

Plastic shields could be answer to COVID risk for motorbike taxis

November 17 2021



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Affordable plastic shields reduce the risk of COVID-19 infection for passengers on motorcycle taxis popular in many developing

countries—offering an economic lifeline for drivers during any future waves of the pandemic, a new study suggests.

Drivers in countries such as Bangladesh, Uganda, Nigeria, Vietnam, Indonesia and Rwanda were banned from working for many months due to the [risk](#) to passengers of airborne exposure to the virus.

Simulations carried out by a University of Leeds-led team showed that a shield between the driver and passenger substantially reduces that risk.

It was already known that large and small virus-laden droplets from a cough by the driver pose different risks. Depending on the motorbike speed, large particles can land on the passenger while he or she may inhale smaller particles. The team used simulations to follow the trail of droplets ejected through a cough from the driver when the motorbike was moving at different speeds. The droplets were carried towards the passenger by the background air flow, which the researchers also measured.

Corresponding author Dr. Amirul Khan, a lecturer at the University of Leeds' School of Civil Engineering, said: "We found that a shield placed between the riders blocks particles and also alters the flow field around the riders, pushing droplets away from the passenger and reducing airborne exposure. This eliminated the risk of inhaling droplets. However, there was still some risk of droplets landing on the [passenger's](#) helmet or clothes."

Prospect of affordable solution

Co-author Professor A.B.M. Toufique Hasan, who works at the Department of Mechanical Engineering, Bangladesh University of Engineering and Technology, said that suitable shields made from recycled plastic would cost Bangladeshi drivers around £5-£6, making it

a cost-effective solution in other developing countries as well.

Co-author Dr. Zia Wadud, Associate Professor at University of Leeds' Institute for Transport Studies and School of Chemical and Process Engineering, said: "Early in the pandemic a few motorbike taxi drivers in countries like Uganda fitted their own screens to protect passengers in the hope they could carry on working. However, the governments did not encourage this practice as there was a lack of evidence on their impact. That plunged many [drivers](#) into poverty. Our research now provides that evidence and, if implemented, this approach can reduce exposure risk for passengers from both COVID and other similar airborne viruses that emerge."

Lead author Rory Hetherington said: "Contrary to initial thinking around COVID, the dominant mode of transmission is through airborne particles. With [vaccination rates](#) still very low in many of the countries where motorbike taxis are used, it is vital that evidence-based safety measures are put in place to allow people to work and travel as safely as possible."

The research was funded by the UK Research and Innovation Global Challenges Research Fund and is part of a wider on-going project on COVID risk trade-offs in different forms of transport being led by Dr. Wadud at the University of Leeds.

The paper is available in the journal *Physics of Fluids*.

More information: R. Hetherington et al, Exposure risk analysis of COVID-19 for a ride-sharing motorbike taxi, *Physics of Fluids* (2021). [DOI: 10.1063/5.0069454](https://doi.org/10.1063/5.0069454)

Provided by University of Leeds

Citation: Plastic shields could be answer to COVID risk for motorbike taxis (2021, November 17) retrieved 26 April 2024 from <https://phys.org/news/2021-11-plastic-shields-covid-motorbike-taxis.html>

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