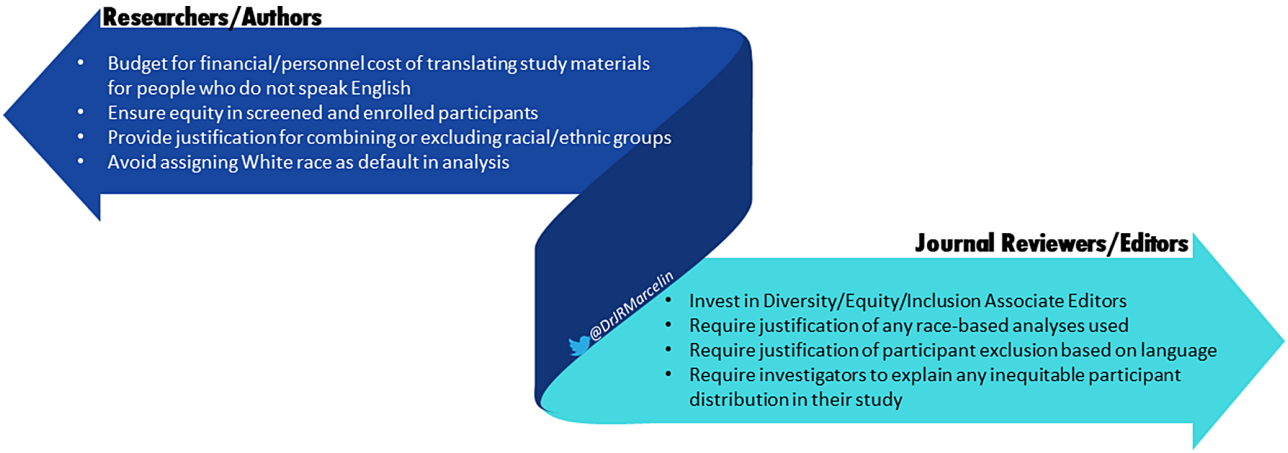

Fig. 1. Considerations for researchers and journals regarding race/ethnicity in publications not specifically focused on health inequities.

3. Jindal RM. Refugees, asylum seekers, and immigrants in clinical trials. *Lancet* 2020;395:30–31.
4. Boyd RW, Lindo EG, Weeks LD, McLemore MR. On racism: a new standard for publishing on racial health inequities. Health Affairs blog website. https://www.healthaffairs.org/do/10.1377/hblog20200630.939347/full/. Accessed June 2, 2021.
5. Strauss DH, White SA, Bierer BE. Justice, diversity, and research ethics review. *Science* 2021;371:1209–1211.

Re: Antimicrobial efficacy and durability of copper formulations over one year of hospital use

Ken G. Trinder JD
EOS Surfaces, Norfolk, Virginia

To the Editor—I read with interest the article by Dr. Bryce et al[1] in which they aimed to describe the impact and durability of copper formulations over 1 year of hospital use. I believe the design used in this study to demonstrate efficacy warrants further review in context of the products being tested and the conclusions being drawn.

The study attempts to demonstrate the efficacy of several copper-formulated surfaces over the course of a year of use. Coupons of the selected materials were mounted on gaskets and affixed to handcart handles and laboratory benches. At 3, 6, 9, and 12 months, the coupons were each swabbed and plated, and the resulting CFUs were compared. The study concluded that all copper formulations had less bioburden than stainless steel at months 3 and 6 and that only 1 formulation had less bioburden than stainless steel at 12 months. Using these data, readers might assume that copper formulations are not consistently efficacious at killing bacteria and that some formulations are more effective than others. These assumptions, which can have significant impact on product reputation and adoptions, must be reconsidered due to significant issues in the study design.

Upon review, it appears that the study design did not accurately capture the way a continuous, self-sanitizing surface impacts bioburden. The method used in the study to test the efficacy of the surfaces after a year of use cannot provide the data required to support the conclusions drawn by the authors. A continuously self-sanitizing surface works to eradicate bioburden over time. Because every surface is constantly being recontaminated by the surroundings, at any given moment, all one can capture is a snapshot of what has fallen on it very recently. Any surface, even a self-sanitizing surface, can have high bioburden or low bioburden in any one of those moments. Taking snapshot samples at 3-month increments, as in this study, only tests the amount of bioburden accumulated since the last cleaning. Additionally, no information about the timing between cleaning and sampling was provided.

The results of the study provide evidence of this very issue: The contamination levels go up and down over the course of the months, without an overall trend. This amount of variability demonstrates how much the recent exposure can impact the bioburden at the time of testing.

I believe that more accurate designs to study the long-term continuous efficacy of copper products are represented in the literature. For example, Jinadatha et al[2] demonstrated the efficacy of biocidal surfaces by testing at 3-hour increments over a 30-hour period without cleaning in between. Using this same method at 3, 6, 9, and 12 months would demonstrate whether the product continues to kill bacteria after being in use. Alternatively, to test whether efficacy remains after a year of continuous use, the surfaces could be removed, kept in a sterile environment to prevent further contamination for 2 hours (per EPA public health claims), swabbed, and plated to count CFUs.

Author for correspondence: Ken Trinder, E-mail: kgt@eos-surfaces.com
Cite this article: Trinder KG. (2022). Re: Antimicrobial efficacy and durability of copper formulations over one year of hospital use. *Infection Control & Hospital Epidemiology*, 43: 1509–1510, https://doi.org/10.1017/ice.2021.275

Another way to measure the impact of continuous self-sanitizing materials is the examination of HAI rates. In the largest study of biocidal surfaces to date, Sifri et al[3] found that HAI rates were reduced at statistically significant levels at a community hospital, allowing for the connection between reduced rates and the intervention of copper-impregnated surfaces.

Confounders further obfuscate the results. The study's snapshots of information would have been more meaningful if the amount of bioburden to which the surfaces were exposed had been quantified or if all the surfaces had been exposed to the same amount of bioburden. However, as mentioned in the study's limitations, no data were collected on how many individuals handled the surfaces, whether or not they used gloves, where the carts traveled, or which rooms they entered. All of these elements have been proven to impact bioburden and must be tracked for accurate analysis or recognized as confounders that prevent clear causation. As a result, the CFUs counted cannot be fairly compared from one surface to the next.

The conclusions drawn by the investigators are that copper formulations do reduce bioburden compared to stainless steel, but this efficacy is reduced after continuous use in the field. I believe the study cannot make this claim without addressing either the limitations of the study (no information about surface exposure) or the design of the study (isolated snapshots rather than tests over time). The conclusions reached by the authors, while positive overall about the potential for copper formulations in healthcare, make implications about efficacy that could have significant impact on the reputation and adoptions of these potentially life-saving products.

Self-sanitizing materials are new. Even seasoned professionals find that they must shift paradigms when considering a product that works to continuously reducing bioburden over time. The novice professional or healthcare professional not involved in infection prevention would have an even steeper learning curve to conceptualize the benefits of such a product in reducing hospital-associated infections. Therefore, researchers investigating these new products must take extra steps to make sure they are testing what they claim to be testing and whether the literature contains proven methods they can use to reach the most valid conclusions possible.

Acknowledgments.

Financial support. No financial support was provided relevant to this article.

Conflicts of interest. All authors report no conflicts of interest relevant to this article.

References

1. Bryce E, Velapatino B, Donnelly-Pierce T, *et al.* Antimicrobial efficacy and durability of copper formulations over one year of hospital use. *Infect Control Hosp Epidemiol* 2021. doi: 10.1017/ice.2021.52.
2. Coppin JD, Villamaria FC, Williams MD, *et al.* Self-sanitizing copper-impregnated surfaces for bioburden reduction in patient rooms. *Am J Infect Control* 2017;45:692–694.
3. Sifri CD, Burke GH, Enfield KB. Reduced health care-associated infections in an acute care community hospital using a combination of self-disinfecting copper-impregnated composite hard surfaces and linens. *Am J Infect Control* 2016;44:1565–1571.

Estimated incidence rate of healthcare-associated infections (HAIs) linked to laundered reusable healthcare textiles (HCTs) in the United States and United Kingdom over a 50-year period: Do the data support the efficacy of approved laundry practices?

Michael R. Overcash PhD[1] and Lynne M. Sehulster PhD[2]

[1]Environmental Genome Initiative, Raleigh, North Carolina and [2]Environmental Infection Prevention, Lawrenceville, Georgia

To the Editor—The assumed transmission of healthcare-associated infections (HAIs) from reusable healthcare textiles (HCTs) has been a perception in the decisions to use disposable versions of these textile items.[1–4] Here, we compared the 50-year publication record of HAIs related to laundry of HCTs to the overall actual occurrence of HAIs in hospitals over the same 50 years.

To reduce the risk of HAIs from reusable HCTs (ranging from linens to isolation gowns to surgical gowns), the reprocessing of these items involves a laundry process that renders the HCTs hygienically clean. In a well-studied database by Sehulster[5] of all outbreak events published between 1970 and 2013, laundered, clean HCTs were implicated as a source of contamination leading to HAIs. Root causes linked to the introduction of microbial contamination of the laundered HCTs were mostly mechanical problems with laundry equipment or the occurrence of inadvertent environmental contamination. The Sehulster review followed the methodology of PRISMA[6] and was peer reviewed. This same methodology was then used for the period of 2013–2020 and we found 3 more studies[7–9] and another review,[10] making the scope of this analysis 1970–2020.

For the purposes of the present assessment of reusable HCTs versus disposable alternatives, we have combined the United States and United Kingdom incidences of HCT laundry-associated HAIs in the 50-year period (1970–2020). Based on available national data, the HAI rate as a percentage of population for the United Kingdom and the United States in ~1995, appears to be similar, 0.5%–0.6% of population, which is near the midpoint of the 50 years of covered in this HAI study (Table 1). In these past 50 years for the United Kingdom and the United States, the 10 published events involved 69 patients with HAIs attributed to reusable

Author for correspondence: Michael R. Overcash, E-mail: mrovercash@earthlink.net
Cite this article: Overcash MR and Sehulster LM. (2022). Estimated incidence rate of healthcare-associated infections (HAIs) linked to laundered reusable healthcare textiles (HCTs) in the United States and United Kingdom over a 50-year period: Do the data support the efficacy of approved laundry practices?. *Infection Control & Hospital Epidemiology*, 43: 1510–1512, https://doi.org/10.1017/ice.2021.274