

Spray Coverage of Droplets: A Medical Biomechanics Analysis and Implication in COVID-19 Prevention

Dear Editor,

Coronavirus disease (COVID-19) pandemic is an important global public health problem at present. The disease can easily get transmitted from person to person and causes a wide scale of the outbreak. The secretion of droplets from an infected patient is the main vehicle carrying pathogens to the others.^[1] The appropriate distancing is required for the preventive purpose.^[2] The study on the movement of droplets in an indoor environment is interesting and can give useful data for disease prevention. In a previous report by Xie *et al.*, droplets of various sizes can move at different distances.^[3] Averagely, the large droplet from breathing can move at a distance before falling and the droplet expelled by sneezing or coughing can move more than 2 m [Table 1].^[3]

Nevertheless, the explanation by the evaporation-falling concept mainly gives a one-dimensional distance. Additional data on area coverage by droplets are necessary for planning the prevention of disease. Here, the authors use a medical biomechanics analysis to estimate spray coverage which implies disease spreading area of droplets. The online engineering tool, spray coverage calculator (<https://www.spray.com/Resources/SprayWare-Calculators-and-Tools/Spray-Coverage-Calculator>), was used for estimation. According to the analysis, the spray coverage of droplets due to breathing, coughing, or sneezing are shown in Table 1. Based on this data, the infectious droplets can easily cover any closed room. For prevention of disease, the very long distancing, ranging 2–12 m, is required.

Table 1: Spray coverage of droplets

Spray actions	Falling distance (meter)*	Spray coverage	
		Area (meter ²)	Volume (meter ³)
Breathing	1	4	8
Coughing	2	16	64
Sneering	6	144	728

*Falling distance is according to the previous referencing study^[3]

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Conflicts of interest

There are no conflicts of interest.

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