infection almost always being acquired overseas. Public Health England reported that around 20 cases of brucellosis have been reported annually in England and Wales over the last 10 years, 34 laboratory exposures to *Brucella* sp. have occurred in laboratories in across England and Wales.

Providing relevant clinical history with BC requests alerts the laboratory to take appropriate measures to prevent potential laboratory exposure. Our laboratory initially processed the specimens in a class 1 biosafety cabinet. However, when the organism failed to be identified by API 20E and MALDI-TOF, there was an error of judgment by performing manipulations outside containment, contrary to the laboratory procedure that requires all manipulation be performed in a biosafety cabinet, until the organism is identified.

In this report, the organism was identified as *B. melitensis* by MALDI-TOF only after the non-validated 'security' database was used. Many laboratory biomedical scientists may not be aware that the standard validated database available with the instrument, cannot identify *Brucella* sp. Our report serves as a reminder of the importance of using the security database to identify potentially hazardous bacteria such as *Brucella* spp., *Burkholderia pseudomallei* and *Franciscella* sp. [4]. Only then can the early identification of these bacteria offered by MALDI-TOF be used, and its role in prevention potential exposure of laboratory staff was highlighted in a recent report [5].

In summary, ideally clinicians need to be aware of the importance of providing relevant clinical information including travel history with laboratory requests. However, it is equally important that laboratory staff follow procedures that exist to protect them. The main message from this report is that the conventional MALDI-TOF database does not identify some organisms such as *Brucella* spp. that are potentially hazardous to the laboratory worker. These organisms can be identified by using the 'RUO' database, speeding up clinical diagnosis, and also potentially protecting laboratory staff from exposure.

Conflict of interest statement
None declared.

Funding sources
None.

References

[1] Godfoid J. Brucellosis in livestock and wildlife: zoonotic diseases without pandemic potential in need of innovative one health approaches. Arch Public Health 2017;75(1):34.
[2] Pappas G, Papadimitriou P, Akritidis N, Christou L, Tsianos EV. The new global map of human brucellosis. Lancet Infect Dis 2006;6(2):91–9.
[3] Sewell DL. Laboratory safety practices associated with potential agents of biocrime or bioterrorism. J Clin Microbiol 2003;41(7):2801–9.
[4] Cunningham SA, Patel R. Importance of using Bruker's security-relevant library for Biotyper identification of *Burkholderia pseudomallei, Brucella* species, and *Francisella tularensis*. J Clin Microbiol 2013;51(5):1639–40.
[5] Becker SL, Zange S, Brockmeyer M, Grün U, Halfmann A. Rapid MALDI-TOF-based identification of *Brucella melitensis* from positive blood culture vials may prevent laboratory-acquired infections. J Hosp Infect 2018;100(1):117–9.

F. Begum
A. McGregor
S. Kava
C. Tilsed
G. Gopal Rao*
Microbiology Department, Northwick Park Hospital, London North West Healthcare NHS Trust, UK

* Corresponding author. Address: Microbiology Department, Northwick Park Hospital, Watford Rd, Harrow, HA1 3UJ, UK.
E-mail address: ggopalrao@nhs.net (G. Gopal Rao)

Available online 16 August 2019

https://doi.org/10.1016/j.jhin.2019.08.010

Bacterial cross-infection related to the use of bladeless fans in a clinical setting

Sir,

Clinical use of portable fans has been linked to cross-infection [1], thus a recent Estates and Facilities Alert [2] has recommended that the use and reuse of fans should be assessed. In recent years, many hospitals have purchased bladeless fans on the premise that they appeared easier to clean. However, it has become clear that their internal components are not readily cleanable. Alsaffar et al. [3] found that the internal mechanisms of a three-year-old bladeless fan were contaminated with various micro-organisms, some of which were of potential clinical significance. Our hospital has purchased a large number of bladeless fans in recent years. As part of our risk assessment of these fans, we conducted analysis on their impact on microbial air quality.

A test facility was established in a patient cubicle on an unused hospital ward. The exterior window and the interior door both remained closed during testing. The room was not mechanically ventilated. A cross-over design was used to compare 10 bladeless fans to two conventional fans and against the control (no fan). Prior to testing, the fans were in regular clinical use. Their ages could not be determined; they were externally clean, but had never undergone cleaning of the internal mechanism.

A grid was mapped out with an area of 3 m × 2.9 m; with settle plates distributed at 12 locations on the grid and fan location were marked. A control air sample (1000 L) was obtained using an air sampler (Thermo Fisher Scientific, UK) before each fan was tested, to maintain the validity of control settle plates collected on day one. Settle plates were laid out and left for 4 h, with the fan running. After collection, the settle plates were incubated for 48 h at 37°C and colony-forming units (cfu) were counted. The data were analysed,

calculating means for each category and obtaining *P*-values using a matched pair *t*-test.

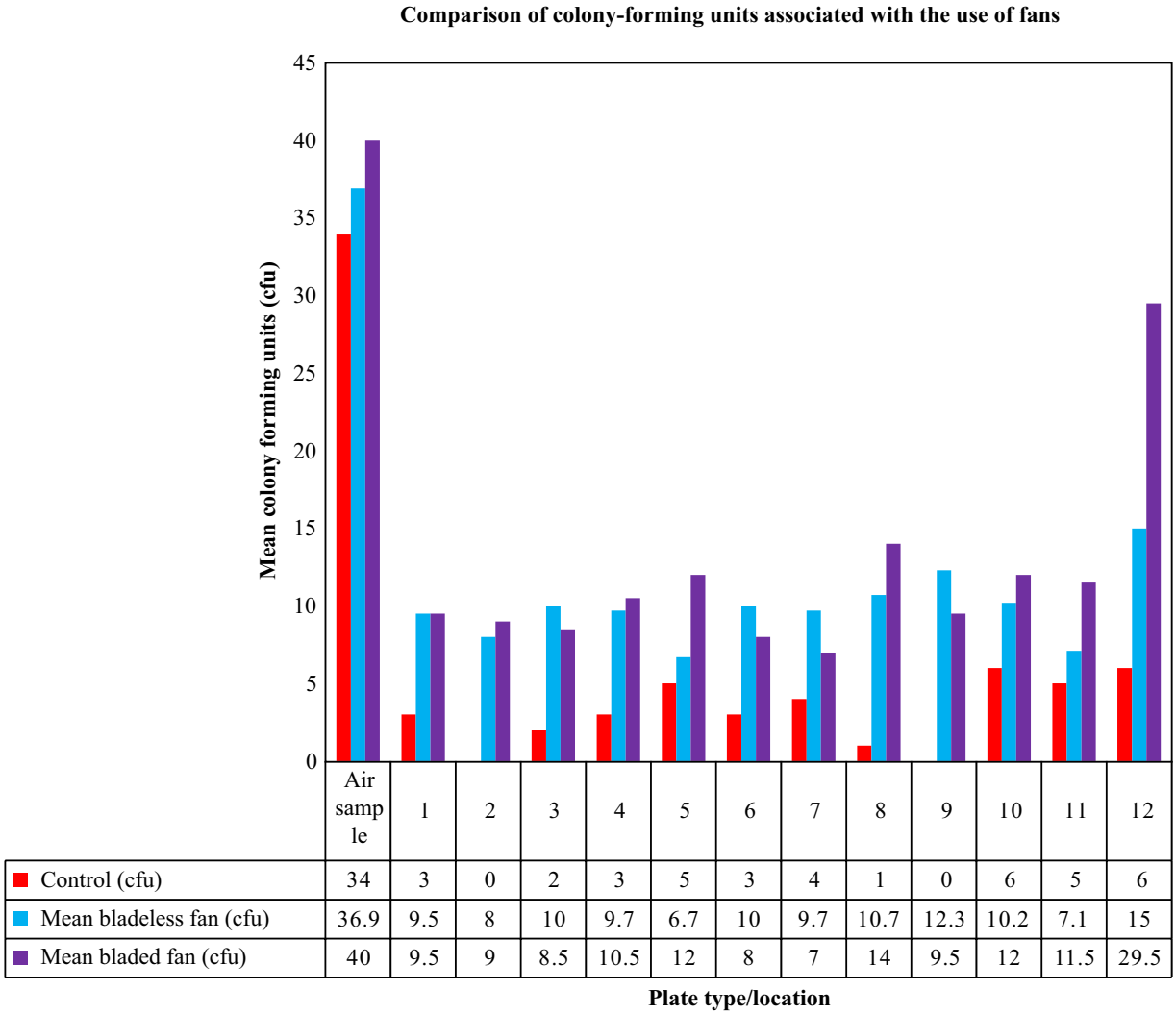
There was significant difference between the cfu (Figure 1) on control plates against bladeless ($P=7.53 \times 10^{-6}$), and bladed ($P=7.41407 \times 10^{-5}$) fan plates However, no significant difference was found when comparing the two types of fans ($P=0.155820438$).

All micro-organisms observed in this study were low virulence bacteria, such as Coagulase-negative Staphylococci, *Micrococcus* sp. and *Bacillus* sp. These bacteria also predominated in the Alsaffar et al. study, although those authors also detected clinically significant micro-organisms, e.g., vancomycin-resistant enterococci, in some samples from the internal components.

Fans are widely used in our hospital for the comfort of patients, their families and staff. Our data indicate that both bladed and bladeless fans increase microbial air counts, and should therefore be avoided for patients with infectious conditions [4,5]. However, these preliminary data doe not suggest that bladeless fans present any more risk than bladed fans, even when the internal mechanism is not regularly decontaminated.

This study is limited by its small scale. To enhance the generalizability of the data, more fans should be tested, linking the test result with age of the fan and its last thorough decontamination. Furthermore, it was impossible to track prior placement of fans, thus the variation in results could not be pin pointed to specific issues in the point of origin of the fan. Fans should also be tested before and after patient use, to determine whether exposure to patient micro-organisms leads to subsequent contamination of the fans.

Provided that fans increase the microbial air burden, they must not be used in patients with airborne infectious conditions. There is no evidence that bladeless fans, that are externally clean, present a greater risk compared with bladed fans. However, the potential for both bladed and bladeless fans to disseminate more pathogenic organisms requires close monitoring, where a mean of regular decontamination of internal components is not feasible. If fans are used in the presence of patients with potentially airborne infectious



	Air sample	1	2	3	4	5	6	7	8	9	10	11	12
Control (cfu)	34	3	0	2	3	5	3	4	1	0	6	5	6
Mean bladeless fan (cfu)	36.9	9.5	8	10	9.7	6.7	10	9.7	10.7	12.3	10.2	7.1	15
Mean bladed fan (cfu)	40	9.5	9	8.5	10.5	12	8	7	14	9.5	12	11.5	29.5

Figure 1. Mean colony-forming units (cfu) related with the use of fans. An air sample and 12 settling plates were tested for each investigation. One control sample was taken prior to testing two bladed fans and 10 bladeless fans. The means were calculated for the number of cfu found for each location in each category.

conditions, they must be quarantined until deemed safe for reuse, or disposed of. It may be useful to investigate other ways to ventilate the rooms and wards at the hospital, particularly for patients with infections pathogens.

Conflict of interest statement
The authors have no conflicts of interest to report.

Funding sources
None.

References

[1] Medicines & Healthcare products Regulatory Agency. Portable fan in health and social care facilities: risk of cross infection. MHRA NHS; 2019. Available at: https://www.cas.mhra.gov.uk/ViewandAcknowledgment/ViewAlert.aspx?AlertID=102823 [last accessed August 2019].
[2] Department of Health. Portable fans in health and social care facilities; risk of cross infection. 2019. Available at: https://www.health-ni.gov.uk/sites/default/files/publications/health/EFA-2019-001.pdf [last accessed August 2019].
[3] Alsaffar L, Osborne L, Bourne NT. Bacterial colonization of bladeless electrical fans. J Hosp Infect 2018;100:476—7. https://doi.org/10.1016/j.jhin.2018.08.020.
[4] Health Protection Scotland. SBAR: portable cooling fans for use in clinical areas. 2018. Available at: https://hpspubsrepo.blob.core.windows.net/hps-website/nss/2680/documents/1_sbar-fans-v1.pdf [last accessed August 2019].
[5] Republic of Ireland Heath Service Executive. Guidelines for the use of portable electric fans in healthcare settings. 2018. Available at: https://www.hse.ie/eng/ [last accessed August 2019].

J. Dhanda*
J. Gray
H. White
Department of Microbiology, Birmingham Women's & Children's NHS Foundation Trust, Birmingham Children's Hospital, Birmingham, UK

* Corresponding author. Address: Department of Microbiology, Birmingham Women's & Children's NHS Foundation Trust, Birmingham Children's Hospital, Steelhouse Lane, Birmingham B4 6NH, UK.
E-mail address: Jaspreet.dhanda1@nhs.net (J. Dhanda)

Available online 03 September 2019

https://doi.org/10.1016/j.jhin.2019.08.020