BEHAVIOR ANALYSIS BEFORE THE DEATH OF THE VICTIM AT DISASTERS

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1. INTRODUCTION

Every year in Japan, there are multiple natural disasters that make many people die. In order to reduce the victims of these disasters, it is necessary to investigate what kind of death of cause does each disaster occupy. For example, at the time of the Great Hanshin-Awaji Earthquake disaster in 1995, it is said to be that most of the victims died mainly due to the collapse of the building (National Land Agency, 1995). On the other hand, Ushiyama (1995) extracts the tendency of the death of cause in each disaster and the lessons learned from it by classifying the victims who died at the earthquake, flood damage based on age, sex, and death place of victims. For example, those who died at Typhoon No. 23 in 2004 were mainly in a young age and found out of their house, and there were few cases in which the disaster vulnerable people such as old people or sick people were delayed for evacuation. Therefore, the research indicates that it is not enough to only provide assistances to disaster vulnerable people also to have the people to have crisis consciousness to disasters. In this study, the objective is to find the tendency of the death at disasters by focusing on especially behaviors of victims.

2. METHODOLOGY

In this study, in order to investigate in detail what kind of behavior victims took to lead to the death just before the disasters died, by analyzing past news articles on disasters, the study identified the factors to reduce the deaths in each disaster. From the current public information, in the past ten years, there were 53 disasters in all applied Disaster Relief Act in Japan, of which there were 39 disasters in which the death occurred. This research excluded the 2011 Great East Japan Earthquake disaster from the research target disasters because it is difficult to understand the death of cause and the actions immediately before victims died. The earthquake disaster that the death occurred is only the 2016 Kumamoto earthquake disaster, but the number of the death exceeded 200 people in the disaster. Also, damages by floods, snowfalls are caused every year, and the number of the dead in snowfall is more than flood-related deaths. Thus, we regarded past 38 disasters as research target disasters.

Based on the damage situation of the disaster, the Cabinet Office announced the number of the dead in these disasters and abstract information of these victims, then, from the past newspaper database, we investigated the behaviors just before the death based on the announced place and classify the behaviors. Before the analysis, we considered a general-purpose model for classifying causes of death based on behaviors before the death (Figure 1). This model is created by classifying behaviors before the death according to newspaper articles. When a disaster occurred, it is first classified as being damaged or not affected on the spot. When they are damaged, it is classified as surviving or being instant death. Even in the case of instant death, it is divided into the death essentially attributable to the hazard and the death that is not essential due to the occurrence of the hazard. For example, when a river flood occurs, a person is caught up in the muddy stream. On the other hand, there are victims who fell into rivers where rivers and bridges were hard to distinguish during the work of loading the soil pack near the river overflowing with muddy water. Although this seems to be the same reason for death, the background of death is quite different because they understand dangerous risks and actively working and they are not delayed to evacuate and escape. Considering an essential reason of the death based on the behavior, actively approaching danger, failing to evacuate, getting a secondary accident, in case of disaster-related death, and secondary disaster can be considered as behaviors before the death.

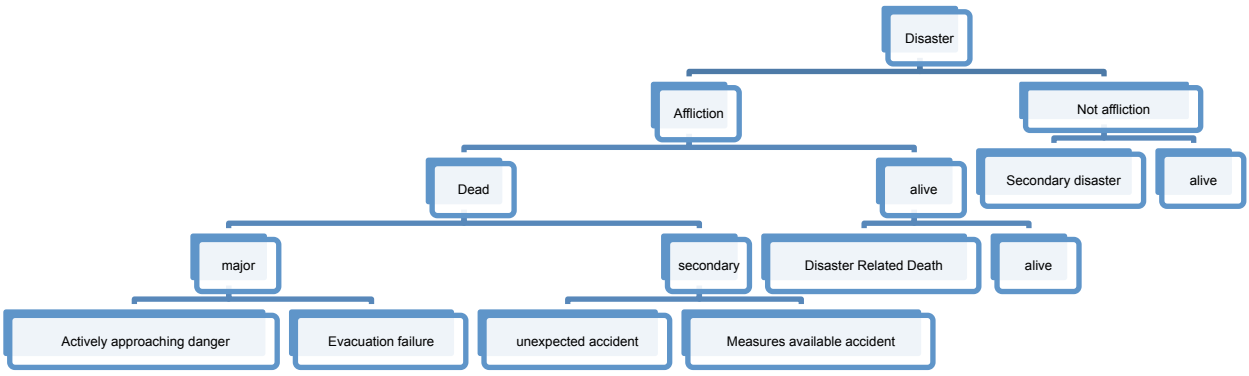

Figure 1. Classification of causes by behavior before the death of disaster victims

Keywords: Disaster, Victim, Cause of death, Behavior, Newspaper
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3. RESULTS

The tendency of the victim's behavior before the disaster was analyzed. Behaviors before the death are different depending on the kind of disaster. Victims actively approaching to the danger area, such as getting caught up in floods and muddy stream while going to check the situation of their rice field, could only be observed in typhoons and floods. In addition, it is presumed that we have some time until we have to complete the evacuation in typhoons and floods, so it can be inferred that whether or not evacuation is successful will be a key to differentiate between life and death. On the other hand, it is said that many victims getting accidents, such as falling off from the roof and suffocation death due to snowfall, can be avoided by countermeasures. The number of the dead in snowfall can decrease. Regarding disaster-related death, it is a major cause of death at the time of an earthquake because of being delayed in the recovery of the lifeline, and there is almost no observation in typhoons, floods or snowfall. Nevertheless, the disaster-related death occurs when not only earthquake but also other disaster occurs. For example, there are elderlies who need treatments at the hospital. When the road leading to the hospital is blocked by the muddy stream, they die because they cannot receive treatments. From these results, we can say that the behaviors before the death are different for each disaster and that it is necessary to take suitable actions for each kind of disaster. In addition, the local governments need to prevent the occurrence of disaster-related deaths in responding to disasters. It is necessary to know the current situation of the disaster vulnerable people inside and outside the evacuation shelter, whether they need the treatment of the hospital. It is necessary to know in advance who needs to receive the treatment on a regular basis.

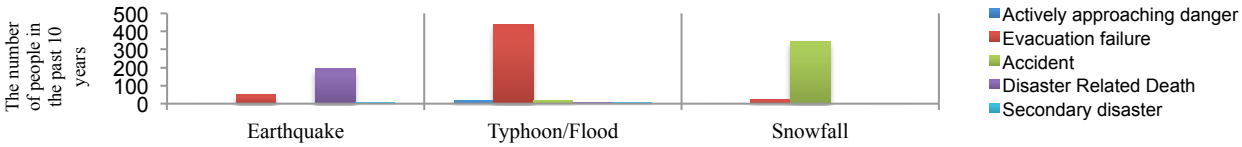

Figure 2. Classification of causes by behavior before the death of disaster victims

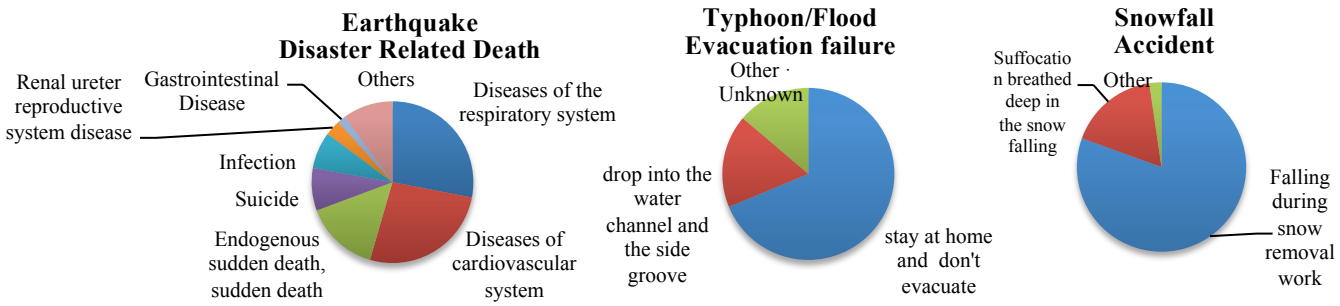

Figure 3. Detailed breakdown of main causes of each disaster

4. CONCLUSIONS

In this research, in order to reduce the number of the dead in the future, both the residents and the local governments take appropriate response against natural disasters in Japan, we analyzed the tendencies of the behavior of the victims in each disaster by extracting information from the government announcement and newspaper articles to know how they died. In this study, we considered and organized a generic model for classifying causes by behavior. When dividing the cause of death into essential causes resulting from disasters and secondary causes incidental to it, Although most of the victims failed to escape from the fundamental threat caused by most natural disasters such as earthquakes, typhoons, and floods, however, it was shown that in the case of snowfall disasters, after escaping their threats, most of them die from secondary accidents. In fact, regarding disaster-related death, the number of deaths varies for each typhoon/flood, earthquake, flood, however, it is common that disaster-related death occurs when it became impossible to provide treatment to the inhabitants who needed chronic disorders regardless of the kind of disaster, and when it is not possible to grasp the inconvenience in the evacuation life of people called disaster vulnerable.

As a future research, in order not to lose a life due to each disaster, we clarify what kind of preparation and response is necessary for mid- to long-term disaster prevention activities and disaster response before and after the disaster. In addition, this research doesn't reveal whether there is a difference between the trends by kind of disaster and the trend in each disaster, it is necessary to investigate in the future.

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