

Evaluation of an enclosed Ultraviolet-C Radiation Device for Decontamination of Keyboards

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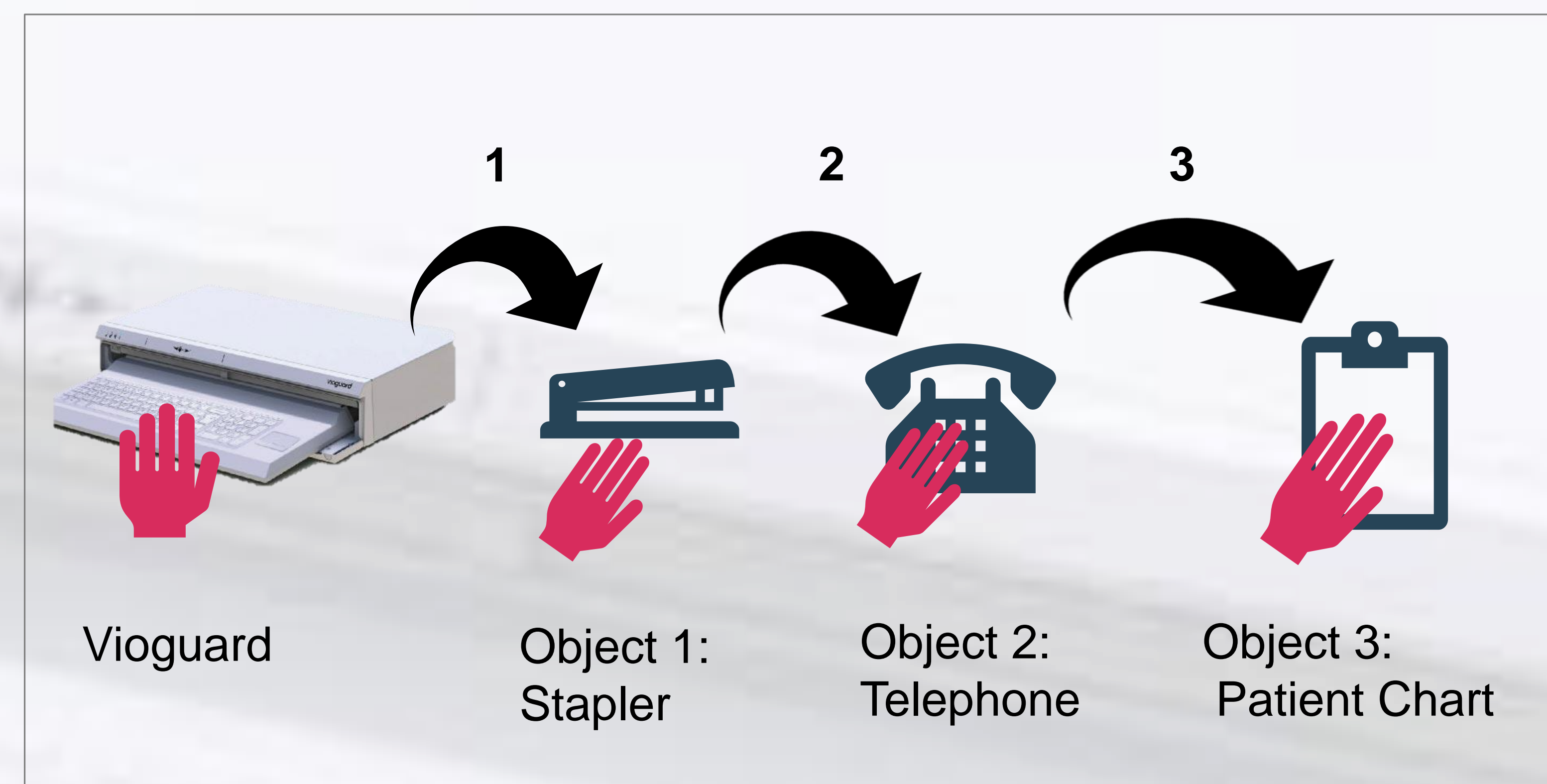
Background

- Ultraviolet-C (UV-C) radiation is effective in killing a wide range of viral and bacterial pathogens, including *Clostridium difficile* spores
- However, high-intensity UV-C devices commonly used for room disinfection cannot be used when people are present
- The Vioguard system is an enclosed keyboard that uses UV-C for automated disinfection
- We tested the efficacy of the device for decontamination of keyboards as well as reduction in dissemination of organisms in a simulated setting

Methods

- After each use, the keyboard is automatically retracted and treated with UV-C for 90s at close proximity
- We examined the efficacy of the device against methicillin-resistant *Staphylococcus aureus* (MRSA), *C. difficile* spores and bacteriophages MS2 and PHI X147 in organic load suspension on steel disk carriers
- Simulation of virus transfer (Fig. 1)
 - Keyboards were contaminated with PHI X147
 - Test subjects touched control or UV-C-treated keyboards and were asked to contact 3 subsequent items
 - Fingerpads and the touched items were sampled for PHI X147

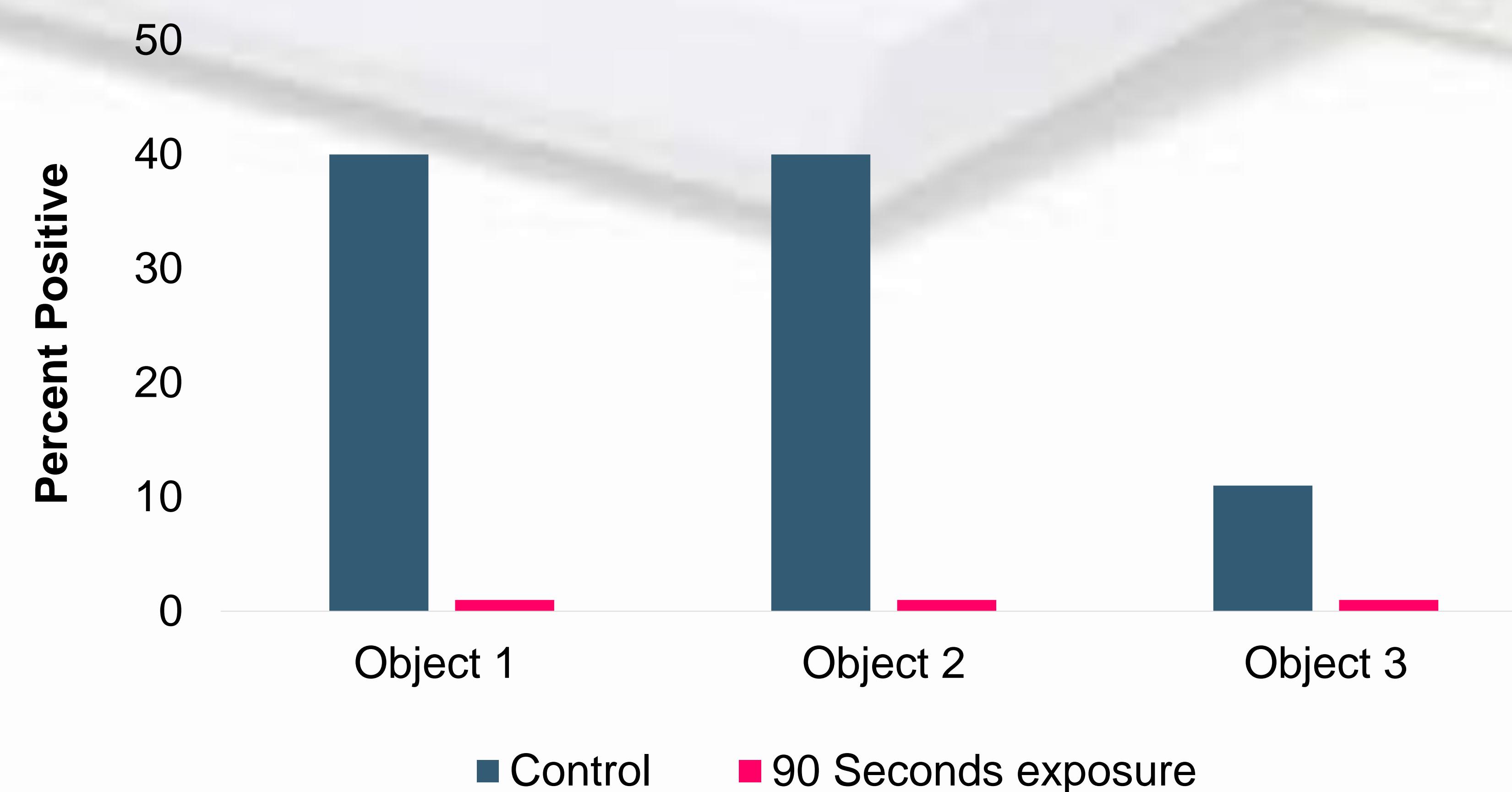
Fig.1. Simulation setup for virus transfer from keyboards to fingerpads and 3 subsequent items



Results

Vioguard significantly reduced transmission to subsequently touched items (Fig. 2)

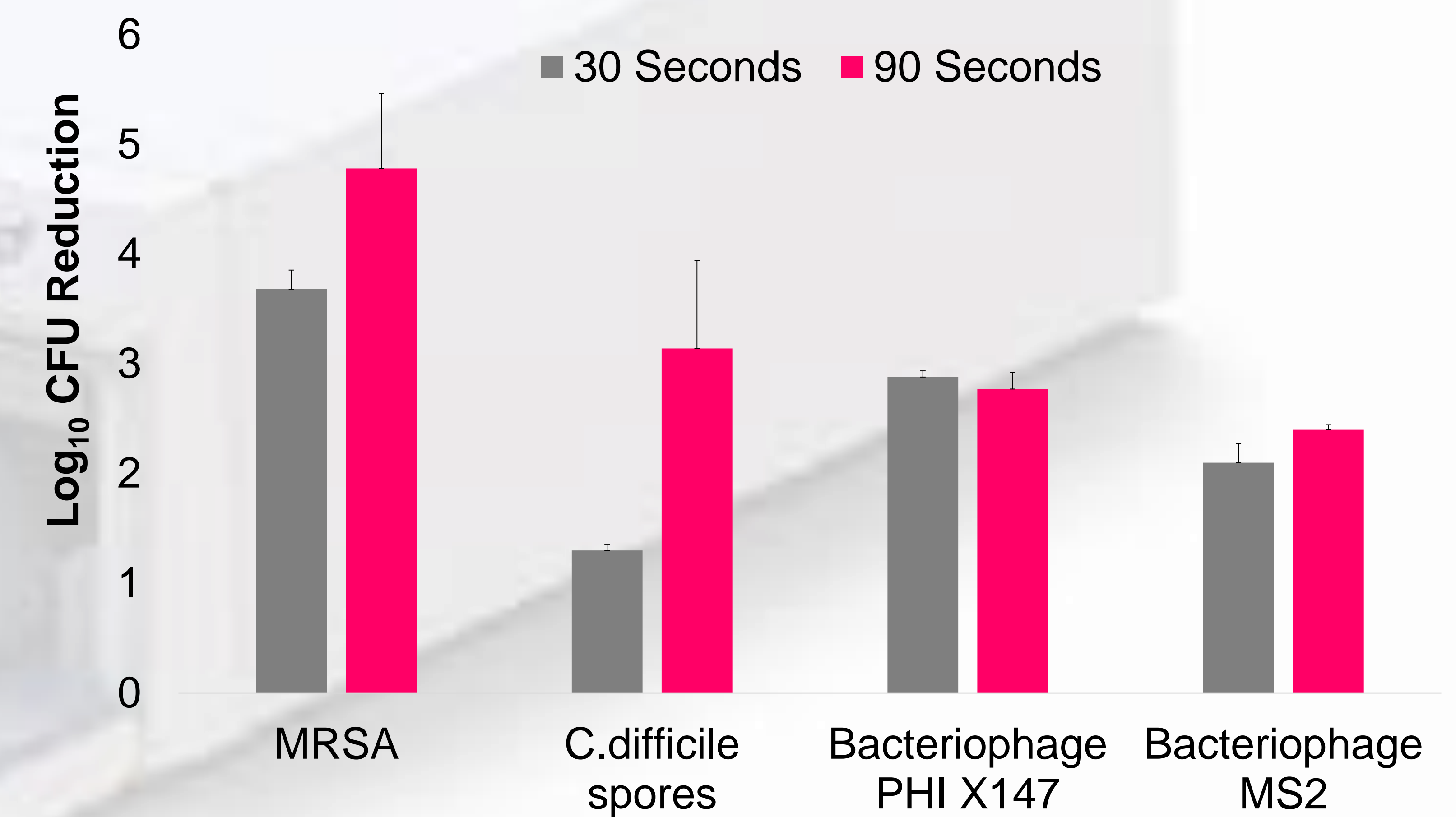
Fig.2. Transmission of PHI X147



Results

On steel disks, recovery of MRSA, *C. difficile* spores, and bacteriophages MS2 and PHI X147 were significantly reduced with 30 or 90 second cycles (Fig. 3)

Fig.3. Reduction of Organisms Exposed to Vioguard



Conclusion

- An enclosed UV-C device provided effective, automated, and safe decontamination of keyboards
- Automated decontamination of keyboards could reduce dissemination of viruses and bacteria in healthcare settings

Acknowledgements

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