



PLASTIC PPE AND THE ENVIRONMENT

Mitigating the environmental impact of plastic PPE: more than just disposal

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Zhang and colleagues discuss the environmental consequences of disposing of single use personal protective equipment (PPE).¹ But there are crucial steps before disposal that incorporate the “5 Rs”: reduce, reuse, recycle, research, and rethink.²

With cumulative use, even simple PPE has major consequences. A standard box of nitrile gloves, for example, has the same CO₂ equivalent as driving 20 miles in a petrol car.³ Simple and effective ways of minimising unnecessary PPE use include employing “runners” outside high risk areas to fetch equipment and drugs and the avoidance of “hygiene theatre” (conspicuous PPE use) in low risk settings.

Zhang and colleagues focus on single use face masks¹; reusable respirator masks and powered air purifying respirators are available, but they are seldom designed for healthcare and can be challenging to clean. Reusable gowns, laundered before re-circulation, have been widely adopted and reduce environmental effects by 65%.³ Recycling PPE presents challenges in terms of material separation and risk of contamination, so design should focus on single materials able to feed into closed loop recycling, complemented by regulatory approvals and systems facilitating safe handling.

With pandemics anticipated to occur more frequently in the future, research must focus on reducing the environmental impact of PPE. This might include the development of reusable equipment that suits healthcare and the use of plastic alternatives such as starch-based biopolymers. The scientific basis for PPE use must be regularly re-examined. Notably, “contact precautions” have featured in PPE policies since the pandemic began,⁴ but prevailing evidence indicates that surface transmission of SARS-CoV-2 is low with effective handwashing.⁵

It seems incredible that we have developed multiple SARS-CoV-2 vaccines but not sustainable PPE. Greener manufacture, use, and disposal and a better understanding of the environmental effects of PPE through life cycle assessments are urgently required as we move towards a “net zero” NHS.⁶

Competing interests: None declared.

Full response at: <https://www.bmj.com/content/372/bmj.n109/rr-2>.

¹ Zhang EJ, Aitchison LP, Phillips N, Shaban RZ, Kam AW. Protecting the environment from plastic PPE. *BMJ* 2021;372:n109. doi: 10.1136/bmj.n109 pmid: 33468450

² Hutchins DCJ, White SM. Coming round to recycling. *BMJ* 2009;338:b609. doi: 10.1136/bmj.b609 pmid: 19278971

³ Rizan C, Reed M, Bhutta MF. Environmental impact of personal protective equipment distributed for use by health and social care services in England in the first six months of the covid-19 pandemic. *medRxiv* 2020; doi: 10.1101/2020.09.21.20198911

⁴ Public Health England. Covid-19: infection prevention and control guidance. 21 January 2021. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/893320/COVID-19_infection_prevention_and_control_guidance_complete.pdf

⁵ Zhang R, Li Y, Zhang AL, Wang Y, Molina MJ. Identifying airborne transmission as the dominant route for the spread of COVID-19. *Proc Natl Acad Sci U S A* 2020;117:14857-63. doi: 10.1073/pnas.2009637117 pmid: 32527856

⁶ National Health Service. Delivering a “net zero” national health service. NHS England and NHS Improvement, 2020. <https://www.england.nhs.uk/greenemhs/wp-content/uploads/sites/51/2020/10/delivering-a-net-zero-national-health-service.pdf>

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