

## **Smooth Sailing! Cruise Passengers Demographics and Health Perceptions While Cruising the Eastern Caribbean.**

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### **Abstract**

*Each year millions of people vacation aboard cruise ships, some carrying thousands of passengers and crew members. These ships are small, floating cities that offer many options for food and entertainment. However, just as in life ashore, cruise passengers can be exposed to dangerous situations involving food-borne illnesses and noroviruses. Cruise ship operators have the obligation to protect all passengers onboard, this paper examine passengers on an Eastern Caribbean cruise demographics and health perceptions. The results of this study show that the majority of the respondents were from the USA (62.4%) and Canada (11.2 %). A one-way ANOVA was used to test for preference differences among the four means for first time cruisers, second time cruisers, third time cruisers and more than 3 time cruisers. The results revealed significant differences between means among the groups with number of cruise traveler experience.*

**Keywords:** Cruise passengers, food safety, noroviruses, health perceptions, Caribbean

### **1.0. Introduction**

Each year millions of people vacation aboard cruise ships, some carrying thousands of passengers and crew members. The cruise industry is the fastest-growing category in the leisure travel market. Since 1980, the industry has experienced an average annual passenger growth rate of approximately 7.2% per annum. A record of just over 20 million passengers in the world cruised in 2012, with 11.2 million North American guests. Coupled with an annual occupancy percentage that exceeded 103% in 2012, this annual passenger growth shows an industry where demand continues to outstrip supply, even in trying economic environments. In 2011 alone, 12 new ships debuted from Cruise Lines International Association (CLIA) member lines, with guest capacities ranging from 162 to 3,652 passengers sailing the world's waters for the first time. According to the Florida Caribbean Cruise Association (FCCA), the industry's growth is headlined by the Caribbean, which continues to rank as the dominant cruise destination, accounting for 39.8% of all itineraries in 2012, versus 41.3% in 2010, 37.02% in 2009, 37.25% in 2008, 41.02% in 2007 and 46.69% in 2006. Passenger numbers continue to remain consistent and high for the Caribbean, despite other rising cruise destinations.

Today's ships offer a new generation of onboard features and a world of innovation, including surf pools, planetariums, on-deck LED movie screens, golf simulators, water parks, demonstration kitchens, self-leveling billiard tables, multi-room villas with private pools and in-suite Jacuzzis, ice skating rinks, rock climbing walls, bungee-trampolines and much more. Today's new ships also offer facilities to accommodate family members of all generations traveling together, a market that is ideally suited for Caribbean cruising. These ships are small, floating cities that offer many options for food and entertainment. Cruises have become a major part of the tourism industry. Recent passenger figures suggest that although the cruise industry is growing, so is the competition. The industry's rapid growth has seen nine or more newly built ships catering to a North American market added every year since 2001, as well as others servicing the European market. Smaller markets, such as the Asia-Pacific region, are generally serviced by older ships. Cruise ship orders through 2012 include 26 new builds with 54,000 berths at a value of nearly \$15 billion (CLIA). This growth has made it imperative for cruise companies to delight their current customers so that they will return and refer new customers.

Achieving a high percentage of loyal customers is new for the cruise industry. Historically, the industry serves a large proportion of first time customers, about 75% in the North American market. As a result, companies are changing their focus from new customer acquisition to better understanding the elements that impact customer retention. Considerable research has demonstrated that the key variable impacting retention is customer satisfaction. Customer satisfaction includes all elements of the passenger experience, before, during and after a cruise. Providing an exceptional passenger experience can be a key differentiator and increasingly has become a key element of business strategy for the cruise industry. As a result of effectively marketing new feature rich ships, passenger numbers have increased in record numbers. But the competition is getting more intense, with many new cruise ships entering the market in the next several years, so satisfying customers is becoming the ante just to stay in the game. The biggest success will come to those companies that understand their passengers and can keep all guests whether new or returning passengers, delighted with their experience. Cruise companies are well aware that food poisoning or noroviruses can ruin the cruise experience.

## **2.0. Literature Review**

It's a traveler's worst nightmare to escape on a Caribbean cruise and suddenly everybody around starts throwing up and has a bad case of "gastrointestinal illness." However, just as in life ashore, passengers can be exposed to dangerous situations involving food borne illnesses, negligence and medical errors cases of gastroenteritis or stomach flu. In addition, cruise ship operators have the obligation to protect all passengers from injuries such as burns or slip and fall accidents, stemming from maintenance deficiencies on board the ship. If one become ill or is injured while aboard a cruise ship or land excursion, the cruise ship operators must provide a reasonable standard of care, i.e. care that is comparable to what another patient would receive in a similar medical situation. Cruise ships operating from US ports are governed by the US Center for Disease Control (CDC, <http://www.cdc.gov/nceh/vsp/>). An incident is an official "outbreak" which occurs only when at least three percent of passengers experience symptoms of the illness. The CDC stated that the norovirus is highly contagious and spreads from person to person, through contaminated food or water, and by touching contaminated surfaces. Careful hand washing with soap and water is key to the prevention of the spread of the norovirus. Contaminated surfaces must be cleaned and disinfected thoroughly to prevent continued spread of the disease. The norovirus outbreaks occur in many types of settings, including, according to the CDC, health care facilities, day care settings, the military, schools and cruise ships.

According to the US Center for Disease Control, several cruise ships have experienced problems with the norovirus over the last decade and beyond, (CDC). The norovirus is common enough in the world, affecting over 300 million people world-wide each year. Cruise ships can often be hit with the norovirus, a group of viruses that cause stomach problems. Symptoms often include nausea, vomiting, diarrhea and abdominal cramps. The virus is spread usually through contaminated food and water or through contact with sick people or even the surfaces they have touched. Most outbreaks occur in a confined space such as a theater, large banquet hall, school, college dorm and of course cruise ships. Outbreaks aboard ships tend to make headlines because the cruise industry is required by US law to report any large outbreak of illness. Outbreaks of illness are the exception, not the norm; given that there is at least one incident per month and on any day there are about 80 cruise ships sailing in the Caribbean Sea. The cruise lines have taken many efforts to prevent and minimize the damages caused by viruses.

The cruise industry has developed a sanitation program in coordination with the CDC that includes such measures as disinfection of high-touch surfaces with vigorous cleaning regimes; encouraging correct hand washing procedures and enhancing this with the use of hand sanitizing gels placed throughout the ships; isolating ill passengers and crew in cabins until non-contagious; encouraging passengers to use their own cabin's bathroom facilities; and providing regular verbal and written communication to passengers about steps they can take to stay well while onboard cruise ships. CLIA ships regularly exceed the CDC's minimum sanitation inspection score of 85. In fact, most CLIA cruise lines score about 95. Scores are available to the public through the CDC website at [www.cdc.gov/nceh/vsp](http://www.cdc.gov/nceh/vsp).

An examination of the information provided by the CDC from 2007 to present, shows that each year there was an average of fourteen incidents on cruise ships. The vast majority of these incidents related to the norovirus, which accounted for about 95% of the incidents while Enterotoxigenic *E. coli* (ETEC) accounted for about 5% of the incidents. New food and water safety issues evolve as the environment changes. Recent food and waterborne illnesses have occurred in new settings and or unique foods not traditionally associated with foodborne illness outbreaks. New issues associated with food safety and security that have emerged support the need for continued education and research. With an aging population and an increased number of people at risk due to medical conditions for food and waterborne illnesses, and the increasing number of people cruising every year, the cruise industry has to be overly vigilant in order to prevent incidents.

The United States has one of the safest food supplies in the world, yet food-related illnesses impose an increasingly important public health problem. It is estimated that 48 million illnesses, 128,000 hospitalizations, and 3,000 deaths result from foodborne disease annually with a cost of \$77.7 billion (Scharff, 2012). High-risk populations such as the very young and the elderly experience the most serious consequences of foodborne illnesses. Not only have known microorganisms caused illness but antimicrobial drug resistance organisms, viruses, and allergic reactions to food are being added to the list of causative disease agents for foodborne illness. Based on a 3-year study of anaphylaxis cases, an estimated 2,500 individuals per year will experience food-induced anaphylaxis (US Health & Human Services). Water is essential for life and is used in all aspects of the food industry. More than 167,000 public water systems exist in the United States. Between 2004 and 2005, 30 waterborne disease outbreaks were associated with drinking water (Liang et al., 2005). With the increased consumption of bottled water, safety issues have surfaced and regulations have been established for these products (Taver, 2008). Cruise passengers are particular vulnerable because of the number of people in a confined space on the ship, a high percentage of people over 55 years and the additional risk of passengers who are exposed while traveling to and from different destinations.

Consumers are more aware of food safety issues today due to the attention that the media outlets give to large or nationwide foodborne illness outbreaks, events from cruise ships seem to get additional scrutiny because cruise ships are required by US laws to report any outbreak. A survey conducted in 2008 by the International Food Information Council (IFIC) concluded that only 45% of Americans were confident in the safety of the US food supply (IFIC, 2008). Confidence of consumers increased when they prepare foods for themselves and families with 96% of consumers reporting that they take at least one food safety precaution while preparing foods at home. The Food Marketing Institute (FMI) reported that in 2007, 66% of consumers, compared to 82% in 2006, were confident that the food they purchased was safe (FMI, 2008). This decrease in confidence in the perception of the safety of food was attributed to the publicity of food safety issues such as spinach, peanut butter, bagged salad, ground meat, imported foods, pet food, and a number of recalls in late 2006 and 2007. In January 2008, consumer confidence in the safety of the food supply rebounded to 81% (FMI, 2008).

Today, Consumer confidence in food safety is at its highest point in seven years, with 88% of shoppers "completely" or "somewhat" confident in the safety of food (FMI, 2011). Consumers are more comfortable with food produced or grown in the United States (87%) than imported foods (45%). Bacteria, product tampering, pesticide residue, and avian influenza topped the list for food safety-related risks that pose a health risk (FMI, 2008). Numerous studies have been conducted to assess consumer knowledge. In a meta-analysis of consumer food handling knowledge and practices, Patil et al (2005) stated that consumer knowledge of safe food handling practices does not correspond with reported use of the practices because consumers tend to underreport the incidence of foodborne illness and may not be aware of the classical symptoms of food borne illness, Knight et al (2008).

The changing environment of producing and processing foods contributes to the safety of our food and water supply and lots of this food is used on cruise ships. According to the Institute of Food Technologists (IFT, 2010), the complexity of the pre-harvest, harvest, and post-harvest environments make it difficult to control for all potential sources of microbial contamination. The *E coli* O157:H7 outbreak associated with spinach in 2006 and the *Salmonella Saintpaul* associated with the tomato and pepper outbreak in 2008 were examples of foodborne illness outbreaks that, due to the wide national distribution of produce, were difficult to trace back. The food industry has developed trace-back systems to aid in finding the source of a pathogen involved, and to recall the implicated food item for further examination of an outbreak. Food recalls are becoming more common as foodborne illnesses are reported and associated with a particular food. Other recalls have occurred because the food company has voluntarily chosen to recall a food product with a potential risk. These situations make it difficult for cruise ships to identify the cause of a problem onboard quickly. Additionally, the globalization of our food supply and the varying food and water safety standards in other countries impact the safety of the food consumed in the United States (IFT, 2010) as well as on cruise ships.

The Institute of Food Technology states that the following issues will affect food safety in the next decade (IFT, 2010): based on the analysis of food borne illness outbreak data from the CDC, they identified five risk factors of food handling practices that were the major contributors to these outbreaks: purchasing food from unsafe sources; failing to cook food adequately; holding food at incorrect temperatures; using contaminated equipment; and practicing poor personal hygiene. The major of viruses causing foodborne illness are hepatitis A and caliciviruses, which include noroviruses, Babcock (2007). Viruses accounted for 54% of foodborne illness outbreaks in 2006 (CDC, 2006), with the norovirus as the most common cause of sporadic cases and outbreaks. A team of researchers from Boston University School (BUSM), Carney Hospital, Cambridge Health Alliance and Tufts University School of Medicine, found that widespread poor compliance with regular cleaning of public restrooms on cruise ships may predict subsequent norovirus infection outbreaks. This study was the first study of environmental hygiene on cruise ships. Outbreaks of acute gastroenteritis (AGE) often occur in close populations, such as among cruise ship passengers. Recent epidemiologic investigations of outbreaks of AGE confirmed that 95% of cruise ship AGE outbreaks are caused by norovirus. Despite biannual sanitation monitoring and hand hygiene interventions among passengers and crew members, 66 ships monitored by the United States Centers for Disease Control and Prevention experienced norovirus infection outbreaks between 2003 and 2008. Many of these incidents occurred on cruise ships in the Caribbean Sea. Trained health care professionals evaluated the thoroughness of disinfection cleaning of six standardized objects (toilet seat, flush handle or button, toilet stall inner handhold, stall inner door handle, restroom inner door handle, and baby changing table surfaces) with high potential for fecal contamination in cruise ship public restrooms.

The researchers found only 37 percent of the 273 randomly selected public restrooms that were evaluated on 1,546 occasions were cleaned daily. The overall cleanliness of the six standardized surfaces on each ship ranged from 4% to 100%. Although some objects in most restrooms were cleaned at least daily, on 275 occasions no objects in a restroom were cleaned for at least 24 hours. Overall, the toilet seat was the best-cleaned object and the least thoroughly cleaned object was the baby changing table. Furthermore, 19 objects in 13 ships were not cleaned at all during the entire five-to-seven-day monitoring period. Toilet area handholds were largely neglected, accounting for more than half of the uncleaned objects on 11 ships. Although almost all standardized objects were assessed at the time of each evaluation, baby changing tables were not found in public restrooms on 79 percent of vessels. On three ships, none of the changing tables were cleaned during the study period. The thoroughness of cleaning did not differ by cruise line and did not correlate with Center for Disease Control and Prevention Vessel Sanitation Program inspection scores which averaged 97 out of a possible 100 points for the study vessels.

According to the researchers these findings are of particular note because five of the six evaluated objects could readily be directly contaminated by pathogens during regular use. Although hand hygiene with soap after toileting may diminish the transmission of enteric pathogens via bathroom door knobs or pulls, hand washing is unlikely to mitigate the potential for any of the other toilet area contact surfaces to serve as a source of transmission of enteric pathogens. Furthermore, there was a substantial potential for washed hands to become contaminated while the passenger was exiting the restroom, given that only 35 percent of restroom exit knobs or pulls were cleaned daily. Only disinfection cleaning by cruise ship staff can reasonably be expected to mitigate these risks. Although the thoroughness of disinfection cleaning was 30 percent on more than half of the ships, near-perfect cleaning was documented on several vessels, providing evidence that a high level of environmental hygiene is achievable.

Koo et al., (2010), identified the noroviruses, infamous for causing outbreaks of gastroenteritis on cruise ships, may now be recognized as a common cause of travelers' diarrhea in multiple regions of the world as well. Researchers from the U.S. and abroad concluded that travelers' gastroenteritis occurs frequently in people traveling between industrialized nations and regions of the developing world. Currently, travelers' diarrhea is largely attributed to *E. coli* infection; however, a specific accusatory agent is never identified in up to 40% of reported cases. Such incidents of unexplained diarrheal illness are believed to be caused by undetected bacterial or nonbacterial pathogens and until now the prevalence of noroviruses as a cause of diarrhea in international travelers has not been well known. Noroviruses, can be contracted through fecal-oral transmission, are highly contagious in people of all ages. Samples from international travelers to Mexico, Guatemala, and India suffering from diarrhea were collected and examined for the prevalence of noroviruses. Of the 571 samples studied noroviruses were identified in 10.2% of the cases, making it second to only diarrheagenic *Escherichia coli* as the most common pathogen associated with the travelers' diarrhea. This study demonstrates that noroviruses are an important pathogen of travelers' diarrhea in multiple regions of the world. It is likely that this enteric pathogen has long been underestimated as a cause of travelers' diarrhea due to limitations of detection methods.

### **2.1. Consumer Perceptions**

Understanding what factors drive consumer perceptions and attitudes regarding food safety is essential to designing public policy and industry strategies to effectively deal with food safety events (Kornelis et al., 2007). Consumer risk perceptions and risk attitudes have been succinctly defined by Schroeder et al. (2007, p.1):

“Risk perceptions represent a person’s views about the risk inherent in a particular situation. Perceptions about food safety risk are what the individual believes would be the amount of health risk, if any; they would face from consuming a food product. Risk attitudes are a person’s overriding tendencies toward risk across different risky situations. Risk attitudes refer to how willing a person is to accept risk. Risk-averse people place a high premium on ventures that are assured safe, risk-neutral people are indifferent regarding choices with different levels of risk, and risk-seeking individuals pursue risky situations.”

However, the importance of risk perceptions increased substantially in the event of a salmonella scare. Schroeder et al. (2007) found that risk perceptions and risk attitudes had significant and varied impacts on beef consumption behavior among consumers in the United States, Canada, Mexico, and Japan. For instance, risk perceptions had approximately twice the impact of risk attitudes on consumers who reduced beef consumption in response to food safety concerns in the United States, Canada, and Japan. The literature also contains studies specific to consumer perceptions of BSE (bovine spongiform encephalopathy) risks. Setbon et al., (2005), determined that perceptions of French consumers regarding BSE risk were more related to emotion and value-based judgments than to socio-demographic variables.

They also concluded that levels of perceived risk associated with consuming beef during the BSE crisis in France were highly correlated with reduced beef consumption, suggesting that consumers were choosing “a level of self-protection beyond public measures taken to reduce it” (p. 823). Pennings, Wansink, and Meulenberg (2002) found that differences in risk perceptions and attitudes about BSE led to different variations in beef consumption by consumers in the United States, the Netherlands, and Germany. Consumers perceive greater safety hazard about food product attributes with which they are less familiar or where they have no choice about their exposure (Caswell and Joseph, 2006; Zepeda, Douthitt, and You, 2003).

Furthermore, food safety risk perceptions and attitudes are likely related not only to socioeconomic characteristics, experiences, and culture, but also to trust in various sources of information (Lobb, Mazzocchi, and Traill, 2006, 2007; Dosman, Adamowicz, and Hrudehy, 2001; Mazzocchi et al., 2008). In formulating perceptions about food safety, consumers may use information from a variety of sources including government, academic researchers, dieticians, physicians and the cruise company websites. In addition, food products themselves are increasingly providing relevant information to consumers using more detailed labels. As noted by Kornelis et al., (2007), the availability of multiple sources of information does not imply that every consumer equally weights or even uses the same sources. Consumers’ risk behavior is influenced by their trust in risk information and in the providers of this information (Cvetkovich & Löfstedt, 1999; Löfstedt & Frewer, 1998; Slovic, 1993; Slovic, 1999).

The implementation of risk communication programs often fail because of public distrust in the information source (Löfstedt & Frewer, 1998). Renn & Levine (1991) identified five factors that influence trust: a) perceived competence of the other party; b) the objectivity of the party in providing information; c) the degree to which the party takes into account all relevant points of view; d) consistency of information; and e) the “good will” of the information provider. In a food context, Frewer et al., (1998) show that whether information is proven to be right or wrong and whether the source is demonstrated to be unbiased, determine the levels of trust in an information source. Sources that are trusted by the public are seen as knowledgeable and as providing well-researched information. Trust is more likely to be an important factor in consumer risk behavior when consumers believe there are no accurate estimates of the risk available, where Bocker and Hanf (2000) describe trust as being necessary to reduce uncertainty to an acceptable level and simplify one’s decisions.

Published research examining diversity in selection, the use of alternative food safety information, and the impact of these on food safety perceptions and attitudes of consumers is limited. Furthermore, examination of drivers shaping consumer risk perceptions and attitudes regarding food safety is sparse. Risk attitude constructs are commonly considered to be rather insensitive to personal experiences and exposure to new information regarding risks (Weber, Blais, and Betz, 2002; MacCrimmon and Wehrung, 1990; Weber and Milliman, 1997). In contrast, risk perceptions are often viewed as varying across individuals because of differences in personal experiences and exposure to new information regarding underlying risks (Liu and Hsieh, 1995; Weber and Milliman, 1997; Viscusi, 1989), suggesting that risk perceptions are more sensitive to factors such as trust and reliance in food safety information. Consumers are considered to form subjective probabilities regarding the risk of any event. Cruise ship companies must be aware of these consumer perceptions trend and act accordingly.

### **3.0. Methodology**

The purpose of the study was to determine cruise passengers demographics and their health perceptions while cruising the Eastern Caribbean. To collect data necessary for this analysis, we conducted surveys onboard two cruise ships on seven-day cruises of the Eastern Caribbean Islands. The survey research method was used and the questionnaire was self-administered to a convenient sample of willing cruise ship passengers. The survey instrument solicited passengers’ personal information and their health perceptions. The survey was conducted in March, 2012 and a total of 125 respondents completed the survey. Summary data of selected demographic attributes of the survey respondents are shown in Table 1. The questionnaire consisted of 5 checklist questions on demographic characteristics (country of residence, gender, age, education, income and booking method) and 13 statements relating to food safety perceptions, health perceptions and information sources. The data was analyzed using SPSS version 18, for frequency, percentage, mean, standard deviation and ANOVA.

### **4.0. Results & Discussion**

This paper has attempted a critical evaluation of cruise ship passengers’ health perceptions. It became apparent that, although the cruise market has an excellent food-safety record, there is still room for improvement. Areas where such improvement can be achieved include developing trust and people communication. The fact that cruise ships carry large and diverse groups of people mean that their officers, staff and crew need a clear understanding of human responses in emergencies and an ability to deal with crowds. Whenever there is an outbreak or in emergency situations, the key personnel (i.e. the safety officer) who has responsibility for the safety of passengers might lead and direct other people, assess the situation and provide an effective response and recognize specific behaviors of passengers and other personnel.

The success of the above can be achieved by the adequate training, specializing on the proper communication with the passengers and the proper use of CDC procedures. Confusion is often caused by poor or ineffective communication between the various parties involved, such as the misunderstanding arising from a range of native languages among the crew. To a large extent, this type of error can be reduced by careful selection and adequate training of crew. Many of the weaknesses existing today in the shipping industry in general and the cruise sector in particular, are due to inadequate flow of information amongst the parties concerned. The results of this study show that the majority of the respondents were from the USA (62.4%) and Canada (11.2 %) with smaller percentages from other areas of the world. Males accounted for about 46.4% with females 42.4%. About 80% had some education beyond high school while just over 60% of the respondents had annual income exceeding \$50,000.

Previous research showed that a higher percentage of cruise passengers were increasingly younger people with incomes of more than \$50,000 and predominantly North American. Today, the cruise market caters for all types of needs, ages and purchasing abilities. Cruising has become more of a leisure product than a transportation mode. The stereotype of a cruise passenger has been changed to a highly segmented market. In our study, 59.2% (74) of the respondents were age 34 or younger, and 15.2% (19) 55 years and older. The Cruise Lines International Association (CLIA) 2011 market profile study indicated that of the current total US population of about 304,130,000 people, not quite half 44% (132,947,000) were prime cruise candidates of age 25 years and older with annual household incomes of \$40,000 and higher. In our study, see Table 1., 36% (45) of the respondents had annual incomes below \$50,000 while about 61% (76) had incomes of more than \$50,000 annually.

In the CLIA 2011 study, of the target population, 55% (73,121,000) of the people did take a cruise before, and somewhat fewer than half of those (32,838,000) did so within the past three years with 60% repeat cruisers. In our study this was the first cruise experience for about 48% (60) of the respondents, while 50.4% (63) indicated they had previously been on a cruise. Respondents major sources of information used to book the cruise were the cruise company web site 28% (35), travel agents 16.8% (21) and talking to friends and relatives 26.4% (33). However when the time came to actually book the cruise, respondents prefer to use the cruise line company either by telephone or the cruise line web site itself, 52.8% (66). Travel agents use for bookings accounted for 20% (25) while others prefer other travel web sites like Travelocity, Orbitz, Expedia, Kayak etc., 24% (30). The two main types of shore excursions for those passengers who left the ship were going to the beach and taking an Island tour. The CLIA study indicated that a majority of cruisers still book at least some of their cruises with travel agents, although that proportion declines to 68% in 2011 from 74% in 2008. Some portion of the decline is attributed to consumer confusion regarding online resources used and travel agents. With continued travel agency adoption of online resources, some customers attribute an online planning/booking when in fact that online resource is sourced to a travel agency. Overall, 45% of travelers most frequently name the Caribbean as their cruise destination of choice.

The tourism industry is a service based industry, and the cruise travel and cruise ship itself can be viewed as a floating resort and tourism destination. Therefore, service quality issue is one of most important topics for cruise marketers because a good service quality and consumer's satisfaction can guarantee business survival at least in the service industry. Consequently, the hospitality and tourism industry have focused on service quality improvement and customers' satisfaction. Incidents onboard cruise ships will negatively affect customer satisfaction and public image about cruising. First, second, third and more than three times cruising passengers' perceptions were evaluated using the mean and standard deviations. The comparison of the mean and standard deviations of cruise experience with cruise safety and health information was done using a Likert-type scale: 1-strongly disagree, 2-disagree, 3-neutral, 4-agree and 5-strongly agree can be seen in Table 2.

A one-way ANOVA was used to test for preference differences among four means for first time cruisers, second time cruisers, third time cruisers and more than 3 time cruisers. The results revealed significant differences between means among the groups cruise traveler experience. For the statement "Enough information about health is available on this ship's company web site,"  $F=3.078$  (3)  $p=0.03$ ; 1<sup>st</sup> cruise  $M=3.53$ , 2<sup>nd</sup> cruise  $M=3.94$ , 3<sup>rd</sup> cruise  $M=4.13$  and more than 3 cruises  $M=3.67$ . Significantly more frequent third cruise takers obtained information from the internet than those on their first cruise or those with more than three cruise experiences. For the statement "I consulted with my health/dental care providers before starting this cruise,"  $F=3.129$  (3)  $p=0.028$ ; 1<sup>st</sup> cruise  $M=2.90$ , 2<sup>nd</sup> cruise  $M=3.63$ , 3<sup>rd</sup> cruise  $M=3.00$  and more than 3 cruises  $M=3.00$ . Significantly more second time cruise passengers consulted with their physician prior to taking their second cruise than first time cruise passengers. For the statement "I have taken personal precautions to prevent illness/disease on this cruise,"  $F=4.847$  (3)  $p=.003$ ; 1<sup>st</sup> cruise  $M=3.55$ , 2<sup>nd</sup> cruise  $M=3.77$ , 3<sup>rd</sup> cruise  $M=4.40$  and more than 3 cruises  $M=4.27$ . Significantly more third and more than three times cruise passengers were likely to take personal precautions to prevent illness or disease while on their cruise ships. Overall, cruise passengers were not overly concerns about their cruise ship food safety practices or the entire cruise industry food safety practices. Generally, cruise passengers felt that their health was not going to be negatively affected while on the cruise, see Table 2.

### **5.0. Conclusions and Study Implications**

Cruise tourism has been the fastest growing sector of the tourist industry for the past twenty years. Since 1990, the industry has had an average annual passenger growth rate of about 8.1% per annum.

Since 1990, nearly 100 million passengers have taken a deep-water cruise of 2 + days. Thirty-seven percent of total passengers have been generated in the past five years alone. This growth is expected to continue into the future. Although cruise tourism can increase economic activity, cruise ship destinations are finding that the environmental and cultural impacts can be substantial. These impacts are particularly noticeable in small island destinations. Accounting for the net economic and fiscal impacts as well as the social and environmental impacts of cruise ship, cruising is being given increased attention as cruise ship activity continues to take a larger slice of the tourism pie in the Caribbean.

The results from this study show that a high percentage of cruise ship passengers were younger, fairly educated with annual incomes exceeding \$50,000. As the literature revealed, consumers were knowledgeable about food safety, consumers are more aware of food safety issues today due to the attention that media outlets give to large or nationwide food borne illness outbreaks, events from cruise ships seem to get additional scrutiny because cruise ships are required by US laws to report any outbreaks. The results of this study show that cruise passengers were not overly concerned about their cruise ship food safety practices or the entire cruise industry food safety practices. Cruise ships can often be hit with the norovirus, a group of viruses that cause stomach problems. Despite an average monthly incident on cruise ships, the results of this study revealed that some cruise passengers were taking the necessary precaution to prevent illness or disease while cruising and overall cruise passengers' perceptions about their health while cruising was very good.

The result implies a need for continued communication of health information with cruise passengers, a proactive approach. Trust therefore becomes central to the process of risk communication, which is related intrinsically to the market demand. Marketers and policy makers should be fully aware of where, when, and to whom to communicate food contamination incidents on cruise ships; at stake is the market that may have taken time and resources to build. Food safety and the norovirus can also present a new set of opportunities for the cruise industry to re-evaluate their sanitation and safety programs in the aftermath of an incident. As food-borne illnesses continue to present themselves in ever increasing complex forms, health and safety perceptions will become increasingly important in differentiating the cruise markets alongside economic variables such as price. In the case of new technologies designed to make food safer, such as vaccination and irradiation, the role of the cruise industry will be critical to improving public image. Trust in those cruise ship companies is therefore of tremendous importance.

Recent passenger figures suggest that although the cruise industry is growing, so is the competition. This growth has made it imperative for the industry to retain its current clientele to thrive. Research has revealed that service experiences can be severely altered, either positively or negatively, by one single "moment of truth." Petrick et al., (2006), study examined cruise passengers' moments of truth using critical incident technique to better understand cruise passengers' overall satisfaction, perceived value, word of mouth, and repurchase intentions. Results imply that analyzing critical incidents can be an effective management tool for cruise line management and that these "moments of truth" are relevant to visitor retention. It was also found that negative incidents have a much greater effect on cruise passengers' post hoc cruise evaluations than positive incidents. Obviously cruise ship companies must do all they can to reduce if not eliminate incidents of foodborne illness or the norovirus which continue to plague the cruise ship experience.

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**Table 1. Demographics of Cruise Passengers**

<b>Country of current residence (N=125)</b>	<b>Frequency(N)</b>	<b>Percent(%)</b>
USA	78	62.40
Canada	14	11.20
Australia	10	8.00
Europe	4	3.20
Asia	7	5.60
Other	12	9.60
<b>Age (N=125)</b>		
18-24	43	34.40
25-34	31	24.80
35-44	17	13.60
45-54	15	12.00
55-64	14	11.20
65-74	4	3.20
75 and older	1	0.80
<b>Gender (N=111)</b>		
Left blank	14	11.20
Male	58	46.40
Female	53	42.40
<b>Education (N=125)</b>		
High School	24	19.20
College	48	38.40
BS Degree	41	32.80
MS Degree	7	5.60
PhD Degree	5	4.00
<b>Income (N=121)</b>		
Blank	4	3.20
<\$50,000	45	36.0
\$50,000-\$75,000	33	26.40
\$76,000-\$99,000	21	16.80
\$100,000-\$125,000	12	9.60
Greater than \$125,000	10	8.00

Table 2. Passengers Perceptions

	1-M	1-SD	2-M	2-SD	3-M	3-SD	4-M	4-SD
<b>Perceptions</b>								
I was given enough information about health aboard this cruise ship.	<b>3.32</b>	<b>0.96</b>	<b>3.94</b>	<b>0.94</b>	<b>4.2</b>	<b>0.86</b>	<b>3.80</b>	<b>1.01</b>
Enough information about health is available on this ship's company web site.	<b>3.53</b>	<b>0.83</b>	<b>3.94</b>	<b>0.80</b>	<b>4.13</b>	<b>0.74</b>	<b>3.67</b>	<b>0.97</b>
I consulted with my health/dental care providers before starting this cruise.	<b>2.90</b>	<b>1.13</b>	<b>3.63</b>	<b>0.97</b>	<b>3.00</b>	<b>1.41</b>	<b>3.00</b>	<b>1.31</b>
It is easy for infections/germs/diseases to spread on a cruise ship.	<b>3.55</b>	<b>0.85</b>	<b>3.63</b>	<b>0.81</b>	<b>3.53</b>	<b>0.91</b>	<b>3.20</b>	<b>1.26</b>
I have concerns about this cruise ship food safety practices.	<b>2.73</b>	<b>0.97</b>	<b>2.31</b>	<b>1.08</b>	<b>2.87</b>	<b>1.24</b>	<b>2.60</b>	<b>1.24</b>
I have concerns about the entire cruise industry food safety practices.	<b>2.70</b>	<b>1.12</b>	<b>2.49</b>	<b>1.17</b>	<b>2.67</b>	<b>1.11</b>	<b>2.47</b>	<b>0.91</b>
I am aware of medical services & doctors available aboard this cruise ship.	<b>3.50</b>	<b>1.06</b>	<b>3.66</b>	<b>1.11</b>	<b>3.87</b>	<b>0.99</b>	<b>3.87</b>	<b>1.06</b>
I am confident that the crew makes sure everything is done to ensure a hygienic environment.	<b>3.75</b>	<b>0.77</b>	<b>3.97</b>	<b>0.95</b>	<b>4.27</b>	<b>0.59</b>	<b>4.13</b>	<b>0.83</b>
I have taken personal precautions to prevent illness/disease on this cruise	<b>3.55</b>	<b>0.99</b>	<b>3.77</b>	<b>0.97</b>	<b>4.40</b>	<b>0.63</b>	<b>4.27</b>	<b>0.70</b>
I wash my hands with soap and water often while on this cruise.	<b>4.05</b>	<b>0.93</b>	<b>3.91</b>	<b>1.12</b>	<b>4.40</b>	<b>0.63</b>	<b>4.40</b>	<b>0.74</b>
I use the sanitizer liquids often and before I enter the buffet line.	<b>3.81</b>	<b>1.06</b>	<b>3.97</b>	<b>1.34</b>	<b>4.20</b>	<b>1.21</b>	<b>4.13</b>	<b>1.06</b>
If I drink alcoholic beverages, I will do so responsibly.	<b>3.73</b>	<b>1.07</b>	<b>4.00</b>	<b>0.97</b>	<b>4.20</b>	<b>1.37</b>	<b>4.20</b>	<b>1.08</b>
Generally I think that my health will not be negatively affected on this cruise.	<b>3.78</b>	<b>0.97</b>	<b>4.00</b>	<b>0.84</b>	<b>4.33</b>	<b>0.72</b>	<b>4.27</b>	<b>1.03</b>