# Effect on patient room environmental bioburden from use of a novel daily-use sporicidal hard surface disinfectant

Authors: Jennifer Perkins, BA, MBA¹; JoAnn Ferguson, RN, BAN¹; Anita Thomasser, BS²; Carmen L. Ventrucci, BS, MBA²; Erin Brown, BA, MS²

### BACKGROUND

A novel peracetic acid/hydrogen peroxide based sporicidal daily-use disinfectant was evaluated for impact on patient room bioburden vs. conventional quaternary ammonium compound (QAC) based disinfectants. Patient room bioburden levels were measured at two hospitals using aerobic culture counts via agar dip slides.

## METHODS

Two hospitals participated in the study. Hospital 1 trialed the novel disinfectant on a 48-bed intensive care and medical-surgical unit. Hospital 2 trialed the novel disinfectant on a 28-bed obstetric and medical-surgical unit. Performance of the QAC based disinfectants was evaluated during the baseline phase. Performance of the novel disinfectant was evaluated during the intervention phase. Training on the new disinfectant provided during the intervention phase specifically excluded mention of cleaning practices to minimize this as a study variable.

Rooms to be terminally cleaned at discharge were evaluated for effectiveness of cleaning and bioburden levels. Effectiveness of cleaning was evaluated using DAZO® Fluorescent Marking Gel (DAZO). High touch objects (HTOs) in the patient room were marked with DAZO before cleaning, and assessed with a black light after cleaning. Complete removal of the DAZO mark was used to indicate that a surface had been cleaned during the room cleaning process. Bioburden levels were measured by aerobic culture counts via agar dip slides (Russell Mainstream BT2). Dip slides were applied to the same HTOs both before and after cleaning. The number of colony forming units (CFU) per slide was documented before and after cleaning. The presence (X CFU) or absence (0 CFU) of bioburden was the measurement used in data analysis.

Patient Room HTOs	
Bed Rail	
Call Button	
Chair	
Door Handle	
Light Switch	
Patient Room Faucet	
Telephone	
Tray Table	



### RESULTS

Figure 4: Hospital 2 Overview

70%

60%

50%

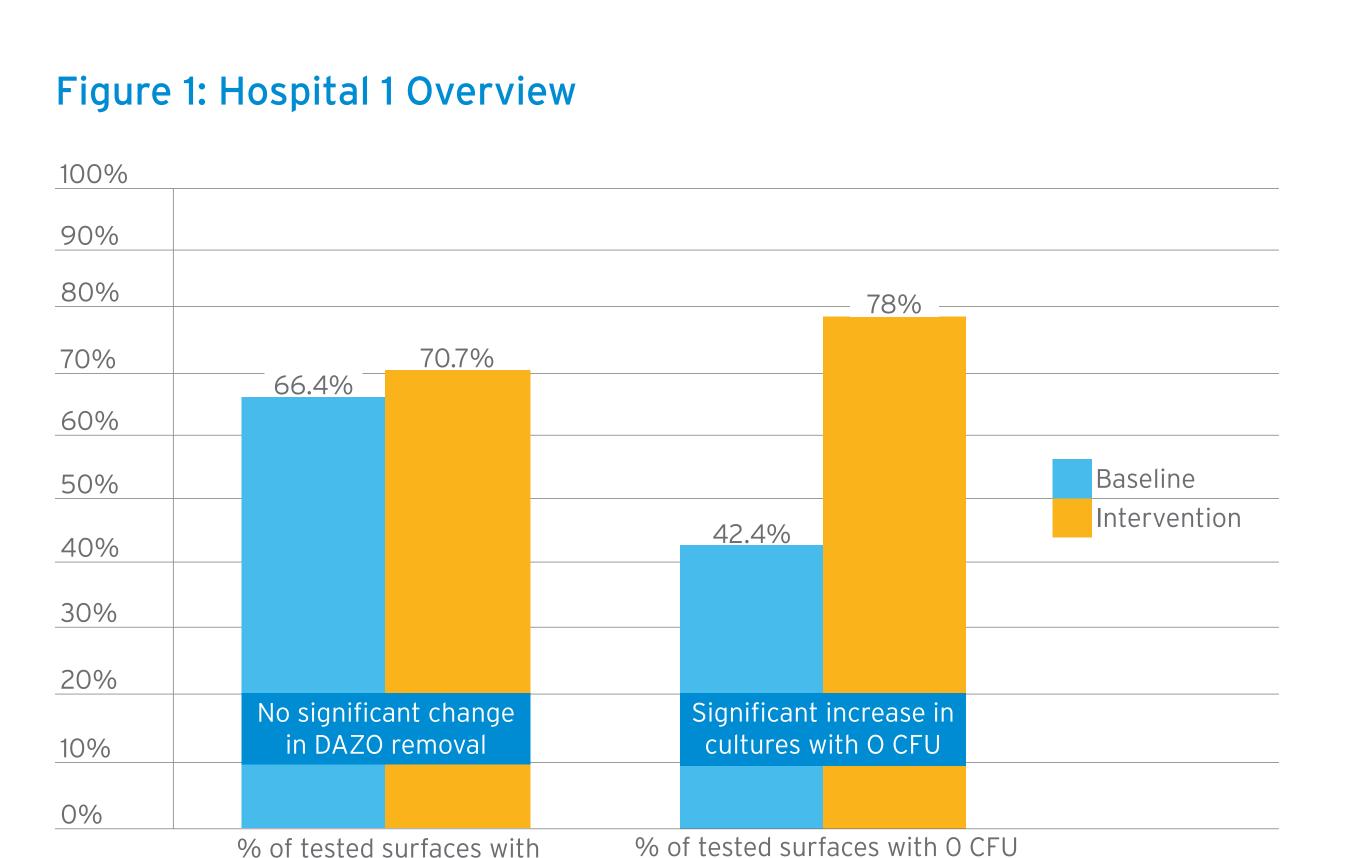
40%

30%

20%

10%

When comparing the overall number of HTOs exhibiting O CFU per slide, Hospital 1 demonstrated a 35.6 percentage point improvement in bioburden reduction during intervention as compared to baseline (see Figure 1 and 3). Hospital 2 demonstrated an 8.6 percentage point improvement in bioburden reduction during intervention as compared to baseline (see Figure 4 and 6). Both of these results are statistically significant (Hospital 1 p<0.001, Hospital 2 p=0.011). DAZO mark removal results did not show a statistically significant change at either hospital (Hospital 1 p=0.291, Hospital 2 p=0.447), indicating that cleaning practice did not change between baseline and intervention (see Figure 1,2,4 and 5).



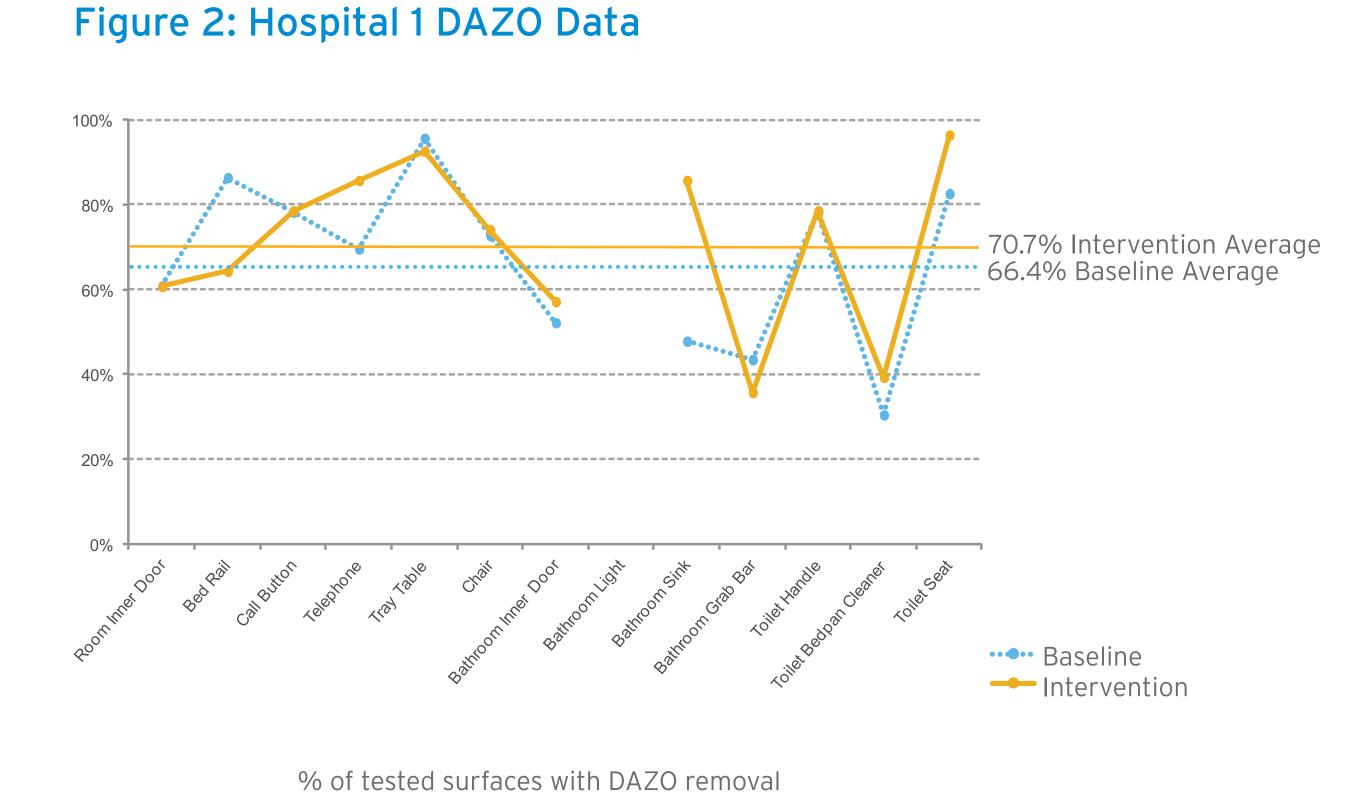
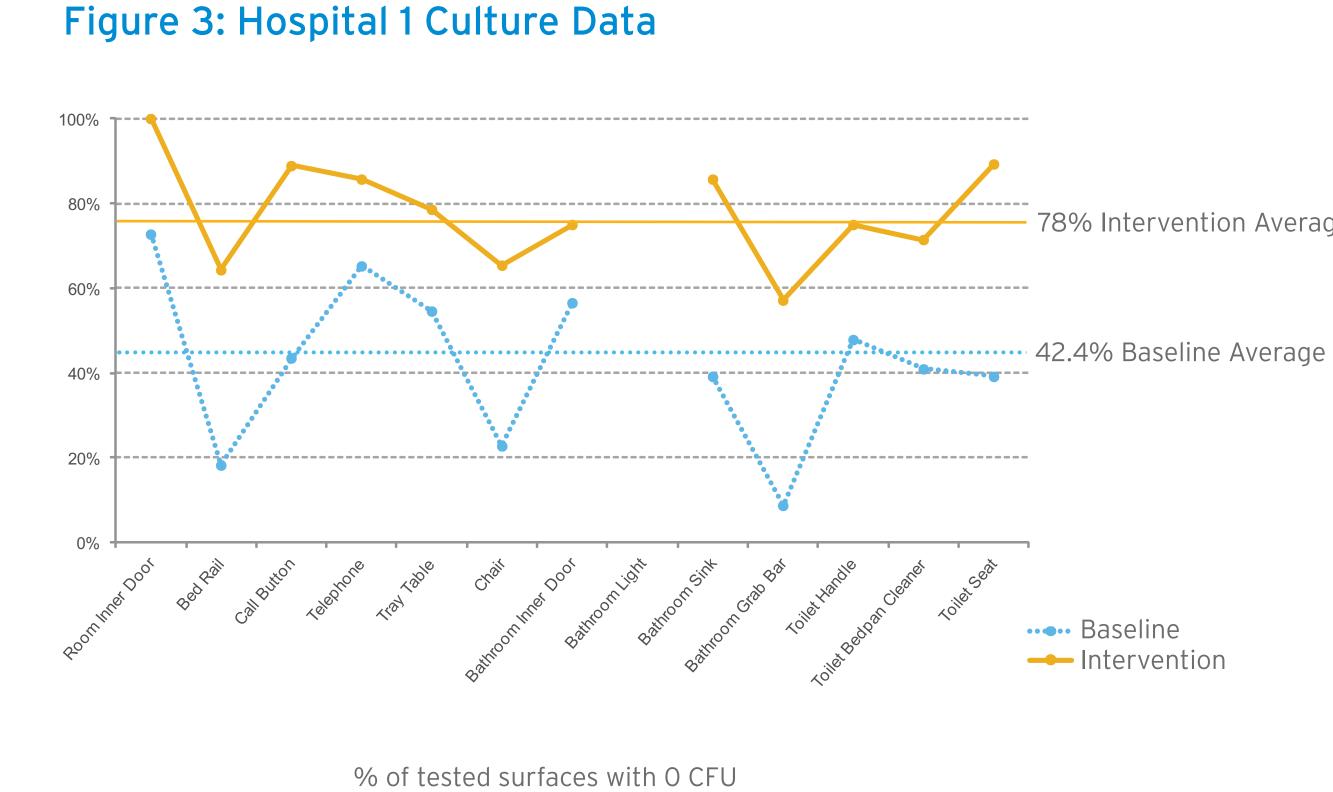
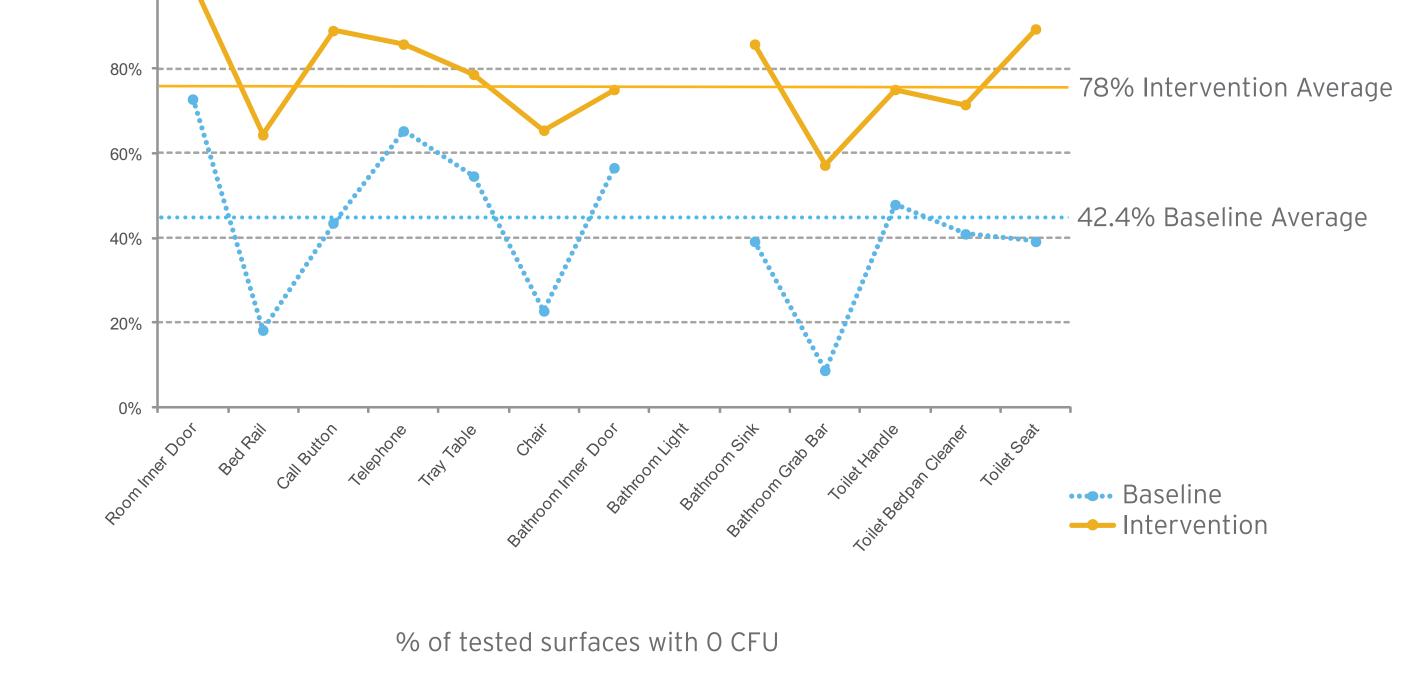
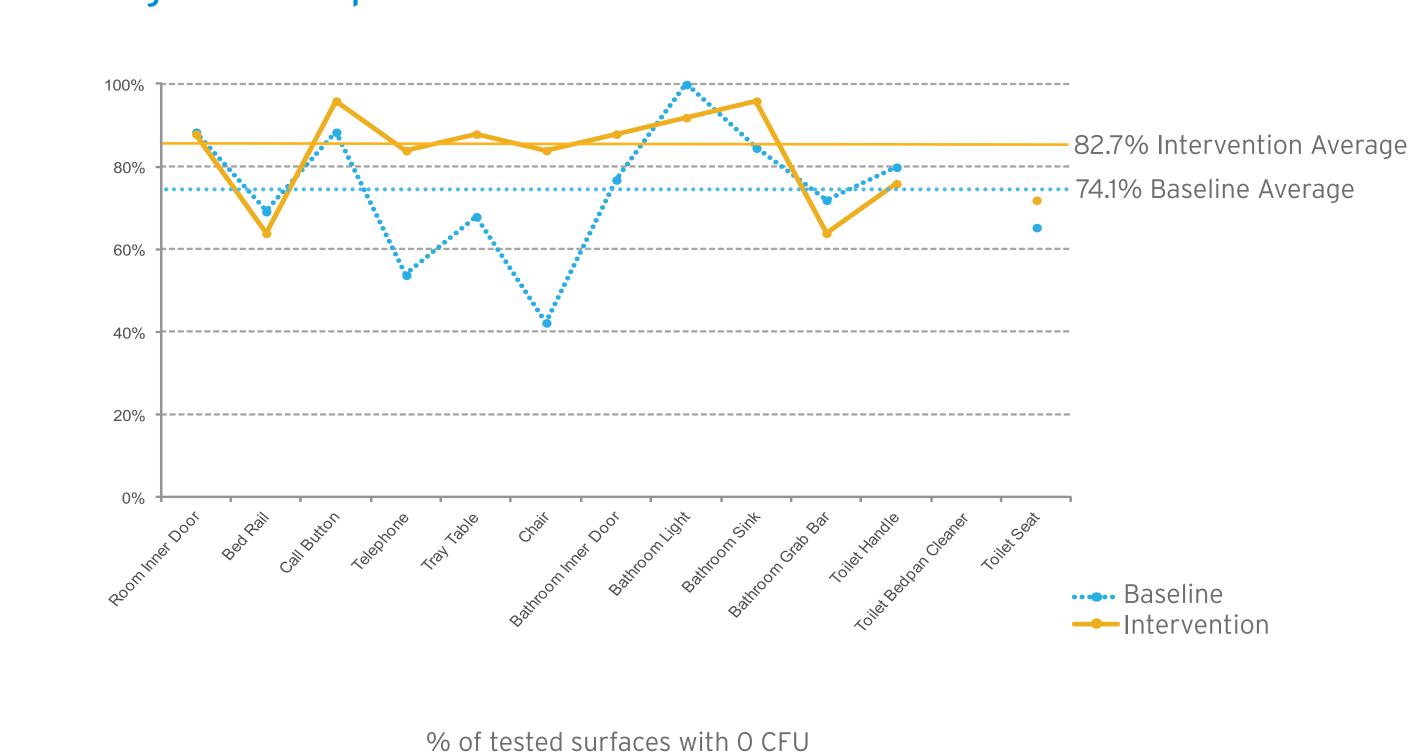


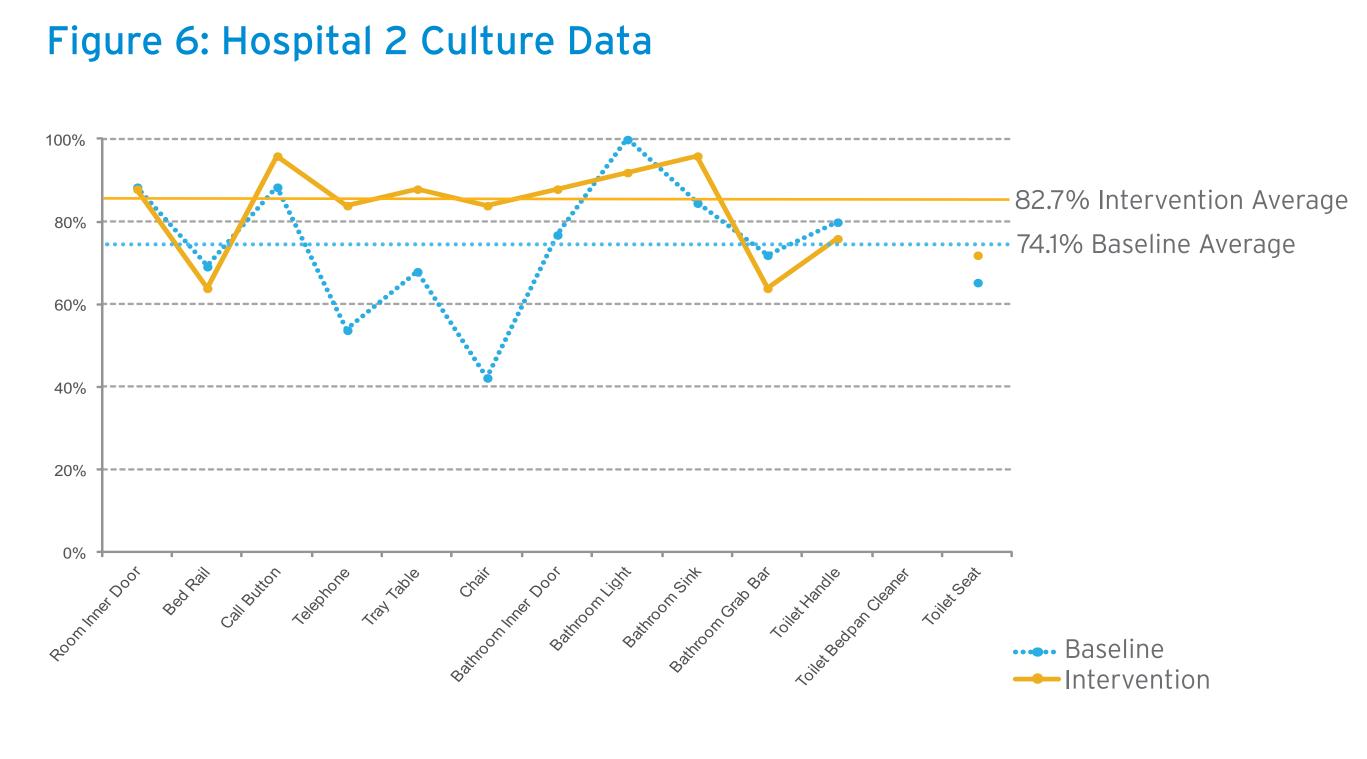
Figure 5: Hospital 2 DAZO Data

% of tested surfaces with DAZO removal



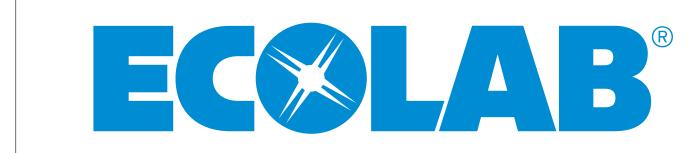


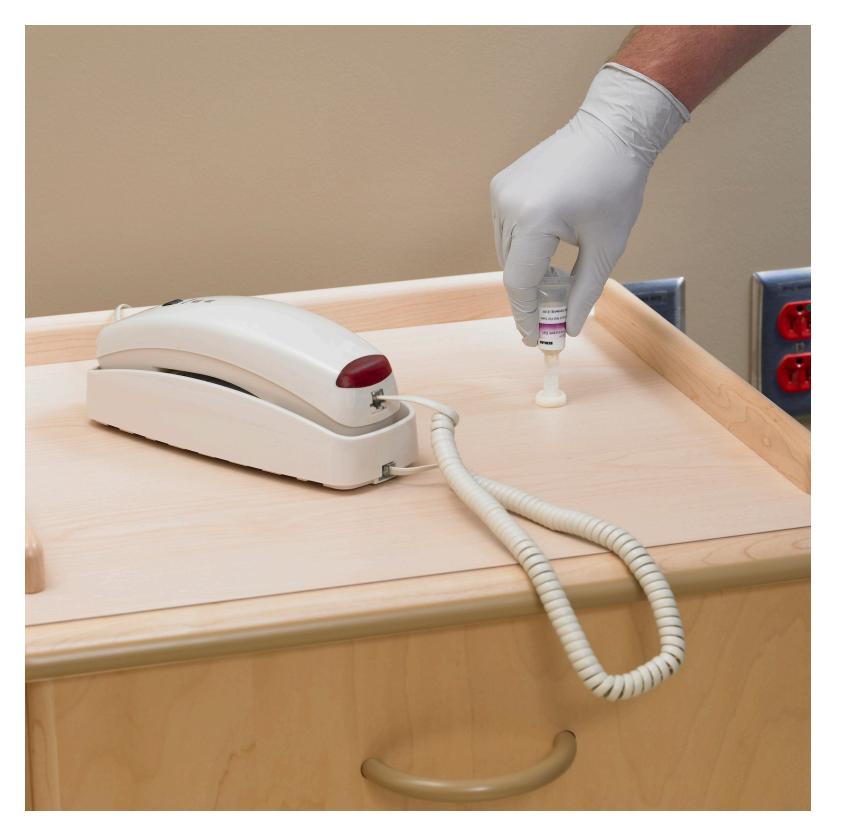




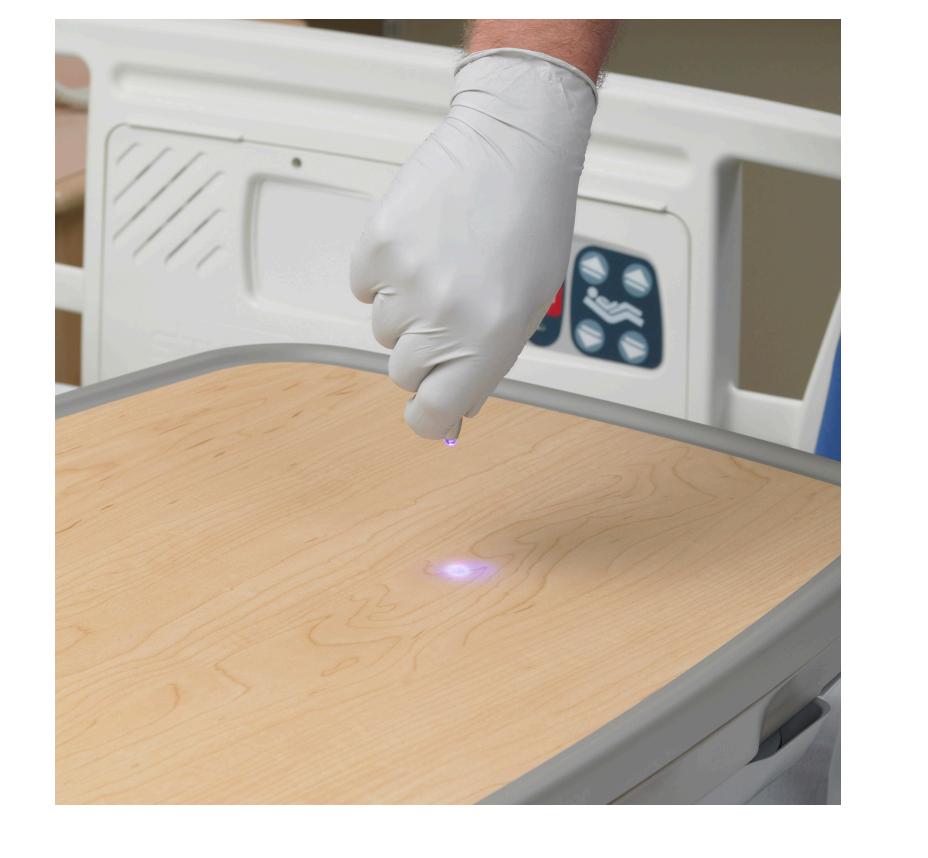














DATA ANALYSIS

For each HTO, the number of dip slides with 0 CFU and complete removal of DAZO were counted for both the baseline and intervention phases. Analysis was conducted to see if there was a significant difference in the proportion of O CFU cultures or complete removal of DAZO between phases. To compare the proportions, Fisher's exact test was used because it gives more accurate results than the chi-square test when sample sizes are small.

### CONCLUSION

The use of the novel peracetic acid/hydrogen peroxide based sporicidal daily-use disinfectant demonstrated a statistically significant reduction in bioburden in the patient environment as compared to the use of a quaternary ammonium based disinfectant in both hospitals as measured by aerobic culture counts via agar dip slides. Cleaning effectiveness, as measured by removal of DAZO marks, did not change significantly, suggesting that the reduction in bioburden was attributable to the introduction of the novel sporicide.



Author/Financial Disclosures: <sup>1</sup>Jennifer Perkins and JoAnn Ferguson are employees of Maple Grove Hospital, Maple Grove, MN <sup>2</sup> Anita Thomasser, Carmen L. Ventrucci, and Erin Brown are employees of Ecolab, Inc., St. Paul, MN