

EARTHQUAKE DISASTER PREPAREDNESS AND LIFE OF HOMESTAY SYSTEM EVACUEES IN HIGH-RISE CONDOMINIUMS

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The possibility of a huge earthquake affecting Tokyo in the future is high. In the event of such an earthquake, many people will face problems returning to their homes, causing complete disorder and confusion as it will be impossible for everyone to access emergency shelters. If buildings such as high-rise condominiums remain standing and safe, it will be desirable that their residents take refuge at home. In this study, we investigated the awareness of disaster mitigation needs using an internet survey of over 800 residents of high-rise condominiums (of 10 or more stories) in central Tokyo. Our results show that approximately 60% of residents would take refuge at home. However, almost none of the respondents had emergency supplies such as water, food, and other daily necessities. This lack of preparedness would result in many people needing to move to emergency shelters. By analyzing these results, we aim to develop a method for avoiding confusion in the aftermath of a disaster and educate building residents on their needs in a disaster situation and the preparatory actions they must take.

Keywords: Refuge life, Awareness of disaster mitigation, Evacuation activity, Shelter, Emergency supplies, Residents.

1 INTRODUCTION

Tokyo has a high possibility of being hit by a huge earthquake. With its high population density, there is a risk of many human lives lost and buildings destroyed. Moreover, many victims will be unable to return home. Presently, few shelters are available, and these shelter accommodations will be inadequate. This is a problem especially in dense areas with many high-rise condominiums (Shirai et al. 2011, Hirata et al. 2011, Takahashi et al. 2013, Hisagi et al. 2013).

Therefore, for the residents of such high-rise buildings that remain habitable in the event of an earthquake, it will be desirable to prepare a refuge at home. The Japanese government has also recommended that residents should stay at their own homes. However, most people are unaware of this information. A survey was conducted to obtain answers from 845 residents of high-rise apartments. The purpose of this survey was to comprehend the residents' awareness of the state of their lives after an earthquake and of disaster preparedness.

2 OUTLINE OF INVESTIGATIONS

The respondents to our survey were 845 residents of high-rise condominiums (of 10 or more stories) in the 23 special wards constituting central Tokyo. The survey was conducted between February 22 and 25, 2012. The investigation assessed the awareness of disaster mitigation, preparation for an earthquake, consciousness of refuge-preparation needs, etc. A part of the investigation outline is given in Table 1.

Table 1. Outline of the Investigation.

Investigation date	February 22-25, 2012
Investigation method	Internet questionnaire
Respondents	High-rise condominium residents in the 23 special wards of Tokyo
Investigation topic	Awareness of issues and needs for disaster mitigation, preparedness for an earthquake, consciousness of refuge-building and supplies, knowledge about formal shelters, ability or willingness to take refuge in one's own home
Respondent	845 people between 18 and 83 years of age
Attributes	Breakdown by gender: male 48%; female 52% Number of stories: 10 to 60 Residential floors: 6th floor to 60th floor

3 AWARENESS OF LIFE AFTER DISASTER

Some of the answers about the state of shelter life after a disaster are shown in Figure 1.

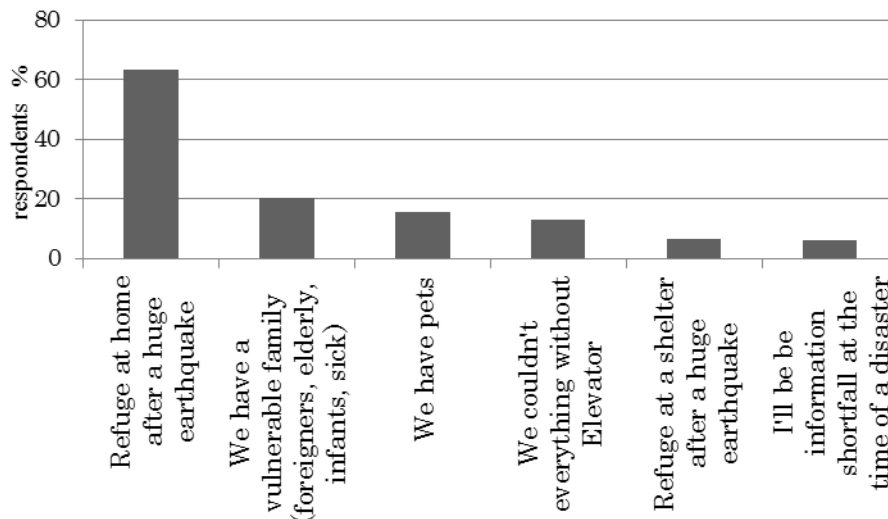


Figure 1. Responses for shelter life after a huge earthquake (multiple answers allowed).

More than 60% of the respondents imagined taking refuge at their own homes. This response was not affected by the residential floor of the respondents, but it tended to increase among senior citizens. Less than 10% of the respondents envisioned taking refuge at a shelter. In addition, the majority of respondents who envisioned taking refuge at home do not have to prepare for adequate stockpiling of supplies. Therefore,

there are many people who will not have to rely on shelters. In central Tokyo, which has shelters to accommodate less than or equal to 50% of the resident population, including stranded commuters, there are no places where many people can take shelter.

The respondents were also asked about their reasons for taking refuge at home. The results are shown in Figure 2.

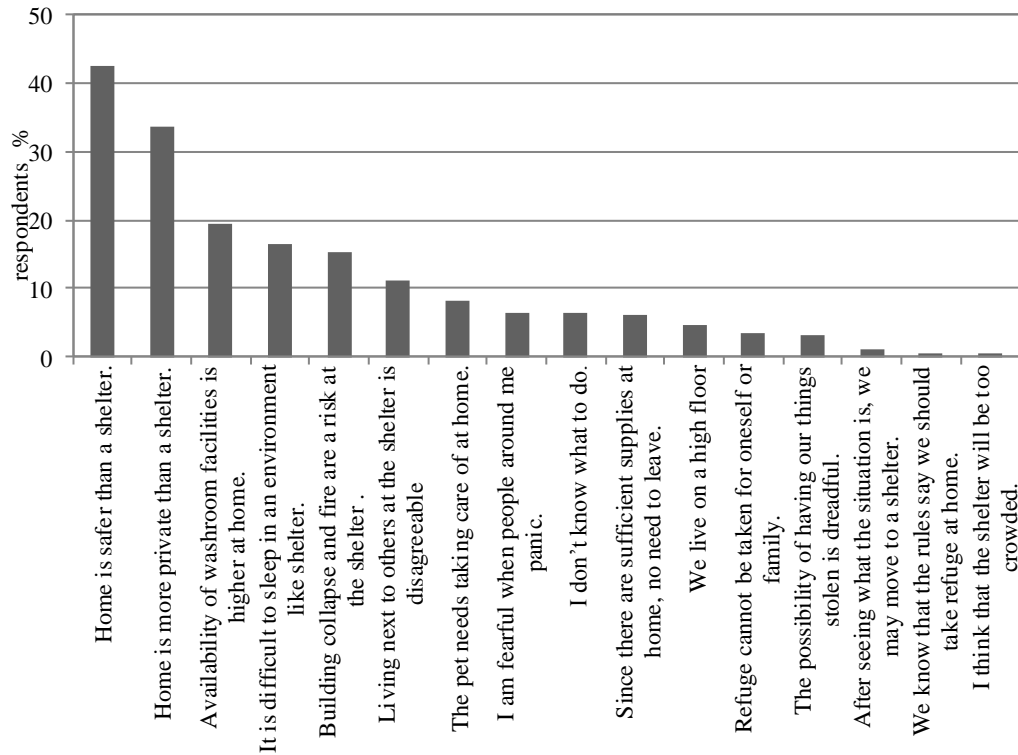


Figure 2. Reasons for taking refuge at home after a huge earthquake (when there is no damage to one’s home).

Respondents who answered that they would take refuge at home cited the safety and privacy of their homes as reasons, whereas people planning to go to a shelter cited safety and the ability to obtain supplies and information. Some of the responses about the state of cooperation in shelter life are shown in Figure 3.

The largest response was “only my family”, followed by “residents of the same condominium”. In the metropolitan area of Tokyo, neighborhood communities such as neighborhood associations have disappeared. Therefore, in the event of a disaster, it is realistic for the residents of a high-rise condominium to cooperate.

4 AWARENESS OF COOPERATION IN HIGH-RISE CONDOMINIUMS

In the Tokyo metropolitan area, long-term disruption of transportation networks and lifeline services is predicted in the aftermath of a huge earthquake.

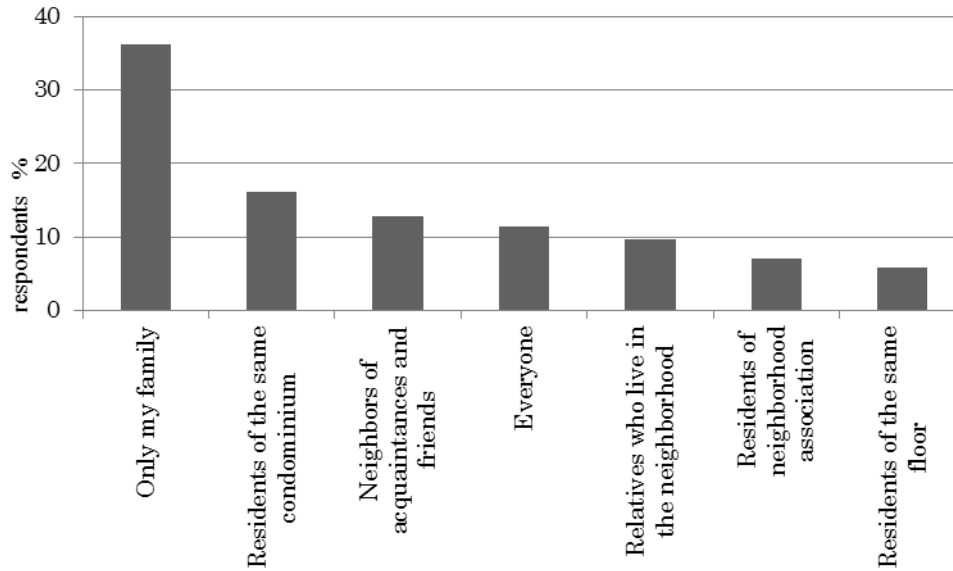


Figure 3. Responses about who the respondents are willing to cooperate with in shelter life.

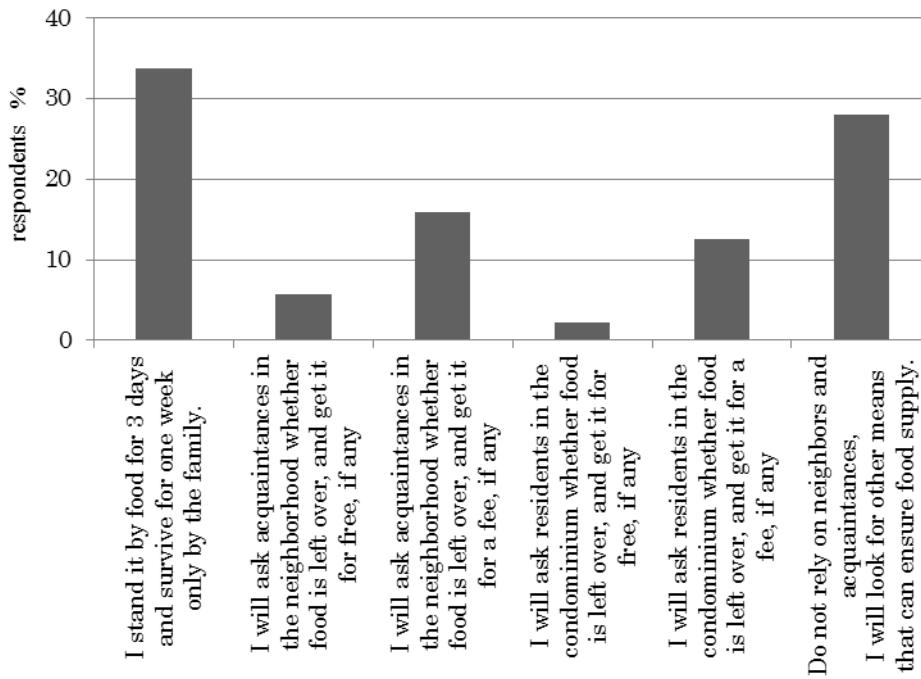


Figure 4. Responses in the case of insufficient stockpiling.

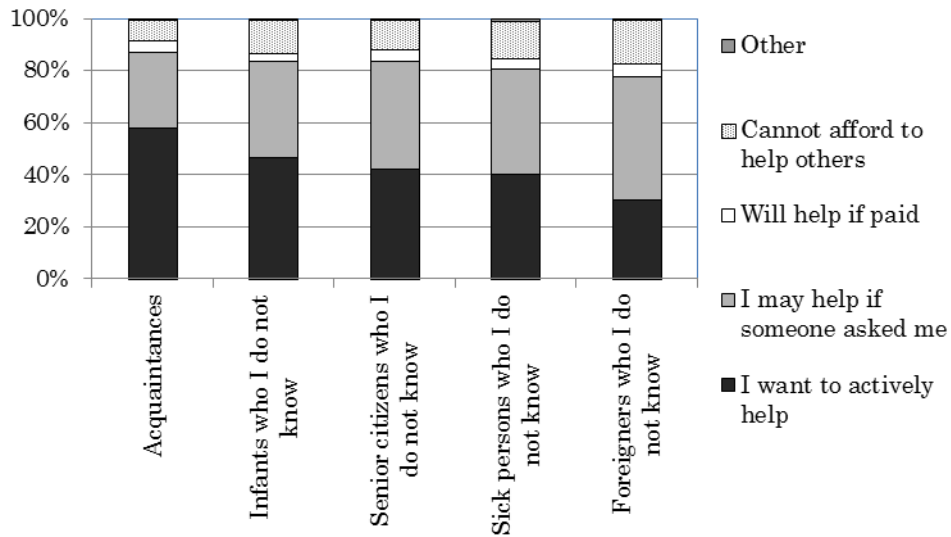


Figure 5. Responses about helping vulnerable people.

In such a case, transportation of goods becomes difficult until relief supplies arrive, which can take a considerable amount of time. Therefore, the residents of the Tokyo metropolitan area will need to stockpile food supplies at home to last for more than a week.

Based on the responses to the amount of current stockpiles at homes, approximately 25% of the respondents had stockpiled supplies for three days, and the percentage of respondents with stockpiles for seven days was 12%. These results point to inadequate stockpiling of food supplies. For such a situation, the respondents were asked how they would spend one week. The results are shown in Figure 4.

Figure 5 shows the responses to questions about awareness of helping vulnerable people. Although 80% of the respondents were willing to help vulnerable people, several answered that they would not be able to afford to help others. These trends were somewhat different depending on who were to be helped.

5 CONCLUSIONS

This research examined approaches to refuge after an earthquake among residents of high-rise condominiums. Awareness of disaster mitigation, actions needed to build a refuge, and options for shelter were investigated.

The results show that over 60% of the respondents would take refuge at home. However, almost none of the respondents had emergency supplies such as water, food, and other daily necessities. This lack of preparedness would result in many people needing to move to emergency shelters.

If the residents' own homes were unscathed, many respondents who still wish to evacuate to emergency shelters cited reasons such as availability of information on aftershocks, damage to the local area, and damage to and restoration status of

transportation facilities and lifeline services. They also expected these shelters to distribute the necessary supplies. In addition, central Tokyo residents imagined spending shelter life with only their families, and awareness of helping neighboring residents was relatively small. Whether residents could communicate with their neighbors is a factor of their relationship on a day-to-day basis. Therefore it is necessary to cultivate some relationships between the neighbors as part of preliminary preparations.

It will be necessary to raise the level of awareness that it is necessary to take refuge in one's own place of residence in the event of a disaster, and to educate people about the required arrangements and supplies. Developing a system to carry out these concrete methods is a subject for future research.

Acknowledgments

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