

Hand Washing In Georgia's Public Schools
A Community Needs Assessment And Intervention Study
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Abstract

Many of Georgia's public schools do not provide soap and paper towels or hand dryers in student restrooms. Even though some schools do provide these supplies, problems such as vandalism by students make it difficult to maintain supplies, thereby preventing consistent and effective hand washing by students. Because hand washing is the single most preventive measure for reducing the spread of contagious diseases and because it is a fundamental personal hygiene practice that is often not done when necessary or is ineffectively done, this study compiles existing information and tools and produces new tools for improving the accessibility and practice of hand washing in schools. This study does this by assessing the availability of hand washing supplies, problems maintaining these supplies and education provided to promote hand washing by students in Georgia's public schools. This study also provides and tests interventions in a sample community of students in three schools for three months. The results include (a) two training outlines: one for elementary level students and another for middle and high school students, (b) hand washing posters for reminding students to wash their hands, (c) a training video for promoting hand washing among students, and (d) recommendations for controlling maintenance of hand washing supplies and providing ongoing education to promote effective hand washing among students.

Dedication



William Doyal Fields
1923 - 1999

I am proud to dedicate this study in memory of my father, William Doyal Fields.

A farm boy... World War II Navy Veteran...

Graduate of the University of Georgia... Pharmacist.

In words and actions, my father taught me to do my best.

On several occasions, he talked to me about getting a Master's Degree.

It was the last thing we talked about before he died.

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Hand Washing In Georgia's Public Schools

A Community Needs Assessment And Intervention Study

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Introduction

Many of Georgia's public schools do not provide soap and paper towels or hand blow dryers in student restrooms. Even though some schools do provide these supplies, problems such as vandalism by students make it difficult to maintain supplies, thereby preventing consistent and effective hand washing by students.

Hand washing is the single most preventive measure for reducing the spread of contagious diseases. In foodborne illness investigations, poor hand washing has been found to be the second highest contributing factor, second only to food temperature control. While a fundamental personal hygiene practice, hand washing is often not done when necessary or is ineffectively done. Hand washing is a learned behavior. To be effective, proper hand washing must be learned, preferably as a child, so that it becomes a routine habit throughout life.

Goals

1. To provide information to the Georgia Department of Education to facilitate the increase in number of public schools that maintain hand washing supplies in student restrooms.
2. To provide the educational tools necessary to the Georgia Department of Education to increase the number of students who wash their hands correctly.

Objectives

1. To gather information from published studies that document the importance of hand washing to public health.
2. To assess the current needs regarding hand washing in all public schools in Georgia.

3. To identify successful ways to control vandalism and other problems occurring when hand washing supplies are placed in restrooms.
4. To find or develop educational tools that will assist students in developing the habit of proper hand washing early in life so that they will continue this habit throughout life (Appendix A).
5. To share the final report and video resulting from this study with the Georgia Department of Education.

Definition of Terms

"Community" means the total population of all students enrolled in Georgia's public schools.

"Sample Community" means the sample population of students in the Whitfield County School System, including all students in one elementary school, grades kindergarten through fifth, and two middle schools, grades sixth through eighth.

"Elementary School" means the elementary school attended by a portion of the sample population and that participated in both the assessment and intervention portions of the study.

"Middle School A" means the middle school attended by a portion of the sample population and that participated in both the assessment and intervention portions of the study. Specifically, this middle school participated in training provided to sixth grade Science students and other interventions.

"Middle School B" means the middle school attended by a portion of the sample population and that participated in both the assessment and intervention portions of the

study. Specifically, this middle school participated in training provided to P.E./Health students and other interventions.

Literature Review

Why is hand washing important?

One hundred and fifty years ago, a physician named Ignaz Semmelweis who worked in the maternity ward of the Vienna Lying-in Hospital, hypothesized that disinfection of hands could stop transmission of disease from cadavers to pregnant women. Mortality rates of women delivered by the medical students fell to the same level as those of women delivered by the midwife trainees when the medical students' hands were soaked in chlorinated lime after autopsies and before examining patients. Semmelweis had recognized that puerperal fever was being spread by contaminated hands (Hospital Epidemiology Service, 2002).

"Hand washing, when done correctly, is the single most effective way to prevent the spread of communicable diseases. Good hand washing technique is easy to learn and can significantly reduce the spread of infectious diseases in both children and adults" (Utah Dept. of Health, 1996).

"Hand washing with warm water and soap can greatly reduce the chances of spreading or getting germs. The mechanical action of scrubbing loosens up the dirt and microbes on our hands and the soap picks them up and binds to them so that the water can wash them away" (American Society for Microbiology, 2002).

Some microorganisms are not found consistently on the skin of most persons and are considered to be "transient flora" or "noncolonizing flora." Such flora can be readily transmitted by the hands unless removed by mechanical friction and soap and water washing or destroyed by the application of an antiseptic handrub. An example of a

microorganism that is considered noncolonizing flora is the gram-negative bacteria, *Escherichia coli* (Larson, 1995).

In addition to transient flora being on hands, there is also "resident flora" also called, "colonizing flora." These microorganisms are considered permanent residents of the skin on most people and are not readily removed by mechanical friction. General hand washing with plain soap and water removes the transient flora, but does not remove or kill most of the resident flora on hands (Larson, 1995).

"For more than a century hand washing has been a universally accepted practice to reduce contact transmission of microorganisms. It is recognized as one of the few infection control practices with clearly demonstrated efficacy and remains the cornerstone of efforts to reduce risk of infection" (Larson, 1988, p. 28).

History and Cleaning Effects of Soap

Soap or other cleaning substances have been around for a long time. Archeological findings during the excavation of ancient Babylon revealed a soap-like material in clay cylinders. Inscriptions on the cylinders indicate that fats were boiled with ashes, which is a method of making soap. Likewise, medical documents from about 1500 B.C. say that Egyptians combined animal and vegetable oils with alkaline salts to form a soap-like material used for treating skin diseases, as well as for washing (The Soap and Detergent Association, 2002).

In the Bible, Moses gave the Israelites detailed laws concerning personal cleanliness. He also related cleanliness to health and religious purification. People were instructed to wash their clothes and bathe in water (The Nelson Study Bible, 1997).

Soap got its name, according to an ancient Roman legend, from Mount Sapo. Animals were sacrificed on this mountain and rain would wash the mixture of melted animal fat and wood ashes down into the clay soil along the Tiber River. Women found that this clay mixture made their wash cleaner with much less effort (The Soap and Detergent Association, 2002).

The famous Roman baths were built about 312 B.C. By the second century A.D., the Greek physician, Galen, recommended soap for both medicinal and cleansing purposes (The Soap and Detergent Association, 2002).

After the fall of Rome in 467 A.D., declining bathing habits had an affect on public health. The great plagues of the Middle Ages and the Black Death of the 14th century can be attributed heavily to lack of personal cleanliness. It wasn't until the 17th century that cleanliness and bathing started to come back into fashion in much of Europe (The Soap and Detergent Association, 2002).

Soap works by reducing surface tension so that water can spread and wet surfaces. Soap, working as a surfactant, loosens and holds soil in suspension until it can be rinsed away (Soap and Detergent Association, 2002).

Soaps are water-soluble or potassium salts of fatty acids. Soaps are made from fats and oils, or their fatty acids, by treating them chemically with a strong alkali (The Soap and Detergent Association, 2002).

There are many different brands of soap on the market today in solid bar soaps, gels, liquid soaps and heavy duty hand cleaners. These products get their cleaning action from soap, other surfactants or a combination of the two. The choice of cleaning agent

helps determine the product's lathering characteristics, feel on the skin and rinsability (The Soap and Detergent Association, 2002).

Liquid soaps are formulated for cleaning the hands or body, and feature skin conditioners. Some contain antimicrobial agents that kill or inhibit bacteria that can cause odor or disease. Heavy duty hand cleaners are available as bars, liquids, powders and pastes. These cleaners are formulated for removing stubborn, greasy dirt and may include an abrasive (The Soap and Detergent Association, 2002).

An evaluation of the cleansing properties of soap was done in 1996 using a fat based ointment to emulate "dirt." The washing process was performed by placing the examined hand in a rotating soap solution for 5 minutes. The capacity of various soaps to remove the "dirt" was assessed by comparing the sebumeter readings before and after the washing process. The difference between the two readings provided a quantitative estimate of the percentage of "dirt" (ointment) that was washed off during the process (Wolf and Friedman, 1996).

Wolf and Friedman (1996) compared the cleaning capacity of two soaps to that of water. Soap #1 showed a cleansing of $81.7 \pm 2.4\%$, soap #2 a cleansing of $75.3 \pm 2.9\%$, as compared to water of $29.7 \pm 3.4\%$. The difference between the cleaning activity of the two soaps tested was statistically significant ($P < 0.0001$). It is interesting to note that the conclusions from this study indicate that while both soaps clean better than using water alone, the more effective a soap is in its cleansing properties, the more it tends to dry the skin. A gentle soap that neither dries nor irritates the skin, has an inferior cleansing capacity (Wolf and Friedman, 1996).

Effective Hand Washing

The 2001 U.S. Food and Drug Administration (FDA) Food Code describes hand washing as:

1. Vigorous friction on the surfaces of the lathered fingers, finger tips, areas between the fingers, hands and arms for at least 10 to 15 seconds, followed by;
2. Thorough rinsing under clean, running warm water; and
3. Immediately follow the cleaning procedure with thorough drying of cleaned hands and arms using individual disposable towels, a continuous towel system that supplies the user with a clean towel, or a heated air drying device (U.S. Public Health Service, 2001).

Several sources, including the Utah Department of Health (2001) add to the above procedures to let the rinse water run back into the sink, not down to the elbows and then turn off the water with a paper towel and dispose in a proper receptacle.

Drying Hands

Drying hands properly after washing is important for several reasons: (a) Proper drying helps prevent hands from chapping, (b) recontamination is reduced because damp hands can pick up more bacteria and viruses than dry hands, and (c) the drying process further removes bacteria and viruses.

Few studies have been done concerning the effectiveness of different drying agents to further reduce bacterial and viral loads. One study conducted in Canada, compared unbleached paper roll towels with cloth towels and no-touch electric air dryers.

Hands of 4 groups of subjects were washed in water alone, rinsed with ethanol and allowed to air dry. The fingers were then inoculated with an E. coli and rotavirus

suspension and allowed to dry for 20 minutes. One of 4 hand washing agents was then applied to the finger pads for 10 seconds. The 4 hand washing agents used were (a) isopropanol (70% v/v), (b) 1:200 aqueous solution of a medicated liquid soap containing 15% (w/v) cetrimide (quaternary ammonium) and 1.5% (w/v) chlorhexidine gluconate, (c) unmedicated liquid soap, and (d) tap water.

Drying of the fingers was accomplished by applying pressure only to either the paper towels or cloth towels for 10 seconds or by holding the fingers under the air dryer for 10 seconds.

The results found that no matter what the hand washing agent was, there was a higher reduction of contamination with using warm air drying than using either paper or cloth towels. Likewise, there was a higher reduction of contamination with the use of paper towels than with the use of cloth towels. The study also showed that all handwashing agents were more effective against *E. coli* than the rotavirus. Furthermore, tap water alone was found to be nearly as effective a liquid soap in the removal of both test organisms (Ansari, Springthorpe, Sattar, Tostowaryk, Wells, 1991).

It must be noted that in the study described, there was only applied pressure and no mechanical friction of either the hand washing agent or the drying agent. Other studies in this literature review have indicated the importance of mechanical friction in removal of transient microorganisms.

Snyder (2002) says that blow dryers should not be used because (a) many individuals do not dry their hands thoroughly when using a blow dryer, but finish drying their hands on their clothes, picking up more bacteria, and (b) blow dryers can actually deposit pathogenic bacteria on the hands that have accumulated from toilet aerosols.

Who Washes Their Hands?

Hand washing is recognized by the Centers for Disease Control and Prevention (CDC) as one of the most important means of preventing germs from spreading. CDC recommends washing hands with soap and water for at least 15 seconds (The Soap and Detergent Association, 2002).

The 2001 Soap and Detergent Association National Cleaning Survey was performed by Opinion Research Corporation International and was based on telephone interviews using a national sample of 1013 adult Americans, 18 years and older. The survey found that 40% of American employees don't wash their hands for at least 15 seconds and 40% of American workers don't wash their hands often enough (At least 5 times daily) (The Soap and Detergent Association, 2002).

The survey also found that encouragement to wash hands seems to help remind and increase numbers of persons who wash their hands. In the survey, it was found that 58% of American employers don't post hand washing reminder signs in bathrooms and kitchens. Seventy three percent (73%) of offices and customer service facilities and 74% of maintenance and construction operations do not post signs to remind their employees to wash their hands. In these same work places, 65% of maintenance and construction workers and 47% of office and customer service workers don't wash their hands often enough. Approximately 50% of maintenance and construction workers don't wash their hands long enough (The Soap and Detergent Association, 2002).

In comparison, when employers post hand washing signs, 72% of workers wash their hands five or more times a day. Eighty eight percent (88%) of food service facilities and 67% of medical facilities post signs encouraging employee hand washing. Eighty six

percent (86%) of medical employees and 68% of food service employees wash their hands five or more times a day. Sixty nine percent (69%) of medical employees and 76% of food service employees wash their hands for 15 seconds or more (The Soap and Detergent Association, 2002).

The findings of the survey indicate that employers could be doing more to encourage hand washing. Ninety three percent (93%) of employers keep their bathrooms and washrooms stocked with soap and towels. However, only 41% post hand washing reminders. Giving encouragement to wash hands by posting reminder signs increases compliance (The Soap and Detergent Association, 2002).

In another study, Wirthlin Worldwide, an international research firm, conducted a Hand Washing Observational and Telephone Survey in August 1996 for the Bayer Corporation Pharmaceutical Division, in association with the American Society for Microbiology (FDA Center for Food Safety and Applied Nutrition, 1999).

The findings include:

1. People do not wash their hands as often as they think they do. While the telephone survey indicated that 94% of respondents (1004 adults) claimed they always wash up after using the restroom, the observational survey found that out of 6333 adults in public restrooms in New York, Chicago, Atlanta, New Orleans and San Francisco (3236 males and 3097 females), only 68%, in fact, did wash their hands.

2. Women wash their hands more often than men (74% versus 61%).

3. The telephone survey questioned people as to when they washed their hands. Seventy-eight percent said they washed their hands after changing a diaper. Eighty-one percent said they washed their hands before handling or eating food (81%). However,

only 48% indicated they washed their hands after petting an animal, 33% after coughing or sneezing and 22% after handling money (FDA Center for Food Safety and Applied Nutrition, 1999).

Hand Washing Studies in Schools and Institutions

1. Hand Washing Makes a Difference. The nursing staff of Glenrose Rehabilitation Hospital, Pediatric Daypatient Program in Edmonton, Alberta planned and implemented a pilot program for first grade students after noticing that children with physical and sensory handicapped conditions seemed to have a higher frequency of colds, influenza and other infections, causing them to be absent or to seek medical assistance more than the average school-aged child (Monsma, Day, and St. Arnaud, 1992).

The program's goal was to decrease student absenteeism and illness rates. The objectives were (a) students would know how and when to wash their hands, and (b) students would understand the relationship between germs, hand washing and wellness. A four week program was planned in collaboration with first grade teachers who agreed to allow for instructional time and support program objectives (Monsma et al., 1992).

The role of the nursing staff was to develop a workbook to reinforce the objectives, teach the content, act as role models, and reward appropriate behavior. The concept of rewards to reinforce positive behavior was adapted from the "Scrubby Bear Handwashing Program," available through the American Red Cross (Monsma et al., 1992).

Two independent evaluators were trained to use an observational checklist developed by the nursing staff. This checklist was used to evaluate hand washing skills and behaviors, including washing hands on the front, back, sides, thumb, and between

fingers for 30 seconds, using soap and warm water, and turning taps off with a towel.

Children were observed prior to the program, immediately after, and one, three, and six months following the program (Monsma et al., 1992).

Overall, the program was successful. Children in the program made 25% fewer visits to the physician, used 86% fewer medications, and were absent 22% less often than the previous year. In addition, the children reminded each other to wash their hands after sneezing, before doing a procedure, or handling food. Some parents reported the children were teaching their siblings how and when to wash their hands (Monsma et al., 1992).

Children in the program were rewarded with stickers, hands stamps, etc. consistently each time they washed their hands correctly. Results showed that 32% washed hands correctly prior to teaching, 65% at one month post-teaching, and 70% at three months post-teaching. The rewards were discontinued after three months to see if children would continue washing their hands correctly. Results at six months were disappointing. Only 57% of the children washed their hands correctly (Monsma et al., 1992).

An evaluation of the program indicated that children were inconsistent in how and when to wash their hands. It was found that children linked rewards to the technique only. Their cue for hand washing had become the presence of the nurse or evaluator rather than the fact that their hands were contaminated. This led to revising the program to suggest 10 seconds of hand washing rather than 30 seconds as is more commonly suggested in literature. A skit presented by members of the nursing staff was eliminated and the workbook was revised to have larger print and to present only one concept per page. The content of the workbook was rewritten to correlate more closely with the

when, why, and how of hand washing. Concerns that training over a four week time period was too long led to revising the program to present the theory and the experiment with Agar plates in one 20-minute session and to give intermittent rewards throughout the school year as a method of consolidating the children's knowledge, maintaining their technique, and increasing their motivation (Monsma et al., 1992).

2. Effects of several interventions on the frequency of hand washing among elementary public school children. The purpose of this study was to assess the effect of several interventions on the frequency of hand washing among elementary public school children. Participants were first grade and fourth grade students from six schools in Rockville and Bethesda, Maryland, Washington, D.C. and Falls Church, Virginia (Early, Battle, Cantwell, English, Lavin, and Larson, 1999).

Phase I of the study assessed bathroom cleanliness and adequacy of supplies for hand washing in each school. The six schools were visited on two separate occasions in the early morning, before normal operating hours. The bathrooms were observed for general tidiness (eg. absence of paper on the floor), running water in sinks, availability and type of soap, availability of paper towels or not air dryers, and functioning toilets or urinals (Early et al., 1999).

Phase II of the study was an observation of frequency of hand washing before lunch or after bathroom use. Observations were made in the bathrooms of each participating school by trained members of the project team. Both hallway and classroom bathrooms were observed. Observations were made at three time intervals: before beginning any intervention, and then from 2 to 3 weeks, and from 3 to 6 weeks after the intervention. The average observation time was 2 to 3 hours per observation period or 10

to 15 hours per school. The goal was to observe a minimum of 60 opportunities for hand washing during each time period although this was not always achieved. Because all observers were women, only girls in the hallway bathrooms were observed. In classroom bathrooms, however, both boys and girls were observed (Early et al., 1999).

Four hand washing interventions were tested in five schools. The interventions included: a peer educational program (2 schools), introduction of hand wipes with an instructional poster in bathrooms (1 school), a combination of the educational program and hand wipes (1 school), and a comparison school that had no intervention but hand washing was observed (Early et al., 1999).

The peer educational training consisted of teaching fourth grade students about "germs" and when, why and how to wash hands. Training materials used, included a video of a clown demonstrating how to wash hands, storyboards, overheads, and posters. Training on how to use various teaching techniques for first graders was also given so that selected fourth graders could then teach the first graders (Early et al., 1999).

Hand wipes impregnated with alcohol, a lemon fragrance, and an emollient were made available in one school, and students were instructed how to use the hand wipes with a large poster mounted in the bathrooms (Early et al., 1999).

Both peer education and hand wipes were used in one school (Early et al., 1999).

Findings in phase II showed that for the entire study group, hand washing overall occurred 58% of the time at the baseline and 67% of the time after intervention. During the baseline phase before intervention, significant differences in the proportion of hand washing between the four intervention groups existed. In the control school, hand washing occurred 42% of the time; wipes only, 50%; education only, 64%; and education

and wipes, 45% ($p < 0.01$). After intervention, significant differences in the proportion of hand washing between the four intervention groups also existed. In the control school, hand washing occurred 46% of the time; wipes only, 66%; education only, 73%; and education and wipes, 67% ($p < 0.01$). In the education only group, hand washing frequency decreased during the last 3 weeks when compared with the first 3 weeks post-intervention ($p = 0.006$); frequency of hand washing was unchanged over time in the wipes group ($p = 0.96$); and increased in both the control ($p = 0.01$) and the education and wipes groups ($p = 0.003$) (Early et al., 1999).

There were several things that may have hindered the outcome of this study. Observation times had to conform to public school schedules; each school was scheduled for comparable hours of observation. However, the actual number of pre-intervention observations for the control, wipes, and education and wipes groups were not equal. Because there were no male observers, only girls were observed in hall bathrooms. In addition, there were problems with keeping enough supplies in the bathrooms including the hand wipes and soap. A hand wash was counted as long as the student used at least running water or a hand wipe. Finally, participating teachers cited lack of time in the school day to reinforce hand washing behavior or even to provide opportunity for students to wash their hands. (Early et al., 1999)

Conclusions were drawn as follows: (a) Education combined with accessible, convenient hand hygiene products may result in a sustainable increase in the frequency of hand washing among elementary school children; and (b) equipment and supplies for hand hygiene in schools should be designed for durability to prevent tampering or pilfering. It was also suggested that schools, through coordinated comprehensive school

health programs, develop standard policies and procedures to facilitate collaboration with other agencies or individuals to conduct potentially useful community-based projects in order to extend and confirm these and other findings (Early et al., 1999).

"Community-based research is complex, presenting both administrative and feasibility challenges. A major administrative challenge in this study was the lack of a clear, identifiable decision-making procedure or authority within or among school districts. Although uniform enthusiasm for the project existed among school officials and teachers, it took months to negotiate through various school systems. Once schools within a district were identified for participation, the contacts within the schools ranged from principals, classroom teachers, health educators, to school nurses. The contacts' willingness and ability to facilitate the project varied considerable. Additionally, certain schools were willing to participate only in selected interventions, and this hindered the random assignment of schools to the intervention groups" (Early et al, 1999, p. 267).

3. Scheduled Hand Washing in an Elementary School Population. The purpose of this study was to evaluate the effect of a mandatory, scheduled hand washing program in elementary school children on absenteeism due to acute communicable illness. About half the students (n = 143) in grades 1 - 5 at Trombley Elementary School in Grosse Pointe Park, Michigan made up the intervention or hand washing group. The rest of the students (n = 162), the control group, continued hand washing practices as usual. (Master, Longe, and Dickson, 1997)

Three weeks before the study started, proper hand washing technique was demonstrated to all students at Trombley Elementary and the germ theory was discussed. (Master et al., 1997)

The hand washing intervention group was required by their teachers to wash their hands after arrival at school, before eating lunch, after lunch recess, and before going home. At these times the whole class would be instructed to go to the restroom by the teacher. Children were told that these hand washings were meant to be in addition to their usual hand washing at other times like after toileting. Hand washing for each individual student was not monitored and nonscheduled hand washings were not quantified. Every two weeks during the study period, a guest lecturer was provided for the hand washing group to talk about different health related topics. (Master et al., 1997)

The frequency of hand washing in the control group was not monitored or quantified. There was no prompting by teachers to wash hands. (Master et al., 1997)

Children in both the hand washing and the control groups used the regular school soap. The soap was not antibacterial. Those conducting the study provided Eucerin lotion to use for dry skin after washing. (Master et al., 1997)

4. Hand washing Practices Among Various School Age Students. This study was conducted to answer the question: Is hand washing after bathroom use a universal practice among various school age students (Pete, 1996)?

The students participating in the study were from four different school age groups: elementary, middle, high school, and university students. Twenty-five males and twenty-five females were observed in each age group for the presence or absence of hand washing after using bathroom facilities. A total of 200 students were observed (Pete, 1996).

Inconspicuous monitors for school bathrooms were selected for each age group from willing teachers and guidance counselors. Their job was to observe whether

students washed their hands or not after using the bathroom facilities. Specifically, monitors were to choose a bathroom in which all sinks were in working order and select a timeframe in which they could observe students for hand washing practices. They were asked to observe the first 25 students who used the bathroom during that time period (Pete, 1996).

For the elementary school, it was found that hand washing was pretty important. The teachers of each class routinely lined up the students and accompanied them to the bathrooms, instructing them to use the bathroom and wash their hands afterwards. Therefore, all students who were observed in the elementary school, washed their hands (Pete, 1996).

The middle school where students were observed was also one in which the students had previously attended the elementary school where students were observed. Since, as elementary students, they had been required to wash their hands, would they still do so in middle school where they were unsupervised in the bathrooms? When observed, only 12 out of 25 females (48%) washed their hands and only 8 out of 25 males (32%) washed their hands (Pete, 1996).

Observations in high school found worse hand washing practices. Only 8 out of 25 females (32%) and 2 out of 25 males (8%) washed their hands (Pete, 1996).

Hand washing practices were a little better at the university level. Fifteen out of 25 females (60%) and 13 out of 25 males (52%) washed their hands after using the bathroom (Pete, 1996).

Several things were observed during this study that may have impeded hand washing among students. Two bathrooms in the high school could not be used for

observations because either there were no handles on the faucets or there was no running water. In one school, bathroom breaks were allowed only after lunch. Students were escorted to the bathrooms, but were not allowed to wash hands in the bathrooms. The students had to wash them later in the classrooms. The interesting thing was that there was no sink in one of the classrooms. In another school where there were no paper towels, the remark was made that "paper towels are saved for teachers and guests!" At the middle school, students had very little time to use the bathroom and make it to class on time. In the high school, students complained that they rushed in the bathrooms as fast as they could because of the thick cigarette smoke (Pete, 1996).

Implications made in this study include the fact that parents should continue to encourage hand washing after their children leave elementary school. School administrations must assure that bathroom facilities are in working order and that supplies are available. Health care providers must work more closely with school officials and parents in developing and implementing programs that will inform students in all age groups of the importance of basic health promotion measures, including hand washing (Pete, 1996).

Foodborne Illness Outbreaks Contributed to by Inadequate Hand Washing

An estimated 76 million illnesses, 325,000 hospitalizations, and 5,000 deaths are attributable to foodborne illness in the United States each year (Mead, Slutsker, Dietz, McCaig, Bresee, Shapiro, Griffin, & Tauxe, 2002). The estimated cost of foodborne illness is \$10 - \$83 billion annually (U.S. Public Health Service, 2001).

Investigations of foodborne illness outbreaks have shown that poor personal hygiene, primarily ineffective hand washing, is an important contributor to foodborne illness, second only to inadequate temperature controls of food.

Many pathogenic bacteria and viruses establish themselves in a host by way of the fecal-oral route, meaning these bacteria and viruses are shed from the body in feces and then contaminate new hosts when feces contaminated objects, food, water, fingers, etc., are placed in the mouth.

There are many foodborne illnesses that have been caused by ineffective hand washing. In February 2000, an outbreak of Norwalk-like virus infections associated with decorated cakes from a grocery store bakery in Gwinnett County, Georgia resulted in at least 113 persons becoming ill. The investigation concluded that contamination of the "simple syrup" used in the final mixing of the frosting by a bakery decorator was how the Norwalk-like virus got into the frosting. During an interview, the bakery decorator said she became ill on Friday evening before coming to work at 5:00 AM on Saturday. However, she also said that she did not have symptoms of diarrhea until after leaving work at 3:30 PM. Upon observing the procedure for adding the "simple syrup" to the frosting, it was suspected that the bakery decorator who did not wear gloves, did not wash her hands properly after using the restroom and subsequently contaminated the cake frosting by dredging dirty fingers and long finger nails in the simple syrup when it was dipped to put into the frosting (Tomashek, Scarborough, Schuitema, Hinton, 2000).

A report from the Centers for Disease Control and Prevention (CDC) by LeBaron, Furntan, Lew, Allen, Gouvea and Mac (1990) indicates that hands may be the most important means by which enteric viruses are transmitted.

In a review of published foodborne illness outbreaks occurring from 1975-1998 by Guzewich and Ross (1999), 81 foodborne outbreaks were believed to have resulted from contamination of food by a food worker. A total of 14,712 persons were affected with outbreaks ranging in size from 5 to 3,175 persons. Three percent (440) of these persons required hospitalization and 2 persons died. Note that published foodborne illness outbreaks only represent a small percentage of foodborne illness outbreaks so there were probably many more persons sick as a result of contamination by food service workers.

Alternatives to Hand Washing - Antibacterial Soaps and Hand Sanitizers

Many different brands of soaps, plain and antibacterial, and hand sanitizers are available on the market. One is faced with questions about which product is the best to use. Plain soap, as previously mentioned in this literature review, has no antimicrobial action, but serves to help lift off noncolonizing flora from the hands through mechanical action. Antibacterial soaps also help lift off noncolonizing flora, but go a step further by actually killing viable bacteria on the skin (Larson, 1988).

There is a misnomer that the antiseptic found in antibacterial soaps and regulated by the U.S. Food and Drug Administration, causes damage to the skin. Drying of the skin is caused by the detergent base that is also found in plain soaps (Larson, 1988).

Antiseptic ingredients found in antibacterial soaps may include (a) alcohols which denature proteins; (b) chlorhexidine gluconate which causes disruption of microbial cell membranes and precipitation of cell contents; (c) hexachlorophene which also disrupts microbial cell walls and precipitation of cell proteins; (d) iodine/iodophors which penetrate cell walls, oxidize and substitute microbial contents with free chlorine; (e) para-

chloro-meta-xyleneol which disrupts microbial cell walls and causes enzyme inactivation; and (f) triclosan which disrupts microbial cell walls (Larson, 1988, Dec.).

The choice of plain soap over antibacterial soap should be decided, based on whether it is important to actually reduce and kill the bacterial load on the hands or to just reduce the number of bacteria, viruses, etc. (Larson, 1988, Dec.).

Alcohol has a broad spectrum, fast-acting effectiveness in killing microorganisms. Alcohol based hand sanitizers, usually 60 to 90% ethyl or isopropyl, kill both the resident and transient microorganisms on the skin surface. However, the alcohol has a drying effect because it removes surface oils from the skin (Snyder, 2002).

Several studies have been done to evaluate the effectiveness of hand sanitizers. Most of these studies have been done in hospital and other institutional settings where hand sanitizers, if effective, can save time over a long hand washing procedure. In one study using a moisturizing (60% ethyl alcohol) hand gel that incorporated a lotion to protect skin from drying, effectiveness was demonstrated against high levels of hand contamination of transient, antibiotic-resistant pathogens. The moisturizing hand gel met the 2.0 log₁₀ reduction benchmark after a single wash and the 3.0 log₁₀ reduction after 10 washes as proposed in the U.S. Food and Drug Administration requirements for health care personnel hand washes (Jones, Jampani, Mulberry, Rizer, 2000).

However, in another study where hand sanitizers were applied to clean hands, the result was a significant increase in bacterial numbers on the surface of the hands. This seems odd, given the fact that in-vitro tests using hand sanitizers indicate as much as a 99.9% effective kill rate for a wide range of microorganisms, including *S. aureus*, *Salmonella chloeruesuis*, *E.coli*, *Bacillus cireus*, and *Listeria monocytogenes*. However,

these tests are performed on nonporous surfaces rather than human skin which is composed of multiple layers with bacteria attached to the pores of each layer. It was pointed out in the study that the drying effect of the alcohol in the hand sanitizer products may actually pull the bacteria residing in the various skin layers to the surface. Since there is no rinsing of the hands after applying the hand sanitizer, there is no mechanical washing away of the bacteria that has been drawn to the skin surface (Miller, James-Davis, Milanese, 1994).

In the same study by Miller, et al., it was pointed out that frequent, continual use of instant hand sanitizer may eventually have an overall effect of sustaining low bacterial populations on the surface of the hands, but frequent use might also cause cracking and chapping, thus providing increased surface area for harboring bacteria.

Alcohols are not cleaning agents, therefore they are not recommended for use in the presence of physical dirt (Larson, 1995).

Snyder (2002) agrees that alcohols, usually 60 to 90% ethyl or isopropyl, kill the resident and transient microorganisms on the skin surface. However, they do not kill fecal microorganisms completely. Studies by Snyder have shown that soap and water give as much or more reduction in hand microorganisms as alcohol.

Hand Washing Education

Several studies in the literature review have indicated the benefit of hand washing education in increasing the effectiveness of hand washing. However, some studies like that of Pete (1986) noted that the effects of hand washing education were not sustained over time.

Knowing that school attendance is critical to education, a school nurse in a Chicago middle to upperclass school, conducted a hand washing program that consisted of surveying teachers, inspecting hand washing facilities, and providing classroom presentations and follow-up activities. The absenteeism rate of classes participating in this program was compared with that of classes not participating, before and after the program was conducted. Prior to the program, there was no significant difference in absenteeism. However, during December/January, after the program had been conducted, absenteeism was significantly higher among non-participants. Percentages of students absent because of flu-like illness in non-participating classes were approximately double that of participating classes. In February, when flu season peaked, absenteeism rates were also compared, but did not show any significant difference between participants and non-participants in the program. This indicated perhaps that the effect of the hand washing program was not sustained (Kimel, 1996)

Why Warm Water is Desirable

In the Chicago school where the study by Kimel (1996) was conducted, like many schools, had no hot water available in student restrooms. The Ivory Handwashing Education Program, 1987, as cited by Kimel (1996) in discussing the most effective techniques for hand washing, notes that while warm water is not essential to removing organisms, it does make hand washing easier.

In North Georgia, during January/February 2002, cold water temperatures were measured to reach as low as 54°F. Water at this temperature is uncomfortable to hands and can therefore discourage effective hand washing.

State Laws, Advocacy and Proposed Legislation

Some states have made laws that require hand washing supplies and other items to be supplied in school restrooms. Florida's code (64E-13) requires mechanical ventilation for toilet rooms, shower and locker rooms. This code also requires partitions between toilets with doors on each compartment. Liquid or powdered soap in soap dispensers are required at hand sinks and individual towels, preferable paper, or hot air hand drying devices are also required. Heated water $\leq 110^{\circ}\text{F}$ is required at showers only (Florida Law, schools, 2002).

Rules in North Carolina do not require heated water in student restrooms, but do require soap and towels (North Carolina Rules).

In South Carolina, similar rules are in place that require toilet tissue, soap and approved towels or electric hand dryers. Heated water is only required in all gymnasium showers and must also be available at lavatories in new school gymnasiums (DHEC Sanitation of Schools, Regulation 61-42).

Mr. Tom Keating, a veteran educator and former Decatur, Georgia school board member, is an advocate for clean and sanitary student restrooms in schools all over the United States. Mr. Keating works with administrators, teachers and students to find solutions to restroom problems and develop written restroom improvement plans. Recently, he was successful in getting Senator Nadine Thomas to sponsor a bill in the 2002 Georgia legislative session that would require toilet tissue, paper towels or hand blow dryers, and trashcans in student restrooms. In addition the bill would require hot and cold water and self-closing doors at the entrance of restrooms. Senate Bill 504 did not pass as of the end of the session in March, 2002 (Georgia Legislation, 2002).

Methodology and Interventions

The primary goal of this study has not changed since the beginning stages of planning. The focus and methods for obtaining the goal has greatly changed, however. Originally, the study was going to be an epidemiological one. A school system was sought that currently did not provide soap and paper towels or hand blow dryers in the student restrooms. The intent was to obtain permission for the study and agreement that the school system would provide soap and paper towels in one to three of its schools for a period of two months, January and February 2002. Interventions to promote effective hand washing and control of maintenance problems were to be made and a comparison of absenteeism during the study period would be made between the school(s) studied and other similar schools in the same school system. A comparison of absenteeism during the study period would also be compared to the absenteeism found in the same school(s) during the same time period in previous years. However, a suitable school system could not be found that would agree to this.

Finally, a school system was found that was interested in the study, but because the system already provided soap and towels and/or air drying devices the focus and methods of the study had to be altered to obtain the desired goals.

The PRECEDE/PROCEED Planning Model was used as a model for this hand washing study. This model seeks to first find "predisposing factors," factors that motivate an individual or group to take action. This may include attitudes, beliefs and existing skills. "Enabling factors" are also determined because without them, the desired action or behavior will be prevented from happening. "Reinforcing factors" are also

sought that will provide incentive and encouragement for the action or behavior to continue (Dignan & Carr, 1992).

The school system participating in this study agreed to allow three schools to participate including one elementary school and two middle schools. The two middle schools will be noted as "middle school A" and "middle school B." The students in the three schools make up the sample community or sample population.

An assessment of conditions in the three schools were made at the beginning of the study by administering surveys to the principals, school nurses, teachers, and custodians in December 2001 (Appendix B). An onsite inspection of all student restrooms was also made during the first week of January 2002. The primary questions to be answered by the surveys and onsite inspections included: (a) What were the current practices of providing hand washing supplies to students?; (b) What were the problems in maintaining supplies in student restrooms?; (c) Were there suggestions for how to control the problems indicated?; and (d) What were the working and sanitary conditions of student restroom facilities? Other questions on the written surveys asked about data related to demographics so that the sample population could later be compared to the total population. There were also questions about absenteeism rates because it was hoped that this could still be used as a comparison after interventions were made.

After surveys were collected and analyzed, the findings were discussed with the principals of the three schools and the school nurse at the elementary school. Several interventions that could be accomplished during January, February and March 2002 were discussed and agreed on. The interventions varied according to the problems and suggestions noted on the surveys in each school. These are outlined below:

Interventions for Elementary School

1. Since a problem noted by 77% of persons filling out the survey was that the soap was too thin and dripped out of the soap dispensers, it was suggested that the principal talk with the County Board of Education to see if a thicker soap could be purchased that was more suitable for the type of dispensers currently installed.

2. Monitoring of students by teachers was already being done with teachers escorting whole classes to restrooms and standing in the hall while students were in the facilities. It was decided that this practice would not be changed.

3. Hand washing signs to remind students to wash their hands would be placed over the sinks in each restroom and classroom.

4. To promote effective hand washing and care of facilities, it was agreed that approximately 30 minutes of training would be provided during January and February to all classes.

5. A hand washing poster contest would be held in March and a winner would be chosen in each grade level.

6. The winners of the poster contest would star in a hand washing training video to later be used in Georgia's public schools to promote effective student hand washing.

Interventions for Middle School A

1. Monitoring of students was suggested on the majority of surveys. It was agreed that teachers would be asked to stand at restrooms during breaks between classes and a sign-out sheet would be kept in classrooms for students to sign when they wanted a hall pass during class.

2. Hand washing signs appropriate for middle school aged students would be

placed over sinks in each student restroom.

3. To promote effective hand washing and care of facilities, it was agreed that approximately 50 minutes of training would be provided during January and February to the sixth grade science classes.

4. A hand washing poster contest would be held in March for the sixth grade science classes and a winner would be chosen from each class.

5. The winners of the poster contest would star with the elementary school students in a hand washing video to later be used in Georgia's public schools to promote effective student hand washing.

Interventions for Middle School B

1. Monitoring of students was suggested on the majority of surveys. By coincidence, a new practice of requiring students to carry an "agenda" at all times had been implemented after the winter break. The agenda included a section in the back where hall pass records were to be kept. It was decided that this new form of monitoring would be tested to see if students messing up restrooms could be traced and if restrooms in general had fewer maintenance problems during January, February and March 2002.

2. Hand washing signs appropriate for middle school aged students would be placed over sinks in each student restroom.

3. To promote effective hand washing and care of facilities, it was agreed that approximately 50 minutes of training would be provided during January and February to the P.E./Health classes. These classes included students from sixth, seventh and eighth grades.

(Note: Middle School B chose not to participate in the hand washing poster contest and making the video.)

Development of Interventions

It was suggested by the schools that posters have language in both English and Spanish since there is a large Hispanic population of students. Posters for the elementary school were obtained from the "The SOPE Project" and placed over the sinks in each student restroom and classroom. Posters for both middle schools were obtained from the American Dairy Council "Got Milk" campaign and adapted to promoting hand washing by adding a note that said, "Hey, Wash Those Germs Away. Wash Your Hands. Lavate Las Manos!" (Appendix C).

A training outline for the elementary school was developed to be used in each class (Appendix D). The school nurse agreed to give the training to each class in kindergarten through fourth grades. The investigator provided the training in the four fifth grade classes.

A training outline for the middle schools was developed (Appendix E). The investigator provided training to all sixth grade Science classes in middle school A and all P.E./Health classes in middle school B.

Rules for the hand washing poster contest were developed and advertised on an 8 1/2" x 11" poster for each school to use in getting students interested in making posters (Appendix F). Thirty-six posters were turned in by elementary school students representing all grades. A winner was chosen from each grade with two tied winners from kindergarten and fourth grade (Appendix G, examples). Middle school A participated, but the contest was not promoted enough to have a lot of participation. As a

result, only four posters were submitted by students. It was decided to use these four students in the video and later the school chose six additional students to participate in the video.

The Office of Communications in the Georgia Department of Human Resources, employer of the investigator, agreed to film and edit the hand washing video since it would later be used by County Environmental Health Offices to promote hand washing among student groups. The script was written by the investigator. (Appendix H) Filming of the video was done in varying sites at the elementary school and middle school A over three days during the last week of March 2002.

Surveying Students During Training

As training was provided to students, basic questions were asked at the beginning of each class: (a) How many of you wash your hands at home?; and (b) How many of you wash your hands at school? In fifth grade classes in the elementary school and in all classes for which training was given at both middle schools, the same questions were asked along with (c) Why do you wash your hands?, (d) When do you wash your hands?, and (e) What do you not like about the restrooms in this school? The last question stirred a lot of discussion in most classes. A summary of answers and discussion is provided under "Findings" in this report.

Post-Study Surveys

Post-study surveys were administered to the principal, school nurse, teachers and custodians in the elementary school. At middle school A, post-study surveys were administered to the principal, custodians and the two teachers of the sixth grade science classes. At middle school B, post-study surveys were administered to the principal,

custodians and the two teachers of P.E./Health. The primary purpose of these surveys was to see if any observable improvements in controlling maintenance problems and promoting effective hand washing by students had been made during the study (Appendix I).

Assessment of Total Community

Surveys were mailed to all 159 County Environmental Health Offices in Georgia. Environmental Health Specialists and Technicians were asked to voluntarily take these surveys to county and city public schools and get them filled out by principals or their designees (Appendix J). The primary purpose of assessing the total community was to determine the availability of hand washing supplies to students in Georgia, the problems in maintaining these supplies, and what is being done to control the problems. The survey also sought to find out if any education specifically to promote hand washing is being taught in the schools surveyed. Out of a total of 1960 public schools in Georgia, 552 schools responded by filling out the surveys.

Conclusion of Study

Findings from the assessment of the total community will be compared to those found in the sample community. Depending on the success of interventions in the sample community, interventions will be recommended for use in the total community. The final report with video will be presented to the Georgia Department of Education to encourage increased promotion of effective hand washing in Georgia's public schools. The report and video will also be made available to County Environmental Health Offices for their use when providing training to student groups.

Demographics

Whitfield County

Whitfield County is located in Northwest Georgia, bordering Catoosa and Walker Counties on the west, Murray County on the east, Gordon County on the south and the Tennessee State line on the north. Whitfield County is about 80 miles north of Atlanta. Interstate 75 runs north-south through the county. There are four municipalities in Whitfield County, including the county seat of Dalton, Cohutta, Tunnel Hill and Varnell. The 2000 census showed Whitfield County having a population of

83,525. The population is 80.9% White and 3.8% Black. A large percentage of people, 22.1 %, consider themselves Hispanic/Latino (Center for Agribusiness and Economic Development, 2001).

Economically, Whitfield County's per capita income is \$25,926, slightly below the per capita income for Georgia which is \$27,324 (Center for Agribusiness and Economic Development, 2001). The major industry is carpet. Dalton, GA is known as the "Carpet Capital of the World!" The carpet and textile related industries make Dalton-Whitfield County third in the state of Georgia in terms of manufacturing, capital investment growth and per capita income growth (Dalton Chamber of Commerce, 2002).

Figure 1

Map of Whitfield County



Historically, Whitfield County is the site of the last capital of the Cherokee Indian nation. Dalton was founded in 1847 and earned a place in Civil War history as a Confederate hospital and manufacturing town. It was in the early 1900's that the colonial art of tufting was revived and popularized. U.S. Highway 41 through Dalton became known as "Peacock Alley," due to the colorful patterns and designs of the spreads displayed along the highway. The success of tufted bedspreads, coupled with the innovative and entrepreneurial spirit of the local citizenry, led to the creation of machines that could tuft carpet (Dalton Chamber of Commerce, 2002).

Whitfield County has two school systems, Whitfield County and Dalton City, serving a total of 17,429 students in the 2001-2002 school year. The Whitfield County School system alone, serves 11,966 students housed in 11 elementary schools, 4 middle schools, and 3 high schools (Whitfield County Schools, 2002). The sample population for the hand washing study includes all students in one elementary school (total enrollment, 618), the students in one middle school (total enrollment, 787), and the students in another middle school (total number, 605). The total number of students in the sample population is 2016. The Center for Agribusiness and Economic Development (2001) states that the population makeup of Whitfield County School System is 82.8% White, 13.4% Hispanic and 1.9% Black. In the sample population, the elementary school is 50% White students, 41.7% Hispanic students, and 4% Black students. Middle school A is 66.6% White students, 29.2% Hispanic students, and 1.8% Black students. Middle school B is 91.9% White students, 4.1% Hispanic students, and 2.5% Black students (Georgia Dept. of Education, 2002).

An indication of the economic status of the sample population is the number of students eligible for free or reduced price meals. The elementary school has 68.19% students eligible. Middle school A has 67.09% students eligible and Middle school B has 34.25% students eligible. Overall, Whitfield County has 44.14% students eligible for free or reduced price meals (Georgia Dept. of Education, 2002).

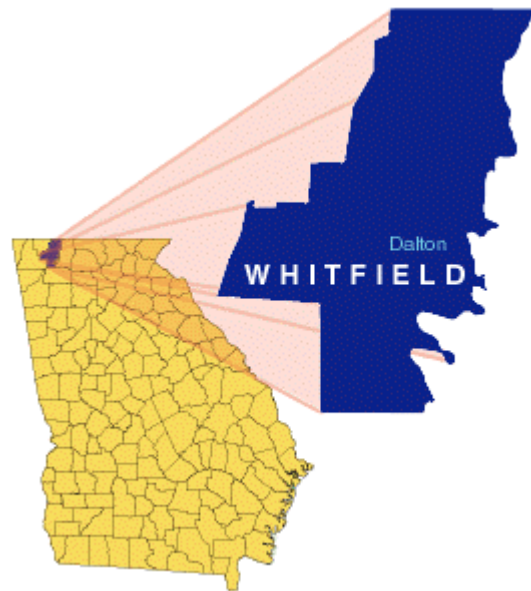
Georgia

The State of Georgia is located in the Southeastern United States and bordered by the states of Alabama on the west side, Tennessee and North Carolina on the north side, Florida on the south side and South Carolina and the Atlantic Ocean on the east side.

The total population is 8,186,453 made up of 65.1% White, 28.7% Black and 5.3% Hispanic/Latino. The per capita income in Georgia is \$27,324, slightly above that of Whitfield County which is \$25,926 (Center for Agribusiness and Economic Development, 2001).

Georgia has 180 public school systems including 159 county systems and 21 city systems. There are 1209 elementary schools, 398 middle schools, and 353 high schools, making a total of 1960 public schools in Georgia. There are 1,470,634 students enrolled in Georgia's public schools in the 2001-2002 school year. This enrollment is made up of

Figure 2
Map of Georgia showing location of
Whitfield County



52.6% White students, 37.9 % Black students and 5.5% Hispanic/Latino students (Georgia Dept. of Education, 2002).

In Georgia's public schools, 44.24% of all students are eligible for free or reduced price meals (Georgia Dept. of Education, 2002).

Georgia's public schools are funded by several sources including State appropriations, The Georgia Lottery, county property taxes, Federal funding for Federal programs and Special Option Local Sales Tax for new school construction. In addition, schools fund their own programs through fund raisers sponsored by the school or the PTA and parent donations.

Findings

Pre-study Surveys

Surveys were administered in December 2001 to the administrator, school nurse, custodians and teachers in each school attended by the sample population. (Appendix B) The findings from these surveys are separated by the school below.

Elementary School. The survey returned by the administrator revealed that 68.19% of students were eligible for free or reduced lunch. The survey and subsequent conference with the principal, also revealed that absenteeism was recorded as excused or unexcused. There was no documentation retained that gave the reason for an excused absence. In addition, a new computer system installed for county schools during the summer 2001 did not include documented absenteeism for previous years.

The survey returned by the school nurse revealed that any child complaining of being ill, goes to the school clinic for evaluation. The school has liquid soap, water, and paper towels at each hand sink. There are 13 student restrooms available and 22 classrooms have hand sinks inside the rooms. An antibacterial soap, Antiseptic Almond Hand Soap made by Kelsan, Inc., is used throughout the school. The nurse stated that there should be greater than 5 scheduled hand washings for students while at school, including (a) after recess/P.E., (b) before eating breakfast, (c) before eating lunch, (d) after going to the restroom, and (e) after blowing nose, sneezing and coughing. A problem noted was that the soap used was too thin for the dispensers and frequently dripped on the floor. A suggested solution was to change to a thicker liquid soap.

The surveys returned by the custodians all agreed that the soap was too thin and that the right soap needed to be found for the dispensers. Another problem given was that children wasted paper towels.

Surveys were returned by thirty teachers. Since sinks are located in kindergarten through third grade classrooms, hand washing is done sometimes in restrooms in the building and sometimes in the classroom's hand sink. Supplies used are liquid soap, water, and paper towels. Only a few parents in some of the grades and one teacher in fifth grade supply hand sanitizer for use at school.

Generally, the teachers noted that there should be from 0 to 5 scheduled hand washings each day at school. The mean was 2.5 times each day and the median was 3 times each day. Times given for these scheduled hand washing included (a) after gym, (b) before lunch, (c) after lunch, (d) after using bathroom, and (e) after recess. Most teachers agreed that there should be a scheduled hand washing after using the restroom. All but one teacher said that children routinely wash their hands after using the restroom.

In the elementary school, students are given scheduled restroom breaks during the day. The teacher escorts the students in the class to the restroom and supervises them. Kindergarten and first grades use the restrooms located inside the classrooms. The other grades use hall restrooms.

Generally, teachers agreed that children should wash hands at the same times as answered for the question concerning scheduled hand washings. However, one teacher added that hands should be washed after blowing nose, painting and gluing. Another teacher added the comment, "Excessive hand washing interferes with instructional time."

Problems in maintaining supplies and restrooms are noted in Table 1 below.

Table 1

Problems in Maintaining Supplies and Restrooms (Elementary School)

<u>Problem</u>	<u>Number of Teachers reporting out of 30</u>
1. Soap drips on floor.	18 (60%)
2. Supplies run out.	1 (3.3%)
3. Restrooms smell bad.	1 (3.3%)
4. Floors stay slippery.	10 (33.3%)
5. Paper towels are not very absorbent.	1 (3.3%)
6. Paper towels put in urinals and on floor.	4 (13.3%)

Suggested solutions to the problems noted in Table 1 are given in Table 2.

Table 2

Suggestions to Control Problems (Elementary School)

<u>Solution</u>	<u>Number of Teachers Reporting out of 30</u>
1. Install different soap dispensers or get a better soap.	7 (23.3%)
2. Get better more absorbent paper towels.	2 (6.6%)
3. Put something under soap dispensers to catch drips.	1 (3.3%)
4. Get hand air dryers.	1 (3.3%)
5. Monitor restroom behavior.	1 (3.3%)

In addition, 5 teachers (16.6%) commented that they would like to have warm water. One teacher (3.3%) commented that she thought it would be a good idea to use hand sanitizer, especially during the cold and flu season. Another teacher asked the following questions: (a) Do hand sanitizers hurt children with asthma?; (b) Do hand sanitizers work as well as soap and water?; (c) Must hot water be used [to effectively wash hands]? Refer to the literature review in this report for answers to these questions.

Middle School A. Surveys were not returned from the administrator or school nurse. Three custodians returned surveys that noted all had observed problems including (a) pulling paper towels out of dispenser and throwing them on floor, in commodes and urinals, (b) throwing rolls of toilet tissue into the commodes, (c) writing on the walls, and (d) urinating and having bowel movements on the floor. Suggestions to control these problems included (a) better monitoring by teachers by standing outside bathrooms during class changes, and (b) better discipline for students who cause the problems. One custodian suggested that second time offenders should be required to scrub the walls and third time offenders should be sent home for a week. Another custodian suggested that offenders should be required to come in on Saturday and clean the walls.

Nineteen (19) surveys were returned by teachers indicating that there were no scheduled hand washing times for students, but there were 5 breaks between classes when students could go to the restrooms and wash their hands. Teachers generally agreed with custodians about the problems in maintaining supplies and restrooms. Teachers added that many times hand washing supplies were depleted in restrooms and that paper towels and tissue were often wadded up wet and thrown to stick on ceiling. Table 3 lists all problems noted by custodians and teachers.

Table 3**Problems in Maintaining Supplies and Restrooms (Middle School A)**

1. Pulling paper towels out of dispenser and throwing them on floor, in commodes and urinals.
2. Throwing rolls of toilet tissue into the commodes.
3. Writing on the walls.
4. Urinating and having bowel movements on the floor.
5. Many times hand washing supplies are depleted in restrooms.
6. Paper towels and tissue are wadded up wet and thrown to stick on ceiling.

Most of the teachers agreed that hands should be washed before and after eating lunch, after using the restroom, after gym class, and after sneezing.

Teachers estimated that less than 5% of students bring hand sanitizer to use at school.

It is interesting to note that while custodians suggested that teachers should more closely monitor restroom behavior by standing in the halls just outside of restrooms, teachers said that they do stand in the hallways during breaks. During subsequent visits to the school, it was noted that teachers do stand in the halls during breaks. They do not always stand just outside the restrooms, but the noise level in the halls would probably prevent them from hearing what goes on in the restroom even if they did.

A few teachers offered suggestions to control the problems mentioned as listed in Table 4.

Table 4**Suggestions to Control Problems (Middle School A)**

1. Have hand washing facilities that accommodate many students at one time. It is difficult for a whole class to wash hands during break time at 2 hand sinks.
2. Blow dryers would keep down the amount of paper on floor.
3. Need better paper towel holders.
4. Hand sanitizer units could be mounted on the wall in restrooms and in classrooms.
5. Need restroom monitors actually in the restrooms.

A statement was added by one teacher, "Middle school students should know when to wash their hands; after each bathroom visit and prior to lunch."

Middle School B. A survey was not returned by the administrator. The survey returned by the school nurse indicated that children who feel ill, come to the school clinic for evaluation. Hand washing supplies in the school include liquid soap, water, and warm air dryers. There is no hot water. There are 5 female student restrooms and 5 male student restrooms. The antibacterial soap brand is the same as in the other 2 schools, made by Kelsan, Inc. Students should wash hands more than 5 times each day, including before eating lunch and after bathroom use.

Problems noted by the school nurse included (a) some children do not use the blow dryers, but instead, dry their hands on their clothes, (b) warm water is needed to wash hands, and (c) need time to wash hands before lunch. A suggestion to solve the problem of not using the blow dryer was to also supply paper towels in all restrooms.

Problems noted by the 2 custodians who returned surveys included (a) wadded wet paper thrown on ceiling, (b) stuff thrown in commodes, and (c) soap pumped onto floor.

Suggestions to solve problems included (a) get a new type of soap dispenser, and (b) get bigger tissue holders for larger rolls.

Nineteen (19) surveys were returned by teachers. There are no restrooms in classrooms so all students use the restrooms in halls. There are no scheduled hand washing breaks, but teachers agreed that students should wash their hands after using the restroom, after lunch, and after outside activities. It was also stated on one survey that there is not time to wash hands before lunch. It was estimated that less than 3% of students bring hand sanitizer to use at school.

Problems noted by teachers are listed in Table 5.

Table 5

Problems in Maintaining Supplies and Restrooms (Middle School B)

1. Students spit in hand soap.
2. Students generally do not take care of facilities.
3. Sometimes soap dispensers are empty.
4. Sometimes blow dryers do not work.
5. There is no hot water.
6. Paper towels are thrown on floor and in toilets.

Suggestions to control the problems listed in Table 5 are listed in Table 6.

Table 6**Suggestions to Control Problems (Middle School B)**

1. Continue to monitor.
2. Need better janitorial service and maintenance.
3. Need hot water.
4. Need more blow dryers.
5. Keep blow dryers repaired.
6. Supplies can be handed out to individual students.
7. Provide hand sanitizer in classrooms.

Walk-Through Assessment

In a walk-through assessment of student restrooms in the three schools attended by the sample population, the overall condition of the restrooms was good. Most restrooms had liquid soap and toilet tissue. The elementary school and middle school A had paper towels only to dry hands. Middle school B had one hand blow dryer installed in each restroom and had paper towels in addition to the dryer in some restrooms. However, several problems in maintaining these supplies and general cleanliness were observed. Several restrooms had a strong urine odor attributed in part to commodes that had not been flushed and also to poor ventilation. It was noted that some restrooms had windows capable of being opened for ventilation, but because it was winter, these windows were not open.

Problems found during the walk-through assessment are listed in Tables 7, 8, and 9.

Table 7**Problems Found in Restrooms During Walk-through Assessment****(Elementary School, 13 student restrooms)**

1. In the restroom located by the gym, the girls' restroom had liquid soap, paper towels, toilet tissue and hot water, but needed to be cleaned.
2. The boys' restroom in the same area had supplies and hot water also, but did not have a trashcan.
3. A commode was stopped up in one boys' restroom.
4. The floor was very wet in one boys' restroom.
5. In three restrooms, 2 boys' and 1 girls', the urine odor was very strong.

In middle school A, there is 1 boys' and 1 girls' restroom for each grade level, sixth, seventh and eighth. There are also boys' and girls' locker rooms in the gym and additional boys' and girls' restrooms in the lobby area of the gym. Bar soap and liquid soap are used in some restrooms and toilet paper rolls are hung on bars with locks. No hot water is available in student restrooms. Problems found during the walk-through assessment are listed in Table 8.

Table 8**Problems Found in Restrooms During Walk-through Assessment****(Middle School A, 12 student restrooms)**

1. The boys' locker room in gym had no supplies and no doors on stalls. It was also in need of cleaning.
2. The boys' restroom in the gym lobby needed cleaning. The restroom also did not have any ventilation and had a very strong urine odor.
3. The gym lobby restroom for girls had sinks that were dirty. There was also no ventilation and there was a strong urine odor. Big holes were found in the walls.

Figures 1 and 2 below show some of the problems found in Middle School A.

Figure 3**Boys' Locker Room with No Soap or Paper Towels**

Figure 4**Boys' Locker Room with Tissue Holder Torn off Wall and No Stall Door**

Middle school B also has 1 girls' and 1 boys' restroom for each grade level, sixth, seventh and eighth grades. There are additional restrooms in the gym and media center. Problems found during the walk-through assessment are listed in Table 9.

Table 9**Problems Found in Restrooms During Walk Through Assessment****(Middle School B, 10 student restrooms)**

1. The blow dryer in the boys' locker room in the gym was broken. There were no paper towels.
2. Wadded tissue was stuck on the ceiling in the boys' locker room.
3. In the girls' locker room, there was lots of tissue in one of the commode.
4. In the media center's girls' restroom, a roll of toilet tissue was found in the commode.
5. The blow dryer was broken the media center's girls' restroom, but paper towels were available.
6. In the media center's boys' restroom, one commode was stopped up.
7. Paper towels were thrown on the floor in one boys' restroom.
8. There was a strong urine odor in the eighth grade boys' restroom.

Figures 5, 6 and 7 show examples of the problems found.

Figure 5

Tissue and Paper Towels Wadded Wet and Thrown on Ceiling



Figure 6

Roll of Toilet Paper in Commode



Figure 7

Paper Towels on Floor



Survey of Students During Educational Training

Students in the sample population were asked questions during the educational training to promote hand washing. In the elementary school, education was given to all students. Students were asked, "How many of you wash your hands at home?," and "How many of you wash your hands at school?" In middle school A and middle school B, the same two questions were asked and in addition, three other questions were asked: (a) Why do you wash your hands?; (b) When should you wash your hands?; and (c) What do you not like about the restrooms in this school? Students in all classes were aware that germs on the hands are the reason why hands need to be washed. Answers received for the other questions are listed in Table 10.

Table 10**Answers Given in Student Survey**

	Wash at home?	Wash at School?	When should you wash you hands?	What do you not like about restrooms?
Elementary Total Students 618	554 (89.6%)	584 (94.5%)		
Middle School A Total Students 243	207 (85.2%)	181 (74.5%)	- Before and after you eat. - After using the restroom	- Students urinate on the walls. - Soap smells bad. Use to have a soap that smelled like bubblegum that we liked. - Graffiti on walls. - We don't have enough time to wash our hands.
Middle School B Total Students 211	108 (51.2%)	116 (55%)	- Before and after you eat. - After using the restroom.	- Things are in the soap. - Students spit in the soap. - Don't have enough time between classes. - Graffiti on walls. - No hot water. - Restrooms look bad.

Post-study Surveys

Post-study surveys were given to administrators of all three schools, the school nurse in the elementary school, all custodians, all teachers in the elementary school, the sixth grade science teachers in middle school A, and the P.E. teachers in middle school B. (Appendix I)

Elementary School. The administrator in the elementary school indicated that no additional monitoring had been done in the school and that she would need additional custodians to do so. She also noted that the liquid soap had not been changed and she did not foresee it being changed during the next year. She noted that children had commented the hand washing posters placed in the restrooms were cute. She also noted that the posters serve as good reminders and that students have commented that they are washing their hands more frequently. The administrator further commented that the overall value of the hand washing poster contest and making the video was good for the students. She said that yes, the interventions done in the elementary school might benefit other schools in facilitating them to provide soap and towels in student restrooms and encouraging students to properly wash their hands.

The school nurse confirmed that all classes in the elementary school had received training. She had used the outline provided by the investigator and had not made any changes. (Appendix D) She thought the training was very beneficial and that numerous students had stopped her in the hallways to tell her they were washing their hands more. However, the nurse said that she had not noticed any improvements in the restrooms: towels were still thrown on the floor and commodes were not flushed.

One custodian in the elementary school reported noticing improvements in the way students maintained the restrooms used by first through third grades. However, the other two custodians did not report any improvements. Generally, the custodians reported that about 1 gallon of liquid soap is used in each student hallway restroom every three days. About three rolls of toilet tissue are put in each restroom each day. In addition, about 300 paper towels are needed in each restroom each day. To summarize, for approximately 100 students, it takes about 1/3 gallon of liquid soap, three rolls of toilet tissue and 300 paper towels each day.

The teachers thought the training was good to excellent with most thinking it was excellent. Most of the teachers did not think there needed to be any changes made in the training and commented that the "blue light" (black light used with "Glo Germ") was very effective. Other comments indicated that the training was very effective for the age level. Thirteen (13) out of 15 teachers said they had noticed evidence that the students in their classrooms were washing their hands more effectively and more often. Some students have reminded others, "You better wash your hands."

Middle School A. The administrator at middle school A reported that more monitoring of restrooms had been done at his school during January - March 2002. Teachers and administration have monitored hallway during class changes. He also stated that the "agendas" now required for students to carry with them have helped in monitoring who is in restrooms during class time and have thus helped improve maintenance of student restrooms. However, the administrator had not received any feedback from students as to whether the hand washing posters had encouraged hand washing. He did think the training provided by the investigator to promote hand washing

was very good. In addition, he thought the overall value of the poster contest was poor (only 4 posters turned in). However, he thought the value of making the video was very good. He also thought that the interventions done at this school might benefit other schools as well. The administrator added a note that read, "We appreciate your efforts to assist ... Middle School. Our students and staff enjoyed the video. Thanks for your help."

The three custodians reported that they had not noticed any improvements in the way students maintained the restrooms. Generally, it was reported that about 2 quarts of soap are used in each restroom each day. About 8 rolls of toilet tissue and approximately 300 paper towels are used in each restroom each day. Each restroom serves about 125 students.

The sixth grade science teachers rated the hand washing training as excellent and very good. Neither of the teachers thought the training should be changed. One teacher reported that students ask to wash their hands more before going to lunch. The other teacher said he had changed the way he washes his hands!

Middle School B. The administrator in middle school B reported that more monitoring had been done since January. Teachers were monitoring the restrooms more closely and the "agenda" had helped monitor who was in the restrooms during class time. He noted that the additional monitoring had contributed to improved maintenance of student restrooms. The administrator had not received any feedback from students as to whether the hand washing posters had encouraged hand washing. He thought the educational training provided by the investigator had been very good. In addition, he thought the interventions done at his school would benefit other schools also.

One custodian reported that she had noticed improvement in maintenance of restrooms. Incomplete information was given about the amount of supplies needed in restrooms each day.

Both P.E. teachers thought the hand washing training was very good. Changes suggested for the training were to have a darker room and let more students participate in the demonstrations. The teachers polled the students after the training to see how many were washing their hands at home and at school. The number of students washing their hands at home and school were 208 (98.6%) and 171 (81%) respectively. Prior to the training, the number of students washing their hands at home was 108 (51.2%). The number of students washing their hands at school was 116 (55%).

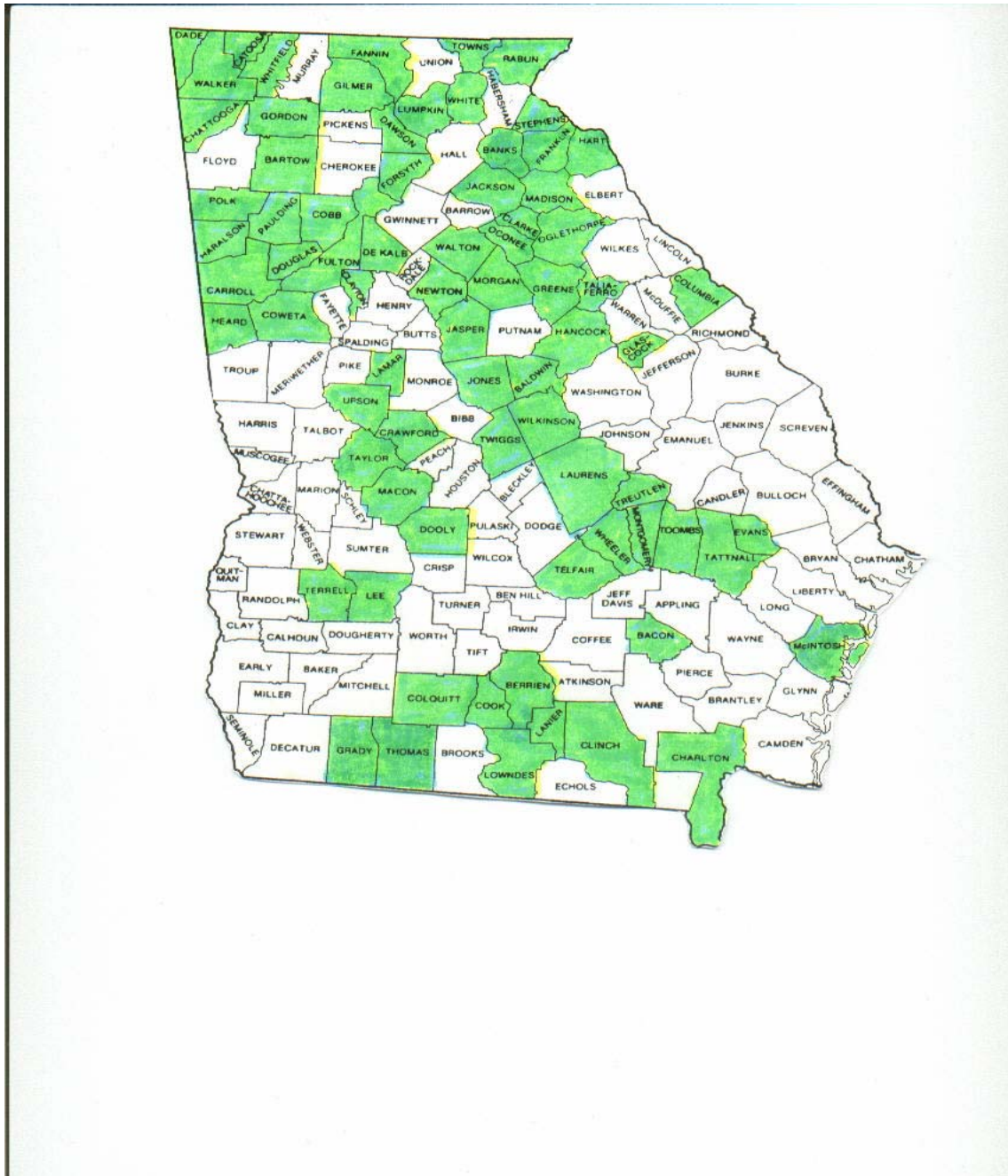
Assessment of Public Schools in Georgia

Surveys were mailed to all 159 County Environmental Health Offices (Appendix J). The letter of consent is found in Appendix K. Environmental Health Specialists and Technicians were asked to voluntarily have the surveys filled out by the principal or his designee in each county and city public school. Out of 1960 total public schools in Georgia, 552 surveys were filled out. These surveys represent 76 counties, including 74 county systems and 12 city systems. In total, 515 county schools and 37 city schools filled out the survey. Figure 8 shows the distribution of counties returning surveys. Separated into type of school, the returned surveys included 342 elementary schools, 121 middle schools and 89 high schools. As classified in this study, 5 of the elementary schools are actually a combination of elementary and middle grade levels. Eight (8) schools classified as elementary are actually a combination of elementary, middle and

high school grade levels and 13 schools, classified as middle, are actually a combination of middle and high school grade levels.

Figure 8

Map of Georgia Showing Distribution of Counties Returning Surveys



Elementary is a classification for any grade level, kindergarten through fifth grade. Middle is a classification for any grade level, sixth through eighth, and high is a classification for any grade level ninth through twelfth. There are 1,470,634 students enrolled in public schools in Georgia. The surveys returned represent 385,575 of these students.

The survey for public schools asked questions in four categories: (a) supplies provided in student restrooms; (b) maintenance problems; (c) supplies and hand sinks provided in other locations or in other ways; and (d) hand washing education provided to students.

In the 552 surveys returned, 483 schools reported that bar soap and/or liquid soap and paper towels and/or blow dryers were in their student restrooms. An interesting point is that 58 of these schools when asked question #3, "If hand washing supplies are not currently provided inside student restrooms, have they been provided in the past?," answered "YES." This could mean that the question was not understood or it possibly could mean that supplies are only in some student restrooms and not all. An additional 53 schools that did not answer as having both soap and towels and/or blow dryers answered "Yes," these supplies had been provided in the past.

A breakdown of supplies available is listed in Table 11.

Table 11**Supplies in Student Restrooms (E = Elementary, M = Middle, H = High)**

Type of school	Soap & towels or dryer	How many have towels & dryers	Dryers but no towels	Towels but no dryers	Soap but no towels or dryer	No toilet tissue	No supplies/ teacher gives supplies	Have hot water
E	287	33	35	250	3	31	160	87
M	111	3	26	88	3	9	25	39
H	83	16	15	57	0	4	8	40
Total = 552	483 87.5%	52 9.4%	76 13.8%	395 71.6%	6 1.1%	44 8%	28 5.1%	166 30.1%

Table 12 indicates the type of supplies in each type of school.

Table 12**Type of Supplies (E = Elementary, M = Middle, H = High)**

Type of school	Bar soap	Liquid soap	Paper towels	Blow Dryer	Toilet tissue	Hand sanitizer	Hot water
E = 342	15	284	283	68	311	24	87
M = 121	6	114	91	29	112	4	39
H = 89	5	83	73	31	85	0	40
Total	26	481	447	128	508	28	166

Figures 9 and 10 show the number and percentage of schools providing supplies.

Figure 9

Number of Schools Reporting Having Supplies in Student Restrooms

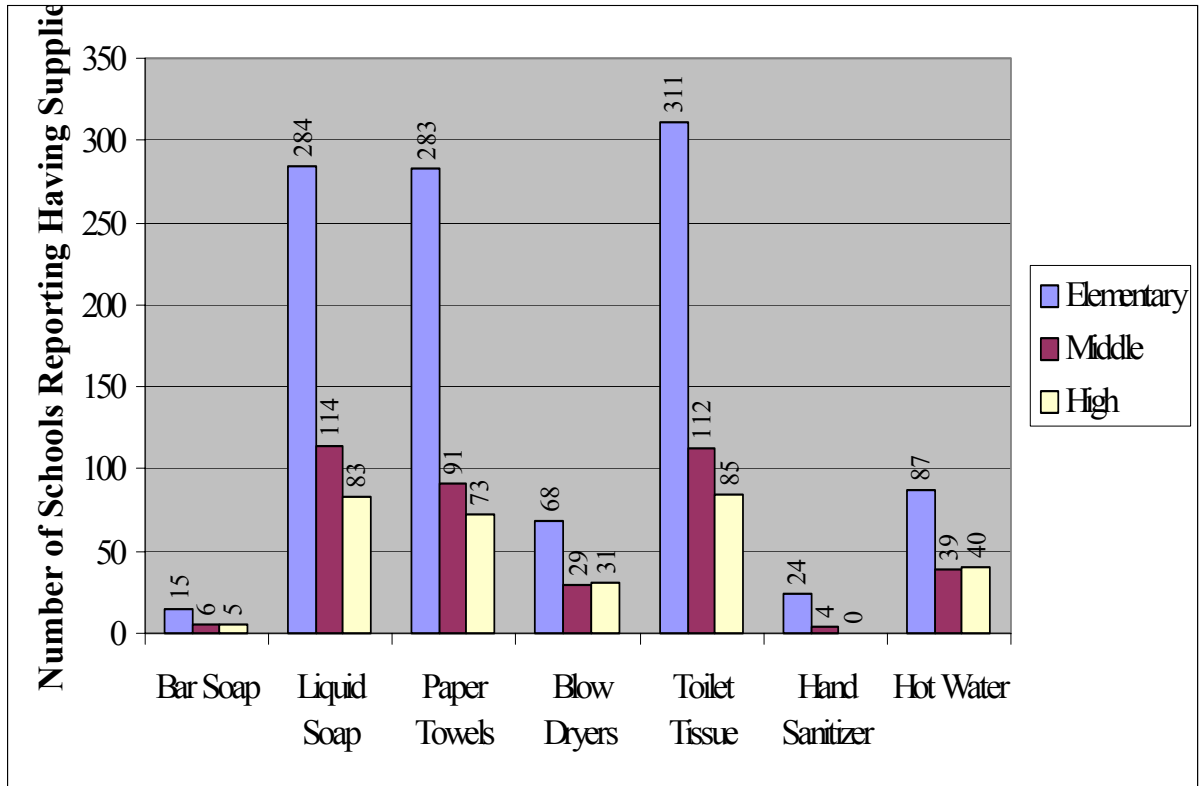
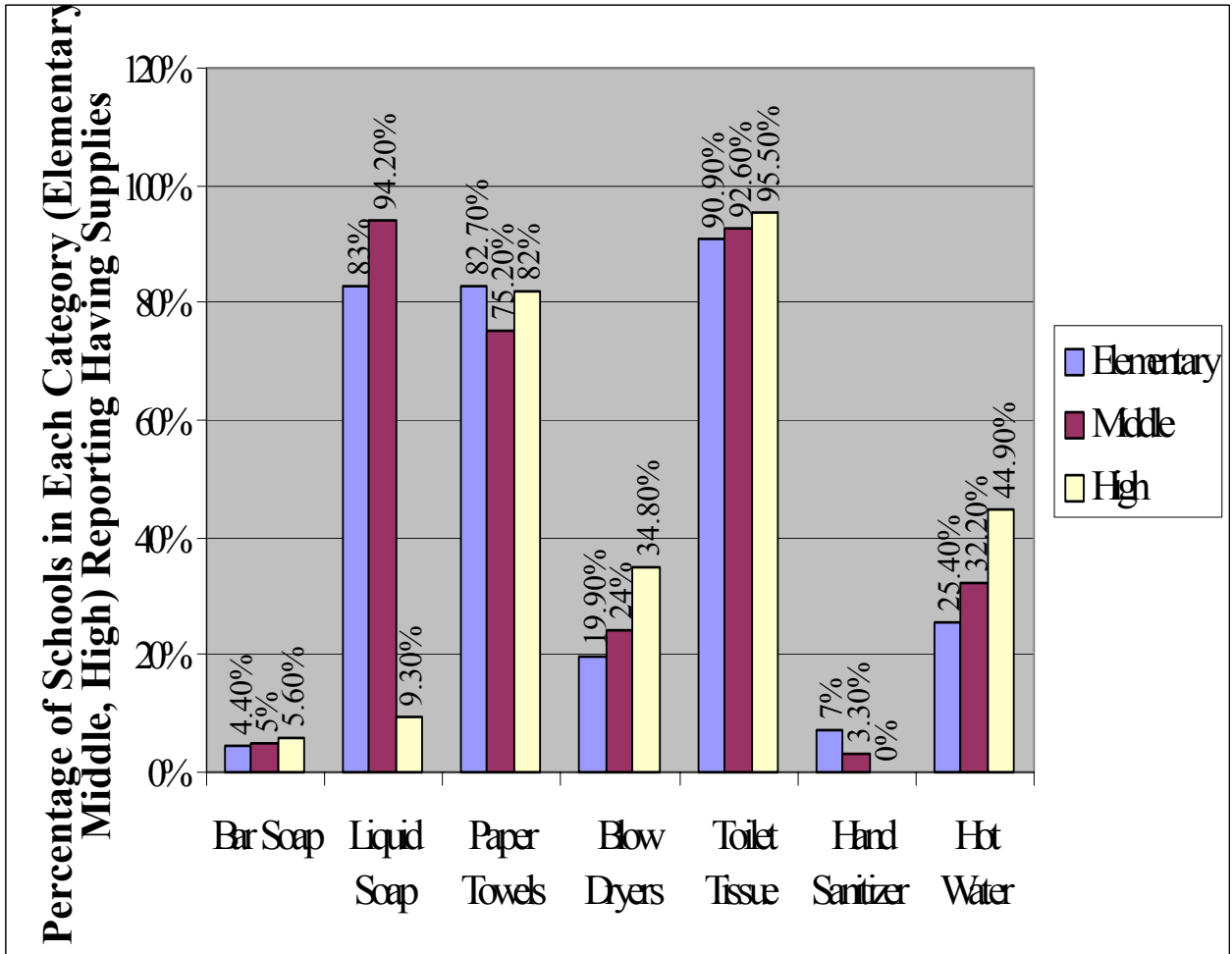


Figure 10**Percentage of Schools Reporting Having Supplies in Student Restrooms**

Under question #1, 29 schools chose to comment. Comments are summarized in Table 13.

Table 13

Comments Given Under Supplies, Question #1

Type of school	Comment
Elementary	Paper towels in classroom to get as needed
	Teachers have liquid soap and sanitizer (5 reported)
	Teachers issue these supplies to students as needed (3 reported)
	Supplies available in restrooms and classrooms
	Student monitor dispenses soap or sanitizer as students go in restroom., issues paper towels as they leave (2 reported)
	Signs are posted to encourage hand washing
	Students may carry liquid soap with them to restroom
	Teachers bring liquid soap with class to restroom
	Supplied through the county local school fund's and some donations from parents and staff
Middle	Most class rooms have hand sanitizer.
High	Supplies are only in some restrooms. Most boys restrooms do not have soap dispensers because they tear them off walls.

Question #4 on the survey asked about the problems observed in maintaining supplies. Table 14 gives a list of problems cited.

Table 14**Problems in Maintaining Supplies (E = Elementary, M = Middle, H = High)**

Type of school	Towels/ tissue thrown on ceiling	Supplies stolen	Equipment torn off walls	Towels thrown on floor	Toilets stopped up with towels	Soap wasted/ dispensed on floor
E = 342	162 (47.4%)	18 (5.3%)	137 (40.1%)	253 (74%)	261 (76.3%)	229 (67%)
M = 121	63 (52.1%)	14 (11.6%)	59 (48.8%)	76 (62.8%)	88 (72.7%)	71 (58.7%)
H = 86	40 (46.5%)	26 (30.2%)	58 (67.4%)	60 (69.8%)	70 (81.4%)	46 (53.5%)
Total = 552	265 (48%)	58 (10.5%)	254 (46%)	389 (70.5%)	419 (75.9%)	346 (62.7%)

Other problems noted in maintaining supplies and general sanitation of restrooms are listed in Table 15.

Table 15

Other Problems in Maintaining Supplies and General Sanitation

Type of school	Problem
Elementary	Restrooms rolled and writing on walls
	Sinks stopped up and water left running
	Sometimes out of supplies and waiting new shipments
	Urinating on walls and floor
	Hispanic population putting used toilet tissue in trashcans
	Placing foreign materials in soap dispenser
	Male students urinating in soap dispensers
	Housekeeping cannot check often enough
	Students sometime do not flush commodes
	Foreign objects in toilets and urinals
	Soap dispensed on floor is a safety hazard
	Wrapping toilet paper around stalls
	Soap dispensers falling off walls
	Paper towels are not very absorbent - students grab a handful
	Throwing soap out the window
	Bars of soap smashed on floor
	Poking holes in bag of liquid soap
	Paper towels stuffed in sink drain and water left on to overflow

Middle	Write on walls
	Paper towels set on fire
	Soap dispensed on floor
	Equipment damaged
	Old buildings - hard to maintain
	Boys tear stall doors off
High	Urinating on floor, walls and toilet seat
	Hispanic population putting used toilet tissue in trashcans
	Improper disposal of tampon and pads
	Placing foreign materials in soap dispensers
	Writing on restroom walls
	Foreign objects in commodes and urinals
	Sinks stopped up with towels and tissue
	Smoking
	Liquid soap dispensers punctured - causing soap to leak out
	Damage to equipment

Question #5 asked schools that currently have supplies about what they are doing to control the problems. Many comments were given. A summary of the comments are in Table 16.

Table 16

What is Being Done to Control Problems?

Type of School	Comment
Elementary	Restrooms are cleaned by custodians routinely during the day.
	Teachers monitor restrooms.
	Teachers assign students monitors to restrooms.
	Life-skill training for students.
	Communication between students, teachers and custodians.
	Teacher and principal have talked to students about proper behavior.
	Teachers have supplies in their rooms as well.
	Teachers take supplies with them to restroom.
	Teachers escort students to restroom.
	1 or 2 children only can go to restroom with a pass.
	Toilet tissue dispensers are on wall as you enter restroom and not in individual stalls. (Purchase large dispensers).
	Talk about paper use on morning announcements.
	Administrative awareness and constant positive reinforcement.
	Students are taught to tell an adult if restroom needs attention.
	Faculty members are able to watch students by having sink facilities in clear view of hallway.
	Students carry their own soap into restrooms.
	Hand blow dryers, metered faucets, and automatic flushing valves.

	Doors to restrooms are left open.
	We have a "caught being good program" to reward students who exhibit good citizenship. (Students are sometimes found cleaning up messes) They are recognized on the morning announcements and have their picture displayed in hall.
Middle	Teachers monitor restrooms
	Custodians clean restrooms routinely
	Restrooms are checked every class period, after breaks
	Student monitors in restrooms
	Restrooms are locked. Teachers escort students to restrooms.
	Encourage students not to waste supplies
	Discipline consequence for misbehavior. Allow limited number of students in restroom at any one time.
	Frequent restocking of supplies.
	Disciplining students when identified through community service clean-up detail
	Blow dryers instead of paper towels.
	Cameras positioned in hallways that have restrooms.
	Students are required to have an agenda pass signed to leave the classroom.
High	Teacher and other staff monitoring especially during class changes and lunch periods.
	Custodians clean restrooms routinely.
	Spot check by administration.

	Students must request tissue paper when going to restroom.
	Blow dryers instead of paper towels.
	Custodians check all restrooms at 15-20 minute intervals throughout day.
	Use locked dispensers.
	Frequent restocking.
	Students are asked to sign in and out of classroom as they visit restroom.
	Limit supply of toilet tissue.
	Discipline for misbehavior.

Question #7 on the survey asked if teachers give supplies to students and if so, how is this done. Generally, for those schools where this occurs, it is done in primarily four ways.

1. The teacher has supplies in the classroom and students wash their hands at the hand sink located in the classroom.
2. The teacher gives supplies to students upon request before students go to the restroom. In the case of soap, this is done by either pumping a small amount of soap into the student's hand or giving the student a pump dispenser to take with him to the restroom.
3. The teacher escorts students to restrooms and gives them supplies upon entering.
4. Teachers have hand sanitizer in the classroom that they provide upon request, in addition to having supplies in the restrooms.

Question #7 also asked about hand sinks in classrooms. In general, most elementary schools have hand sinks in kindergarten classrooms (259) and first grade classrooms (200). For second grade classrooms, the number fell to 141 and for third grade classrooms, the number was 119. In the survey, 86 fourth and fifth grade classrooms had hand sinks in the classroom. Thirty-two (32) middle schools and 31 high schools reported having sinks in science labs, art rooms, home economics classrooms, and special education classrooms.

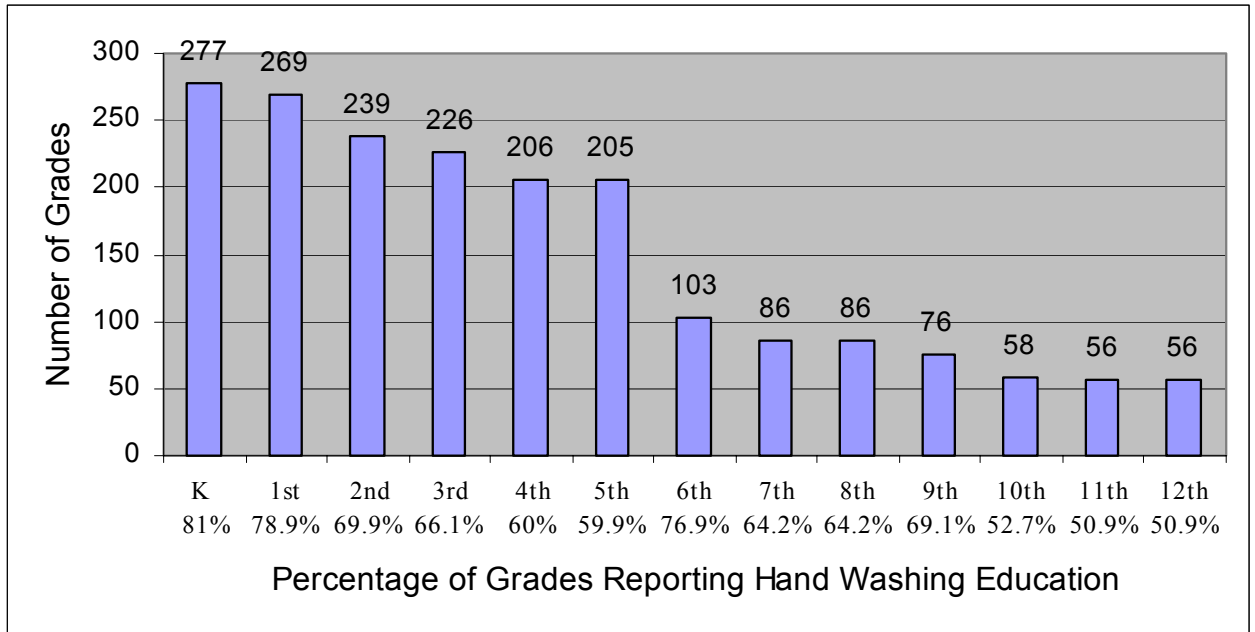
Question #8 asked about education to promote hand washing. Table 17 lists by grade, how many provide education to promote hand washing. Figure 11 shows the number and percentage of grades at each grade level that reported providing education.

Table 17

Grades Providing Education to Promote Hand Washing

K	1	2	3	4	5	6	7	8	9	10	11	12
277	269	239	226	206	205	103	86	86	76	58	56	56

In elementary schools, educational training to promote hand washing is usually done by teachers, school counselors and/or school nurses. Some elementary classes reported teaching about hand washing in health and science classes. In middle and high schools, educational training is given in health, science, home economics and life-skills classes. Some schools reported using videos and posters to remind students.

Figure 11**Number and Percentage of Grades Reporting Hand Washing Education**

Conclusions and Recommendations

Hand washing is important. The literature review in this paper has compiled information concerning studies that have proven the effectiveness of hand washing on removal of transient bacteria and viruses. Information has also been given concerning alternatives to hand washing such as the use of hand sanitizers. Studies have been reviewed and summarized in this paper concerning how many people of all ages, in different settings have been found to effectively wash hands. These studies have also proven the increased frequency of hand washing when posters are displayed to remind people to wash their hands. The literature review also reveals the increased cleaning ability of washing hands with soap versus using only plain water. Studies have also shown that except for hands with a lot of foreign matter, especially oil or grease, hands are just as effectively washed with cold water as with warm water. For comfort and to encourage hand washing, warm water is desirable. Effective drying devices, paper towels, continuous roll cloth towels and blow dryers, have been compared. While there is mention of the possibility of microorganisms being blown on the hands from blow dryers, the elimination of paper towels that often are thrown on the floor or used to clog commodes and sinks make blow dryers the desired drying device. Studies in the literature review and this study in Georgia's public schools have shown that education does have a positive effect on increasing the number of people who wash their hands. However, it has also been shown that as time goes by, people tend to slip back into old habits of not washing their hands when they should. This implies that if effective hand washing is to be maintained, education must be ongoing and frequently repeated.

Promoting hand washing is only part of the issues facing Georgia's public schools. This study has sought to find out the current status of providing hand washing supplies in public schools, the problems associated with maintenance of these supplies and general cleanliness of restroom facilities and what is being done to control the problems mentioned.

This study has shown that most of the schools returning surveys (87.5%) do provide hand washing supplies in student restrooms. However, there are many problems that schools have in maintaining these supplies and general cleanliness of the restrooms. This study has also shown that many of the surveyed schools do provide education to promote hand washing. The scope and length of education given in the schools was not learned. This study has shown through working with a sample population that education to promote hand washing does have a positive effect. However, like other studies have shown, comments from teachers and staff have indicated that the positive effect wears off as time goes by. In addition to education, other interventions done in the sample population have had positive effects. Increased monitoring by teachers and staff decreased the maintenance problems in student restrooms. Hand washing posters placed in the elementary school and hand washing posters made by students in the elementary school had a positive effect on students as noted by their comments and increased hand washing observed by teachers and staff.

Based on the literature review and findings in this study, the following recommendations are provided:

1. To provide information to the Georgia Department of Education to facilitate

the increase in number of public schools that maintain hand washing supplies in student restrooms.

2. To provide the educational tools necessary to the Georgia Department of Education to increase the number of students who wash their hands correctly.

The information provided can help schools that currently provide hand washing supplies, improve control of maintenance problems as well as help schools that currently do not provide supplies, find ways to provide them. The information can also assist in the planning process for new schools, to design facilities that eliminate some of the design and equipment pitfalls that lead to maintenance problems that existing schools currently have.

Recommendations to Promote Hand Washing among Students

1. Hand washing supplies should be provided in all student restrooms. These supplies should include liquid soap, paper towels or preferably warm air blow dryers and toilet tissue. In addition, warm water (90°F - 110°F) should be supplied to hand sinks.

2. Posters to remind students to wash their hands should be hung on the wall above hand sinks.

3. Education to promote hand washing should be routinely done each year for each grade. It is further recommended that the length of time spent on this education be 30 minutes for elementary students and the length of one class period for middle and high school students. It is suggested that education for elementary students be done by the school nurse. Education for middle and high school students should be done by the school nurse and/or science teachers.

Recommendations for Controlling Problems in Maintaining Hand Washing

Supplies

1. Restrooms should be monitored by staff throughout the day during breaks and lunch periods. Preferably, monitoring should include a staff member going in the restrooms during breaks.
2. Documentation of the names of students who wish to leave class needs to be kept in case a problem in a restroom makes it desirable to find out who was out of class during a certain time. This can be done by (a) signing out when leaving the class room, and/or (b) requiring students to carry a signed agenda record when they leave a class.
3. Some schools have had success with using student monitors in the restrooms. Each school administration can evaluate its own situation to determine if this might be feasible.

Physical Issues for New Schools and Issues for Existing Schools to Consider When

Remodeling

1. All dispensers should be heavy duty, commercial quality and capable of being locked.
2. To reduce misuse of paper supplies, warm air blow dryers should be installed.

Although some studies have indicated that microorganisms may be circulated in the restroom and blown onto the hands, hand blow dryers do reduce the cost and misuse of paper supplies. An adequate number should be installed to allow proper drying of hands with consideration of the length of break times. A suggested formula is given here:

Example:

125 students using restroom 2 times each day and washing hands 1 additional time before going to lunch (3 hand washings)

$125 \times 3 \text{ hand washings} = 375 \text{ hand washings in restroom per day}$

These hand washing are done during 5 breaks @ 5 minutes each.

Approximately only 3 minutes out of every break is usable in order to get to class on

time. $5 \text{ breaks} \times 3 \text{ minutes} = 15 \text{ minutes}$ for 375 hand washings

$15 \times 60 \text{ seconds} = 900 \text{ seconds}$ (Warm air blow dryer takes 20 seconds to dry hands)

$900 \div 20 = 45$ times that one dryer can be used during total break times.

$375 \text{ times needed} \div 45 \text{ times that 1 dryer can be used} = 8.3$ or round off to 9 dryers needed.

This sounds like a lot of dryers, but it shows why 1 or 2 dryers are just not enough. If less dryers than the number determined by this formula are installed, they should be supplemented with paper towels also.

3. Self flushing commodes and urinals should be installed.
4. Metered faucets should be installed in hand sinks. It is also suggested that if warm water is supplied to hand sinks, cold water is not necessary, i.e. existing plumbing which in a lot of existing schools, only has one cold water pipe supplying each sink, can be used to supply only warm water 90°F to 110°F.
5. To determine the number of hand sinks needed, the formula for determining blow dryers can be used since effective hand washing means lathering the hands for 15 to 20 seconds and then rinsing. An alternative to having several hand sinks is having a hand basin that has more than one metered faucet for several persons to use at one time. The same formula as described can be used to determine the necessary number of faucets.
6. Mechanical ventilation should be installed in every restroom even if there are windows that can be opened. This ventilation should be completely separate from the ventilation system elsewhere in the school.

7. To promote pride in students, restrooms should be constructed and painted to be colorful and pleasing.
8. For monitoring purposes, doors are not desirable on student restrooms. The "U" format of entering the restroom should be the standard.
9. Installing all hand sinks in the halls just outside restrooms will help assist monitoring efforts. However, this may not be desirable, especially if blow dryers are used. The noise of the blow dryers will add to the noise in the halls. It is suggested that if hand sinks are installed in the halls, that paper towels be used.

Administrative Issue to Consider

To promote hand washing before eating, it should be considered to allow a break time or allowance for hand washing before lunch periods.

Limitations of this Study

Because this was a community based study and the sample population was chosen from a school system that would allow the study to be done, the sample population does not necessarily represent all other school populations. The ethnic ratios, economic status, and other intervening factors may be different. In addition, because complaints are frequently received by health departments from parents, concerning the lack of hand washing supplies and toilet tissue in student restrooms, the findings from the assessment of public schools in Georgia was somewhat surprising. A possible explanation for the high percentage of 400 out of 552 schools having soap and paper towels and/or blow dryers, could be that schools not having the supplies chose not to answer and return the survey. It is hoped, however, that this is not the case. This study does indicate that few schools are without problems when it comes to maintaining hand washing supplies. All schools that endeavor to maintain hand washing supplies and promote hand washing are to be applauded.

Submission of This Report to the Georgia Department of Education

A bound copy of this report, a copy of the video made as an intervention in this study, and a cover letter outlining the goals, objectives, and findings of this study will be submitted to Ms. Linda Shrenko, State Superintendent of Schools (Appendix L). In the letter, a proposal for a presentation of the study to Ms. Schrenko and her staff will be requested.

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Appendix A

Hand Washing Education and Other Resources

(* Indicates Resources Used in Study)

Books

*Berger, M. & Hafner, M. (1985). Germs Make Me Sick!. Harper and Row.

*Ferrin, W.W. (2000). Germs on Their Fingers. The Wakefield Connection, Inc.

*Katz, B. & Bjorkman, S. (1996). Germs! Germs! Germs!. Scholastic, Inc.

*Ross, T. (1998). Wash Your Hands!. Kane/Miller Book Publishers

Education Resources

American Red Cross. (2002, May 1). Community Education. Scrubby Bear. [On-line]. Available: <http://www.redcrossbirmingham.org/commeducation.htm>

American Society for Microbiology. (2001, Aug. 31). Don't Get Caught Dirty Handed! Clean Hands Campaign. [On-line]. Available: www.washup.org

American Society for Microbiology. (2001, Aug. 31). Communications, Americans Caught Dirty Handed. [On-line]. Available: www.asmtusa.org

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Children's Health Education Center (2001, Aug. 31). Keep illness under control with proper hygiene. Oh those dirty hands!. [On-line]. Available:

www.chw.org/CHEC/ParentingWorks/archive/Hygiene-ThoseDirtyHands.htm

Dietary Managers Association. (2001, Aug. 31). DMA Food Protection Education Center, Handwashing - Training Aids. [On-line]. Available:

www.dmaonline.org/fppublic/connect18.html

*Georgia Department of Human Resources, Division of Public Health, Environmental Health, 2 Peachtree St., 16th Floor, Atlanta, GA 30303-3186, contact Melinda Scarborough, , phone (404) 657-6534, mfscarborough@dhr.state.ga.us (Video - "Hand Washing Does Make a Difference," hand washing lesson plans and Power Point presentation)

*Georgia-Pacific Health Smart Institute, Handwashing and Hygiene Lessons, K-12, Phone 1-877-GPCLEAN, [On-line]. Available: www.gphealthsmart.com

*Glo Germ Company, P.O. Box 537, Moab, Utah 84532, Phone 1-800-842-6622. (2002, May 5) [Online] Available: www.glogerm.com/ (Hand Outs, Coloring Materials)

Health Care Health & Safety Association (HCHSA) of Ontario. (2002, March11). Correct hand washing procedure. [On-line]. Available:

www.labs.net/schools/marion/mms/html/body_handwashing.htm

Healthy Hands, Healthy Kids. (2001, Aug. 31) [On-line] Available:

www.healthyhands.com

Henry the Hand by Dr. William P. Sawyer. (2001, Aug.31). [On-line]. Available:

www.henrythehand.com (Poster and other materials)

Life Education Central Tablelands N.S.W. (2001, Aug. 31). Harold Washing his Hands. [On-line]. Available: www.lisp.com.au/~life-ed/Hands.html (Interactive coloring for elementary age students)

M-CARE House Call (2001, Aug. 31). Health Education, Why we need to wash our hands. [On-line]. Available: www.mcare.org/housecall/spring2001/story06.html

Keating, Tom. Project CLEAN. (2002, May 1) [Online]. Available: projectclean@mindspring.com. or www.project-clean.com

Tacoma Pierce County Health Department, Food & Community Safety, 3629 S. D Street MS:012, Tacoma, WA 98418-6813. Operation Suds Hand Washing Lesson Plan.

The Nelson Study Bible, (1997). Leviticus 15. Thomas Nelson Publishers

The Soap and Detergent Association. (2002, March 15) [On-line]. Available: www.sdahq.org

*The Sope Project, 1211 Ernest McMahan Rd., Sevierville, TN 37862. [On-line]. Available: www.sope.net (SOPE Hand Washing Poster)

*U.S. Food and Drug Administration, Center for Food Safety and Applied Nutrition, (2002, April 1) Fight Bac!. [On-line] Available: www.fightbac.org (Hand Outs and Coloring Materials)

U.S. Food and Drug Administration, Center for Food Safety and Applied Nutrition, (2001, Aug. 31) Germs On The Run!. [On-line]. Available: www.foodsafety.gov/~dms/fsegerms.html

U.S. Public Health Service. (2001). Food Code. Order by phone: 1-800-553-6847. [On-line]. Available: vm.cfsan.fda.gov/~dms/fc99-toc.html

Demonstration and Laboratory Materials

*3M Microbiology Products, 3M Center, St.Paul, MN 55144-1000. (petrifilm, pipetts)

*International Bioproducts, P.O. Box 0746, Bothell, WA 98041, (Butterfield's Buffer)

*Glo Germ Company, P.O. Box 537, Moab, Utah 84532, Phone 1-800-842-6622.
(2002, May 5) [Online] Available: www.glogerm.com/ (Glo Germ demonstration kit, florescent paint and black light)

Appendix B

Hand washing in Schools Questionnaire for School Nurse

Whitfield County Health Department would like to learn more about the hand washing policy and methods used in Whitfield County Public Schools. This information will be used to more effectively target resources to prevent communicable diseases in school children.

1. Date: _____
2. Are you the school nurse?
Yes / No
3. If not, what is your title? (Circle one)
School nurse
Clinic volunteer
Public health nurse
Other : _____
4. Name of School: _____
5. What happens when a child gets sick at your school? (please circle one that happens most frequently)
Child goes to sick room in school clinic
Child stays in classroom until parent arrives
Child has to leave building immediately
Other: _____
6. What method of hand washing is used in your school? (Circle one option from each column)

CLEANING	RINSING	DRYING
A1. Bar soap	A2. Water	A3. Paper towels
B1. Liquid soap		B3. Warm air dryer
C1. Hand sanitizer		C3. Cloth towel
D1. Nothing available	D2. No water available	D3. Nothing available
7. If you answered "D" in any of the categories of question #6, what is the reason for lack of a cleaning agent, water or drying agent?

8. How many restrooms are available for the students to use in your school?
 _____ restrooms available.

9. How many classrooms have functioning sinks (plus soap and paper towels)?

10. _____ classrooms with sinks.
Is hot and cold running water available at any restroom or classroom sinks?
_____yes, _____no. If yes, how many sinks have both hot and cold water?

_____ # of sinks. If in question #6 you answered "A1 or B1" what type of soap does your school use (please ask custodian)?

Brand name:

Company:

11. If your school does supply soap (i.e. you answered "A1 or B1" in question #6) for hand washing, is it anti-bacterial soap (please ask custodian)?

Yes / No / Not sure

12. If in question #6 you answered, "C1. hand sanitizer" with no water rinse what type of HAND SANITIZER does your school use (please ask custodian)?

Brand name:

Company:

13. How often (times per day) and what method of hand washing (as above in #6) do you think is appropriate in your school?)

Times per day: None 1 2 3 4 5 >5

Method (as in #6):

14. Referring to question #13, please comment on when you think children should wash their hands.

15. Please comment on what problems, if any, you have observed when hand washing supplies have been supplied in school restrooms.

16. Please suggest things that can be done to prevent or control the problems noted in your answer to questions #7 and #15. Please be as specific as possible.

17. If you would like to make further comments about any of the questions above or on hand washing in general, please comment below.

THANK YOU!

Hand washing in Schools Questionnaire for Teachers

Whitfield County Health Department would like to learn more about the hand washing policy and methods used in Whitfield County Public Schools. This information will be used to more effectively target resources to prevent communicable diseases in school children.

1. Number of children in your classroom: _____
2. Grade: _____ Section or classroom #: _____
3. School name: _____
4. Where do your students wash there hands (circle all that apply)?
 - Restroom in same building as classroom
 - Sink in classroom
 - Restroom in another building that is close to building your classroom is in
 - No hand washing facility available

5. What method of hand washing is used by children in your classroom?
(Circle only one option from each column)

CLEANING	RINSING	DRYING
A1. Bar soap	A2. Water	A3. Paper towels
B1. Liquid soap		B3. Warm air dryer
C1. Hand sanitizer		C3. Cloth towel
D1. Nothing available	D2. No water available	D3. Nothing available

6. If you answered "D" more than once in # 5 above, what is the reason for lack of a cleaning agent, water or drying agent?

7. Please comment on any problems you have observed when hand washing supplies have been supplied in school restrooms.

8. Please suggest things that can be done to prevent or control the problems answered in questions #6 and #7.

9. How many scheduled hand washing times per day are there in your class (please circle one of the following options)?

None 1 2 3 4 5 >5

10. If there is scheduled hand washing when does it occur (Circle all that apply)?

Before lunch

After lunch break

After recess

After gym class

After bathroom

In class after bathroom break

Other: _____

11. Are there scheduled bathroom breaks in your classroom?

Yes / No

12. Are bathroom breaks supervised?

Yes / No

13. Do children in your class routinely wash their hands after going to the bathroom?

Yes / No / Unknown

14. Do children in your class bring their own hand sanitizers to school?

Yes / No / Unknown

15. What percent of children in your class bring hand sanitizers to school?

_____ %

16. How often and what method of hand washing (as above in #5) do you think is appropriate in your school?

Number of scheduled hand washes/day: None 1 2 3 4 5 >5

Method (as in #5):

17. Please comment on when you think children should wash their hands.

18. If you would like to make further comments about any of the questions above or on hand washing in general, please comment below.

THANK YOU!

Hand washing in Schools Questionnaire for Administrator
Whitfield County Health Department would like to learn more about the hand washing policy and methods used in Whitfield County Public Schools. This information will be used to more effectively target resources to prevent communicable diseases in school children.

1. Name of School: _____
2. Phone number: _____
3. Number of children enrolled at your school: _____
4. Grades taught at your school (circle all that apply):
Pre-K K 1 2 3 4 5 6 7 8 9 10 11 12
Other specify: _____

5. Please write in the number of students currently enrolled in each grade:

Number of students per Grade				
Grade _____ Code _____ Identifier: _____	Grade _____ Code _____ Identifier: _____	Grade _____ Code _____ Identifier: _____	Grade _____ Code _____ Identifier: _____	Grade _____ Code _____ Identifier: _____

|||

6. How are school absentees recorded at your school (please circle one only)?
Computer
Written in a log book or notebook
Not recorded
Other (specify): _____
7. Does your school record the REASON for the school absence such illness (symptoms), vacation, or unknown?
Yes / No
8. Does your school record school absence by class?
Yes / No
9. What happens when a child gets sick at your school? (please circle one only)
Child goes to sick room in school clinic
Child stays in classroom until parent arrives
Child has to leave building immediately

Other: _____

10. How many children per grade qualify for free school lunch at your school?

Number of students per grade qualifying for free school lunch					
Grade: _____ Code Identifier: ____	Grade: _____ Code Identifier: ____	Grade: _____ Code Identifier: ____	Grade: _____ Code Identifier: ____	Grade: _____ Code Identifier: ____	Grade: _____ Code Identifier: ____

11. Number of children absent per grade **(due to illness)** Jan 1 to Feb 28, 2001.

Number of students per grade ABSENT due to illness					
Grade: _____ Code Identifier: ____	Grade: _____ Code Identifier: ____	Grade: _____ Code Identifier: ____	Grade: _____ Code Identifier: ____	Grade: _____ Code Identifier: ____	Grade: _____ Code Identifier: ____

THANK YOU!

Hand washing in Schools Questionnaire for Custodian

Whitfield County Health Department would like to learn more about the hand washing policy and methods used in Whitfield County Public Schools. This information will be used to more effectively target resources to prevent communicable diseases in school children.

1. Name of School: _____
2. Do you clean restrooms at the school where you are employed and/or refill supplies (toilet tissue, soap, paper towels, etc.)? Yes _____, No _____.

If you answered yes to Question #2, please answer the following questions.

3. Which restrooms are you responsible for? Please identify by hall, grades or other method. _____

4. Have you observed any problems with maintaining supplies in the restrooms you are responsible for? (Misuse by students, lack of supplies or other problems.)

Yes / No

If yes, please explain what kind of problems you have found. _____

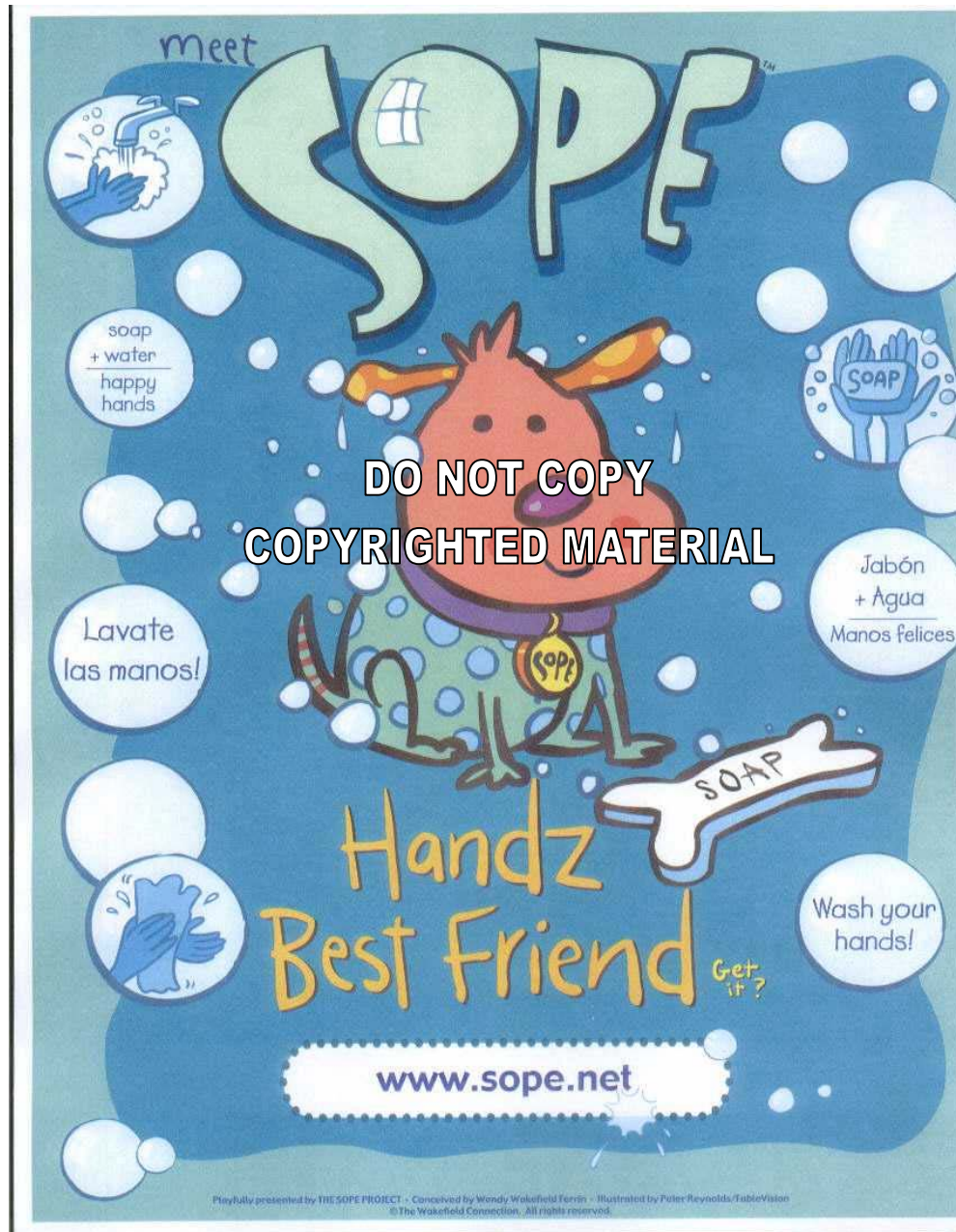
5. Do you have any suggestions for how to control the problems stated above?

THANK YOU!

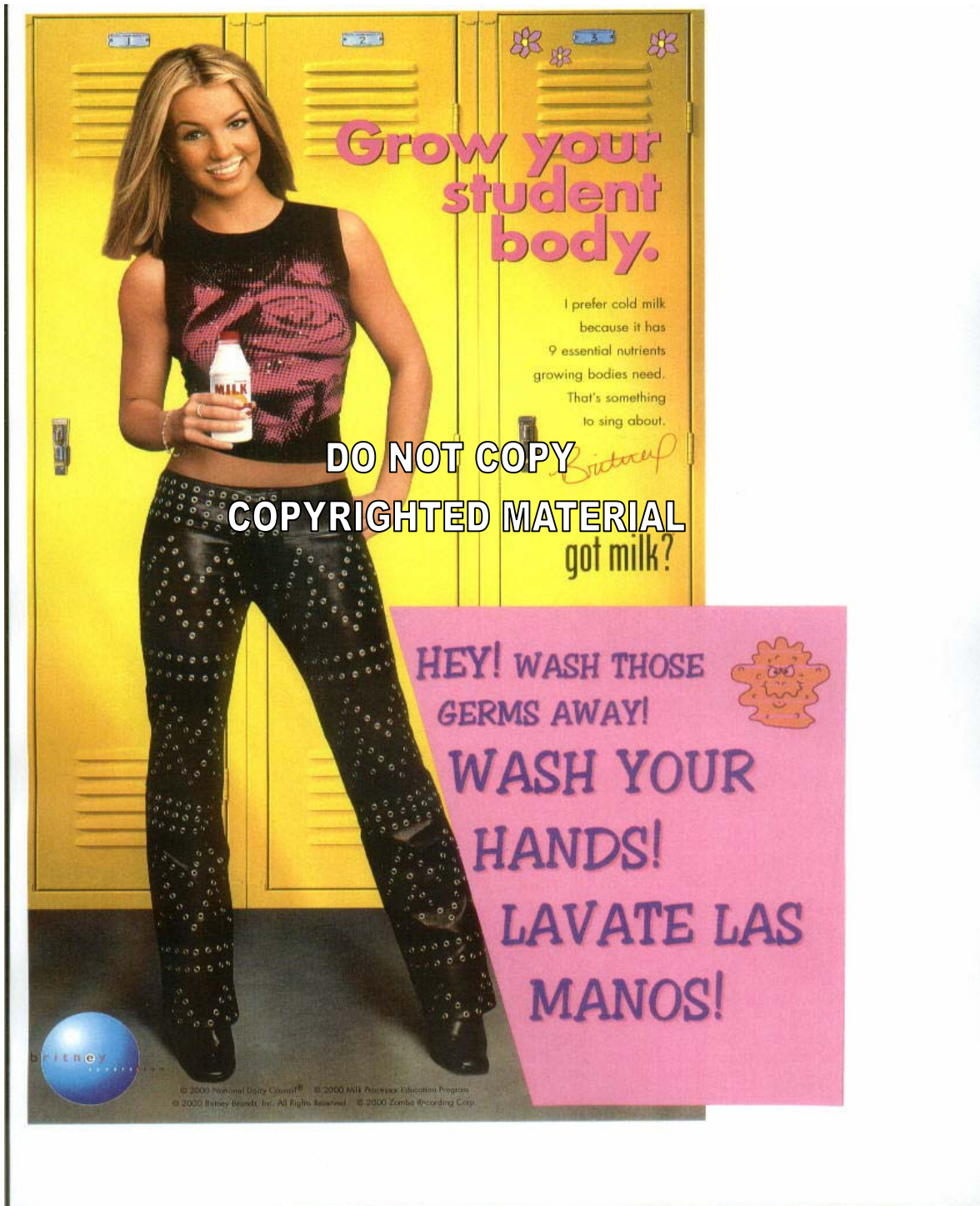
Appendix C

Hand Washing Posters Used in Schools of Sample Population

Elementary School



Middle Schools A and B



Appendix D

Hand Washing Training Outline (approximate time = 30 minutes)

Elementary School

Date: _____

Grade: _____

Class: _____

Total number of students in class: _____

Begin by asking questions:

How many of you wash your hands at school? _____

How many of you wash your hands at home? _____

When do you wash your hands? _____

Why do you wash your hands? _____

Tell students basic facts about germs:

- Germs are everywhere.
- Germs are very small and can only be seen with a microscope.
- Some germs can make you sick.
- You can get rid of germs by properly washing your hands.

Read Germs! Germs! Germs! by Bobbi Katz to Kindergarten and 1st grade.

Read Germs Make Me Sick by Melvin Berger to 2nd through 5th grades.

Use a spray bottle to spray a small amount of water in each child's hand. Ask each child to touch his hand to his desk, chair or clothes.

Ask, "What happens?"

Explain that this is what happens when we sneeze or cough and don't wash our hands before touching someone or something.

Demonstrate hand washing – If there is no hand sink in the room, just pretend.

- Turn on water and wet hands.
- Get a little soft soap.

- Wring hands and go between fingers for 20 seconds. Do this to the tune “Here We Go Round the Mulberry Bush,” using the words, “This is the Way We Wash Our Hands...” in the handout (Little boy standing behind sink with words written beside him. Glo Germ Company) Give this handout to children.

Demonstrate with Glo Germ – Ask for two volunteers. Put a small amount of Glo Germ liquid (shake it well) on hands. Turn out lights and let all children see how it glows under the black light. Let the two children go to the nearest hand washing sink in room or in restroom to wash their hands. If the sink is in the room, then all the children can practice singing the song again while the two volunteers wash their hands. Turn out the lights again and shine the black light on the washed hands to see how well they washed!

Give “Connect the Dots” handout. Ask students to pledge that they will wash their hands at home and at school after they use the restroom, after they play, and before they eat, etc.

Explain that it is important to keep the school restrooms as clean as possible to keep away bad germs and provide a nice place for each of them and their friends. Explain that when they mess up the restrooms, it makes extra work for the custodians. Each one of the students plays a role in keeping his/her restroom nice and in good condition.

Appendix E

GERMS AND YOU

Outline For Middle School

Class: _____

Total number of students in class: _____

I. Questions for Students.

- A. How many of you wash your hands at home? _____
- B. How many of you wash your hands while you are here at school? _____
- C. When should you wash your hands?
- D. Why do you wash your hands?

II. The World We Can't See.

- A. Bacteria
 - Living one-celled organisms
 - Can only be seen with microscope
 - Multiply by dividing
 - Many different types - some good, some bad
 - Some form spores to protect themselves
 - Some produce toxins
 - Some cause infection

Bacteria need food, moisture and warmth to survive and multiply

- B. Viruses
 - Not a complete cell
 - Must rely on a living cell to multiply, therefore do not reproduce in food
 - Can survive conditions that bacteria cannot
 - Transmitted from person to person, from people to food, and from people to food-contact surfaces
 - Can contaminate both food and water supplies. An example is shellfish harvested from sewage-contaminated waters.
- C. Parasites and Fungi (Yeasts and Molds)

III. History of Discovery.

- A. 1500's - Invention of the Microscope by Zacharias Jansen,
 - from Middleburg, Holland
 - first compound microscope using two lenses
- B. 1600's - Discovery of the Single-celled Microorganism by Anton van Leewenhoek
 - Dutch biologist
 - Worked with a single lens microscope to first see single celled microorganisms
 - Discovered red blood cells, capillary systems and bacteria in the human mouth.
 - Found out bacteria were shaped like bacilli, cocci and spirilla
- C. 1800's - "Germ Theory of Disease" by Louis Pasteur
 - From France
 - Discovered that most diseases are caused by microorganisms or germs.
 - Germ Theory of Disease is one of the most important theories in science.
 - Found that rabies was transmitted by agents so small they could not be seen under a microscope (viruses)
 - Developed rabies vaccine for dogs and humans bitten by rabid dogs.
 - Developed pasteurization, process by which harmful germs are destroyed by heat, without destroying food.
- D. 1900's - Development of Polio Vaccine by Jonas Salk, M.D.
 - Grew up in New York City
 - He studies what caused influenza (flu)
 - Developed vaccine for polio, a disease that had crippled many children and President Franklin Roosevelt
 - In 1955, Dr. Salk tried his vaccine on humans and it worked
 - Polio has almost been eradicated from the world

IV. How Are Bacteria and Viruses Spread?

- By transferring contamination from one place to another.
- Bacteria - food, water, humans and insects.
- Viruses - transmitted from person to person, from people to food, and from people to food-contact surfaces

(Example: Dirty Hands Contaminating Food - Story about foodborne illness from turkey and dressing contaminated with Salmonella bacteria.)

(Demonstration: Use spray bottle of water to spray a few students' hands. Let them shake hands of other students. This is what happens when you

sneeze or cough into your hands and you don't wash them before touching someone or something.)

(Demonstration: Ask for 1 volunteer. Ask him/her to rub his/her fingers over petri film. After washing hands properly later after demonstration, rub fingers again on another petri film.)

V. How Can We Avoid Being Infected With Harmful Bacteria and Viruses?

- A. Clean Habits
- B. Good Personal Hygiene and Washing Hands.

(Demonstration of washing hands properly: Ask if anyone has a Birthday today. If not, this week? Try to get two students who have had or will soon have birthdays. "When we wash our hands, we should wet them first with warm water if it is available, then put a small amount of soap on one hand and lather both hands together for about 15-20 seconds, making sure that we get between fingers. We should also rub the fingertips on each hand in the palm of the other hand to get them clean. A simple way to make sure that we lather our hands for 15-20 seconds is by singing Happy Birthday." [Pretend that you are washing hands while singing Happy Birthday to the two volunteers.]

(Demonstration: Ask for 4 - 5 volunteers. Put a small amount of GLO GERM liquid on hands. Let them rub it in well, turn out the light, and then shine black light to show florescence. Ask the volunteers to wash their hands and come back to see how well they wash them. When they are back, shine the blacklight on them again. (Room must be dark to show the florescence with the blacklight.) Ask the cleanest one or two to rub fingers over petri film.

VI. Keeping the Bathroom Clean!!!

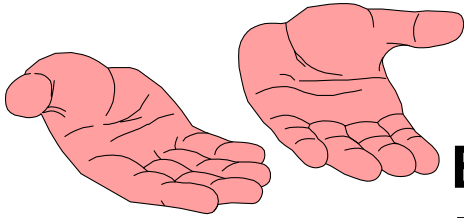
- A. Why?
- B. What to do if you find the bathroom has been messed up.
- C. Why don't some of you wash your hands at school? Discuss.
(Record answers on paper tp discuss later with school administration)

(Petri films should be stored in a warm place and observed after 24 and 48 hours for bacterial growth.)

A Power Point presentation is available for this training outline. Contact Melinda Scarborough at (404) 657-6534 or mfscarborough@dhr.state.ga.us

Appendix F

HANDWASHING POSTER CONTEST



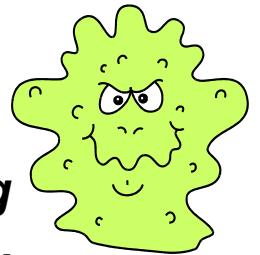
**Eastside Elementary
Eastbrook Middle**

Minimum size 8 ½" X 11"

Maximum size 11" X 17"

***Hand Washing is the single most effective means
for preventing the spread of germs.***

***Use your imagination to draw, color or paint
a poster to encourage good hand washing
and proper care of restroom facilities.***



***A winner from each grade in each school will be
selected. Posters will be judged on originality,
imaginative qualities, neatness and effectiveness.***

***Winners will star in a hand washing education
video to be used in Georgia's Public Schools.***

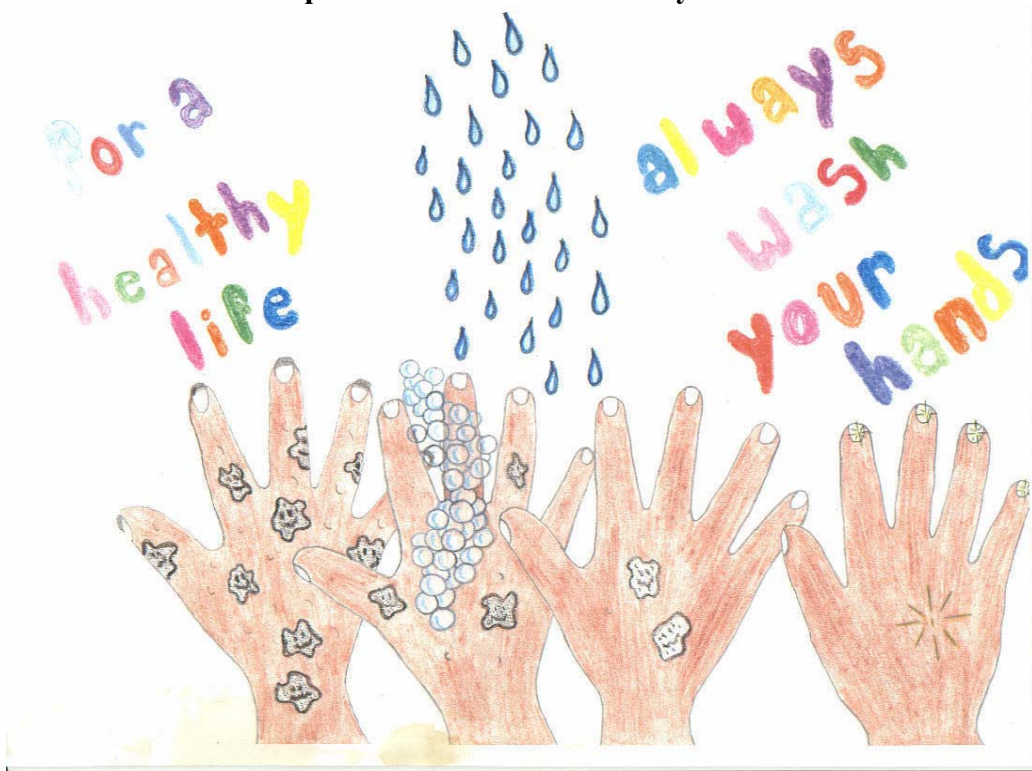
Deadline for Entry – March 12, 2002

Please submit poster to your school office.

Submission of posters will authorize future use by the Georgia Department of Human Resources, Sponsor of the poster and video project.

Appendix G

Examples of Posters Submitted by Students





Appendix H

Script for Hand Washing Video

HAND WASHING DOES MAKE A DIFFERENCE!

Opening Scene - *Outside school*

Scene 2 - *Melinda walking into school*

Scene 3 - *(fade to boys in restroom talking and not washing hands.)*

Scene 4 - *(fade to "GERMS" - doing high fives and laughing, "Streppi," "Eli Coli," and "Vira Virus"*

Scene 5 - *Students walking into class and classroom*

Melinda says, "Good morning class. Today we're going to do something a little bit differently. You know there's been a lot of students out the past couple of weeks because they have been sick with colds and different things. So we're going to talk today about the importance of hand washing. Why do we wash our hands? Can anybody tell me? Yes Chastity." *(fade to look at students.)* Chastity says, "Because of germs." Melinda continues, "That's exactly right. When we talk about germs, we are talking about living microorganisms that are everywhere. *(fade back to look at Melinda.)* They're on the tables. They're all over us and they are especially on our hands. When we talk about germs we are mainly talking about bacteria and viruses. Have any of you heard of bacteria and viruses? Haven't you talked about them in your science classes."

Scene 6 - *(fade to someone looking through a microscope.)*

"I'd like to talk a little bit about bacteria first. Bacteria are very very small microorganisms and we can only see them through a microscope because they are so tiny. Our hands pick up these germs with everything we touch. Germs are all over our hands and maybe that's why we take hand washing for granted because we can't see them. We can only see germs through a microscope."

Scene 7 - *(fade back to classroom looking at Andy)*

"Yes Andy" Andy says, "Mrs. Scarborough, I haven't washed my hands in a week."

Scene 8 - *(fade to looking at Melinda)*

"Well Andy were going to talk about hand washing today and I hope by the end of today's class we all take hand washing a little more serious."

Hand washing is very important because hands are the # 1 way that you transfer a illness you have to someone else.

Not all bacteria on your hands cause you to be sick but as we touch other people who are sick or touch door knobs or other things that sick people have touched...

Scene 9 - *(fade to petri films)*

...we get bacteria on our hands that can cause us to be sick. If you are sick we get these bacteria on our hands when we use the restroom or cough or sneeze into our hands. I bet all of you have been taught when you were little to cough into your hands. Right? And do all of you do that? When you cough into your hands little droplets get on your hands and they contain the germs."

Scene 10 - *(fade to girls in restroom sneezing, not washing hands,)*

Scene 11 - *(fade to germs, sneezing and laughing)*

Scene 12 - *(virus invading a cell)*

"Colds are caused by viruses. They are much smaller than bacteria and can only be seen through a very powerful microscope."

Scene 13 - *(fade back to class looking at Melinda)*

Now when we talk about bacteria and viruses it's important to know that not all bacteria are bad. There are both bad and good bacteria and we pick up these up on our hands everyday. Bacteria have to have food, water and warmth to grow and when we pick them up on our hands, our hands have oils on them. They're also damp. They get sweaty sometimes and bacteria can live for quite awhile before they die.

Scene 14 - *(fade to looking at class)*

Viruses, on the other hand, are not complete cells like bacteria. They can only grow and multiply inside the cells of living human beings and animals. However, they can survive several hours on our hands before they die.

Scene 15 - *(fade to girls playing basketball and then to students on playground.)*

Bacteria and viruses can not move on their own. They depend on us to move them from one place to another. We use our hands in almost everything we do: when we work, when we are outside playing on the playground, when we play basketball, when we write with a pencil, or when we prepare food.

Scene 16 - *(fade to classroom, looking at students)*

How many of you help your parents at home make snacks and other foods? Some of you, do. Do you enjoy it? Do you make a habit of washing your hands before you prepare those foods? Some of you do. Good. I'm glad to see that.

Scene 17 - *(fade to playground again and then to students at lockers and then to boy checking oil in car.)*

It is very important because everytime we get our hands contaminated we transfer those bacteria and viruses to whatever else we touch. So that's why it's so important to wash our hands several times during the day. The dirt that we get on hands and the oils that's on our hands pick up those bacteria and viruses. So if we wash our hands and the dirt and oil off we also remove the bacteria and viruses.

Scene 18 - *(fade to students feeding Smokey the lizard)*

If we sneeze or cough into our hands like we've been taught or if we know we are sick, we need to wash our hands often. Always wash your hands after using the restroom or after feeding your pets or playing with them. We need to wash our hands often to remove the harmful bacteria and viruses that get on our hands.

Scene 19 - *(fade back to classroom.)*

Amanda is going to demonstrate to us today the proper way to wash hands so we're going to go down the hall now and let her do that for us."

Scene 20 - *(fade to scene of hand washing demonstration)*

Scene 21 - *(fade to scene of students walking back to classroom)*

Scene 22 - *(fade back to classroom and Chastity raising her hand.)*

"Yes Chastity." Chastity says, "Mrs. Scarborough, shouldn't we wash our hands before we eat?"

Scene 23 - *(fade to girl washing her hands.)*

"Yes, we should always make a habit of washing our hands before we eat. Washing our hands will get rid of harmful bacteria and viruses that may get on our food that we pick up and eat.

Scene 24 - *(fade to cafeteria and boys eating.)*

Taking the time to wash our hands can help prevent us from getting sick. Washing our hands can also help prevent us from giving an illness we have, to someone else."

Scene 25 - (*fade to boys in restroom washing hands, fade to germs disappearing "POOF"*)

Scene 26 - (*fade to girls in restroom washing hands, fade to germs disappearing "BLAST"*)

Appendix I

HAND WASHING STUDY

Post Evaluation

Principal
Elementary School

Several interventions for the purpose of increasing the number of students properly washing their hands and improving maintenance of restroom facilities have been done at Eastside Elementary School during January, February and March, 2002. The surveys completed in December 2001 indicated two ideas that might improve maintenance of restrooms. One idea was increased monitoring of the restrooms by teachers or other staff. The second idea indicated on the surveys was the need to replace the current soft soap used with a thicker soap. Please give your most candid response to the following questions.

1. Has there been increased monitoring of the student restrooms during Jan.-Mar.?
☐ YES ☐ NO
2. If there has been increased monitoring, who has done the extra monitoring and how has it been done? _____

3. If there has been increased monitoring, do you feel that it has contributed to improved

- maintenance of student restrooms? ☐ YES ☐ NO
4. Has the thin soft soap been replaced with a thicker soap? ☐ YES ☐ NO
5. If the soap has not been replaced, do you foresee it being replaced within the next year? ☐ YES ☐ NO
6. Hand washing posters to encourage students to wash their hands have been displayed in all student restrooms. Have you received any feedback by students and/or staff as to whether these posters have encouraged students to wash their hands?
☐ YES ☐ NO Please comment on any feed back you have received. _____

7. Educational training for each grade has been provided by your school nurse or Melinda Scarborough. Please rate the overall value of this training below and comment on whether you think this training has benefited your students or not and if it should be changed in any way.
 I rate the training given as:
 Excellent ☐ Very Good ☐ Good ☐ Fair ☐ Poor ☐

8. A hand washing poster contest was held for students during March. Please rate the overall value of this contest to your students and comment on the benefits, if any, that this poster contest provided for students.
 I rate the value of the poster contest as:
 Excellent ☐ Very Good ☐ Good ☐ Fair ☐ Poor ☐

9. A hand washing video was made with the actors being students who won the hand washing poster contest. Please rate the overall value of making this video to your students and comment on the benefits, if any, that this experience had for your students.
 I rate the value of making the video as:
 Excellent ☐ Very Good ☐ Good ☐ Fair ☐ Poor ☐

10. Overall, do you think the interventions done at your school might benefit other schools in facilitating them to provide soap and towels in student restrooms and encouraging students to properly wash their hands? ☐ YES ☐ NO

Please write any other comments in the space below.

HAND WASHING STUDY

Post Evaluation

School Nurse
Elementary

During the hand washing study conducted during January, February and March, 2002, you have assisted in providing training in the importance of hand washing to several classes at Eastside Elementary. Please answer the following questions with your most candid answers.

1. Were there any classes in your school that did not receive training? ☐ YES ☐ NO
If the answer is yes, please list the classes that did not receive training? _____

2. What was the total number of students who received training? ☐☐☐

3. Did you find the outline that was provided for training helpful? ☐ YES ☐ NO

4. What changes in the outline did you make or would you make, should you do more training in the future? _____

-
-
5. Do you think the training given to students has been beneficial by increasing the number of students who properly wash their hands?
Extremely Beneficial ☐ Very Beneficial ☐ Beneficial ☐ Not Beneficial ☐
Please comment on any evidence you have noticed that may indicate an increased number of students are washing their hands. _____
-
6. Have you observed any improvements in the maintenance of restrooms by students since the hand washing training took place? ☐ YES ☐ NO
Please comment on what you have observed. _____
-
7. If you asked students how many of them washed their hands at home (prior to the hand washing training) please list the total number here.
8. If you asked students how many of them washed their hands at school (prior to the hand washing training) please list the total number here.
9. For classes that you asked the above questions in, please ask their teachers to ask the students again (since the training and hand washing poster contest) and list the total numbers here. Wash hands at home Wash hands at school

Please write any other comments in the space below.

HAND WASHING STUDY

Post Evaluation

Teachers
Elementary

Training on the importance of hand washing has been given in your classroom during January, February and March, 2002. In addition, hand washing posters have been placed in student restrooms and there has been a hand washing poster contest for students. Please answer the following questions with your most candid answers.

1. Please rate the overall value of the training given in your classroom.

I rate the training given as:

Excellent ☐ Very Good ☐ Good ☐ Fair ☐ Poor ☐

2. Please comment on whether you think this training, including the books, audiovisuals and demonstrations, should be changed in any way.

3. Have you observed any evidence since the training and hand washing poster contest that students in your classes are washing their hands more often?

☐ YES ☐ NO

If yes, please comment on what you have observed. _____

4. Please ask the students in your classroom the following two questions and record the answers here.

How many of you wash your hands at home? ☐☐

How many of you wash your hands here at school? ☐☐

Please keep the attached consent form for your records.
 Thank you.

HAND WASHING STUDY Post Evaluation

Custodians

Several things have been done in the school you work in during January, February and March, 2002 to increase the number of students properly washing their hands and to improve maintenance of restrooms. Please answer the following questions.

1. In the restrooms you routinely clean, have you noticed any improvements in the way students maintain the restrooms. ☐ YES ☐ NO

If yes, please comment on the improvements you have noticed. _____

2. What restrooms do you routinely clean and maintain? _____

3. Please describe the average amount of soap that you usually need to fill dispensers in one restroom each day.

1 Gallon ☐ 1 1/2 Gallons ☐ Other ☐ How much? _____

4. Please describe how many new rolls of toilet tissue you usually need to put in one restroom each day. _____

5. Approximately how many paper towels are put in dispensers in one restroom each day. _____

HAND WASHING STUDY

Post Evaluation

Principal
Middle School A

Several interventions for the purpose of increasing the number of students properly washing their hands and improving maintenance of restroom facilities have been done at Eastbrook Middle School during January, February and March, 2002. Please give your most candid response to the following questions.

1. The surveys completed in December 2001 indicated one intervention that might improve maintenance of restrooms. This intervention was increased monitoring of the restrooms by teachers or other staff. Has there been increased monitoring of the student restrooms during Jan.-Mar. ☐ YES ☐ NO
2. If there has been increased monitoring, who has done the extra monitoring and how has it been done? _____

3. Do you feel the agendas that are required to be in a student's possession at all times have helped in the monitoring of who is in restrooms during class time and between regularly scheduled breaks? ☐ YES ☐ NO
4. If there has been increased monitoring, do you feel that it has contributed to improved

maintenance of student restrooms. ☐ YES ☐ NO

5. Hand washing posters to encourage students to wash their hands have been displayed in all student restrooms. Have you received any feedback by students and/or staff as to whether these posters have encouraged hand washing. ☐ YES ☐ NO

Please comment on any feed back you have received. _____

6. Educational training for sixth grade science classes has been provided by Melinda Scarborough. Please rate the overall value of this training below and comment on whether you think this training has benefited your students or not and if it should be changed in any way.

I rate the training given as:

Excellent ☐ Very Good ☐ Good ☐ Fair ☐ Poor ☐

7. A hand washing poster contest was held for students during March. Please rate the overall value of this contest to your students and comment on the benefits, if any, that this poster contest provided for students.

I rate the value of the poster contest as:

Excellent ☐ Very Good ☐ Good ☐ Fair ☐ Poor ☐

8. A hand washing video was made with the actors being students who won the hand washing poster contest. Please rate the overall value of making this video to your students and comment on the benefits, if any, that this experience had for your students.

I rate the value of making the video as:

Excellent ☐ Very Good ☐ Good ☐ Fair ☐ Poor ☐

9. Overall, do you think the interventions done at your school might benefit other schools in facilitating them to provide soap and towels in student restrooms and encouraging students to properly wash their hands? ☐ YES ☐ NO

Please write any other comments in the space below.

HAND WASHING STUDY

Post Evaluation

Teachers of Sixth Grade Science Classes
Middle School A

On February 21 and 22, 2002 Melinda Scarborough gave training on the importance of properly washing hands to the students in each of your classes. Please answer the following questions with your most candid answers.

1. Please rate the overall value of this training.

I rate the training given as:

Excellent ☐ Very Good ☐ Good ☐ Fair ☐ Poor ☐

5. Please comment on whether you think this training, including the audiovisuals and demonstrations, should be changed in any way.

6. Have you observed any evidence since the training and hand washing poster contest that students in your classes are washing their hands more often?

☐ YES ☐ NO

If yes, please comment on what you have observed. _____

7. Please ask the students in each science class period the following two questions and record the numbers below.

How many of you wash
your hands at home?

Period ____	#		
Period ____	#		
Period ____	#		
Period ____	#		
Period ____	#		
Period ____	#		

How many of your wash your
hands here at school?

Period ____	#		
Period ____	#		
Period ____	#		
Period ____	#		
Period ____	#		
Period ____	#		

HAND WASHING STUDY

Post Evaluation

Assistant Principal
Middle School B

Several interventions for the purpose of increasing the number of students properly washing their hands and improving maintenance of restroom facilities have been done at Westside Middle School during January, February and March, 2002. Please give your most candid response to the following questions.

10. The surveys completed in December 2001 indicated one intervention that might improve maintenance of restrooms. This intervention was increased monitoring of the restrooms by teachers or other staff. Has there been increased monitoring of the student restrooms during Jan.-Mar. ☐ YES ☐ NO
11. If there has been increased monitoring, who has done the extra monitoring and how has it been done? _____
-
-
12. Do you feel the agendas that are required to be in a student's possession at all times have helped in the monitoring of who is in restrooms during class time and between regularly scheduled breaks? ☐ YES ☐ NO

13. If there has been increased monitoring, do you feel that it has contributed to improved maintenance of student restrooms. ☐ YES ☐ NO

14. Hand washing posters to encourage students to wash their hands have been displayed in all student restrooms. Have you received any feedback by students and/or staff as to whether these posters have encouraged hand washing. ☐ YES ☐ NO

Please comment on any feed back you have received. _____

15. Educational training for physical education classes has been provided by Melinda Scarborough. Please rate the overall value of this training below and comment on whether you think this training has benefited your students or not and if it should be changed in any way.

I rate the training given as:

Excellent ☐ Very Good ☐ Good ☐ Fair ☐ Poor ☐

16. Overall, do you think the interventions done at your school might benefit other schools in facilitating them to provide soap and towels in student restrooms and encouraging students to properly wash their hands? ☐ YES ☐ NO

Please write any other comments in the space below.

HAND WASHING STUDY

Post Evaluation

Teachers of Physical Education Classes
Middle School B

On January 23, 2002, Melinda Scarborough gave training on the importance of properly washing hands to the students in each of your classes. Please answer the following questions with your most candid answers.

1. Please rate the overall value of this training.

I rate the training given as:

Excellent ☐ Very Good ☐ Good ☐ Fair ☐ Poor ☐

8. Please comment on whether you think this training, including the audiovisuals and demonstrations, should be changed in any way.

9. Have you observed any evidence since the training and hand washing poster contest that students in your classes are washing their hands more often?

☐ YES ☐ NO

If yes, please comment on what you have observed. _____

10. Please ask the students in each PE class period the following two questions and record the numbers below.

How many of you wash
your hands at home?

Period ____ # ☐☐
 Period ____ # ☐☐
 Period ____ # ☐☐
 Period ____ # ☐☐
 Period ____ # ☐☐
 Period ____ # ☐☐
 Period ____ # ☐☐

How many of your wash your
hands here at school?

Period ____ # ☐☐
 Period ____ # ☐☐
 Period ____ # ☐☐
 Period ____ # ☐☐
 Period ____ # ☐☐
 Period ____ # ☐☐
 Period ____ # ☐☐

Appendix J

PUBLIC SCHOOL HAND WASHING SURVEY

Date of Survey ☐☐☐/☐☐☐/☐☐☐☐

Name of School _____

City _____ County _____ Enrolled # of Students ☐☐☐☐

Name of Principal _____ Phone # (☐☐☐)☐☐☐-☐☐☐☐

Name of person answering this survey _____

First Name

Last Name

Grades at this school: (circle those included)

K - 1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9 - 10 - 11 - 12

1. Are any of the following hand washing supplies and/or toilet tissue supplied inside any of your school's student restrooms? (Please check all that are supplied)

Bar soap ☐ Liquid Soap ☐ Hand Sanitizer ☐

Paper Towels ☐ Blow Dryer ☐ Toilet Tissue ☐

Other (specify) _____.

2. Is hot water available in any student restrooms? ☐ YES ☐ NO
3. If hand washing supplies are not currently provided inside student restrooms, have they been provided in the past? ☐ YES ☐ NO

4. If hand washing supplies are currently provided inside student restrooms, or if they have been provided in the past, what problems have occurred in being able to maintain them?

Towels and/or tissue thrown on ceiling ☐

Supplies stolen ☐

Equipment torn off walls ☐

Towels pulled out and thrown on floor ☐

Toilets stopped up with towels and tissue ☐

Soap wasted by dispensing on floor ☐

Other problems: _____

5. If hand washing supplies are currently being provided inside student restrooms, what is being done to control problems in maintaining supplies and cleanliness of restrooms? _____

6. If hand washing supplies are not currently being provided inside student restrooms, are supplies being provided any other way? ☐ YES ☐ NO

7. If supplies are being provided other ways, how are they being provided?

Teacher gives supplies to students ☐ Please explain how this is done _____

Hand sink in classrooms with hand washing supplies provided ☐ Please circle the grade levels for which hand sinks are available in classrooms:

K - 1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9 - 10 - 11 - 12

Other way(s) that supplies are being provided. Please explain: _____

8. Is any educational training on the importance of hand washing taught in any grade?

☐ YES ☐ NO If yes, for what grades? (circle those applicable)

K - 1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9 - 10 - 11 - 12

9. If educational training on the importance of hand washing is taught, what subject(s) is it included in? _____

Please write any additional comments in the space below:

***THANK YOU** for your help in completing this survey. A study is currently being done to find successful ways to control problems in maintaining hand washing supplies in student restrooms and to improve proper hand washing by students. Your County Environmental Health Specialist will collect this survey or instruct you on how to get the completed survey to him or her. If you have questions about this study or want to make additional comments, please call Melinda Scarborough, Project Director, at (404) 657-6515. Your assistance is greatly appreciated.*

What about confidentiality?

For the study, any information you provide will be kept confidential and only reported with the total group, not on an individual basis. After the study is over, any papers or information that could link the information you give us with your name will be destroyed.

I give my consent to take part in this study.

Signature of Person Answering Survey

Appendix K

Letter of Consent (Version: 3-2002)

Hand Washing in Georgia's Public Schools A Community Needs Assessment and Intervention Study

Principal Investigator: Melinda F. Scarborough
Director of Food Service Program
GA Dept. of Human Resources, Environmental Health
Student - Emory University

Purpose of Study: To find successful ways to control problems in maintaining hand washing supplies in student restrooms and to improve proper hand washing by students.

Statement of procedures: Participation in this study involves completing a questionnaire. The time needed for this is approximately 15 minutes.

Statement of Being Voluntary:
Participation in this study is completely voluntary. You may choose to answer all, only some or none of the questions on the survey.

Confidentiality:

For this study, any information you provide will be kept confidential and only reported with the total group, not on an individual basis. Individual data will only be available to the principal investigator. After the study is over, any papers or information that could link the information you give us with your name will be destroyed.

Contacts:

Questions about the hand washing study can be directed to Melinda Scarborough at (404) 657-6515.

If you have any questions about your rights as a participant in this study, you may contact Dr. Karen Hegtvedt, Chair, Social, Humanist, and Behavioral Institutional Review Board at Emory University. She can be reached at (404) 727-7517.

Please keep this consent document for your records.

Thank You,
Melinda F. Scarborough, REHS

Appendix L



Jim Martin, Commissioner
Kathleen E. Toomey, M.D., M.P.H., Division Director

Georgia Department of Human Resources • Division of Public Health
Two Peachtree Street NW • Suite 15-470 • Atlanta, Georgia 30303-3186 • Tel: (404) 657-2700 • Fax: (404) 657-2715

May 1, 2002

Ms. Linda Schrenko
State Superintendent of Schools
2066 Twin Towers East
Atlanta, Georgia 30334-5001

Dear Ms. Schrenko:

Many of Georgia's public schools do not provide soap and paper towels or hand blow dryers in student restrooms. Even though some schools do provide these supplies, problems such as vandalism by students make it difficult to maintain supplies, thereby preventing consistent and effective hand washing by students. Because hand washing is the single most preventive measure for reducing the spread of contagious diseases and because it is a fundamental personal hygiene practice that is often not done

when necessary or is ineffectively done, a study was conducted in January, February and March 2002 that sought to compile existing information and tools and produce new tools for improving the accessibility and practice of hand washing in schools. The study does this by assessing the availability of hand washing supplies, problems maintaining these supplies and education provided to promote hand washing by students in Georgia's public schools.

The study also provides and tests interventions in a sample community of students in three schools for three months. The results include (a) two training outlines: one for elementary level students and another for middle and high school students, (b) hand washing posters for reminding students to wash their hands, (c) a training video for promoting hand washing among students, and (d) recommendations for controlling maintenance of hand washing supplies and providing ongoing education to promote effective hand washing among students.

This hand washing study was done through the support of the Georgia Department of Human Resources, Division of Public Health, Environmental Health Section and as a Special Studies Project to complete my Master of Public Health degree at Emory University. A copy of the final report with the hand washing training video that was produced during the study is enclosed for your review. At your convenience, I would be very glad to present to you and your staff, the findings in a power point presentation and answer any of your questions. I can be reached at (404) 657-6515.

Sincerely,

Melinda F. Scarborough, M.P.H., R.E.H.S.
Director of Food Service, Tourist
Accommodation and Swimming Pool
Programs