different types of PPE depending on the treatment, rather than default HCID standards.

c. Guidance emphasised IPC measures like early case recognition, triaging, separation of patients, education, TBPs, and limiting ill visitor access; and safe systems of work considering local risks, resource allocation, compliance monitoring, and adjustments based on real-time needs.

**Mode of transmission for Covid-19**

110. In 2013, I co-authored a paper **[LR/042][INQ000130561]** with the aim of providing guidance to support healthcare workers in hospital or community settings to select and wear appropriate respiratory and facial protection to minimise the risk of acquisition of infection in the workplace. This paper did not directly assess the evidence for the mode of transmission of all viruses; it made recommendations based on what was commonly understood to be the predominant mode of transmission for some exemplar viruses such as influenza virus. In the case of SARS-CoV-1, the predominant mode was thought to be droplet (and contact with contaminated surfaces) but with a possible risk of aerosol transmission under certain circumstances that were not well defined. This paper also discussed non-SARS coronaviruses as predominately transmitting by droplets. Therefore, while evidence for mode of transmission of other coronaviruses was considered for this 2013 paper, that evidence does not directly provide evidence for the mode of transmission for Covid-19.[7]

111. Throughout the pandemic my understanding of the mode of transmission of Covid-19 was informed by evidence summaries, data and guidance published by the WHO, which in turn informed the UK IPC guidance. Current evidence suggests that Covid-19 is also primarily transmitted through respiratory droplets generated by coughing and sneezing **[LR/069][INQ000130532] [LR/070][INQ000492315] [LR/071][INQ000269267] [LR/072][INQ000492323] [LR/073][INQ000492324] [LR/074][INQ000492329]**.

[7] The evidence that SARS-CoV-1 could transmit by aerosol was weak, circumstantial and very limited in volume, the most convincing evidence was from the Amoy Gardens (McKinney 2006) where aerosol from toilets (not respiratory tracts) was thought to travel between apartments via the plumbing system. So, it was certainly possible and worth noting as a possibility due to the high consequence nature of SARS-CoV-1, but there wasn't evidence (certainly not with any certainty) to say that the airborne route was common/dominant.

112. My view regarding the evidence that aerosol transmission is significant compared to other routes is that this is not sufficiently strong to recommend that FFP3 respirators are routinely used in locations other than high risk clinical areas where AGPs take place. However, local risk assessments were recommended in the UK IPC guidance, and if deemed appropriate (residual risk), healthcare workers should have been provided with FFP3 respirators.

113. For example, the document *Masks for healthcare workers to mitigate airborne transmission of SARS-CoV-2* **[LR/043][INQ000075022]** stated:

*Improved understanding of aerosol risks supports the need for a greater consideration of this route of transmission within risk assessment and IPC strategies, including ensuring compliance with wearing of FRSM as source control by staff and patients (as far as possible) and paying specific attention to the effectiveness of ventilation in both clinical and non-clinical areas (medium confidence). If an unacceptable risk of transmission remains after rigorous application of the hierarchy of controls it may be necessary to consider the extended use of RPE for patient care in specific situations (medium confidence).*

114. On reflection, there was, and remains, inconsistency in the use of terms to describe the various modes of transmission, especially when considering the language around 'airborne' transmission, where several terms are used including 'airborne', 'droplet', 'droplet nuclei', 'aerosol', 'long-range' and short-range'. For example:

a. Pre-pandemic, some PHE guidance on respiratory pathogens used the term ‘airborne’ when describing pathogens that require droplet precautions.

b. During the pandemic, aerosol and airborne were used as two different things at times, for example:

i. airborne in the HCID context refers to droplet and/or aerosol in addition to contract transmission; and

ii. during an SPF workshop on 6 October 20211 it was stated by my colleague, Jackie McIntyre, that *“in terms of aerosol transmission, this has come around during the pandemic and it is distinct from airborne transmission, for us they are two different things”* **[LR/016][INQ000067197]**. I believe that in the context of this meeting, the distinction mentioned was regarding long-range aerosol transmission which requires specific interventions under

'airborne precautions' i.e., isolation in negative-pressure isolation rooms, and the use of RPE for all routine care.

115. Scientific paradigms are essential for the progression of science, providing the structure within which research is conducted, while also allowing for the flexibility to adapt and change as new knowledge emerges. Before the pandemic, categories like contact, droplet, and airborne were used for this purpose in IPC. However, the pandemic has prompted a reassessment of the practicality and accuracy of these categories. The WHO, CDC, and NHS England IPC Team are currently reviewing these definitions **[LR/075][INQ000492325]**. The NHS England IPC Team review is at the data extraction and write up phase; the first draft is expected in Quarter 3 of 2024. The Devolved Administrations are not involved at this stage but will be included in any consultation/engagement exercises. ARHAI Scotland have updated their TBPs definitions review, but the definitions within the NIPCM Scotland have not been updated at this time. The WHO have published their first draft report, and the CDC work is on-going. The reviews of the WHO and the CDC have a slightly different remit to the NHS England review.

116. Over the course of the pandemic substantial new evidence was published in the field of aerobiology and on the topic of infectious disease transmission modes, specifically of SARS-CoV-2. Advancements in our understanding of the behaviour of airborne particles and their generation during normal human activity e.g., talking, has challenged our understanding of established modes of transmission.

117. The concepts and definitions of transmission should be reviewed considering the new and emerging evidence in the field of aerobiology as well as by re-examining historical evidence.

118. There is a need to reconcile the differences in definitions and terminology used not just internationally but within the UK (specifically the NHS) when describing how infectious organisms transmit and the bundled IPC interventions required for their effective control.

**Asymptomatic transmission**

119. Pathogens that can be spread asymptomatically are micro-organisms that can infect a person without causing noticeable symptoms or illness in the infected individual. These pathogens can still be transmitted to others and may cause disease in susceptible individuals. As with symptomatically transmittable infections, the

management of infections that can transmit asymptomatically requires the use of multiple key measures. These include:

- Hand hygiene and respiratory and cough hygiene (i.e., cough etiquette);
- Encouraging or mandating the use of masks in public settings, especially indoors and where physical distancing is difficult and/or impractical;
- Social distancing;
- Limiting the number of people in indoor spaces to avoid crowding;
- Increasing ventilation in indoor spaces by opening windows and using air filtration systems to reduce the concentration of airborne pathogens;
- Implementing routine testing for asymptomatic individuals, especially in high-risk settings like healthcare facilities;
- Separating individuals who test positive, even if asymptomatic, to prevent them from spreading the infection;
- Keeping close contacts of confirmed cases in isolation until it's confirmed they are not infected;
- Contact tracing to identify and inform people who may have been exposed to the virus by an asymptomatic carrier;
- Cleaning frequently touched surfaces (fomites) such as doorknobs, light switches, and electronic devices with appropriate disinfectants;
- Encouraging remote working where possible to reduce physical interactions;
- Promoting vaccination to reduce the overall incidence of infection and transmission, even from asymptomatic carriers, and ensuring up-to-date vaccination status with booster doses if recommended; and
- Ensuring adherence to guidelines and adjusting measures based on surveillance data.

120. Addressing asymptomatic transmission requires a multifaceted approach that combines rigorous IPC practices, regular screening and testing, environmental controls, and continuous education of the public and healthcare workers. By integrating these strategies, healthcare systems can better manage and mitigate the spread of infections, even from those who do not show symptoms.

121. I was not at the SAGE meeting in January 2020. However, it is my understanding that at this time, the proportion of truly asymptomatic infections i.e., those who are infected but never develop symptoms, was unclear but appeared to be relatively low **[LR/076][INQ000325281]**.

122. In early April 2020, the WHO reported both pre-symptomatic (the time between getting infected with Covid-19 and showing symptoms, usually 5-6 days but can be up to 14 days – referred to as the incubation period) and asymptomatic transmission, which highlighted that people could spread Covid-19 without showing symptoms.

123. In May 2020, NERVTAG stated: '*There is considerable uncertainty on relative infectiousness'* and reported: *'There is wide variation in the estimated proportion of infections that are truly asymptomatic across different studies… with the rapid review providing a pooled estimate (based on 22 studies) of 28% but with very low confidence levels.'* It was my understanding that this assessment highlighted the uncertainty and imprecision in estimating how many people with Covid-19 remain asymptomatic, and that more robust and consistent research was needed to provide a more reliable and precise estimate. Despite this uncertainty the UK IPC guidance included many key measures/recommendations, as outlined above, to mitigate the risk of asymptomatic transmission.

124. NERVTAG published a rapid review of the asymptomatic proportion of PCR-confirmed SARS-CoV-2 infections in community settings on 9 September 2020 **[LR/077][INQ000203996]**. The review reported that asymptomatic transmission was likely associated with '*a substantial minority of SARS-CoV-2 infections when estimated using methodologically appropriate studies*.'

125. While there was uncertainty in the rate of asymptomatic transmission, the UK IPC guidance continued to recommend a wide-range of measures to support healthcare systems manage and mitigate the spread of Covid-19.

126. Throughout the Relevant Period, NHS England's IPC Team and the represented organisations of the UK IPC Cell were receiving and reviewing the recommendations and outputs from SAGE and the SAGE subgroups, the four nations nosocomial working groups and other expert groups e.g., NERVTAG, and the Independent High-Risk AGP Panel (see Section 5 below), as well as reviewing international guidance and published scientific literature, and accordingly translating the evidence on transmission into practical IPC advice for healthcare settings. We were continuously reassessing, drafting and recommending (to UKHSA/PHE) updated content for UK IPC guidance based on the emerging epidemiology and scientific evidence, and while also taking into account the available interventions (e.g., diagnostic tests and the Covid-19 vaccination programme) to support the reduction of asymptomatic carriers. This translation of emerging evidence into workable interventions in healthcare

settings was a key part of the NHS England IPC Team's activity throughout the pandemic.

**Nosocomial infections**

127. I was a member of the HOCI WG and represented NHS England's IPC Cell and what became known as the UK IPC Cell (as Chair).

128. My advice on minimising the risk and impact of nosocomial infections (within HOCI WG or otherwise), was centred on providing clear and consistent advice, using best available evidence and current best practices, and seeking to provide implementable guidance to help individuals make informed decisions, aligning advice with established guidelines and standards where applicable. To support the tailoring of advice to specific settings, NHS England's IPC Team developed supporting resources to assist the NHS, NHS commissioned services and other healthcare providers with the implementation of the UK IPC guidance. The IPC Team also provided advice on IPC measures in relation to Covid-19 to specialist associations (e.g., the British Association of Perinatal Medicine and the Renal Association) when requested to support operational guidance to assist with the implementation of UK IPC guidance.

129. I saw a key part of my role as the Chair of the UK IPC Cell as staying up to date with new information and revised advice and guidance. This included being ready or getting ahead of likely revision, whilst respecting the autonomy of organisations and clinicians, and their right to decide what works best for them based on local risk assessments.

130. A number of factors contributed to nosocomial transmission during the pandemic. Transmission was predominantly a consequence of the inherent transmissibility of the virus, high/increasing community prevalence and the number of patients with Covid-19 in hospitals. However, the condition and layout of the available hospital estate and infrastructure of healthcare settings was also a constraining factor when implementing IPC guidance.

131. An analysis published by PHE on 29 October 2021 showed that the application of recommended IPC measures is likely to have reduced healthcare worker infection rates by around 51% in Wave 1, with patient infections being reduced by about 80% of what they would have been in this period without these IPC measures; this level of infection prevention equated to an estimated 140,000 nosocomial infections being avoided. The analysis also noted that the single most helpful measure implemented over this period to prevent the spread of the virus between healthcare workers was

the introduction of universal mask wearing in healthcare settings **[LR/044] [INQ000330923]**.

## SECTION 5: UK IPC CELL AND THE PRODUCTION OF UK IPC GUIDANCE

### UK IPC Cell

132. The UK IPC Cell brought together the IPC leads of the NHS and public health bodies from the four nations, reflecting the collaborative approach taken and promoted by the UK CMOs and CNOs, working across national and organisational boundaries during the pandemic. Each member had considerable technical knowledge, experience and skills in the field of IPC, and collectively, were proficient in ensuring a check and challenge approach to achieve a consistent, unified, science-based approach to IPC policy, leveraging the management experience of guidance development in NHS Scotland.

133. The UK IPC Cell started meeting in early February 2020. The membership of the UK IPC Cell sought to provide a UK-wide consensus view on issues relating to IPC measures, such as the practicalities of the use of PPE including RPE. Meetings were a forum for sharing information on efforts undertaken and progress at a country level to support IPC practice across the UK.

134. Membership of the UK IPC Cell included NHS England, PHE/UKHSA, PHW, ARHAI, Scotland, the Scottish Government HAI Policy Unit, PHA, the Association of Ambulance Chief Executives ("**AACE**")[8] and DHSC. As this group grew out of the NHS England cell structure, NHS England's IPC team hosted and administered the UK IPC Cell meetings, including organising meetings and recording actions.

135. As stated in paragraph 34.c, above I chaired the Cell from June 2020 to 31 March 2021, after which Dr Eleri Davies from PHW became the chair. The role of the chair throughout the Relevant Period is set out in the terms of reference exhibited at paragraph 140 below.

136. The Cell liaised with many groups, and invited/co-opted members, as and when required for ad hoc expert advice, including colleagues from estates, cleaning, and decontamination services, to provide expert subject knowledge and input.

[8] I do not recall being involved in providing specific IPC advice to the ambulance sector. The AACE representative, similar to the other agency/organisation representatives, was responsible for communicating/forwarding any collective decisions taken by the UK IPC Cell through to their responsible lead in their own clinical governance structure. As I recall, the ambulance sector had their own IPC guidance document which was based on/aligned to the UK IPC guidance.

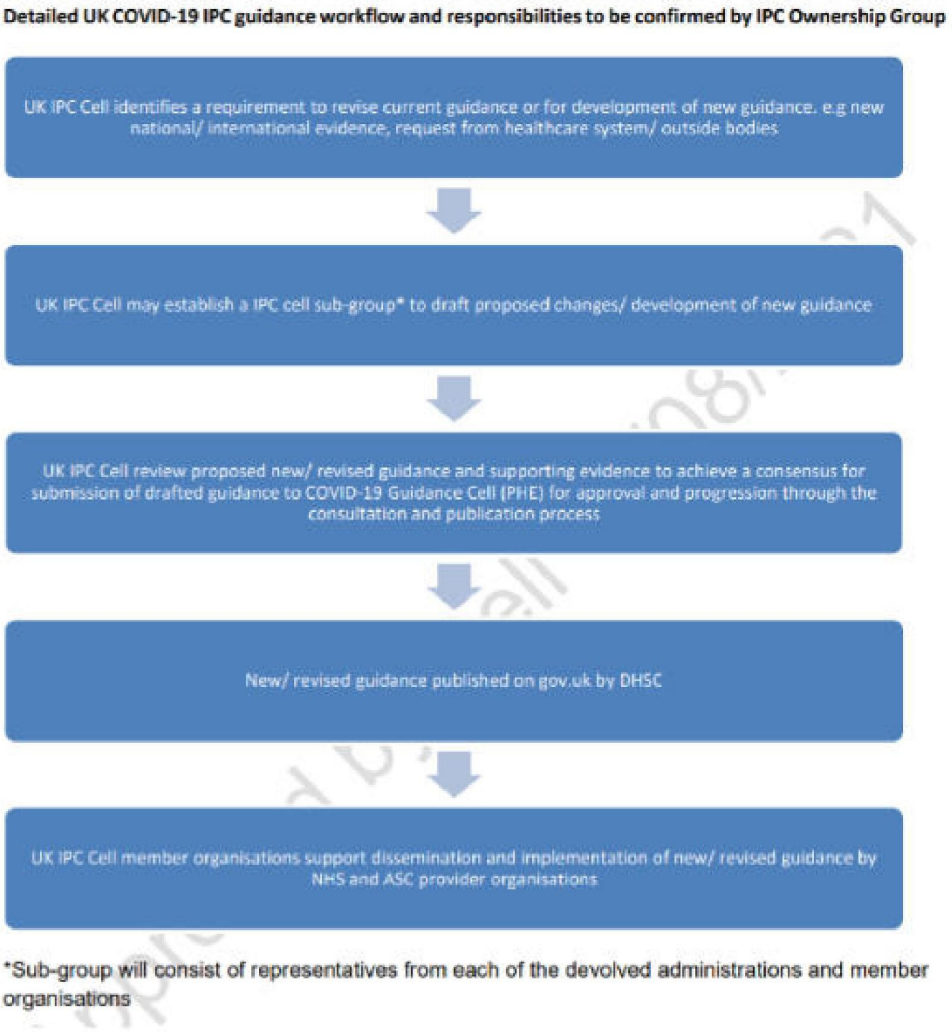
137. The process by which the Cell approached the IPC guidance was based on evidence and technical input. Decisions/recommendations made in the UK IPC cell were made by consensus agreement and had a clear rationale documented in the minutes. The chair had ultimate responsibility in determining whether consensus had been achieved, and in the event of the group not being able to reach consensus raising the matter with senior clinical leaders (CMOs and CNOs) from the four nations of the UK.

138. In the context of decision making, my interpretation of consensus is that of a general agreement among a group of people, involving a process where everyone discusses their views and opinions, leading to a collective decision that is acceptable to all members of the group. It does not necessarily mean that everyone is in complete agreement, but rather that all participants agree to support the decision made.

139. The Cell was not a decision-making body. The 'decisions' of the Cell were recommendations based on the combined expertise of the members. Following a decision by the Cell, each national representative organisation was accountable to and responsible for their own governance structures in terms of decision making regarding the content of the IPC guidance for their nation, i.e., the individuals representing each of the four nations, national agencies or organisations, would forward any collective decisions taken by the UK IPC Cell through to the responsible lead in their own national clinical governance structure, usually either their CNO or CMO, for approval. While the IPC cell worked extended days/long nights to have documents ready to be presented, discussed and approved, I do not recall any occasions on which material changes were subsequently made to guidance by PHE/UKHSA, CNOs or CMOs.

140. In England, because NHS England is not the body responsible for public health, the output from the Cell was provided to PHE/UKHSA who would then comment on the proposals (in addition to their contribution as members of the Cell) **[LR/078][INQ000492327] [LR/079][INQ000492328]**. It is acknowledged that the early terms of reference were not as clear as they could have been on roles and responsibilities given that any "decision making authority" was only a decision on the recommendation to be made not the final content of guidance. However, noting the consensus and development principles set out above, my belief is that the roles and functioning of the IPC cell were well understood and accepted by participant members (example terms of reference from 2020 through to 2022 are exhibited at: **[LR/045][INQ000489995] [LR/046][INQ000489996] [LR/047][INQ000348137]**

**[LR/048][INQ000489988] [LR/049][INQ000416768]**). The terms of reference from August 2021 made the position clearer by inserting the following flowchart:




141. Clearer arrangements on roles and responsibilities in relation to guidance production have been agreed between DHSC, NHS England and UKHSA and will be recorded in a document signed on behalf of NHS England, DHSC and UKHSA.[9] This includes collaboration on pathogen-specific guidance from UKHSA, which is reflected in the operational guidance contained within England's NIPCM.

UK IPC Cell role in relation to AGPs

142. Understanding which procedures were AGPs was essential in ensuring that healthcare workers were appropriately protected **[LR/080][INQ000492309]**

[9] A copy of this document will be made available to the Inquiry once finalised and signed.

**[LR/081][INQ000492310]**.

143. In April 2020 NERVTAG had been asked to undertake an evidence review to consider whether chest compressions and defibrillation were associated with an increased risk of transmission of acute respiratory infection and should be considered AGPs. The evidence review was based on work undertaken by HPS. My understanding of the rationale for the decision to not include CPR an AGP is as set out in the published NERVTAG consensus document **[LR/099][INQ000257933]**. In summary, the scientific evidence examining the risks of specific procedures encompassed by CPR, like chest compressions, defibrillation, manual ventilation, and intubation, was weak and subject to several biases and limitations. A systematic review reported no significant association between chest compressions or defibrillation and increased infection risk; that while chest compressions might generate aerosols similar to an exhalation breath, they were not considered high-risk or AGPs; defibrillation was unlikely to cause significant breath exhalation; airway intubation and manual ventilation were the highest-risk procedures during CPR (Tran et al, 2012). As set out at paragraph 74 above, manual ventilation is not an AGP.

144. In July 2020, the UK Independent Panel on High-Risk AGPs was established to provide practical and scientific advice to the UK CMOs on specific high risk AGPs in the context of the pandemic **[LR/082][INQ000300663] [LR/083][INQ000492316]**. The panel was comprised of independent experts invited by the CMO(E).

145. Organisations that wished to seek the Panel's advice were requested to submit evidence to support their view of a proposed classification of a medical procedure via the UK IPC Cell. This relationship with the panel ensured that the UK IPC Cell was able to respond to enquiries and feedback from the Panel and operationalise any recommendations.

146. The Panel reviewed medical procedures if there was concern or challenge about their classification as an AGP if requested by the UK IPC Cell. For example, as chair of the UK IPC Cell, I forwarded a request from the British Medical Association for a re-evaluation of CPR as an AGP, to the Panel on 18 March 2021. The UK IPC Cell response was endorsed by the Panel **[LR/084][INQ000492318][LR/085][INQ000492320][LR/086][INQ000492322]**.

147. The Panel produced a summary of recommendations arising from evidence reviews to date (first published on 11 January 2021), which included the status of CPR **[LR/050][INQ000489984] [LR/051][INQ000300546]**. Following the publication, I was

invited alongside others to speak with the Panel on perspectives of the state of the evidence reviewed to date to inform the extant AGP list, and how to proceed **[LR/087][INQ000492319]**.

148. It is important to highlight that the AGP list does not exist to restrict the use of RPE for Covid-19 to a list of specific procedures. The 'UK' AGP list as it was at the beginning of pandemic had existed since at least 2014, when it was first published in chapter 2 of the NIPCM for Scotland. The concept of an AGP and the existence of an AGP list long preceded the emergence of Covid-19. During the pandemic, the UK AGP list was one of the most inclusive globally; at the request of stakeholders, members of the UK IPC Cell reviewed the evidence for over 40 medical procedures and published these findings.

149. The evidence base for AGPs was continually monitored **[LR/088][INQ000492312] [LR/089][INQ000492313]**, in addition to ad hoc assessments at the request of stakeholders. The UK IPC guidance included a list of AGPs based on the findings of previously conducted reviews. A review of the extant AGP list was deemed necessary to support NHS remobilisation needs across the UK. The review was carried out in 2021 by NHS England on behalf of the UK IPC Cell. The research question for the review was intentionally focused: 'What is the available evidence to support the removal of any procedures currently included on the UK AGP list?' The rapid review assessed the available evidence identified for each procedure included on the UK AGP list and identified risks specific to Covid-19 based on the then situation (including with reference to the epidemiology and vaccination programme).

150. As outlined above, prior to the pandemic the UK AGP list was globally the most inclusive; additional procedures were reviewed and added (often as a precautionary measure) as the pandemic progressed. The risk that an AGP had been omitted from the list was low; however, what became a greater risk was the increasing backlog of patients requiring procedures that were considered aerosol generating based on limited scientific evidence. Therefore, the focus of the review carried out in 2021 by NHS England on behalf of the UK IPC Cell was to remove procedures from the list that were not supported by evidence. This was considered important in order to enable remobilisation of services and for timely patient diagnosis and treatment.

151. The UK IPC Guidance did not restrict the use of FFP3 masks in circumstances where local risk assessments deemed their use appropriate outside of high risk areas or AGPs. As set out in this statement, PPE and RPE are elements within a broader set of IPC measures (the hierarchy of controls).

152. It is not possible to provide detail on every scenario where an AGP may take place as this will vary by setting, patient condition and care being delivered. The likelihood of AGPs being carried out should be determined locally (in Trusts) as part of routine IPC risk assessments.

**UK IPC Guidance**

153. A timeline of:

a. IPC guidance in relation to the pandemic; and

b. developments in IPC guidance and governance in England since 1998,

is set out in NHS England's Third Module 3 Statement.

154. Guidance needs to be based on evidence. In practice, where there have been a lack of studies or only poor-quality studies have been conducted, this is considered an 'absence of evidence' and guidance then needs to be based on current good practice, expert opinion, and risk assessments/clinical judgement.

155. The volume and quality of Covid-19 evidence was a challenge throughout the pandemic. It was estimated that approximately 1.5 million studies were added to the global scientific literature in 2020 **[LR/090][INQ000492331]**. There was no time to follow standard methodologies for clinical guidance development, which typically take several months, and there were significant gaps in the scientific understanding of the virus. Therefore, we were required to assess emerging evidence as it developed using rapid review methods, and draft guidance rapidly and transparently for application by healthcare workers managing patients.

156. As set out in Section 4, the evidence for Covid-19 being a virus spread predominately via the aerosol mode of transmission was not sufficiently strong to warrant the IPC guidance to recommend the use of FFP3 respirators as standard. There was/is a lack of well-designed and conducted studies examining all potential routes of SARS-CoV-2 transmission, and well-conducted comparative studies examining the relative effectiveness of IPC mitigations, including RPE and FRSM. Therefore, subject to local risk assessments, FRSMs (in combination with other elements of PPE) were, and are, considered suitable protection against the potential risk.

<u>NHS England's role in the production of IPC guidance</u>

157. NHS England's role in the UK IPC Guidance production was through membership of the UK IPC Cell. As set out in the witness statement of the CNO(E):

a. The process of continually reviewing the guidance as new evidence emerged, conducted by both PHE/UKHSA and the UK IPC Cell, ensured that the latest knowledge was assessed by experts as our understanding of Covid-19 developed.

b. Throughout the Relevant Period the work on the UK IPC guidance was undertaken by PHE/UKHSA and the UK IPC Cell:

i. From January to April 2020, PHE drafted and published the UK IPC Guidance, asking the UK IPC Cell for advice on specific areas.

ii. From mid-2020 onwards, as the guidance began to require greater operational IPC expertise, the UK IPC Cell took on a more prominent role in the drafting of IPC guidance.

c. In practical terms, the UK IPC Cell, once it had taken on a more prominent role in drafting the UK IPC Guidance from PHE in mid-2020, ensured that senior PHE/UKHSA views on draft guidance were sought and addressed to enable timely PHE/UKHSA publication approval, due to PHE/UKHSA's statutory responsibilities.

158. An iterative Equality Health Impact Assessment was completed on the UK IPC guidance by NHS England on behalf of the UK IPC Cell **[LR/091][INQ000492333] [LR/092][INQ000492317]**. It is the responsibility of managers/employers to ensure that healthcare workers are aware of and have access to guidance, including the measures required to protect themselves and their employees from infection risk; that healthcare workers have had instruction/education on IPC by attending events and/or completing training (Criteria 1 and 9, Health and Social Care Act Code of Practice); that healthcare workers who may be at high risk of complications from infection (including pregnancy) have an individual risk assessment; and that healthcare workers have had the required health checks, immunisations and clearance undertaken by a competent advisor (Criterion 10, Health and Social Care Act Code of Practice).

159. Separate to the UK IPC Cell, NHS England's IPC Team developed supporting resources to assist the NHS, NHS commissioned services and other healthcare providers with the implementation of the UK IPC guidance. The IPC Team also

provided advice on implementation of IPC measures in relation to Covid-19 to specialist associations (e.g., the British Association of Perinatal Medicine and the Renal Association) where requested.

The 'Precautionary Principle'

160. The precautionary principle means taking proactive measures to prevent the spread of infections, even when there is no conclusive evidence about the extent of the risk. It emphasises minimising potential harm but subject to risk assessment (i.e., the precautionary principle does not mean implementing every possible preventative measure because those measures may carry risks that can outweigh the possible benefits). Key aspects include:

a. Early action: Implementing measures early (as per the hierarchy of controls and as was set out in the IPC guidance) before the full extent of the infection risk is scientifically confirmed.

b. Preventive measures: Using protective equipment, hygiene practices, and other interventions to reduce the risk of infection transmission.

c. Risk minimisation: Prioritising actions that minimise potential exposure to infectious agents.

d. Adaptive policies: Continuously updating and adapting policies based on the latest available evidence and emerging threats.

e. A comprehensive approach: Integrating a range of IPC measures, including hand hygiene, use of PPE, environmental cleaning, and isolation protocols.

161. For England, these aspects link to corresponding NHS England policy, for example, the National Cleaning Specifications, Health Building Notes and Health Building Memoranda, and Uniform policy, and to external agencies, for example UKHSA, HSE, and DHSC.

162. It is my view that the UK IPC Guidance adopted stringent and comprehensive preventive strategies to protect health workers and patients, thereby reducing the spread of infections even in the face of uncertain risks i.e., consistent with the precautionary principle.

163. For example, it was agreed that the UK IPC guidance would be strengthened to:

a. Recommend the wearing of facemasks by all inpatients at all times across all care pathways, providing this is tolerated by the patient and ensuring this is not detrimental to medical/care needs (June 2020).

b. Highlight that adherence with the guidance must be considered across all Trusts/areas (June 2020).

c. Highlight that where possible (ensuring it is not detrimental to care) patient movement in hospital settings should be limited (March 2020).

d. Highlight the need for testing particularly in high or increasing prevalence areas for staff and patients (January 2021).

Supporting IPC Teams

164. The pandemic highlighted a need to support and strengthen IPC teams across the health system. Between March and June 2021 a Florence Nightingale Foundation IPC Leadership online learning programme was provided for 180 specialist IPC nurses. This included action learning sets exploring psychological safety to support emotional wellbeing, resilient leadership and to facilitate change in the context of embedding IPC practice in trusts across England.

165. Between March and August 2021, a series of nine Subject Matter Expert (SME) national webinar events were delivered for IPC practitioners, using lessons learned and themes from the HOCI WG. These included seminars on outbreak management, mental health, risk assessments, Covid-19 joint working, and PPE sustainability and innovation, with 200 to 400 healthcare staff joining each session.

166. To support NHS organisations in the recovery and restoration of services, the NHS England IPC, Communications, and Behavioural Change Unit (BCU) teams delivered a research project to identify the complex drivers of behaviours that influence compliance with Covid-19 IPC measures. Insight was gathered from frontline staff, patients, professional bodies, and clinical, communication and IPC experts to understand these drivers. A suite of co-designed Every Action Counts (EAC) products were developed to address the key themes **[LR/093][INQ000330908] [LR/098][INQ000493482]**. These resources were launched with a national webinar and content in the CNO(E) bulletin, with over 14,000 viewing the tools and over 10,000 downloads of the supporting resources.

Shortage guidance

167. IPC guidance is produced based on the requirements to ensure healthcare worker, patient, and visitor safety to respond to particular situations or pathogens (risks). It is not contingent on supply.

168. As the number of Covid-19 cases in hospitals increased during March and early April 2020, there were increasing reports from healthcare workers on PPE supply shortages. PHE's Deputy Director of the National Infection Service was responsible for drafting guidance on steps to be taken during PPE shortages **[LR/052][INQ000489981] [LR/053][INQ000489980] [LR/054][INQ000477783]**.

169. On 17 April 2020, PHE published "*Considerations for acute personal protective equipment shortages*". The UK IPC Cell did not endorse this guidance, the CNO(E) could not support the proposals and I advised the CNO(E) that I could not support the position set out in the guidance either. It was my view that this was a matter for HSE. The rationale for this guidance as stated in NHS England's Third Module 3 Statement was that:

*[t]here was a need to prepare for the worst-case scenario in case PPE shortages became so acute that there was not enough supply for the NHS. The shortages guidance was withdrawn on 9 September 2020 by PHE on the basis that it was not required. Whilst those involved in publishing the guidance felt it necessary to publish it to provide organisations with essential advice in the event that the worst-case scenario of national shortages materialised, and recognising that the tighter national supply becomes, the more difficult it will be to ensure even distribution, publishing the guidance sent a negative signal about stock availability. In addition, although national and Trust level supply was sufficient, some organisations have multiple sites and departments/locations and so delivery to all those individual sites may have been incomplete. For instance, some community Trusts, mental health Trusts and ambulance Trusts have 100+ locations. In hindsight, the guidance would therefore have been more useful for that particular cohort of providers than for general distribution.*

170. As supply issues receded, the focus moved to the type of PPE to be used when treating Covid-19 patients.

171. The sourcing, distribution, and supply of PPE was not within the remit of the Cell. I understand that Module 5 will examine procurement of PPE and RPE in detail and note that IPC guidance is produced based on the characteristics of a pathogen and is not contingent on availability of PPE/RPE.

Use of FFP3 respirators

172. On 23 December 2020, PHE produced a report titled *Use of FFP3 respirators for all suspected and confirmed COVID-19 patients in non AGP settings* **[LR/055][INQ000408934]**, which stated (in relation to the emergence of the Alpha variant) that "*[t]here is currently no substantive evidence to suggest that the new variant has a different mode of transmission, other than it being more transmissible."* This was discussed by the Cell on that same day **[LR/056][INQ000398242]** and the minutes confirm that there was consensus that in the absence of evidence of a different mode of transmission there should be no change to guidance.

173. On 25 May 2021, PHE produced a *position paper on the HOCI and EMG paper "Masks for healthcare workers to mitigate airborne transmission of SARS-CoV-2"* **[LR/057][INQ000348395]**. At this time I was on bereavement leave, however, NHS England also prepared a response as noting that the SAGE report **[LR/043][INQ000075022]** recommended the extended use of FFP3 respirators with Covid-19 patients only in situations where all other elements of the hierarchy of controls have been considered, applied as well as they can be and where an unacceptable level of residual risk remains. The SAGE paper stated that "*[i]t is important to emphasise that those responsible for healthcare settings should ensure that all current infection prevention and control measures, including with respect to respiratory measures, are fully implemented."* This includes the use of FRSMs as source control and ensuring effective ventilation. The SAGE paper further highlighted that there was known variation in compliance with existing measures in healthcare, stating *"[i]nspections of acute hospital trusts have identified clear variability in compliance with the full range of 'COVID-secure' guidance recommended to mitigate virus transmission risk (high confidence)."* The other measures to mitigate transmission included physical/social distancing. There was a lack of evidence that extended use of FFP3 respirators reduced risk to healthcare workers when other aspects of the hierarchy of controls were not in place.

174. In October 2021 the Respiratory Evidence Panel convened by PHE reported that whilst both long- and short-range aerosol transmission was possible, other factors, including but not limited to viral load, ventilation, and nature and duration of exposure were also associated with transmission. The Panel's assessment also reported that the evidence suggested "*that all types of face coverings are, to some extent, effective in reducing transmission of SARS-CoV-2 in both healthcare and public, community settings – this is through a combination of source control and protection to the wearer*

*(high confidence)*". The UK IPC guidance was subsequently revised (in November 2021) to reiterate the increased physical/social distancing and universal masking (source control) recommendations.

175. On 8 December 2021 at a Cell meeting **[LR/058][INQ000398184] [LR/094][INQ000340001]**, this position was discussed further in light of the Omicron variant. It was agreed by consensus that *"the previous statement in hierarchy of controls 'unacceptable risk of transmission remains of following the application of controls it may be necessary to consider the extended use of RPE' should be moved to the main messages. UKHSA colleagues agreed this to be acceptable."*

176. In January 2022, the IPC guidance was updated **[LR/059][INQ000348432]** to ensure that healthcare workers understood that use of RPE should be informed by a dynamic risk assessment, and that if deemed necessary RPE should be available to them. This decision must be based on residual risk following application of the hierarchy of controls i.e., healthcare worker preference should not be a deciding factor. There had been anecdotal evidence that healthcare workers were being denied the use of RPE locally unless performing AGPs. This was a pervasive topic of discussions at different meetings involving different agencies and organisations.

177. In summary, the Cell recommended changes to the IPC guidance as evidence became available, however, the Cell could not provide guidance for every interaction, with every patient, in every setting across the UK, and it was not within the Cell's remit to do so. The interpretation and application of the guidance was ultimately decided at local level where there was a better understanding of the specific exposures/risks and the ability to apply the hierarchy of controls. The use of RPE was not prohibited outside of AGPs by the UK IPC guidance. If local risk assessments deemed the use of RPE necessary following the application of the hierarchy of controls, Appropriate and suitable RPE should have been available to healthcare workers.

**Reflections**

178. Notwithstanding the unprecedented demand for IPC equipment and expertise affecting global supply, the IPC response to the pandemic in the UK was grounded in established practices, including scientific evidence from the WHO. Coordinated by the UK IPC Cell, the guidance was continuously reviewed and updated in response to new evidence and the changing epidemiology of the virus.

179. SICPs encompassed patient screening, hand hygiene, respiratory hygiene, PPE, and the safe management of environments, equipment, linen, waste, and body fluids. TBPs included isolation, cohorting, increased decontamination, and universal masking. Additional measures involved risk management through the hierarchy of controls, physical distancing, and universal masking for source control, alongside the development of specific care pathways to manage the disease.

180. The implementation of established IPC practices effectively reduced Covid-19 transmission in healthcare settings. The extant literature reviews and evidence synthesis that had previously been conducted by HPS to inform the NIPCM Scotland and the revised DHSC *Pandemic Influenza in Healthcare Settings guidance (2019)* was crucial in the swift response, management and implement of IPC measures during the pandemic.

181. The combined impact of multiple interventions proved most effective; key measures included decreasing occupancy, increasing bed spacing, and testing on admission. Universal masking significantly reduced infection rates among healthcare workers.

182. Reflections on IPC during the pandemic highlighted several key points:

a. Standardised, evidence-based guidance ensured consistency across the UK.

b. Effective communication and collaboration among IPC stakeholders were essential.

c. The pandemic revealed gaps in IPC training and emphasised the need for enhanced education across all healthcare settings.

d. Compliance with IPC measures were influenced by the design of healthcare facilities. Ultimately healthcare systems must strike a balance between IPC and the potential impacts on service quality and capacity.

e. The pandemic highlighted a need to agree terminology in order that there is a common understanding, specifically of IPC precautions and routes of infection transmission.

183. The pandemic has also highlighted the necessity for contingency plans to address acute PPE shortages, providing clear guidance for managing such situations. It has also emphasised the importance of establishing robust systems and frameworks that can swiftly adapt to future pandemics or healthcare crises, ensuring that IPC guidance remains effective and that supply chain issues do not compromise safety

standards. This should include clearly defined and communicated roles and responsibilities related to PPE sourcing, distribution and supply.

**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: 23 July 2024**

## ANNEX 1

## Career History

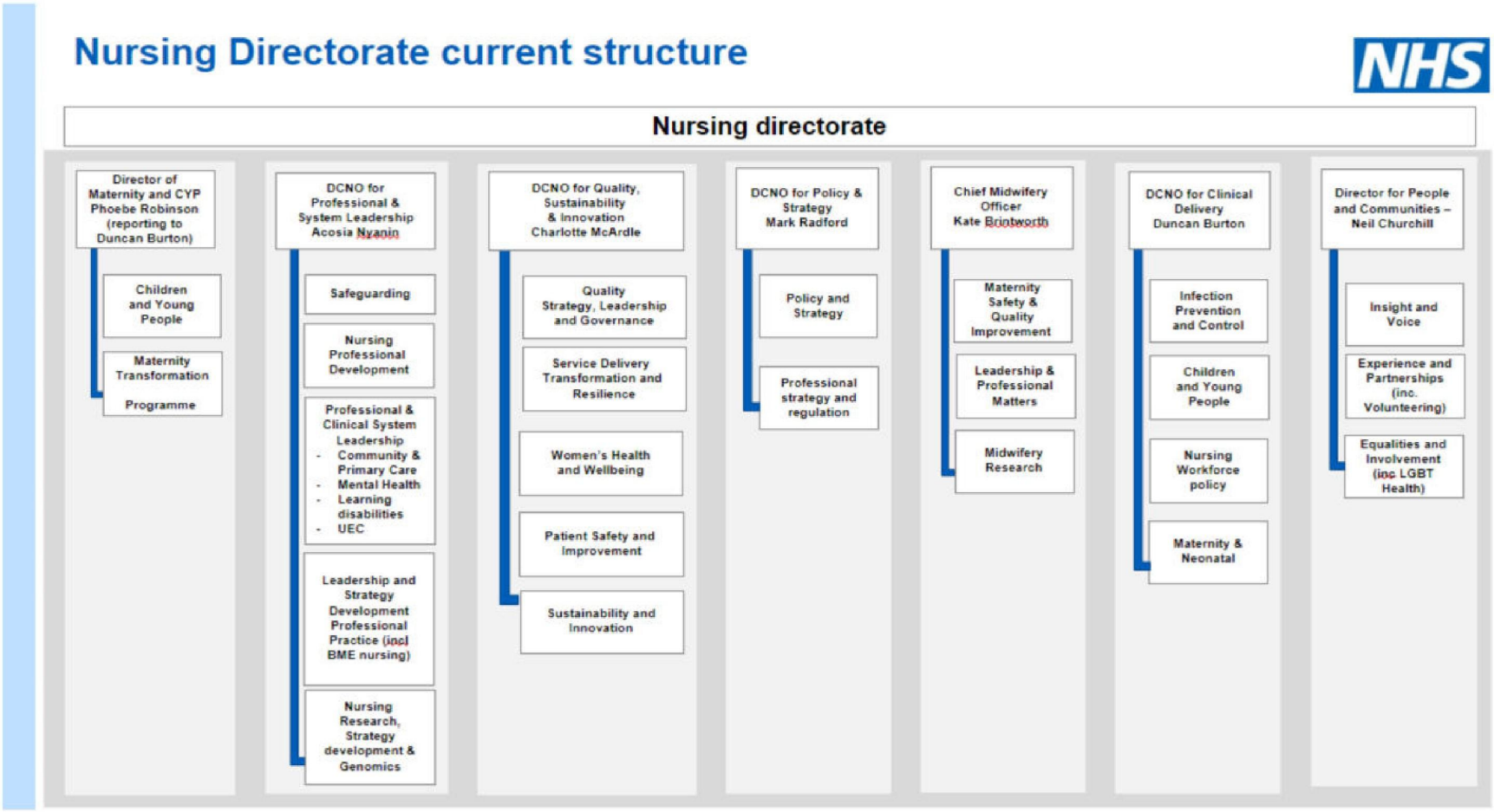
1. The key roles I have held since 1992 are set out in the table below:

| Date | Role |
|---|---|
| Since April 2020 | National Deputy Director of Infection Prevention and Control (previously Head of IPC) for NHS England. |
| March 2018 – April 2020 | Seconded from HPS to NHS England's Gram-Negative Bloodstream Infection Team, as a Clinical Fellow for two days per week. |
| 2009 – 31 March 2020 | Nurse Consultant in IPC at HPS in Glasgow. I was responsible for clinical leadership of the National IPC Policy, Guidance and Outbreak Programme in the Antimicrobial and Healthcare Associated Infections (ARHAI) Group.<br><br>Note: I was employed with HPS until 31 March 2020. My period of employment notice ran from January to 31 March 2020 but I was officially on annual leave from 13 March 2020 before taking on my NHS England role. |
| 2008 | I secured a £125,000 research grant from the Scottish Infection Research Consortia (SIRC) as Principal Investigator of a quasi-experimental study of the effectiveness of admission risk assessment and pre-emptive patient cohorting in the control of MRSA cross-transmission |
| 2002 | I was promoted to Senior IPC Nurse and was responsible for leading and managing prevention and control of infection services across NHS Dumfries and Galloway. |
| 1998 | I took up the position of Community Infection Control Nurse, responsible for clinically leading and managing the prevention and control of infection service across primary and community care services. |
| 1992 - 1998 | I held the following roles at NHS Dumfries and Galloway:<br><br>• Primary care provider (Staff Nurse). |

| | |
|---|---|
| | • Project Nurse, leading on clinical audits across all the health board managed sites.<br>• Senior Nurse for Quality Assurance, leading and managing the clinical complaints procedures for the health board; and the registration and inspection of all nursing homes and agencies across the region.<br>• Commissioning Manager for Community Services, leading, managing, and co-ordinating the redesign and development of service strategies and specifications, leading to the commissioning of affordable and clinically effective community health care services across the region. |

**ANNEX 2**

**Nursing Directorate**



# Nursing Directorate 1 April 2020