CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY

Name(s)
Gabrielle A. Evey

Project Number
S1506

Project Title
Bothersome Bacteria Encountered in Restaurant Restrooms: Which Surface Is Dirtiest?

Abstract

Objectives/Goals
This science project was created to promote awareness of how much, or how little, bacteria is on common bathroom surfaces. The hypothesis was stated as, if the toilet seat, faucet knobs, and exit door handle are swabbed from a women's public restaurant restroom, then the exit door handle will have the highest amount of bacterial growth in 72 hours.

Methods/Materials
A total of 20 restaurants were swabbed in this project. Before swabbing, nutrient agar was boiled and poured into sterile petri dishes with the use of sterile rubber gloves. Restrooms were swabbed focusing on 3 areas: the toilet seat, faucet knobs, and exit door handle. After swabbing, the bacteria was placed onto the petri dish, sealed with masking tape, and placed into the incubator. The visible amounts of growth were placed into three categories: excessive, moderate, and trace after 24, 48, and 72 hours. Excessive contained large colonies, many colonies, or swarming bacteria with colonies. Moderate contained a number of medium-sized colonies. Trace contained 3-10 small colonies.

Results
After 72 hours: 75% of toilet seats contained excessive growth and 25% with moderate. 30% of faucet knobs contained excessive growth, 30% with moderate, and 40% with trace. 30% of exit door handles contained excessive growth, 30% with moderate, and 40% with trace. Percentages reflect 72 hours of incubation at 98 degrees Fahrenheit.

Conclusions/Discussion
This data did not support the hypothesis. The data shows that toilet seats grew the most bacteria in 72 hours, rather than the exit handles. Strains of E. coli and staph aureus were found in the petri dishes, so in an additional small study, generic antibacterial soap was placed onto the infected petri dishes to see if the soap killed the bacteria. No bacteria was visible on the parts of the petri dishes containing soap, supporting that soap reduces the growth of these bacteria. The spread of infection by these bacteria can be reduced by hand washing with soap and water after touching these common restroom surfaces.

Summary Statement
Toilets seats, faucet knobs, and exit door handles were swabbed to see which grew the most bacteria.

Help Received
Mother drove to collect bacteria and purchased materials; Used lab equipment at Edwards AFB Clinic under the supervision of Gabe Bannerman.