The far-UVC source used in this study was a 12 W 222-nm KrCl excimer lamp module made by USHIO America. The lamp is equipped with a proprietary optical filtering window to reduce lamp emissions outside of the 222 nm KrCl emission peak. The lamp was positioned 22 cm away from the exposure chamber window and directed at the center of the window. Optical power measurements were performed using an 818-UV/DB low-power UV enhanced silicon photodetector with an 843-R optical power meter (Newport, Irvine, CA). Dosimetry was performed prior to starting an experiment to measure the fluence within the chamber at the position of the aerosol.

The distance between the lamp and the irradiation chamber permitted a single lamp to uniformly irradiate the entire exposure window area. Measurements using the silicon photodetector indicated an exposure intensity of approximately 90 μW/cm2 across the exposure area. The chamber is equipped with a reflective aluminum surface opposite of the exposure window. As in our previous work with this chamber23, the reflectivity of this surface was approximately 15%. We have therefore conservatively estimated the intensity across the entire exposure area to be 100 μW/cm2. With the lamp positioned 22 cm from the window and given the 20 seconds required for an aerosol particle to traverse the exposure window, we calculated the total exposure dose to a particle to be 2 mJ/cm2. We used additional sheets of UV transmitting plastic windows to uniformly reduce the intensity across the exposure region to create different exposure conditions. While in our previous work with these sheets we measured a transmission closer to 65%23, for these tests we measured the 222-nm transmission of each sheet to be approximately 50%. This decrease in transmission is likely due to the photodegradation of the plastic over time4. The addition of one or two sheets of the plastic covering the exposure window decreases the exposure dose to 1 and 0.5 mJ/cm2, respectively. (Buonanno et al., 2020)

According to Casini et al. (2019). The PX-UVC device (Xenex Disinfection Services, San Antonio, TX USA) uses a xenon flash lamp to generate high-energy, broad-spectrum ultraviolet and visible light (UVC 100–280 nm, visible 380–700 nm), in microsecond bursts (pulses) at 67 Hz. No touch UV technology is dependent on the distance between the lamp and the surface being disinfected. The inverse square law states that the doubling of distance between the lamp and the surface being disinfected will quadruple the time required for disinfection. The PX-UVC device uses 5-min disinfection cycles and multiple positions with minimal distances from high-touch surfaces. The manufacturer recommends that high-touch surfaces are within two meters of the lamp in order to achieve optimal efficacy. For patient rooms, the device requires one 5-min disinfection cycle on each side the patient bed and one cycle in the private bathroom (if applicable). For operating theatres, the device requires one 10-min disinfection cycle on each side of the operating bed. Due to the high-intensity broad-spectrum UV light, the device is operated in unoccupied rooms. The PX-UVC device, like most UVC lamps, causes chemical reactions that increase the concentration of ozone in the air.

Far-UVC light (222 nm) efficiently and safely inactivates airborne human coronaviruses, accessed 31 March 2022, <<https://www.nature.com/articles/s41598-020-67211-2>>

Evaluation of an Ultraviolet C (UVC) Light-Emitting Device for Disinfection of High Touch Surfaces in Hospital Critical Areas, accessed 31 March 2022, <<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6801766/>>