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Nosocomial COVID: the moral and clinical imperative for worldwide data collection and action

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Abstract
There is a wide disparity worldwide in data collection and sharing of rates of hospital-acquired coronavirus disease (COVID). There is an ethical imperative that such information is systematically gathered, distributed and acted on to reduce rates of this form of preventable and devastating transmission during a pandemic.

Key words: nosocomial COVID, healthcare-acquired infection, data collection, data sharing

First do no harm, a popular dictum that summarizes part of the Hippocratic Oath. It is this ethical basis that makes hospital-acquired, or nosocomial, infections so problematic and a long-described marker of healthcare quality [1]. Patients who have caught SARS-CoV-2 during hospital admission and develop coronavirus disease (COVID) have a higher mortality rate than those admitted with community-acquired COVID, 41.3% compared to 25.9% in one UK study [2]. This is likely due to differing case-mix as hospital admissions tend to be comprised of older co-morbid people in an already weakened state. However, the disparity and paucity of data worldwide make quantifying, understanding and addressing the issue of nosocomial COVID difficult. Here, we highlight the importance of and call for the international collection and publication of nosocomial COVID data, as well as sharing best practices in reducing rates, to ensure that this devastating method of transmission is halted.

Hospital-acquired COVID has been detected worldwide with rates from 0.1% to 52.6% (Table 1). However, comparisons between different countries are difficult due to gaps and differences in data quality, collection, publication and even definition: usually, a patient who tests positive >7 or 14 days after asymptomatic hospital admission is considered probable- or definite-hospital-acquired COVID infection.

Yet despite published data and a critical government report in October 2020, nosocomial COVID continues to be a problem in the UK, reaching rates of 25% in January 2021. In August 2021, there were spikes in rates of nosocomial COVID of 34–46% in two English hospitals despite COVID bed occupancy and community rates being a fraction of previous levels [3]. Allowing for the shocking statistics, one area the UK has proved exemplary is in continuing to collect and openly share this information, despite the criticism it must weather as a result. A US study identified that in a highly vaccinated healthcare workforce, there was a resurgence of COVID infections months after inoculation due to waning immunity [4]. This means nosocomial transmission continues to be an issue that must be addressed. A pre-COVID World Health Organization (WHO) report warned that healthcare-associated infections were a third more common in low- and middle-income countries compared to high-income countries, yet there is no current comparison on how countries are faring in the current pandemic [5].

There have been some efforts to study nosocomial COVID globally. The NOSO-COR project is a prospective, observational, multicentre study of nosocomial COVID based in France that has recruited hospitals worldwide [6]. Indeed, the COVID pandemic has revealed how well countries are able to work together in data-sharing, taking for example the global tracking of gene mutations by the regular uploading of genomic sequencing on public databases like GISAID or Nextstrain. Such platforms may well be rapidly adapted both for collecting nosocomial data and disseminating best practices.

Longer-term, data-gathering and -sharing have emerged as one of the WHO's focuses in trying to achieve its Sustainable Development Goals, for which they have set up the Division for Data, Analytics and Delivery for Impact. As part of this, they developed the SCORE package that countries can use to identify gaps in data collection and how to address these according to local circumstances. They advocate the use of the Family of International Classification so that there is a common language to enable data comparison, for example, when defining nosocomial COVID. The World Health Data Hub is under development as a place to collect and compare these data. These steps can be utilized as a pathway for countries during this COVID and in future pandemics to collate data like rates of nosocomial infection in a rapid, systematic and effective manner.

Table 1 Published data on rates of nosocomial COVID worldwide

Country	Cohort	Rate of nosocomial COVID (%)	References (see Supplementary material)
Brazil	Nationwide hospital admissions 1 March 2020–31 May 2020 67180 COVID cases	2.95	De Souza *et al.*, 2020
China	A systematic review of 40 Chinese studies	44.0	Zhou *et al.*, 2020
England	Neurology/stroke ward 1 March 2020–31 May 2020 133 patients	38.0	Jewkes *et al.*, 2020
England	Nationwide hospital admissions 1 March 2020–31 August 2020 293 204 COVID cases	15.4	Bhattacharya *et al.*, 2021
France	Geriatric ward 25 February 2020–16 March 2020 24 patients	20.0	Vanhems *et al.*, 2020
France	Three gastroenterology wards 1 March 2020–5 April 2020 305 patients	4.9	Luong-Nguyen *et al.*, 2020
Malta	Nationwide hospital admissions 7 March 2020–24 April 2020 447 COVID cases	6.3	Micallef *et al.*, 2020
Poland	Haematology ward 7 April 2020–21 April 2020 19 patients	52.6	Biernat *et al.*, 2020
Spain	Tertiary orthopaedic hospital 9 March 2020–4 May 2020 288 patients	6.48	Lakhani *et al.*, 2020
South Korea	808-bed university hospital 9 March 2020–31 August 2020	0.0	Kim *et al.*, 2020
USA (Boston)	University hospital 7 March 2020–30 May 2020 9149 patients	0.1	Rhee *et al.*, 2020
USA (North Carolina)	Three hospitals 1 April 2020–28 February 2021 14668 patients	0.29	Lewis *et al.*, 2021

Crucially, these data must then be acted on appropriately and promptly. What we can learn and implement must be specific to the economic, physical and cultural environment. For example, a 2009 WHO report advocated the use of natural ventilation in infection control, particularly to address 'pandemic-prone acute respiratory diseases in healthcare'. While a small hospital in Niger may not have the testing capacity of a large centre in the UK, it may have superior natural ventilation that significantly reduces the risk of airborne transmission. There are multiple published approaches institutions and countries can take to reduce nosocomial infections, from new technologies for cleaning hospitals to multi-disciplinary simulation within healthcare teams, as well as various methodologies that can be adapted for use such as Six Sigma DMAIC or the WHO's Infection Prevention and Control Assessment Framework [7–10].

There are lessons each country, healthcare setting or economy can take now from this pandemic. Places like Singapore and South Korea took heed from the last coronavirus epidemic, severe acute respiratory syndrome (SARS), and have fared well this time, with low nosocomial transmission. There is a moral imperative to our patients, families and communities that we act immediately to stem further nosocomial infection and prevent outbreaks. The problem must be understood, and the solution shared. Healthcare systems, their leaders and medical staff are duty-bound to put this into action.

Supplementary material

Supplementary material is available at *INTQHC Journal* online.

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Author's contributions

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