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Characteristics of fatal marine accidents

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ABSTRACT

Background: *Venturing onto the water for business or pleasure is not a risk-free activity. Despite the dangers facing crew and passengers there is little data on the characteristics of fatal accidents involving vessels in the water. The goal of this study was to review accident reports from the National Transportation Safety Board (NTSB) to determine characteristics of fatal marine accidents.*

Materials and methods: *Data was obtained from the Marine Accident Reports issued by the NTSB. Information regarding the number of people involved, fatalities and the accident itself was collected.*

Results: *Fifty-two accidents involving 5045 people from 1972 to 2019 were included in the study, with 468 fatalities reported. Of the fatalities, 155 (33.1%) were definitely on the vessel when they died, 49 (10.5%) were probably on the vessel, 65 (13.9%) were definitely or likely in the water, and the location of 199 (42.5%) was unknown. The most common cause of death was drowning (88, 18.8%), the most common accident cause was sinking (63.5%), and accidents most often started during nighttime hours (7pm–7am, 30, 57.7%).*

Conclusions: *This study found that sinking was the most common accident cause for fatal marine accidents, drowning the most common cause of death, and where fatality location was known most were on the vessel when they died. This suggests that, particularly when a ship is in the process of sinking, it is of paramount importance to ensure passengers and crew are familiar with exit routes, are able to exit the vessel, and are instructed to do so in a timely manner.*

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Key words: water, drowning, immersion

INTRODUCTION

Venturing onto the water is not a risk-free activity. The commercial fishing industry has one of the highest occupational injury and mortality rates, with water, weather, and the ship itself posing hazards [1, 2]. Merchant shipping likewise poses risks [3]. Despite awareness of the dangers crew and passengers face there is little data on characteristics of fatal accidents involving vessels in the water. The purpose of this study was to review accident reports from the United States' National Transportation Safety Board (NTSB) to determine characteristics of fatal marine accidents with the goal of identifying areas for improvement to reduce marine fatalities.

MATERIALS AND METHODS

Data was obtained from the Marine Accident Reports issued by the NTSB. Reports were included if a PDF copy of the accident report was available, the accident involved a fatality, and the accident occurred while the vessel was moored or moving in the water [4]. Accident reports were excluded if they involved a vessel that was docked at the time of the accident or if the fatality was located on the shore. Information regarding date, time, location, nature of the accident, people on board, number of fatalities, and location and cause of the fatalities was collected. A fatality was classified as being "definitely" on the vessel if the body was found on the vessel, "probably" on the vessel if the

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individual was last seen on the vessel, "water" if the body was found in the water and they were not seen on the vessel during the incident, and "unknown" if the body was not found. Cause of death was classified as "unknown" if the body was not found or cause of death was not given in the report. Data was analysed using Microsoft Excel.

RESULTS

A total of 52 accidents involving 5045 people from 1972 to 2019 were included in the study. A total of 468 fatalities were reported. Of the fatalities, 155 (33.1%) were definitely on the vessel when they died, 49 (10.5%) were probably on the vessel, 65 (13.9%) were definitely or likely in the water, and the location of 199 (42.5%) was unknown. The causes of death included drowning (88, 18.8%), burns or smoke inhalation (44, 9.4%), trauma (20, 4.3%), hypothermia (20, 4.3%), and unknown (296, 63.2%). Accident causes included sinking (63.5%), capsizing (40.4%), and collision with another ship (17.3%). Accidents most often started during nighttime hours (7pm–7am, 30, 57.7%) and most often occurred in July (7, 13.5%), October (7, 13.5%), and December (6, 11.5%). Accidents tended to happen fast, with an average duration of 113 minutes and a median duration of 11 minutes (range: 0–1195).

DISCUSSION

This study found that vessel sinking is the most frequent cause of fatal marine accidents. When cause of death is known, drowning is unsurprisingly the most common. Although the location of many fatalities is unknown, over 40% of fatalities were definitely or likely on the vessel, suggesting that when an emergency occurs on a ship, it is of vital importance to get off the ship. Of course, many shipboard emergencies can be fixed without evacuating the vessel, giving rise to the difficult judgement call captains must make in determining when to abandon ship.

A study of accidents in British maritime shipping found seasonal variation in accidents and fatalities, with both being higher between September and April [3]. The current study also found that some months were more common for fatal accidents than others, but there was less of a clear trend.

A study of commercial fishing fatalities in the United States found that most occur during an event in which the crew must abandon the ship and that Alaska, the Northeast, and the Gulf of Mexico are the most common regions of fatalities [2]. Most reports in the current study also involved passengers and crew needing to abandon ship.

Limitations of this study include use of a single database, the exclusion of reports that did not have a copy of the report available, and the exclusion of marine accidents the NTSB did not investigate.

CONCLUSIONS

In this study of 52 fatal marine accidents, sinking was the most common accident cause, drowning the most common cause of death, and where fatality location was known most were on the vessel when they died. This data suggests that, particularly when a ship is in the process of sinking, it is of paramount importance to ensure passengers and crew are familiar with exit routes, are able to exit the vessel, and are instructed to do so in a timely manner.

Conflict of interest: None declared

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