

Brief Report

Cite this article: Kobashi Y, Morita T, Ozaki A, Sawano T, Moriyama N, Ito N, Tsubokura M (2022) Long-term care utilization discrepancy among the elderly in former evacuation areas, Fukushima. *Disaster Med Public Health Prep* 16: 892–894. doi: <https://doi.org/10.1017/dmp.2020.481>.

First published online: 24 March 2021




Keywords:

Fukushima; long-term care utilization rate; aging people; evacuation area

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Long-term Care Utilization Discrepancy Among the Elderly in Former Evacuation Areas, Fukushima

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Abstract

Objective: It is crucial to determine the health status of returnees to former evacuation areas. We aimed to examine the long-term care (LTC) utilization rate among elderly returnees as the indicator of care needs.

Methods: This study used a resident registration database to collect information on LTC utilization rate among elderly returnees to former evacuation areas in Fukushima, Japan, following the 2011 Fukushima Daiichi Nuclear Power Plant accident. LTC utilization rates were descriptively analyzed.

Results: For all age groups, the LTC utilization rates were lower among returnees than evacuees. The LTC utilization rate among returnees in each age group (chi-square test results compared to evacuees) were as follows: 0.78% ($P = 0.194$) for those aged 65–69, 0.69% ($P = 0.003$) for those aged 70–74, 3.23% ($P = 0.007$) for those aged 75–79, 6.79% ($P < 0.001$) for those aged 80–84, 22.84% ($P = 0.011$) for those aged 85–89, and 44.09% ($P = 0.089$) for those aged 90 and over.

Conclusion: Elderly returnees had fewer LTC needs than elderly evacuees. Nevertheless, the proportion of aging people is high in evacuation area, meaning the number of elderly returnees would increase at an enormous rate. Therefore, LTC utilization rate would increase in the future.

Introduction

The Fukushima Daiichi Nuclear Power Plant (FDNPP) accident caused severe damage in the Hama-dori area in Fukushima Prefecture, where the government ordered evacuations of approximately 55000 households in 12 municipalities due to radioactive contamination.¹ However, decontamination efforts and the physical decay of radioactive materials eventually reduced the levels of radiation.¹ This resulted in lifting the evacuation orders, meaning that many residents returned to the area.

However, it is urgently required to ascertain the health status of returnees to former evacuation areas, since various health issues have emerged, including an increase number of the elderly, population decline, the loss of local social connections, inadequate infrastructure reconstruction, and reduced health care access. Nevertheless, little information is available on the actual health status of returnees, especially for the elderly.

In this study, we aimed to examine the long-term care (LTC) utilization rate among elderly returnees in the former evacuation area, following the 2011 FDNPP accident.

Methods

Study Setting

The study site was Odaka district in Minamisoma City, which is located approximately 20km from the FDNPP and thus deemed an evacuation area after the accident.^{1,2} The government terminated the evacuation order in July 2016 according to the reduction of radiation level. The information on doses from radiation exposure among returnees to the Odaka district is reported in the previous study.²

Although there had been 2 hospitals in the Odaka district before the accident, these facilities were closed just after the FDNPP accident. While 1 hospital reopened in April 2014, it only

provided outpatient services. A total of 3 of the 7 clinics reopened from 2018. A total of 3 LTC care facilities (89 total beds) and 8 LTC offices for home care had been available before the accident, however, only 1 LTC care facility (50 beds) and 4 LTC offices for home care reopened from 2018.

Long-term Care Utilization Rate

LTC utilization rate were set as primary outcome indicators for the elderly residents requiring care. All Japanese residents over 65 years have been insured through the national public LTC service since 2000. When the elderly request to use the national public LTC service, municipal governments conduct interviews and surveys for living situation concerns.³ The level of required LTC is determined by the Care Needs Certification Board, which is comprised of medical professionals and other specialists.³

Data Collection

We extracted age, district level addresses, and LTC utilization data, from the Minamisoma City resident's database between March 11, 2011 and January 1, 2019. A person living in Japan is registered only in 1 municipality. This resident registration reflects the living place for each resident, and is lost with death. Nevertheless, after the FDNPP accident in 2011, many residents were forced to evacuate with their resident registration remaining in the evacuee areas. Thus, resident registration municipalities and actual living addresses were different among affected residents during the evacuation period.

Inclusion criteria were participants who had resident registration in Minamisoma City between March 11, 2011 and January 1, 2019. Exclusion criteria were residents who died or relocated their resident registrations to other municipalities between the time periods. Returnees were defined as those who lived in Odaka district and had resident registration in the Odaka district between March 11, 2011 and January 1, 2019. On the other hand, evacuees were defined as those who did not live in the Odaka district but had resident registration in the Odaka district between March 11, 2011 and January 1, 2019.

Data analyses

First, we determined the number of returnees and evacuees aged 65 years and over. Second, LTC utilization rate among returnees and evacuees were determined for each age group. Age distributions between returnees and evacuees were statistically analyzed with the Mann-Whitney U test each age group, while LTC utilization rate were statistically analyzed with the chi-square test for each age group. Statistical significance was expressed with *P* value < 0.05. The STATA IC software (Lightstone, Texas USA, version 15) was used for analysis.

Results

A total of 12842 residents were registered in the Odaka district as of March 11, 2011. Of these, 7273 (56.6%) were registered in the Odaka district on January 1, 2019, and thus was included for analysis (i.e., 2577 (35.4%) returnees and 4696 (64.6%) evacuees). Median and interquartile age ranges were 67 years (55–77 years) for returnees and 54.4 years (34–69 years) for evacuees, respectively (Mann-Whitney U test: *P* value < 0.001).

LTC utilization rates were lower among returnees when compared to evacuees in all age groups. Except for the groups aged 65–69 and 90 and above, all such differences were significant.

Specifically, LTC utilization rate among returnees of each age group (chi-square test results compared to evacuees) were as follows: 0.78% (*P* = 0.194) for those aged 65–69, 0.69% (*P* = 0.003) for those aged 70–74, 3.23% (*P* = 0.007) for those aged 75–79, 6.79% (*P* < 0.001) for those aged 80–84, 22.84% (*P* = 0.011) for those aged 85–89, and 44.09% (*P* = 0.089) for those aged 90 and above. LTC utilization rates increased with age. LTC utilization rate among evacuees were similar to those recorded as national averages for their respective age groups (data not shown) (Figure 1).

Discussion

This study found that returnees had relatively fewer needs for LTC when compared to evacuees. This may have been the result of policies and countermeasures aimed at residents in the former evacuation area. Specifically, LTC utilization rate were lower among returnees in all groups aged 65 years and older. There are 2 main possible reasons for this. First, mostly healthy persons returned. LTC resources are limited in the Odaka district, with only 1 LTC facility for inpatients. This lack of resources may have presented a barrier to potential elderly returnees who relied on LTC. Indeed, this idea is supported by the fact that LTC utilization rate among evacuees were nearly identical to the national averages. Second, status of wellbeing may have improved among returnees once they were able to reenter the Odaka district,⁴ meaning that LTC needs decreased. This discrepancy might cause increasing inequalities of health status among residents registered in the Odaka district. Additional support is thus required to help evacuees return to their hometowns.

Findings showed that LTC utilization rate increased in the former evacuation area as the population ages. While current data show that returnees use less LTC than evacuees, this demand will increase dramatically due to high numbers of elderly residents in former evacuation areas. LTC resources in the Odaka district are very limited when compared to national standards. Preparations must therefore include a thorough enhancement of local LTC resources.

Caution should be taken when interpreting this study's results as LTC needs depend on the living environment, since a strong relationship between LTC coverage and family support exists.⁵ The present study did not investigate the association between LTC needs and informal care support from their families and relatives. Previous studies have shown that the LTC costs for residents over 65 years in the former evacuation areas in Fukushima prefecture were approximately 1.5 times higher in 2012–2014 than before the earthquake.^{3,6} This was caused by a marked increase in the utilization ratio of mild-degree LTC presumably due to the loss of informal at-home care. Currently, there is not enough information on whether the loss of informal care is more prominent in the evacuee or returnee groups hence, more information on family members is needed to properly understand the health care needs of those living in former evacuation areas.

Limitations

This study had some limitations. First, it used a small sample size. Second, caution should be taken when attempting to generalize its results, as they may not fully apply to other municipalities inside or outside of Fukushima prefecture since policies and countermeasures in each district were different. Third, there was no data on relocated residents who moved their resident registrations to other areas except Odaka district.

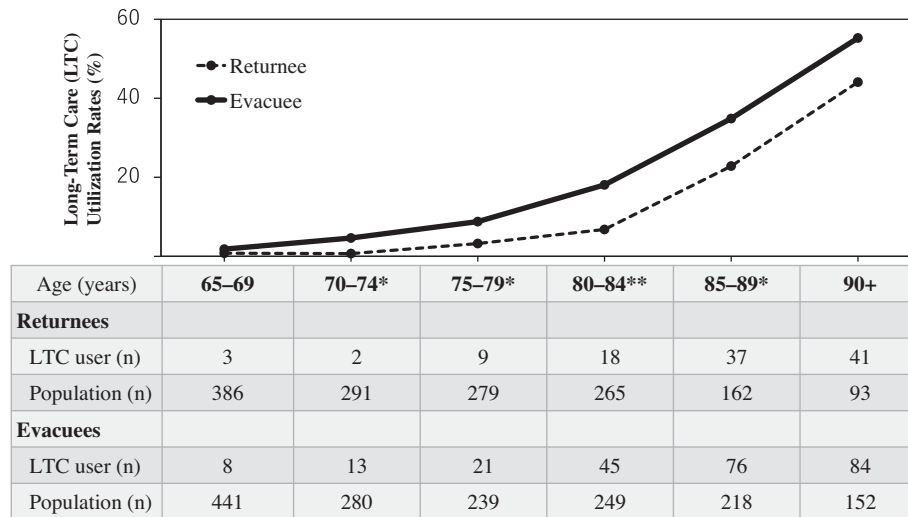


Figure 1. Long-Term Care (LTC) utilization rate among returnees and evacuees in each age group, and the number of LTC user among returnees and evacuees in each age group. * $P < 0.05$; ** $P < 0.001$ (In chi-square test to compare LTC utilization rate among returnees and evacuees in each age group).

Conclusion

Elderly returnees to former evacuation areas required less LTC utilization rate compared to evacuees. However, the number of elderly returnees will continue to increase at an enormous rate and residents who have returned to Odaka District will become older, meaning that LTC utilization rate will also increase in the future. Thus, it is necessary to enhance the LTC provision in the future for the elderly in former evacuation areas. Without this effort, the health status of the residents needing LTC service and also health and well-beings of their caregivers would be highly jeopardized. In this respect, we believe that the implications of this study could be interpreted not only as mere local health need assessment but also as critical fundamental data to safeguard health and well-beings of entire local communities in the former evacuation zone.

Acknowledgements. This work was supported by Research project on the Health Effects of Radiation organized by Ministry of the Environment, Japan. We would like to thank Ms. Yuka Harada, and Mr. Masatsugu Tanaki for providing data management for this research.

Author Contributions. All the authors have made a substantial contribution to this research. YK, MT, TM, AO, TS contributed to writing the paper. All authors contributed to the study design, data collection, and coordination with local stakeholders. YK, TM, MT contributed to data analysis.

Ethics Statement. This study was approved by the Ethics Committee of Minamisoma Municipal General Hospital (Approval number: 1-14). The Ethics Committee of Minamisoma Municipal General Hospital waived

individual informed consent because the opt-out consent process was performed in this study.

Conflict of Interest. Akihiko Ozaki receives personal fees from MNES Inc., outside the submitted work. All the other authors report no proprietary or commercial interest in any product mentioned or concept discussed in this article.

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