

The proposed project “Aerosol Generation by Cough” (0920-06AP) will measure the amount and size of airborne particles produced by healthy individuals when they cough, and also measure the ability of surgical masks and respirators to intercept aerosols produced by coughing people before they are released into the environment. This project is intended to provide initial data on aerosol production by people and to determine how much aerosol production changes over time and after repeated coughs. It is also intended to begin examination of the effectiveness of masks and respirators when issued to patients. The study is not expected to directly result in information that can be used to make policy recommendations. However, it will develop study methods and provide baseline data which will be useful in future studies of the spread of respiratory illnesses such as influenza.

Aerosol particle diameters and concentrations will be measured using two commercial devices. The first analyzer, a TSI 3321 Aerodynamic Particle Sizer (APS), has a size range of 0.5 to 20 μm . The second analyzer, a TSI 3936 Scanning Mobility Particle Sizer (SMPS), has a size range of 10 nm to 0.5 μm . By comparison, the average size of a single influenza virus particle is about 100 nm. Thus, the size range of the two instruments combined should cover all cough-generated particles that could potentially contain viruses.

The techniques and information from this study will be used in a follow-on study, “Experimental and Theoretical Study of Early Detection and Isolation of Influenza” (0920-07AW), which will study aerosol production in influenza patients (this follow-on study has already been approved by OMB). The combination of the two studies will establish if influenza affects aerosol production and how much. The two studies will also help establish if aerosol generation experiments using healthy people can be used in studying and modeling the airborne spread of respiratory infections.