Bacteriophage MS2 Transmission Across a High School Classroom and the Effect of an Antimicrobial Intervention

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Health officials world-wide have reported that the use of hand sanitizer does not affect microbial development on hands and extremities. The purpose of this experiment was to track and record the movement of MS2, a bacteriophage surrogate for viral pathogens, across a high school classroom both to demonstrate the transmission of a virus and to study the effect of an antimicrobial intervention of hand sanitizer. The methodology used included the following: 1. Host bacteria and virus propagation 2. Classroom seeding and collection of surface/location solutions using nutrient solution-spongesicles; surface solution processing with TSA agar plates 3. Application of antimicrobial intervention; repeat steps from pre-intervention After the conclusion of the pre-intervention, the surface holding the highest plaque formation units was the inside classroom door handle (3.4035 pfu/cm^2). Of the 10 surfaces tested, 6 reported viral transfer in at least one of three trials conducted. Following the post-intervention, 2 of the 6 surfaces (teacher computer surface and student desks) reported a reduction in pfu (73.47% and 80.75% respectively). However, the remaining 4 surfaces displayed a drastic increase in pfu (ranging from 400-25,000%) over the course of three trials. These results could be interpreted in two ways: the lack of reduction in pfu could be caused by hand sanitizer's inability to disrupt antimicrobial agents or MS2 transmission is dependent on specific types of surfaces. The results of this project demonstrate the ineffectiveness of hand sanitizer in stopping the spread of a virus within classroom and work settings; the chemical make-up of the sanitizer is effective, but the manner in which the sanitizer is applied is not.

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