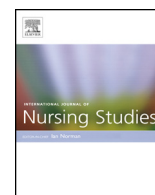




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Letter

Response to Martin-Moreno et al. (2014) Surgical mask or no mask for health workers not a defensible position for Ebola



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Martin-Moreno et al. suggest that we have misunderstood their commentary (Martin-Moreno et al., 2014a,b). However, we quoted directly from their commentary in our editorial, so cannot identify the scope for misunderstanding. A fuller direct quote than we included in our editorial is “*In fact, goggles and masks might not even be necessary to speak with conscious (Ebola) patients, as long as a distance of 1–2 metres is maintained (the maximum distance that infectious droplets might reach)*” (Martin-Moreno et al., 2014a). We maintain that we do not support this statement. We advocate for a N95 respirator to be the minimum respiratory protection, not a surgical mask (or worse, no mask) in this situation. As we outline in our editorial, (MacIntyre et al., 2014) given the high case fatality rate of Ebola and the uncertainty about transmis-

sion modes of Ebola, the precautionary principle must to be invoked to ensure the occupational health and safety (OHS) of health care workers (HCWs) caring for Ebola patients. Further, it is unrealistic to expect HCWs to be aware of the exact distance between them and the patient at all times. The unpredictability and changeable nature of the acute clinical setting makes it unfeasible and impractical to make such recommendations.

The three cases of transmission of Ebola outside West Africa have all been in nurses, all apparently following PPE guidelines, in the US and Spain. The nurse who cared for a known Ebola patient in Spain contracted Ebola in September 2014 despite following WHO PPE guidelines. Instead of questioning the guidelines, authorities have blamed the nurses for lapses in protocol, resulting in Spanish health workers protesting for lack of adequate protection and respect for their rights (Phillip and Ferdman, 2014). If our health workers do not feel confident in the level of protection afforded, this will compromise the ability of health systems to respond to Ebola. The indisputable fact is that health workers continue to become infected and die from Ebola. It has come to light that several health workers in West Africa adhered to strict infection control protocols but contracted Ebola anyway, which suggests transmission modes are not as clear-cut as suggested (Cohen, 2014).

Blaming this entirely on failure to don and doff properly is pure speculation, not supported by evidence (Fischer II et al., 2014), whereas there is ample evidence that Ebola can spread through non-contact modes (MacIntyre et al., 2014).

Martin-Moreno et al. rely on a classification of transmission as exclusively droplet or aerosol, which is based on outdated and misleading experiments, as recently pointed out (Brosseau and Jones, 2014).

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Few organisms are transmitted by a single mode alone, and transmission in the clinical setting is more complex than the prevalent dogma of unimodal transmission. It is time to reject artificial, dangerous and outdated classifications of respiratory transmission as purely contact, droplet or airborne (Brosseau and Jones, 2014). What we have further raised is a serious inconsistency of Ebola PPE guidelines for HCWs compared to laboratory workers. This inconsistency of PPE guidelines is also seen with Middle East Respiratory Syndrome Coronavirus (MERS-CoV), which is primarily transmitted through close contact (Center for Disease Control and Prevention (CDC) 2014b) and has a lower case-fatality rate than Ebola. Yet the Centers for Disease Control and Prevention (CDC) advocates airborne precautions for management of known and suspected cases of MERS-CoV and use of an N95 respirator (Center for Disease Control and Prevention (CDC) 2014a). This is despite it being documented that MERS Co-V is not easily transmitted from human to human (Drosten et al., 2014), nor present in high concentrations in the upper respiratory tract (Guery et al., 2013).

Finally, arguments about comfort and duration of tolerance of PPE raised by Martin-Moreno et al. are secondary to the risk of death for HCWs. Many HCWs have contracted Ebola despite wearing PPE, which in itself supports the case for conservative recommendations. Whilst there is some increase in discomfort with use of a N95 respirator compared to a mask, (MacIntyre et al., 2011, 2013) comfort should not be the primary consideration in making recommendations for a disease with such a high case-fatality rate. Nor should the duration of tolerability of PPE drive recommendations. The OHS of the HCW is the primary consideration and reason for recommending PPE in the first place. The choice of respiratory protection is one facet of an array of PPE for ensuring the OHS of health workers, including gowns, gloves, goggles and protective suits. Suggesting HCWs use lesser protection because they could work 3 h instead of 40 min is illogical, when the risk of working longer in lesser PPE may be death. Whether they comply or not due to comfort is their choice, but to recommend less for frontline doctors and nurses than for laboratory workers, is not defensible on any level. Under pressure after the infection of two nurses, along with reasoned arguments such as ours, the CDC revised their guidelines to a higher level of protection on October 21st 2014. The guidelines of WHO and many countries for a surgical mask for HCWs caring for Ebola patients need to also be revised.

We apologise for the error in the citation, and have published a corrigendum.

References

- Brosseau, L.M., Jones, R., 2014. September. Health workers need optimal respiratory protection for Ebola, CIDRAP perspectives, <http://www.cidrap.umn.edu/news-perspective/2014/09/commentary-health-workers-need-optimal-respiratory-protection-ebola>.
- Center for Disease Control and Prevention (CDC), 2014a. Interim Infection Prevention and Control Recommendations for Hospitalized Patients with Middle East Respiratory Syndrome Coronavirus (MERS-CoV). Available from: <http://www.cdc.gov/coronavirus/mers/infection-prevention-control.html> (accessed 27.09.14).
- Center for Disease Control and Prevention, 2014b. Middle East Respiratory Syndrome (MERS). Transmission. Available from: <http://www.cdc.gov/coronavirus/mers/about/transmission.html> (accessed 27.09.14).
- Cohen, J., 2014. When Ebola protection fails. *Science* 346, 17–18.
- Drosten, C., Meyer, B., Muller, M.A., Corman, V.M., Al-Masri, M., Hossain, R., Madani, H., Sieberg, A., Bosch, B.J., Lattwein, E., Alhakeem, R.F., Assiri, A.M., Hajomar, W., Albarak, A.M., Al-Tawfiq, J.A., Zumla, A.I., Memish, Z.A., 2014. Transmission of MERS-coronavirus in household contacts. *N. Engl. J. Med.* 371, 828–835.
- Fischer, I.I.W.A., Hynes, N.A., Perl, T.M., 2014. Protecting health care workers from Ebola: personal protective equipment is critical but is not enough. *Ann. Intern. Med.*, In: <http://annals.org/article.aspx?articleid=1900481>.
- Guery, B., Poissy, J., el Mansouf, L., Sejourne, C., Ettahar, N., Lemaire, X., Vuotto, F., Goffard, A., Behillil, S., Enouf, V., Caro, V., Mailles, A., Che, D., Manuguerra, J.C., Mathieu, D., Fontanet, A., van der Werf, S., 2013. Clinical features and viral diagnosis of two cases of infection with Middle East Respiratory Syndrome coronavirus: a report of nosocomial transmission. *Lancet* 381, 2265–2272.
- MacIntyre, C.R., Chughtai, A.A., Seale, H., Richards, G.A., Davidson, P.M., 2014. Respiratory protection for healthcare workers treating Ebola virus disease (EVD): are facemasks sufficient to meet occupational health and safety obligations? *Int. J. Nurs. Stud.* 51, 1421–1426.
- MacIntyre, C.R., Wang, Q., Cauchemez, S., Seale, H., Dwyer, D.E., Yang, P., Shi, W., Gao, Z., Pang, X., Zhang, Y., Wang, X., Duan, W., Rahman, B., Ferguson, N., 2011. A cluster randomized clinical trial comparing fit-tested and non-fit-tested N95 respirators to medical masks to prevent respiratory virus infection in health care workers. *Influenza Other Respir. Viruses* 5, 170–179.
- MacIntyre, C.R., Wang, Q., Seale, H., Yang, P., Shi, W., Gao, Z., Rahman, B., Zhang, Y., Wang, X., Newall, A.T., Heywood, A., Dwyer, D.E., 2013. A randomized clinical trial of three options for N95 respirators and medical masks in health workers. *Am. J. Respir. Crit. Care Med.* 187, 960–966.
- Martin-Moreno, J.M., Llinás, G., Martínez-Hernández, J., 2014a. Is respiratory protection appropriate in the Ebola response? *Lancet* 384, 856.
- Martin-Moreno, J.M., Llinás, G., Martínez-Hernández, J., 2014b. Response to “MacIntyre et al., 2014: Respiratory protection for healthcare workers treating Ebola virus disease (EVD): are facemasks sufficient to meet occupational health and safety obligations?”. *Int. J. Nurs. Stud.*, <http://dx.doi.org/10.1016/j.ijnurstu.2014.10.005>.
- Phillip, A., Ferdman, R.A., 2014. A vexing mystery in Spain: how did a nurse contract Ebola? *The Washington Post*. Available from: <http://www.washingtonpost.com/news/to-your-health/wp/2014/10/07/after-nurse-contracts-ebola-spanish-health-workers-raise-concerns-about-protective-equipment/> (accessed 08.10.14).