

Effect of Hand Sanitizer Use on Elementary School Absenteeism

Case Study Methods and Protocol

The school districts used in this case study were selected to provide varying geographical locations (Delaware, Ohio, Tennessee, and California) and demographics (city, suburban, and rural). Within each school district, schools were paired based on similarities such as student population and geographical location, and assigned as either product or control schools. When only one school was used, adjacent grades were paired so that the school served as its own control. Control group schools differed from the schools in the product group in that they did not use the hand sanitizer. The control groups were not instructed to wash hands more often than normal to provide the same number of hand hygiene incidences as the treatment groups. Therefore, the only comparison between the groups was the availability/use of hand sanitizer.

For this case study, GOJO provided the test product, PURELL® with Aloe, to the schools in the product group. Product and dispensers were installed by or supervised by GOJO personnel, who also provided training and instruction to the teachers and administrative staff involved in the study. Both 800 mL dispensers, with the 800 mL refill, and 12 oz pump bottles with wall brackets were placed in the classroom. The dispensers were installed next to the door in every classroom for easy access when entering and leaving the room. The 12 oz bottles were mounted in various locations around the classroom for ease of use, and generally placed on the teacher's desk as well. The total amount of product used in each classroom was tracked and documented.

Students were asked to wash their hands as they do everyday, but also use PURELL at certain times during the day, such as before and after lunch, after recesses and after using the restroom. It was very important that the teachers made sure that the students used PURELL consistently. GOJO personnel visited the product schools at least twice during the academic year to reinforce the importance of using hand sanitizer, as well as to collect feedback from the teachers and staff concerning any issues regarding the study.

Students were able to withdraw from the study for medical or personal reasons. Approximately 0.8% (25 out of 3080) of the students did not participate or complete the study. These students were removed from the database containing the relevant absentee data. Absenteeism records were kept by school personnel who identified the reason for the absence. The schools provided the study with the records on absenteeism due to illness. For this study, absenteeism was defined as the aggregate number of non-attending school days due to illness, with illness defined as colds, flu, and gastro-intestinal symptoms. All other absenteeism, such as doctors' appointments, family vacations, broken legs, etc., was excluded.

GOJO received the appropriate absentee data from the schools with no identification to link back to individual students. Absentee record forms were designed by GOJO, and were collected at regular intervals for analysis. One school system was found not to be following the protocol in recording their absenteeism rates. Their data were found to be invalid, and therefore, dropped from the study.

Two types of statistical analyses were performed on the absenteeism data. The first was a simple determination of the percentage decrease in absenteeism. After normalizing the total days absent for the product and control groups to the control group population size, the equation:

$$\% \text{ Reduction in absenteeism} = \frac{(\text{Total Days Absent Control} - \text{Total Days Absent Product})}{\text{Total days Absent Control}} \times 100$$

was used to give the percent reduction of absenteeism in the product schools as compared to the control schools. The second type of analysis was conducted by an independent statistician. Since the data were uniformly distributed and nominal, a non-parametric statistical analysis, a Chi-square 2'2 design, was employed to determine statistical significance of the data.


This case study involved over 6,000 students from four states, five individual school districts and 19 individual schools. Students from kindergarten through sixth grade were enrolled in the study. Table 1 summarizes the demography of the students.

School District	Number of Students	Grades	Number of Students in PURELL Group	Number of Students in Control Group
Cuyahoga Falls, Ohio	2,576	K-5	1,440	1,136
Hudson, Ohio	818	2 and 3	266	552
Wilmington, Delaware	223	3 and 4	110	113
Athens, Tennessee	1,272	K-6	680	592

Irvine, California	1,191	K-5	579	612
Overall	6,080	K-6	3,075	3,005

Results and Discussion

The results of absenteeism were evaluated for individual schools as well as cumulatively. Individual and overall data were provided to an independent expert for statistical analysis. Across all schools, **the overall reduction in absenteeism due to illness was 19.8%** (Table 2) for students using PURELL® as compared to the control. This value is highly statistically significant ($p < 0.0001$).



School District	Percent Difference - Over Control	Statistical Significance
Total	19.76%	Yes
Cuyahoga Falls, Ohio	32.96	Yes
Hudson, Ohio	11.49%	Yes
Wilmington, Delaware	7.87%	No
Athens, Tennessee	19.07%	Yes
Irvine, California	-3.75%	No

When data for the individual schools were analyzed, a statistical difference in absenteeism for the PURELL group was found for three out of five schools. A school in Irvine, California showed more absenteeism (-3.75%) in the PURELL school than in the control. However, this difference was not statistically significant. On the other hand, a school in Wilmington, Delaware showed a 7.87% difference in absenteeism for PURELL group over the control but this result was not statistically significant either.

This case study has demonstrated that elementary school absenteeism due to illness is significantly lower when PURELL, an instant hand sanitizer, is available and used in the classroom. While this was not a formalized clinical study with precisely controlled variables, it points out that hand hygiene is an important parameter for overall health in a school setting. More rigorous and controlled studies are warranted to determine the causality of illnesses in elementary schools.