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# **The Global Epidemiology of Tourist Fatalities**

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## Abstract

With the yearly increase of travelers around the world, tourist fatalities continue to rise. As seen before with infectious diseases, the proper evaluation of the diseases causing tourist mortality and the creation of effective preventive plans has helped to decrease tourist mortality from these ailments. The objective of this study is to identify the types of pre-death activities leading to trauma-based tourist fatalities, contributing factors in fatal incidents, and the demographic trends of the tourist fatalities. The findings reinforce industry trends from previous studies, implying that the creation of a tourist fatality database would have large levels of effectiveness in the creation of preventive and educational plans to significantly decrease the number of trauma-based tourist fatalities. Between January 1, 2013 and December 31, 2015, there were 3,121 tourist fatalities reports. As seen with many other studies, transportation-based fatalities were among the highest recorded with 875 (28%) incidents. However, this study concluded that water-based activities, specifically swimming and boating, are now the largest cause of mortality with 1,035 (33.2%) reported. Nearly half (49.4%) of the fatalities recorded took place in Asian countries, followed by European (15.3%) and African (14.6%) countries. The study also found that Asian tourists accounted for the highest number of fatalities (37.1%), followed by European (17.9%) and American (7.9%) tourists. Press releases report on a biased standard, focusing on tourist fatalities that have shock value, rather than reporting on tourists dying of natural causes or illnesses. As seen in previous tourist fatality studies, the data collected lacks an accurate denominator to calculate the actual rate of fatalities. This does not take away from the significance of this study's findings, as this information is valuable to medical practitioners, travel medicine, and the travel industry as a whole for aiding in the reduction of tourist mortality worldwide.

## **Introduction**

As global travel continues to increase, it is increasingly threatened by health and safety challenges<sup>1-5</sup> Despite an increasing knowledge about the injuries and diseases that threaten tourists regionally, there is yet to be any research conducted on the distribution of tourist fatalities at a global level. Out of the one billion tourists traveling globally each year, it is estimated that 30%-50% are either injured or become ill while traveling abroad.<sup>2-3,6-7</sup> As the amount of travel increases and the number of tourists activities expands, it is likely the number of incidents resulting in tourist fatalities will increase.<sup>1</sup>

Unintentional injuries of tourists is currently the largest preventable factor contributing to fatalities.<sup>8-9</sup> There is an increased risk when traveling that is often overlooked but is crucial when detecting the implications of travel on a traveler's mental and physical health.<sup>8-10</sup> Without recognizing and understanding the problem areas associated with domestic and international travel, implementing prevention strategies will prove a challenging if not impossible task.<sup>2,8-9</sup>

Existing research has identified motor vehicle crashes and drowning incidents as the leading trauma causes of tourist fatalities.<sup>1</sup> Along with motor vehicle and water-related incidents, cardiovascular incidents have been identified as a common cause of tourist deaths.<sup>5-6</sup> Though these claims are valid and supported by statistics, research investigating the added risks in other tourist activities and the factors that contribute to them has been neglected. The lack of strong data providing an overview of tourist injuries and illnesses leading to death on a global scale has hindered the ability to accurately address the growing rate of tourist fatalities, and to create effective preventative and educational materials for those choosing to travel. To combat this lack of awareness in the industry, the objective of this study is to identify the global distribution of

tourist fatalities and identify the pre-death activities and factors contributing to these fatal incidents occurring during the dates of January 1, 2013 and December 31, 2015. The study highlights the pre-death activities, any contributing factors, and basic demographics of each incident so trends can emerge and be addressed.

## **Literature Review**

The increase in the number of individuals choosing to travel, both internationally and domestically, is resulting in an increase in tourist fatalities.<sup>2</sup> Researchers have worked to establish trends and increase awareness, but studies so far have failed to incorporate enough evidence to support recommendations on a global scale.<sup>13</sup> Despite specific statistics of activities resulting in tourist death, it is widely accepted that those choosing to travel assume a higher level of risk leading to injury or death than those who choose not to travel.<sup>7, 11-19</sup> For example, a study conducted in Yosemite National Park observed tourist behaviors that posed drowning risks of visitors and studied hikers who ventured into ‘risk zones’ near the Merced River.<sup>17</sup> The researchers found that subjects entered these ‘risk zones’ during 81% of their observation hours. They also identified males, teens, and solo hikers in the summer months to be most likely to take these risks.<sup>17</sup>

Previous literature addressing the deaths of tourists have identified injuries as the leading cause of mortality.<sup>2, 8-10</sup> To this day, travelers are receiving advice related to the prevention and treatment of infectious disease even though many studies are showing that health advice needs to be largely focused in other areas, and more tailored to the individual receiving advice.<sup>3-4, 11, 16, 18, 21-22</sup> Existing research has also suggested that existing models of pre-trip consultations tend to be overloaded with information, which in turn makes recalling important information difficult to

recall and utilize.<sup>3</sup> The same research noted the most effective approach is to customize information to the individual receiving consult and provide additional follow-up materials to increase the likelihood of the tourist returning home healthy and happy.<sup>3</sup>

### *Demographics*

There are a number of factors commonly identified as contributing factors to tourist fatalities. For example, demographics and seasonality are often analyzed in fatal incidences.<sup>2, 6, 8, 10, 24, 26, 29, 35</sup> Demographically, researchers have been able to identify specific groups that report fatalities more frequently than others. For example, in many studies male tourists account for a larger portion of deaths than females.<sup>2, 8-9, 15-17, 20, 23-25</sup> Moreover, tourists between the ages of 20 and 29 also account for the largest number of deaths in a decent portion of the studies.<sup>2, 4, 7, 26</sup> The majority of fatalities in this age group were trauma-based, with only a small fraction being the result of illness or infectious disease. Furthermore, a 2003-2004 study in the U.S. National Parks found that males accounted for 75% of total tourist fatalities.<sup>2</sup> The same study also concluded that visitors in the 20-29 and 50-59 age groups accounted for 51% of deaths overall. Transportation and water-based injuries resulting in fatalities were recorded most frequently in the study years. Due to these statistics, it has been assumed that young adults, specifically young males tend to engage in riskier behavior while traveling.<sup>14</sup> Even with so many fatalities occurring in this age group, researchers have also identified trends in populations over 60. The literature notes that persons over 60 are more likely to die of natural causes.<sup>2, 6, 14, 26</sup>

Although tourists undoubtedly travel throughout the year, there are two peaks in travel summer (May-August) and winter (November-February) holiday months.<sup>2, 6, 26</sup> A study in an Australian resort town identified an increase in Accident and Emergency (A&E) services during

summer (January/February) and winter (June/July) holidays. They concluded that the increased visitation during holidays were most likely due to the tourists visiting the area and needing assistance.<sup>6</sup>

### *Pre-death activities*

Transportation and water-based incidents have been noted most often when evaluating tourist fatalities.<sup>2, 4, 6, 8, 10, 12, 14, 20, 26, 28-30</sup> In a study of tourist fatalities in the U.S. National Parks, transportation related accidents accounted for 26% of all fatalities, water related accidents accounted for 23% of all fatalities, and land based accidents accounted for 18% of all fatalities.<sup>2</sup> Furthermore, transportation related accidents accounted for 59% of the tourists based accidents in Australia from 2001-2003.<sup>20</sup> Driving in unfamiliar environments, driving an unfamiliar vehicle, signage issues, fatigue, side of the road/car familiarity, sightseeing, and weather have been established as contributing factors leading to transportation fatalities among tourists.<sup>8, 20, 31</sup> An additional study addressing risk perception in tourists found that many tourists are aware of transportation risks and often make changes to their plans when the perceived risk is greater than they are willing to take.<sup>12</sup> Tourists traveling in automobiles chose to drive at a different time in 68% of the cases, and chose alternative transportation in 28% of the study cases when they were relying on public transportation.<sup>12</sup>

When examining water-based incidents, the travel medicine literature identifies water-related incidents as the second leading cause of tourist deaths.<sup>2, 8, 16-17, 20, 32</sup> Many researchers identify beach settings as being the most common place for drownings with rip currents, river currents, and large waves being common contributors.<sup>2, 20</sup> The 2001-2003 Australian study that found 59% of tourist fatalities resulted from transportation incidents also found that drowning

accounted for 21% of deaths during the same time period.<sup>20</sup> Another Australian study found that 39% of all drowning fatalities between July 1, 2002 and June 30, 2012 occurred in beach locations, with the most common activity being swimming.<sup>16</sup> Additional sources reported the most frequent pre-death activities of tourists were boating, swimming, snorkeling, and scuba diving.<sup>8, 32</sup>

Environmental and human factor causes of death including animal mauling, rock climbing, mountaineering, photography, etc. continue to rise yearly as involvement in nature-based activities continue to grow.<sup>15, 27, 33-36</sup> For example, a ten year study in South Africa identified seven tourists who died as a result of wild animal attacks.<sup>15</sup> Though the animals were clearly the cause of death, the researchers also cited many human factors (carelessly approaching animals on foot, ignorance of animal behavior, flagrant disregard of rules, etc.) that also contributed to the incidences.<sup>15</sup> An unusual animal behavior with no contributing human factors was only cited in one case.<sup>15</sup> The growing 'selfie' trend inspired a 2016 study that identified a range of tourist injuries and deaths that were the result of the phenomenon.<sup>27</sup> The researchers cited the lack of situational awareness inherent with selfie taking that ultimately lead to the tourists' downfall.<sup>27</sup> Despite the common assumption largely based on media reports, these types of deaths currently do not occur as frequently as many believe, and they certainly do not make up the largest percentage of tourist fatalities.<sup>2</sup> Exotic causes of death, though infrequent, occur at a rate higher than other activities for both travelers and non-travelers.<sup>37</sup>

Many studies in the travel medicine field are aimed at identifying traveler issues so they can then aid in planning and implementing prevention strategies.<sup>1-38</sup> The countless studies prove that a concern for health and safety matters is not a new concept. Though many researchers start out with the goal of providing accurate, helpful strategies to reduce the likelihood of severe



injuries and illnesses, few have developed models to carry these strategies out. However, in 1970, aiming to create an awareness of the factors contributing to injuries, the severity of the injuries, and the timing involved in those factors, Dr. William Haddon Jr. devised a two-dimensional matrix consisting of three columns and three rows to do just this.<sup>39</sup> Just like an infectious disease, Haddon theorized that injuries are the product of the interaction between the host, agent, and the environment. Haddon defined the *host* as the person injured or at risk of being injured, the *environment* as the elements of the physical surroundings that contribute to the occurrence of injury, and the *agent* as injury-producing energy transferred to the host by either an inanimate vehicle or animate vector.<sup>39</sup> This commonly used paradigm has proved to be widely successful in the field of public health.

The rows in Haddon's matrix represent time phases (pre-injury, injury, and post-injury) and the columns represent the host, agent, and environmental factors that contributed to the injury process.<sup>39</sup> Haddon used the matrix to explain how the host, agent, and environmental factors contributed to the increase in exposure to the potentially damaging incident.<sup>39</sup> Once the risk was plotted in the matrix, professionals could determine which factor needed to be adjusted for a more favorable outcome.<sup>39</sup> The benefit of using the Haddon matrix is that it provides a framework for enhancing our understanding of the underlying causes of tourist fatalities and the risk factors that lead to death. By employing the Haddon framework, one can identify and analyze the risk factors and causal origins of tourist fatalities and eventually develop preventive strategies at each phase in the matrix.<sup>39</sup> Another benefit is that the Haddon matrix is an interdisciplinary framework and is applicable to any health problem in any discipline.<sup>39</sup>

## Methods

Given the absence of any systematic global reporting system reporting tourist fatalities, data for this study followed the methods of Durrheim and Leggat<sup>7</sup> and was collected daily from Google News press releases reporting the deaths of tourists worldwide between January 1, 2013 and December 31, 2015. The working guideline for what qualified a participant for this study was influenced by previous tourist injury and fatality studies.<sup>2, 20, 38</sup> In order to depict the most accurate trends and changes in tourist fatalities, participants were selected on a worldwide scale. For the purpose of this study, all individuals labeled as tourists in the Google News press releases were candidates for participation. Individuals were included in the study if they met three criteria: (1) the tourist suffered a fatal experience between January 1, 2013 and December 31, 2015 due to a travel-related illness or injury, (2) they were a tourist traveling at least 50 miles away from their place of residence and staying a minimum of one day, but no more than one year, when the fatality occurred, and (3) their fatality was presented through media outlet Google News and verified by a medical facility and other media outlets. Information collected included the demographics of each tourist fatality, the date and time of death, the country in which the incidence occurred, the nationality of victim, the pre-death activity the victim was participating in at the time of death, and any known factors that contributed to the fatality. The data was examined utilizing a modified version of the Haddon Matrix (Table 1). The matrix was utilized to identify the agent, host, and environment of tourist fatalities. The model also examined the pre-death activity of the tourist leading up to the fatal incident. Because Haddon's matrix was created for injuries and needed to note response methods, there was a third row dedicated to these measures. The 'after event' section has been removed for this study. The *host* is the tourist

who had a fatal experience, the *environment* contains the elements of the physical surroundings that contributed to the occurrence of tourist fatality, and the *agent* is the actual activity that resulted in death (Table 1).

Table 1: *Modified Haddon Matrix for Classifying Tourist Fatalities*

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	Agent	Host	Environment
Pre-Death			
Incident			

### *Research Questions*

Based on existing research, this study specifically addresses the following statements:

- A. The highest number of tourist fatalities will occur in less-developed regions of the world and involve international tourists.
- B. Motor vehicle crashes and drowning incidents will be the primary pre-death activity in all global regions.
- C. Tourists from the United States and China will account for the highest number of tourist fatalities.
- D. Trauma-based incidents will be more common than those associated with infectious diseases.
- E. Male tourists and males specifically aged 20-29 years will be the most commonly reported fatalities.

## **Results**

### *Incidences and total fatalities*

During the time frame of January 1, 2013 and December 31, 2015, there were 1,100 fatal incidences resulting in 3,121 tourist fatalities worldwide that were recorded and reviewed for this study. In 2013, there were 330 incidents resulting in 624 reported tourist fatalities. In 2014, there were 275 incidents that accounted for 808 tourist fatalities. In 2015 there were 495 incidents resulting in 1,689 tourist fatalities.

### *Seasonality*

Figure 1 shows the seasonal distribution of tourist fatalities between January 1, 2013 and December 31, 2015. In the three year time, the most fatalities were recorded in June (640, 21%) and the fewest were recorded in December (75, 2%). The holiday peaks (May-August, November-February) identified in previous studies were loosely supported with the data in this study, accounting for 1,256 (41%) and 502 (15%) of total fatalities, respectively. However, the months of April (432, 14%) and October (453, 15%) recorded nearly as many tourist fatalities in each single month as the second holiday peak saw in four months.

### *Domestic vs. international, and the location of incidences*

Domestic tourists accounted for 892 (29%) fatalities while international tourists accounted for 1,574 (50%) fatalities. The incident location was not recorded in 655 (21%) of the cases used for this study. Fatality trends among the nationalities of the deceased and the

location of incidences are displayed in Table 2 and Table 3. Table 2 provides the fatality rates by nationality of tourist, and Table 3 shows the location of incidences. Major transportation catastrophes in South Korea (11%) and Russia (9%) placed both countries in the top in regards to the nationalities of deceased tourists. Additionally, Indians accounted for the most domestic fatalities, reporting roughly 7% of the total fatalities worldwide. Tourists from China (7%) and the U.S. (6%) made up a large portion of global tourist fatalities. More specifically, Asian countries account for three of the top five locations reporting tourist fatalities. The location that recorded the most tourist deaths was China (17%), followed by Egypt (11%), and South Korea (10%). India (8%) and France (7%) rounded out the top five and were closely followed by Thailand (6%) and the United States (5%).

### *Gender and Age Distribution*

The gender for roughly 40% (1,237) of the 3,121 fatalities was recorded in media reports. Of these 1,237 cases, males accounted for 64% of the fatalities, and females accounted for 36% of the fatalities worldwide during the same time period. The age of only 1,045 (33%) tourists with fatal incidents was recorded. Of these 1,045 reported incidents, tourists in the 20-29 year old age group made up the largest portion of tourist fatalities (23%). The 30-39 (17%) and 50-59 (16%) age groups were the closest to the top contenders. The 40-49 and 60-69 year old age groups each accounted for 12% of the fatalities reported. The 0-9 and 10-19 age groups recorded 1% and 6% of the tourist fatalities, respectively. Finally, the 70-79 year old tourists and 80+ tourists accounted for 7% and 1% of the known tourist fatalities. The gender of 1,884 (60%) and age of 2,076 (67%) tourists with fatal incidents were not recorded in the media reports used for this study. Figure 2 shows the correlation between gender and age in regards to fatal incidents.

### *Pre-death Activity*

Table 4 displays the pre-death activities. Water-based traumas, namely from swimming (88) and boating (83), made up 33.2% (1,035) of the overall tourist fatalities. Other common water-based activities included from snorkeling (38), scuba diving (27), white water rafting (17), wading in area with strong current (15), and parasailing (5). Additional water activities cited in tourist fatalities ranged from surfing (4), kayaking (2), tubing (2), kite surfing (1), and cliff jumping (1). There were 13 instances where victims were found in the water but their cause of death was unknown. Finally, water vessels including cruise ship (432) and ferry boats (307) sinking accounted for two mass casualty incidents.

Following water-based incidents, ground transportation-based incidents accounted for 28% (875) of deaths. Bus crashes (654) accounted for 75% of all transportation fatalities, and 21% of all fatalities overall. Bus crashes were most common in Asian countries where bus transportation is common. Additional locations of bus crashes are displayed in Table 5. Automobiles (154), motorcycles (32), snowmobiles (9), trains (7), and bicycles (7) resulted in the remaining transportation-based fatalities. A small number of plane crashes that resulted in hundreds of fatalities helped place aviation in the third spot, accounting for 15.7% (490) of total fatalities. Other aviation-based activities included hot air balloons (25), hang-gliding (10), helicopters (7), gyrocopters (2), and skydiving (2).

Land-based activities, such as hiking (33) and skiing/snowboarding (11) accounted for 5.4% (167) of all deaths. The most common land-based incidents cited were falls (84), both from man-made structures and in the natural environment. Mountaineering (19), rock climbing (12),

and horseback riding (2) added to the count. Complications while on amusement park rides were also placed in this category and accounted for six tourist fatalities.

Activities and behaviors that didn't fit with a specific title were placed in the 'other' category and made up 13% of tourist fatalities overall. Terrorist attacks (89) were cited most frequently, followed by head and spine trauma (55), heart disease/failure (33), and trampling by crowd (27). Suicides accounted for 26 of tourist fatalities, closely followed by animal attacks (25), alcohol consumption/poisoning (18), taking selfies (14), drug overdose/induced seizure (13), poisoning (13) landscape photography (12), and natural causes (10). There were fewer than 10 incidences in the remaining activities. It is important to note that infectious diseases specifically were only cited in 6 cases, which made up less than 1% of overall deaths.

Finally, homicides accounted for 3.1% (96) of the overall fatalities. The most common methods of murder were stabbing (29) and gunshots (27). Additional methods included beating (18), strangulation (5), burning (4), and poisoning (1). The weapon/method in an additional 12 cases was unknown. The pre-death activity in 54 (1.6%) cases was not cited in the media reports used for this study.

## **Discussion**

Three years of data only begins to uncover the relationships between demographics, activities, and behaviors in fatal incidents. Previous studies have looked at correlations between fatalities and each variable separately, but this is the first study to consider all factors as a whole and at a global scale. The results confirm that most fatalities are the result of various factors;

therefore, identifying ways to offer more beneficial pre- and post-travel services to tourists is complicated.

There are a variety of conclusions that can be drawn from this study, the first being in the demographic findings. Like found in many other studies, males have been identified as the most at-risk sex for unintentional tourist mortality.<sup>2, 8-9, 15-17, 20, 23-25</sup> Out of the cases where sex was disclosed, males accounted for 55% of deaths, which is slightly less than the percentages estimated in previous studies. However, males aged 20-29 made up 15% of the tourist fatalities of this study. The 20-29 age group as a whole accounted for 23% of total fatalities. At-risk age groups for tourist mortality based upon fatality statistics have been previously identified as 20-29 years old, 40-49 years old, and 50-59 years old, respectively.<sup>1-38</sup> The age group of 20-29 years old has been identified by this study as the most at-risk age group for unintentional tourist mortality supporting previous findings. This study also identified the age group of 30-39 years old as the second most at-risk group for tourist mortality from unintentional injury instead of the previously mentioned 40-49 years old. Speculations could be inferred that individuals in the age range of 30-39 years old are taking more risks and that the age range of 50-59 years old are decreasing the level of accepted risk while traveling. Outside influences such as delayed age of marriage, increased health, and increased age for having children, could be contributing factors to these changes.

Medical-related deaths while traveling have been found more among older populations 45-85+, with heart-related issues being the most prevalent.<sup>20</sup> This study found tourists over 60 to be the most at-risk group for illness deaths while traveling, which closely aligns with the findings in previous studies.<sup>2,10,13,20,24,35-36,38</sup> Of the 131 illness fatalities, 41 (31%) of them were heart related issues. Traveling causes additional stress, especially for older individuals, as issues with



transportation, accommodation, and entertainment in a place that is unfamiliar arises. It is important for travelers to undergo a thorough physical examination before departing to another country, as health systems in outside countries are unfamiliar and provide levels of care that individuals are not familiar with. Receiving the correct care and the best care increases an individual's chance at survival, so any pre-existing issues should be noted and understood before venturing to outside places. Other common medical issues found in this study included alcohol consumption (18, 14%) and drug abuse (13, 10%). Infectious diseases, such as Ebola and malaria, only accounted for 6 (<1%) deaths overall.

Although incidents involving high-risk adventure sports and animal attacks have high shock value and attract the focus of media outlets, these types of fatalities do not make up the majority of tourist fatalities in this study, or in many others like it. Between January 1, 2013 and December 31, 2015, only 25 (<1%) fatalities were documented as the result of animal attacks. Sharks were involved in 9 (36%) of these 25 attacks. High-risk adventure sports including mountaineering (19), rock climbing (12), cliff jumping (1), white water rafting (17), surfing (4), and kite surfing (1) accounted for 1.7% (54) of all tourist fatalities during the same time period. As seen in other studies, the majority of incidences were the result of transportation and water-based activities. <sup>1-2, 4, 6, 8-12, 16, 20, 23-26, 28-32, 35-38</sup>

This study identified bus crashes, with the majority involving domestic tourists in India, as the most common transportation-based activity leading to death. Bus crashes accounted for 654 (21%) overall tourist deaths. Though India (19) alone recorded 17.7% of total bus fatalities, frequent crashes also happened in other countries including Egypt (8), Thailand (8), and the United States (7). Results from bus crashes are expanded in Table 5. Automobiles were the next most common vehicles that resulted in fatalities, with 154 (5%) deaths being logged between

January 1, 2013 and December 31, 2015. Studies have found that transportation-based tourist fatalities range from 20% to 28%, and this study found that 28% of overall deaths were the result of transportation issues. Even with continued findings of motor vehicles claiming high volumes of tourists' lives, little attention has been given to address these issues in regards to increasing safety. Contributing factors such as poor road conditions, drivers' failure to control, and drivers running into other cars were found in this study and are highlighted in Figure 4.

Regardless of where the tourist is visiting, it is almost guaranteed that they will need to rely on some form of transportation at one point or another. Whether their choice of transportation is bus, automobile, motorcycle, or bike, mobility will play an essential role in their vacation experience. Because of this, greater attention needs to be given to those providing various methods of transportation for tourists. For example, bus drivers should continually undergo training to ensure they know how to create the safest traveling experience for visitors. Furthermore, tourists need to analyze their own ability to safely operate motor vehicles in unfamiliar places. Since driving is a common activity for most adults, many tourists ignore the risks that motor vehicles pose, both in their home countries and abroad. Preventative information including pamphlets and questionnaires administered before renting vehicles could aid in increasing safety and decreasing the number of transportation-based tourist fatalities.

Water-based activities are common in many vacations, but are also common in many tourist fatalities.<sup>1-2,6,8-10,16-18,20,24,32,38</sup> These activities were the leading cause of tourist fatalities during the period of January 1, 2013 and December 31, 2015. After considering a ferry boat incident in South Korea that killed 300 high schoolers and a cruise ship disaster in China that claimed the lives of 431 passengers, swimming (88, 2.8%) and boating (83, 2.7%) were the most common activities that tourists were partaking in at the time of their deaths. Boating incidents

were spread globally, but a large portion of swimming fatalities were logged on the beaches of Thailand's tourist islands. Frequently changing wave dynamics paired with a many tourists that did not know how to swim created a danger-zone among these frequently visited tourist destinations. Though contributing factors were not cited in most of the water-based cases, changing tides/shifting currents were mentioned in the vast majority of drowning incidents. A lack of signage warning visitors of the dangers in the water has been listed as a primary factor leading to these deaths. In addition, tourists' actions such as entering the water with little to no swimming experience and ignoring flags/warnings from patrol have been cited as major factors contributing to tourist mortality from swimming. It is extremely important that destinations implement prevention measures, starting with developing tourist beaches with proper signage and patrol. By establishing safe beaches, destinations ensure tourists safety, which helps the tourism industry overall.

Outside of medical issues, adventure sports, transportation, and water-based activities, crime poses a threat to tourists everywhere. Between January 1, 2013 and December 31, 2015, there were 96 (3.1%) tourist homicides reported, not including the 89 tourists who perished as a result of a terrorist attack. Various weapons were used to commit the 96 homicides, but knives (29) and guns (27) were the most cited. Figure 5 provides more information about the methods of homicide in tourist cases. Alcohol, a lack of situational awareness, and ignorance of other cultures were commonly noted as contributing factors. Making tourists aware of potential dangers of the area, as well as offering educational materials about the local culture could aid in reducing the frequency of tourist murders.

After disregarding the South Korean ferry boat crash, the Russian plane crash, and domestic bus crashes of Indian tourists, this study found that Chinese and American (U.S.)

tourists accounted for the most fatalities, accounting for 205 and 177 deaths, respectively. In these tourists, there were no specific activities that stood out as leading causes of death other than transportation and swimming, which were cited as leading causes of death overall. It can be assumed that Chinese and American tourists accounted for the most fatalities because these nations have the highest number of domestic and international tourists every year.

The summer months of June, July, and August are traditionally shown to have the highest amount of tourists killed annually when looking at tourism in the United States.<sup>2</sup> Being in the northern hemisphere, these months prove to be the most ideal for travelling inside the United States. Global travel is different though, as tourists have the ability to pick both a location and a season of travel that is not restricted to only the northern hemisphere. After removing single incidents that killed over 50 tourists, this study showed that the months of August and October had the highest number of tourist fatalities logging 262 and 229 fatalities, respectively. As shown in other studies, the months of November and December logged the lowest number of tourist fatalities, implying a possible decrease in the amount of individuals choosing to travel during this time period.<sup>2</sup> Figure 1 shows the distribution of tourist fatalities by month and includes all incidences.

The validity of news reports as a source of data has been discussed in previous literature.<sup>15,26-27</sup> Reporting bias found in newspapers and other forms of media shifts the focus to stories with “shock-value” rather than stories of common frequencies.<sup>2,15,26-27</sup> Other studies have chosen to use official documentation rather than media reports in efforts to reduce bias. This study’s main data source was generated from the use of press releases and found results that supported many studies with small populations and “official” data collection sources. These findings

suggest that though reporting bias is undoubtedly found in the media, it may not be as large of an issue as many have assumed it to be.

### *Limitations*

Limitations for this study can result from both the use of press releases as the primary data source, and the broad range used for the study. Though other studies<sup>2,15,27</sup> have collected retrospective data for the purpose of studying tourist health and safety, it is still assumed that news reports tend to be biased, typically only publishing stories involving trauma and exotic experiences and avoiding deaths related to natural causes and medical cases. Additionally, due to the sheer size of the scale, only a perspective of tourist fatalities could be compiled instead of an accurate description largely due to the limited collection source for data. For this reason, the findings in this study must be evaluated cautiously, as the data collected and used lacks an accurate denominator to calculate the actual rates of fatalities.

### **Conclusion and Future Studies**

The creation of tourist fatality databases have aided professionals in addressing issues that lead to tourist mortality. The strength of this study is that it examines all reported tourists fatalities on a global. Moreover, the data from this study suggests that preventative measures created from previous databases have not been as effective as intended. In addition, the baseline data collected in this study will allow for more specific future analysis of specific tourists activities while already recognized the at-risk tourist population and contributing factor. Finding a data source such as that used in this study provides the information needed to establish actual

fatality numbers and helps the tourist industry to provide accurate, effective pre- and post-travel services to tourists. Future research investigating the effectiveness and success of any preventive measures put in place to prevent tourist fatalities is recommended.

### Figures and Tables

Figure 1: *Number of Tourist Fatalities (TF) by Month of Year, January 1, 2013 to December 31, 2015, n=3121*

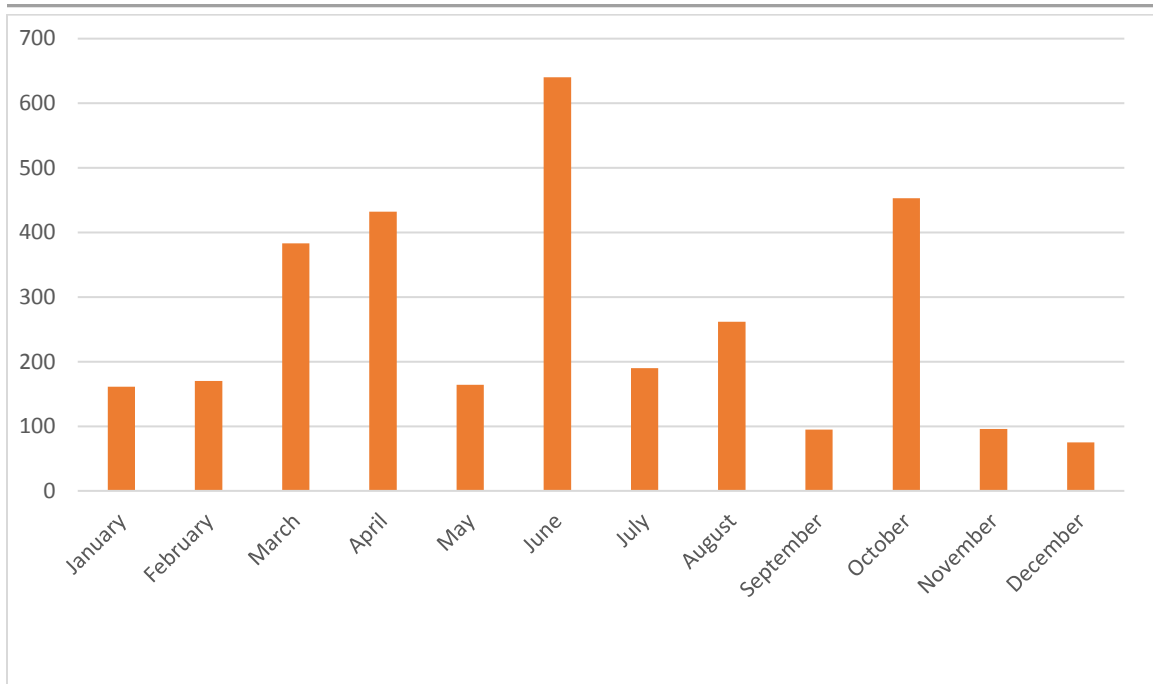


Figure 2: *Age and Gender Distribution of Tourist Fatalities, January 1, 2013 to December 31, 2015, n=1237*

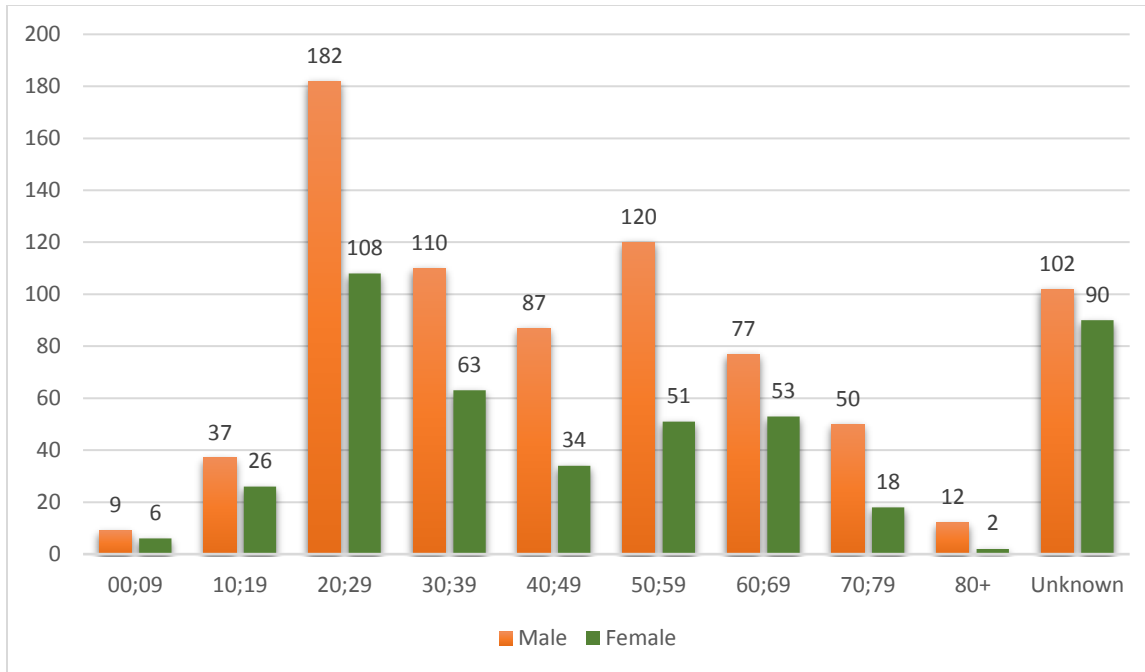


Figure 3: *Distribution of Contributing Factors in Fatal Transportation Incidents, January 1, 2013 to December 31, 2015, n=156*

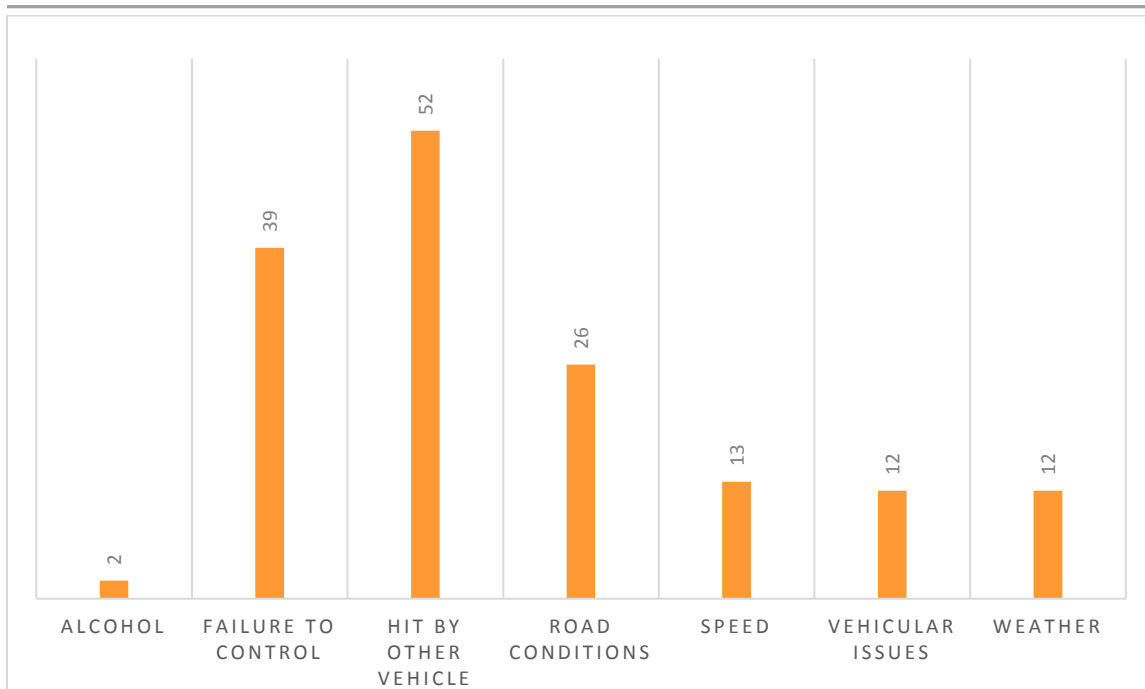


Figure 4: *Methods of Homicide in Tourist Fatalities, January 1, 2013 to December 31, 2015, n=96*

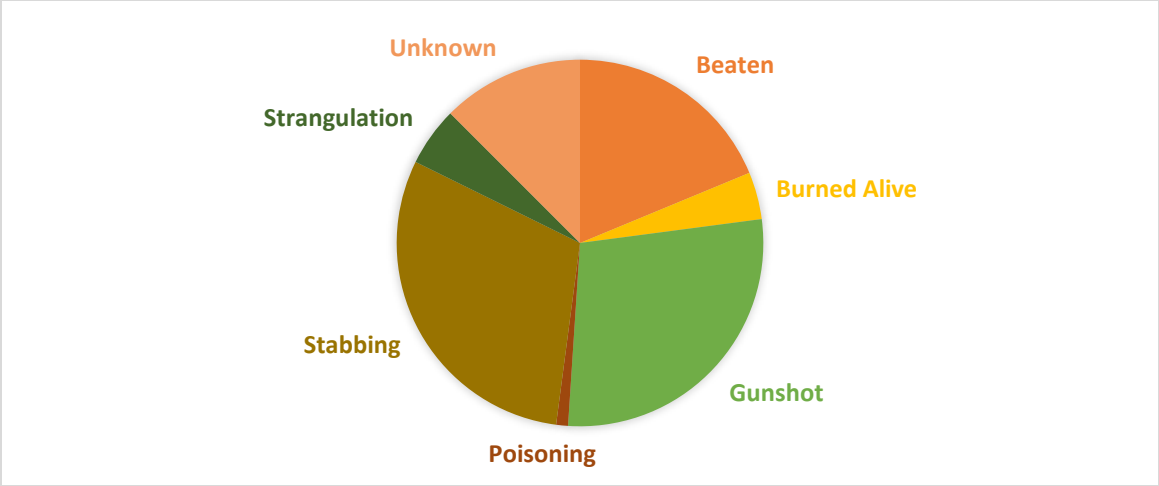


Table 2: *Distribution of Tourist Fatalities by Nationality of Tourist, January 1<sup>st</sup>, 2013 to December 31<sup>st</sup>, 2015*

Region	Country	# of TF	% of TF
AFRICA	Egypt	40	
	Niger	1	
	Senegal	1	
	South Africa	6	
	<i>Subtotal</i>	<i>48</i>	<i>1.5%</i>
ASIA	China	205	
	Croatia	1	
	India	211	
	Indonesia	2	
	Japan	42	
	Malaysia	18	
	Nepal	2	
	Philippines	11	
	Russia	293	
	Singapore	4	
	S. Korea	328	
	Taiwan	20	
	Thailand	14	
	Vietnam	8	
<i>Subtotal</i>	<i>1159</i>	<i>37.1%</i>	
AUS/NZ	Australia	64	
	New Zealand	9	
	<i>Subtotal</i>	<i>73</i>	<i>2.4%</i>



CEN/S. AM.	Argentina	13			
	Bolivia	4			
		Brazil		62	
	Chile	2			
	Colombia	9			
	Costa Rica	1			
	Dominican Republic	1			
	Ecuador	1			
	Guam	1			
	Guyana	1			
	Peru	1			
	<i>Subtotal</i>		96	3.1%	
EUROPE	Austria	4			
	Belgium	10			
	Bulgaria	7			
	Czech Republic	4			
	England	28			
	Finland	2			
	France	51			
	Germany	69			
	Iceland	1			
	Ireland	21			
	Italy	62			
	Malta	1			
	Netherlands	13			
	Norway	3			
	Portugal	1			
	Romania	20			
	Scotland	14			
	Spain	16			
	Switzerland	18			
	*United Kingdom	192			
Ukraine	10				
	<i>Subtotal</i>		547	17.5%	
MID. EAST	Greece	1			
	Iran	1			
	Israel	27			
	Kazakhstan	2			
	Kuwait	2			
	Lebanon	1			
	Pakistan	1			
	Saudi Arabia	3			
	Sri Lanka	1			
	Turkey	3			
	U.A.E.	2			
	<i>Subtotal</i>		44	1.4%	

N. AM.	Canada	36	
	Mexico	35	
	United States	177	
	<i>Subtotal</i>	<i>248</i>	<i>8%</i>
<i>[Unknown]</i>		<i>905</i>	<i>29%</i>
<b>TOTAL</b>		<b>3121</b>	<b>100%</b>

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Table 3: *Distribution of Tourist Fatalities by Country of Incidence, January 1, 2013 to December 31, 2015*

<b>Region</b>	<b>Country</b>	<b># of TF</b>	<b>% of TF</b>
AFRICA	Botswana	1	
	Egypt	350	
	Ethiopia	2	
	Gambia	1	
	Kenya	5	
	Madagascar	2	
	Mauritius	1	
	Morocco	1	
	Nambia	1	
	Namibia	1	
	Nigeria	1	
	South Africa	23	
	Swaziland	1	
	Tanzania	1	
	Tasmania	3	
	Tunisia	57	
	Uganda	3	
	Zambia	2	
<i>Subtotal</i>	<i>456</i>	<i>14.6%</i>	
ASIA	Bhutan	3	
	Borneo	1	
	Cambodia	10	
	China	540	
	Croatia	4	
	India	251	

	Indonesia	28	
	Japan	2	
	Laos	5	
	Malaysia	60	
	Maldives	7	
	Nepal	47	
	Philippines	26	
	Russia	9	
	Singapore	2	
	Slovakia	1	
	S. Korea	301	
	Taiwan	46	
	Thailand	193	
	Vietnam	5	
	<i>Subtotal</i>	<i>1541</i>	<i>49.4%</i>
AUS/NZ	Australia	64	
	New Zealand	69	
	Fiji	3	
	<i>Subtotal</i>	<i>136</i>	<i>4.3%</i>
CEN/S. AM.	Argentina	4	
	Bahamas	5	
	Barbados	1	
	Bermuda	3	
	Bolivia	11	
	Brazil	61	
	*Cayman Islands	16	
	Chile	2	
	Colombia	14	
	Costa Rica	13	
	Dominican Republic	7	
	Ecuador	1	
	Guam	14	
	Honduras	2	
	Panama	2	
	Peru	10	
	St. Vincent	1	
	Tortola	1	
	Trinidad & Tobago	3	
	Turks & Caicos	1	
	Uruguay	10	
	Venezuela	1	
	<i>Subtotal</i>	<i>184</i>	<i>5.9%</i>
EUROPE	Albania	2	
	Algeria	1	

	Austria	6	
	Belgium	7	
	Bulgaria	10	
	*Canary Islands	8	
	Czech Republic	3	
	England	6	
	Finland	1	
	France	209	
	Germany	3	
	Iceland	8	
	Ireland	9	
	Italy	58	
	Macedonia	1	
	Malta	8	
	Montenegro	18	
	Netherlands	3	
	Norway	12	
	Portugal	11	
	Prague	1	
	Romania	2	
	Scotland	6	
	Slovenia	1	
	Spain	41	
	Switzerland	10	
	*United Kingdom	15	
	Ukraine	16	
	<i>Subtotal</i>	<i>476</i>	<i>15.3%</i>
MID. EAST	Crete	1	
	Cyprus	10	
	Greece	8	
	Israel	6	
	Jordan	2	
	Lebanon	1	
	Pakistan	12	
	Palestine	2	
	Saudi Arabia	1	
	Sri Lanka	3	
	Turkey	41	
	U.A.E.	4	
	<i>Subtotal</i>	<i>91</i>	<i>2.9%</i>
N. AM.	Canada	22	
	Cuba	3	
	Mexico	31	
	Puerto Rico	6	
	United States	149	
	<i>Subtotal</i>	<i>211</i>	<i>6.8%</i>

[Unknown]	26	0.8%
<b>TOTAL</b>	<b>3121</b>	<b>100%</b>

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Table 4: *Distribution of Tourist Fatalities by Pre-Death Activity, January 1, 2013 to December 31, 2015, n=3121*

<b>Environment</b>	<b>Activity</b>	<b># of TF</b>	<b>% of TF</b>
<b>Aviation</b>	Airplane	444	
	Gyrocopter	2	
	Hang-gliding/paragliding	10	
	Helicopter	7	
	Hot air balloon	25	
	Skydiving	2	
	<i>Subtotal</i>	<i>490</i>	<i>15.7%</i>
	<b>Homicide</b>	Beaten	18
Burned alive		4	
Gunshot		27	
Poisoning		1	
Stabbing		29	
Strangulation		5	
Unknown		12	
<i>Subtotal</i>		<i>96</i>	<i>3.1%</i>
<b>Land-based</b>	Amusement park ride	6	
	Fall from height	84	
	Hiking	33	
	Horseback riding	2	
	Mountaineering	19	
	Rock climbing/rappelling	12	
	Skiing/snowboarding	11	
	<i>Subtotal</i>	<i>167</i>	<i>5.4%</i>

<b>Transportation (Ex. Air)</b>	Automobile	154	
	Bicycle	7	
	Bus	654	
	Motorcycle	32	
	Snowmobile	9	
	Train	12	
	Quad/ATV	7	
	<i>Subtotal</i>	875	28%
<b>Water-based</b>	Boating	83	
	Bridge/cliff jumping	1	
	Cruise ship	432	
	Ferry	307	
	Kayaking	2	
	Kite surfing	1	
	Parasailing	5	
	Wave dynamics/rip currents	15	
	Scuba diving	27	
	Snorkeling	38	
	Swimming	88	
	Surfing	4	
	Tubing (river)	2	
	Unknown (found in water)	13	
	White water rafting	17	
<i>Subtotal</i>	1035	33.2%	
<b>Other</b>	Alcohol consumption/poisoning	18	
	Allergic reaction	5	
	Animal attack	25	
	Asphyxiation	8	
	Bleeding (internal/excessive)	4	
	Burning (fire)	9	
	Drug overdose/induced seizure	13	
	Food poisoning	2	
	Head/spine trauma	55	
	Heart disease/failure	33	
	Heat stroke/dehydration	5	
	Hypothermia	6	
	Infectious disease	6	
	Lightning	5	
	Natural causes	10	
	Photography – selfies	14	
	Photography – landscape	12	
	Poisoning	13	
	Respiratory failure	8	
	Suicide	26	
Terrorist attack	89		
Trampled by crowd	27		
<i>Subtotal</i>	404	13%	

*Unknown (general)*

**54**

**1.6%**

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Table 5: *Distribution of Bus Fatalities by Country of Incident, January 1, 2013 to December 31, 2015*

<b>Region</b>	<b>Country</b>	<b># of Incidents</b>	<b># of TF</b>	<b>% of TF</b>
AFRICA	Egypt	8	86	
	Kenya	2	3	
	S. Africa	1	1	
	<i>Subtotal</i>	<i>11</i>	<i>90</i>	<i>13.8%</i>
ASIA	Cambodia	1	1	
	China	5	72	
	India	19	116	
	Indonesia	1	5	
	Laos	1	3	
	Malaysia	4	40	
	Nepal	5	25	
	Philippines	2	11	
	Taiwan	2	2	
	Thailand	8	32	
	Vietnam	1	1	
	<i>Subtotal</i>	<i>49</i>	<i>308</i>	<i>47.1%</i>
CEN/S. AM.	Bolivia	1	10	
	Brazil	1	54	
	Colombia	2	11	
	<i>Subtotal</i>	<i>4</i>	<i>75</i>	<i>11.4%</i>
EUROPE	Belgium	1	5	
	France	3	47	
	Italy	1	40	
	Montenegro	1	18	

	Norway	2	5	
	Portugal	1	4	
	Prague	1	1	
	Scotland	1	1	
	Spain	2	2	
	Virgin Islands	1	2	
	<i>Subtotal</i>	<i>14</i>	<i>125</i>	<i>19.1%</i>
MID. EAST	Turkey	6	21	
	<i>Subtotal</i>	<i>6</i>	<i>21</i>	<i>3.2%</i>
N. AM.	Mexico	2	17	
	United States	7	17	
	<i>Subtotal</i>	<i>9</i>	<i>34</i>	<i>5.2%</i>
	<i>[Unknown]</i>	<i>1</i>	<i>1</i>	<i>0.2%</i>
	<b>TOTAL</b>	<b>94</b>	<b>654</b>	<b>100%</b>

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