

## PROTECTION EFFICIENCY OF N95 RESPIRATOR AGAINST COVID-19: AN EPIGRAMMATIC REVIEW

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### ABSTRACT

Coronavirus Disease 2019 (COVID-19) has badly impacted the entire world. Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) is causing this infectious disease. Healthcare professionals are using N95 respirator to prevent SARS-CoV-2 from entering the respiratory tract. This paper mainly discusses the protection efficiency of N95 respirator against COVID-19. The published guidelines, reports, and research articles were sought to collect information on the protection efficiency of N95 respirator. It has been found that they are highly efficient against the pathogens  $\geq 300$  nm in diametric size. They may not offer the desired protection with a 95% threshold value for the nano-size virus particles. Past research revealed that the penetration of small virus particles in the 10-80 nm size range can be more than 5% depending on the inhalation flow rate. In addition, the wearers may have more virus particles into their respiratory tract if the respirator is not well-fitted without any leakage. The viral load due to more than 5% penetration and respirator leakage can be quite enough over time to cause infection. The risk will be more for healthcare professionals working in aerosolized areas. To reduce the risk of infection, a face shield should be used over an N95 respirator. Moreover, a surgical mask can be used over an N95 respirator. This may reduce the viral load on N95 respirator. Furthermore, full-facepiece air-purifying respirator and powered air-purifying respirator including highly efficient filters should be used by the healthcare personnel in aerosolized areas for protection against COVID-19. Such practices will reinforce the defence level against COVID-19.

**Keywords:** COVID-19, N95 respirator, protection efficiency, SARS-CoV-2, virus particle.