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Article type : Short Communication

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COVID-19 NHS infection control strategy: *errare humanum est, perseverare autem diabolicum*.

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Running title: NHS infection control strategy for COVID-19

Keywords: COVID-19, SARS-CoV-2, infection control

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This article has been accepted for publication and undergone full peer review but has not been through the copyediting, typesetting, pagination and proofreading process, which may lead to differences between this version and the [Version of Record](#). Please cite this article as [doi: 10.1111/ODI.13605](https://doi.org/10.1111/ODI.13605)

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Accepted Article

COVID-19 NHS infection control strategy: *errare humanum est, perseverare autem diabolicum*.

A recent BMJ Editorial (“*Getting it right in the pandemic*”) has discussed examples of countries that have done better than others in responding to COVID-19 pandemic and, conversely, those policymakers and health systems that got it wrong. (Loder, 2020)

There is little doubt that, when facing a pandemic with a high speed of onset and transmission, “nobody should be surprised that errors were made” (Adebowale et al, 2020) and “what it was done some weeks ago is not what we would do today”. (Nelson, 2020) Although we appreciate that to err is human, we also believe that to persist [in error] can be sometime diabolical (*errare humanum est, perseverare autem diabolicum*).

This viewpoint wishes to start a constructive discussion about the UK National Health System (NHS) infection control strategy against COVID-19 and highlight examples where getting it wrong could have been easily and quickly converted into getting it right, if only decisions were based upon increasingly available evidence, prudence, or even just the good old common sense. The views and opinions expressed in this article are based upon the authors’ direct experience as clinical academics in an NHS outpatient Oral Medicine service in UK; however they can be generalised and be of relevance to any medical specialty within and outside the UK NHS.

Using masks at all times in hospitals to reduce nosocomial transmission

One example of persisting errors during the pandemic is the recommendation (or lack thereof) of using masks within all areas of NHS hospitals including the non-patient facing areas. The benefit of using masks/facial covering in order to reduce the risk of SARS-CoV-2 transmission in both the community and health care setting has been increasingly reported. (Gray & Back, 2020; Feng et al, 2020; Esposito, Principi, Leung & Migliori, 2020; Chu et al. 2020) Nonetheless, NHS policy have recommended the use of masks only in patient-facing areas until the government introduced a new policy on the 15th of June in response to the increasing concerns on sustained nosocomial transmission. (Public Health England, 2020) For the initial three months of the pandemic there have been reports of health care workers (HCWs) clustering in non-clinical areas (e.g. staff and meeting rooms, waiting rooms) of NHS hospitals without masks and little, if any,

social distancing. Reports have reached the news (Grubb, 2020; Thomas, 2020), though not the medical literature. The general perception within NHS organisations was that SARS-CoV-2 infection transmission could only occur from patient to staff in clinical areas, and not between staff members and potentially in any part of the hospital. Although NHS organisations have been experiencing a large number of HCWs infected with SARS-CoV-2 during the outbreak (e.g. up to more than 40% of frontline staff), (Houlihan et al, 2020) little attention was paid towards the additional benefit of using masks at all times in preventing transmission among HCWs. Other countries' health care organisations have adopted a much more rigid infection control policy including the use of masks at all times, and have demonstrated that transmission among HCWs can be minimised, if not completely prevented. (Liu et al, 2020) The pandemic outbreak hit those countries notably earlier than UK and it remains unclear why NHS policy makers did not look at those experiences as an example of good practice. Beyond prudence and common sense, there is a lesson to learn regarding the ability of the NHS as health care organisation to capture, digest and adapt to the emerging knowledge and experience, even when not supported by the highest level of evidence. With a pandemic evolving at such high speed, the persistence in not considering, for months, a simple, inexpensive, adverse-effect free and likely beneficial infection control measure was indeed, to our eyes, diabolical.

Individual complacency and policy loopholes

Following the 15th June introduction of mandatory mask in all areas of NHS hospitals, (Public Health England, 2020) there have been reports of HCWs declining to comply with the new policy, in one particular case leading to an outbreak of some 70 staff and immediate closure of the A&E department. (Siddique & Campbell, 2020) Although complacency has been previously reported among HCWs dealing with infectious respiratory disease prevention, (Schmid, Rauber, Betsch, Lidolt, Denker, 2017) there remain concerns that this behaviour may contribute to further nosocomial spread of COVID-19 at the very delicate time when elective services are resuming. Furthermore, and perhaps more concerning, there remain some NHS organisations that have declared areas of their organisation exempt from this policy. Hospital administrative offices are one example, which probably represents an interpretation of the WHO guidance on PPE

relevant to hospital administrative staff not performing routine activities in patient areas. (WHO, 2020) This policy loophole is however notably risky as some administrative offices are also routinely attended by HCWs who, after working in patient-facing clinical areas, sit at their desks for a prolonged time nearby non-clinical administrative staff. Considering the emerging evidence on the benefit of widespread use of masks for all individuals (Gray & Back, 2020; Feng et al, 2020; Esposito, Principi, Leung & Migliori, 2020; Chu et al. 2020) and the likelihood of SARS-CoV-2 airborne transmission in enclosed poorly ventilated spaces (see below), it is difficult to understand why these NHS organisations introduced policy loopholes rather than following the precautionary principle.

Airborne or not airborne: that is the question

A final and possibly the most crucial example of repeated mistakes is the rigid belief that SARS-CoV-2 infection spreads mostly through droplets and fomites. PHE have for months stated that airborne transmission of the virus is possible only after medical procedures that produce aerosols, (WHO, 2020; (Public Health England, 2020a) and NHS infection control recommendations have accordingly focussed on droplets measures (mostly distancing and hand washing), with airborne measures being restricted to aerosol generating procedures (AGPs).

Nonetheless, from late March/early April an increasing body of literature has questioned this approach, culminating in a recent appeal to national and international medical bodies signed by 239 scientists. (Morawska & Milton, 2020) They state that available evidence demonstrates, beyond any reasonable doubt, the significant potential for airborne transmission of SARS-CoV-2: virus-carrying respiratory microdroplets can be released into the air by infected people while coughing, sneezing or simply with exhalation or talking. (Morawska & Milton, 2020) They called for the adoption of adequate airborne preventive measures, with hand washing and social distancing, albeit helpful, being insufficient to provide full protection from airborne transmission, especially in crowded enclosed environments with poor ventilation. (Morawska & Milton, 2020; Somsen, van Rijn, Kooij, Bem, & Bonn, 2020)

It is singular to see that, although evidence remains incomplete for both COVID-19 microdroplet and large droplet/fomite transmission, the NHS policy has repeatedly ignored the former and embraced the latter, with the only exception being AGPs.

Paradoxically the evidence supporting the increased risk of SARS-CoV-2 transmission with AGPs is similarly not robust. (Wilson, Norton, Young & Collins, 2020).

Recognising the potential for SARS-CoV-2 airborne transmission also translates into accepting that N95 or similar respirators would offer enhanced protection as compared to surgical masks in the health care setting, which is in keeping with the results of a recent meta-analysis. (Chu et al, 2020)

Frontline HCWs of health care organisations adopting strict infection control measures (including airborne PPE at all times) were infected at a notably lower rate than frontline HCWs of a NHS central London hospital. (Houlihan et al, 2020; Liu et al, 2020; Lai et al, 2020) Similarly, a recent report from China shows that non-frontline HCWs, although theoretically at lower risk, had a significantly higher rate of SARS-CoV-2 infection with respect to frontline HCW, likely due to differences in PPE (basic vs enhanced). (Lai et al, 2020)

Nonetheless NHS guidance on PPE has remained unchanged. Furthermore, NHS policy makers have also dismissed appeals for PPE use to be based on a better-tailored and targeted risk assessment rather than the current one-size-fits-all policy. This is particularly relevant to those HCWs (e.g. specialists in Oral and Dental Medicine, Otolaryngology and Maxillofacial Surgery) who are believed to be at increased risk as they get routinely in close proximity of anatomic regions where the exposure to respiratory droplets and secretions, as well as the SARS-CoV-2 viral loads, can be notably higher and with no option for source control (patients cannot wear a mask during consultations). (British Association of Oral and Maxillofacial Surgery, 2020; British Association of Oral Surgery, 2020).

Conclusions

As the time of writing this viewpoint (13th of July 2020) the UK COVID-19 pandemic wave, although reducing slowly, is far from settled. There remains sustained transmission, and there are in fact concerns of an early resurgence of new outbreaks and deaths. Beyond the exceptional bravery, commitment and heroic efforts of frontline NHS staff in caring for COVID-19 patients, we appeal to NHS leaders and policymakers to recognise past mistakes, learn from their and others' experience, and develop a new enhanced infection control strategy that could effectively mitigate the risk of further nosocomial transmission

and ensure that HCWs feel, and indeed are, safe at work. (Academy of Medical Sciences, 2020)

Accepted Article

Authors' contribution

SF designed the manuscript, searched the literature and other data in the public domain, and drafted the article. SRP reviewed the draft, commented on the literature, and edited the manuscript.

Declaration of Interest

SF and SRP reports no conflict of interest

Funding source

SF receives salary support from the NIHR UCLH Biomedical Research Centre (NIHR UCLH BRC), which had no role in the writing of the manuscript or the decision to submit it for publication.

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