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Review of fluid dynamic science associated with contamination and decontamination ANDREI KHODAK, IGOR KAGANOVICH, Princeton Plasma Physics Laboratory, MIKHAIL SHNEIDER, Princeton University — The history of research on the virus spread by sneezing started in the middle of last century. A lot of experimental and theoretical studies determined the spread of droplets using assumptions standard for the description of the turbulent submerged jet. In these studies, it was shown that the effects of the environment (either indoors or outdoors, humidity, etc.) need to be taken into account. These studies provide grounds for recommendations for the safe distance. Penetrations of droplets through the masks will be also reviewed. Poor ventilation systems can significantly contribute to infection spread. Closed HVAC (Heating Ventilation and Air Conditioning) systems can conserve contamination inside the buildings and multiply it over time. Models of contamination spread in the building with force air HVAC systems were created for various purposes and provide guidance for establishing healthier indoor environments. A retrofit air-exchange system can be added to supply fresh air inside the building, while maintaining the system efficiency through heat exchange between incoming from outside and outgoing inside air. These systems were introduced several decades ago and are now mandated by the code in the new buildings in many states. Retrofit UV lamps installed inside the ventilation system can be much less expensive to manufacture and install than the air-exchange units, because they would not have any moving parts and would not require additional ductwork.

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