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'Antibiotic footprint' as a communication tool to aid reduction of antibiotic consumption—authors' response

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Sir,

We thank Dominic Moran for describing the potential implications of our proposed antibiotic footprint and how the ecological footprint was originally defined.[1] The 'antibiotic footprint' has been designed as a simple metric focusing on communication with the general public, healthcare professionals and policy makers to aid reduction of antibiotic consumption.[2] Reducing misuse and overuse of antibiotics is an important action in the fight against antimicrobial resistance (AMR).[3] Unlike carbon offset, which is an indirect way for people to compensate for their carbon emissions, the antibiotic footprint does not aim to find a way to compensate people's overuse or misuse of antibiotics. Rather, we recommend multiple ways to support people to directly reduce their own 'antibiotic footprint'.[2] For example, improving the quality of water and sanitation, public health and infection prevention will all reduce infection and transmission of AMR and therefore the need for antibiotics.[2–4] Vaccination can reduce the incidence of both susceptible and resistant infections and thus reduce the use of antibiotics.[2,5] Good animal husbandry could also reduce the need for antibiotics in animal agriculture.[6]

We agree that there are multiple advanced metrics (such as DDD, mg/population correction unit, mg/kg, daily dose metrics and course dose metrics) that can be used to describe antibiotic consumption, together with simple metrics (such as antibiotic footprint).[2] These currently defined and potentially new metrics could be efficiently calculated if complete data on antibiotic usage in each sector from every country were to be made openly available. Unfortunately, official data in many low- and middle-income countries are currently unavailable and the antibiotic footprint aims to encourage us to collectively work to reduce our antibiotic footprint, in the same way as we might seek to directly reduce our carbon footprint.

There is more work to be done to compare antibiotic consumption in different sectors and for different types of antibiotics and to quantitatively evaluate the impact of reducing our antibiotic footprint. That said, we believe that the antibiotic footprint could be a useful communication tool to help encourage reductions in the use of antibiotics.[2]

Transparency declarations

None to declare.

References

1 Moran D. Comment on: 'Antibiotic footprint' as a communication tool to aid reduction of antibiotic footprint consumption. *J Antimicrob Chemother* 2019; **74**: 2822.

2 Limmathurotsakul D, Sandoe JAT, Barrett DC *et al*. 'Antibiotic footprint' as a communication tool to aid reduction of antibiotic consumption. *J Antimicrob Chemother* 2019; **74**: 2122–7.

3 WHO. *Global Action Plan on Antimicrobial Resistance*. https://www.who.int/antimicrobial-resistance/publications/global-action-plan/en/.

4 Wuijts S, van den Berg H, Miller J *et al*. Towards a research agenda for water, sanitation and antimicrobial resistance. *J Water Health* 2017; **15**: 175–84.

5 Bloom DE, Black S, Salisbury D *et al*. Antimicrobial resistance and the role of vaccines. *Proc Natl Acad Sci USA* 2018; **115**: 12868–71.

6 Van Boeckel T, Brower C, Gilbert M *et al*. Global trends in antimicrobial use in food animals. *Proc Natl Acad Sci USA* 2015; **112**: 5649–54.