

Technical Report

*Older Persons in Emergency Situations:
A case study of the
Great Hanshin-Awaji Earthquake*



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EXECUTIVE SUMMARY

Great Hanshin-Awaji Earthquake

Event

- Major and unexpected earthquake in the heavily urbanized area of Kobe in winter (17 January 1995)
- Large area affected: 20km x 1km
- Widespread destruction of homes, power, transportation, communications, essential services
- Secondary fires added to casualties and damage
- Extent of damage in Kobe alone required 3 months to restore essential services, and 6 months to fully restore transportation facilities

Data Sources

- Regional experts, using extensive administrative data and research with survivors

Impact on the General Population and on Older People

General Population

6,433 deaths, 43,792 injured, 510,000 homes damaged

- Higher than average mortality and losses among economically disadvantaged persons (notably more damage of homes due to post-earthquake fires)
- 5,488 immediate deaths and 945 more earthquake-related deaths later, thus, 6,433 deaths
 - among immediate casualties: 53% in Kobe and 56.6% in Hyogo overall were aged 60+
 - among later earthquake related deaths: 90% were aged 60+
- 320,000 people evacuated to shelters
- Major and lasting displacement in temporary accommodation and permanent re-housing in unfamiliar environments

Older People

- Higher mortality rates:
 - among immediate casualties: 53% in Kobe and 56.6% in Hyogo overall were aged 60+
 - among later earthquake related deaths: 90% were aged 60+
- Greater negative health impacts related to evacuation and relocation

Emergency Preparedness and Response: Gaps, Strengths and Best Practices

General and individual preparedness

- Minimal : *"earthquake preparedness consciousness among Hanshin residents and associated measures were either non-existent, poor or at a minimal level"*

Evacuation

- Older people tended to remain in own homes, without available support, even when homes were dangerous to live in, and evacuated later than others

Shelter/housing

- Arrived to already overcrowded shelters and had to sleep on concrete floors in corridors and entrances
- Inadequate emergency shelter facilities; no heating, inaccessible sanitation facilities, structural fall hazards, no activities

Food and Water

- Poor nutrition; "dry boxed meals" resulted in diarrhea in temporary shelters
- Inadequate water supply

Health

- Major health problems resulting from inadequate, overcrowded hazardous shelter conditions and lack of adequate food and water (e.g., dehydration, hypothermia, loss of functional capacity) *"Even healthy older people living in the evacuation centres were likely to become unable to move and become bedridden. The condition of older people who needed rehabilitation deteriorated as their functional training was suspended or they had lost their auxiliary aides"*
- Health care facilities unable to care/accommodate sick elderly from shelters, who were sent back to the shelters
- Community-dwelling seniors with health problems cut off from caregiving and support network and unable to access health services owing to damaged roads, resulting in aggravated conditions
 - Administrative data from emergency first aid stations showed a correlation between age and time of consultation: *"The higher the age, the earlier the symptoms of maladaptation to change in the environment. The average age of those patients who died after the earthquake was 69.2 years."*
- Establishment of some successful congregate housing with services for seniors needing support/care
 - Temporary housing with support service and a 24-hr life-support adviser for older people with Activities of Daily Living (ADL) needs unable to go to emergency shelters and temporary housing for persons with ADL care needs
 - Emergency short stay beds established in nursing homes for older people needing special care

Recovery: Gaps, Strengths and Best Practices

Temporary Housing Issues

- Long time to secure land and build,
 - Far from city centre
 - Priority given to move elderly and disabled from emergency shelters, but high concentration of elderly and disabled were in unfamiliar locations, without social support
 - *"40% of temporary houses accommodated elderly families by themselves and half of them lived alone"*
 - Very few units built were adapted to needs of elderly and disabled (e.g., no handrails or ramps, units visually undistinguishable)
 - Frequent relocation before permanent re-housing
 - *"In one survey, one year after the earthquake, 22.6% of respondents said that they had symptoms that concerned them or symptoms of illnesses they were being treated for", while two years after the earthquake this figure rose to 79.4%".*
 - *"A survey on health and lifestyle in temporary housing where many senior citizens were accommodated revealed that over 90% of residents had some kind*

of health problem with 40% suffering chronic illnesses. The most common was hypertension, but other complaints which were after-effects of the earthquake included lumbago and arthralgia.... approximately 25% had either not seen a doctor, had difficulty keeping with, or cancelled treatment, or, in cases where they were receiving treatment, had problems with self-care, such as taking medicines properly".

- Social isolation, loneliness
- Care and Support Provided
 - Nursing outreach and regular home visits to isolated persons in temporary housing
 - Nursing health consultation sessions in temporary housing for monitoring, referral to mainstream health services, and advocacy to address structural barriers
 - Health advisers-- recruited from regular and volunteer nursing staff "provided continued support particularly for people with chronic conditions, pregnant women, children, senior citizens, disabled people and others with special needs".
 - Community centres in large temporary housing complex staffed by professionals, with organized and informal events and support for residents' association activities (i.e., social, health and spiritual support, including health promotion)
 - Particular focus on persons who moved frequently (24-hour life care advisor, emergency communication devices)

Permanent housing Issues

- Persons with low incomes, many of them older and/or disabled, obliged to remain longer in temporary housing, and then obliged to move to public permanent housing units-- high rise units in unfamiliar neighbourhoods
- Barriers in design (difficulty opening and closing heavy doors, no provision of space for garden) exacerbated isolation
- High social isolation in public housing: *"According to a survey conducted by Kobe University, 505 of the residents had contact with neighbours before the earthquake, but this dwindled to 30.3% in temporary housing and fell again to 12.5% in permanent housing".*
- Community rooms with health consultations provided to monitor health and support self-care and adjustment-- later converted to "Town Health Care Room": community health promotion, education and disease prevention locations
- Health and social outreach services, community health centres to ensure continuity of care, prevention, promotion, self-care and social networks
- Establishment of residents' self-help groups for health education and promotion

Contributions of Older People

- *"While senior citizens were classified as vulnerable people at the time of the disaster, they also demonstrated a vigorous capability of continuing life in spite of drastic changes in their environment, as well as mutually supporting each other and solving problems independently in temporary and permanent housing"*
- Storytelling groups since the earthquake struck were created to meet students to relate the disaster and provide lessons for the future. Narrations from older people of their experience, resilience and lessons learned are preserved in Kobe's Disaster Reduction and Human Renovation Institute
- Independent mutual aid and support projects established in temporary housing
- Ongoing outreach and peer support by older people to other older people affected by the earthquake still in need

Unexpected Outcomes

- First time temporary housing with care services provided to older people: led to establishment of collective housing and expansion of Life Support Adviser services in permanent public housing.

Recommendations

Preparedness and Response

- Establish a department responsible for planning and implementing evacuation support for vulnerable people
- Collect information about location and profile of vulnerable people
- Individual plans for evacuation support should be made and filed
- Disaster prevention study meetings and emergency training involving elderly people should be organized
- Establish information systems for evacuation preparation:
 - advise ordinary residents to prepare for evacuation
 - allow sufficient time to prepare vulnerable people, who need more time to evacuate
- Develop and periodically revise concrete measures and 'individual' advance plans to provide evacuation support for vulnerable people in co-operation with families and caregivers
- Develop concrete evaluation plans for home-based bedridden elderly people and those with chronic conditions requiring artificial respirators and oxygen supply equipment,
 - Set up back-up systems that provide at least two options for vulnerable elderly people living alone, so that if one option fails, the other one can function
- Establish a community-based setting or network to provide necessary care immediately after an emergency for older people and others in need who are in shelters (Town Health Care Room).
- Prepare evacuation centres to meet needs of vulnerable persons:
 - Reserve rooms especially for elderly and disabled people in advance, or establish specialized shelters providing necessary support such as physical care and medical supervision

Recovery

- Create systems to monitor and ensure well-being of residents who are undergoing psychosocial stress and isolation
 - Support the development of community organizations and autonomous networks of elderly people, to become aware of residents' needs, and to facilitate information exchange among service providers, volunteers, and other relevant people.
 - Nurses, who are in a position to be able to judge both physical and mental health, are effective as specialist volunteers
- Design accessible, age-friendly, temporary housing that is adequately heated, clean, quiet and pleasant. Structures and outdoor areas should be fully accessible to persons with disabilities
- Accommodate persons to maximize access and inclusion
 - Visually-impaired people should not be allocated units in the middle of a terraced row, Physically disabled people should be given units without steps
 - Elderly people should not be too concentrated in one area
 - Situate older people closer to health and community services

- Co-ordinate with local health and social services and other organizations to visit, assess the needs and develop care and support plans as soon as possible for high-risk persons such as elderly people living alone, elderly households, disabled bedridden elderly, elderly people with dementia, sensory-impaired people, and people with TB, or chronic illnesses
- Create mixed intergenerational communities where older people can adapt to the neighborhood, relax in relationships, provide mutual assistance and restore their health.
- Diversify accommodation for frail and disabled persons to include group homes with a family-like environment and a certain degree of support

Permanent Relocation

- Establish a sense of security and safety through on-site staff resources for older persons relocated in large-scale high-rise public housing
- Create opportunities for individual involvement and contribution to heighten a sense of self-efficacy and restore quality of life
- Establish community centres to provide information, advice, support and to facilitate opportunities for social interaction

I. INTRODUCTION

Many of those affected by earthquakes and other recent disasters from natural hazards have been older people.

As society continues to age, whether we like it or not, we will need policies to cope with the needs and capacities of older people, disabled people, and others who need support in a disaster, in order to reduce the number of victims among those who are vulnerable in the case of a disaster. In the Great Hanshin-Awaji Earthquake (1995), approximately half of the 5,488 people who died as a direct result of the earthquake were elderly people.

Nakatsuji et al. claimed that this was the first “aged society earthquake” in the world. This case study report reflects on the situation of elderly victims of the Great Hanshin-Awaji Earthquake through the perspective of the disaster cycle, and summarizes measures perceived to be necessary for the future.

II. BACKGROUND

1. The Great Hanshin-Awaji Earthquake

The Great Hanshin-Awaji Earthquake, which struck early in the morning of 17th January 1995, was a major disaster that left 6,433 people dead, 43,792 injured, and 510,000 homes damaged or destroyed. The total cost of damage in the Hyogo prefecture, including buildings, railways and expressways, amounted to US\$ 100 billion. In the city of Kobe, it took 3 months to restore lifelines and 6 months to restore all transportation facilities to normal. This disaster destroyed people’s health, disrupted everyday lives, and struck a socio-economic blow to the region affected and the entire Japanese society.

The damage to residential property had an effect on people’s life reconstruction after the disaster. Many people found it difficult to rebuild their homes and lives by themselves, and there arose a polarization between those who did rebuild independently and those who depended mainly on welfare policies, moving from emergency shelters to public temporary housing and restoration public housing.

In Japan, emergency temporary housing, according to the Disaster Relief Law enacted in October 1947, falls under the jurisdiction of the Ministry of Health, Labour and Welfare (MHLW), and is administered by the prefectural governor. However, this temporary housing, as a general rule, can only be erected on public land, so it took time to secure land for building, and even then most of the temporary housing was erected on reclaimed land or land proposed for housing development in suburbs a distance away from the city center. In some places, large compounds of over 2,000 temporary houses were erected. As a result, many disaster survivors were driven out of “their familiar neighborhoods (birthplaces)”, necessarily forced to move to unfamiliar areas where they knew no one. Furthermore, there was an order of priority in the allocation of temporary housing, and from the first to fourth rounds of applications, senior citizens and disabled people were given top priority, which meant that there were high proportions of these people in some of the areas. Overall, the total number of temporary housing units built in Hyogo prefecture was 48,300, but only 1,885 of these were specifically designed to be suitable for people with disabilities or elderly people.

In Hyogo prefecture, about 42,000 housing units were built in large-scale high-rise accommodation (disaster restoration public housing). Before settling in this permanent housing, people inevitably went through repeated movements, having to adapt each time to a new environment. Moreover, as a result of the high concentration of elderly, disabled and low-

income households autonomous self-management has proven to be difficult vis-à-vis due the need to move as many people in to the housing units as soon as possible,.

2) Previous disasters

In the past recorded history, Hyogo prefecture suffered an unprecedented mudflow disaster in July 1938. In Kobe city alone, 616 people died. In addition, in the final stages of World War II in 1945, the Hyogo Prefecture area was subjected to 128 air strikes. 4 air strikes between February and June 1945 destroyed Kobe.

It was generally accepted that earthquake as a disaster risk would not occur in the Hanshin area, so earthquake preparedness consciousness amongst Hanshin residents and associated measures were either non-existent, poor or at a minimal level before the Great Hanshin-Awaji Earthquake.

III. ELDERLY CASUALTIES

1. The proportion of elderly people among human casualties

Below are details of the total number of victims, 5,488, whose cause of death was attributed directly to the earthquake between January and June of 1995.

As shown in Figure 1, a large number of people over the age of 65, especially women, were among the dead. The high proportion of 20-24 year old men and women among the dead is said to be attributed to the fact that there was a concentration of universities in the disaster area. Of those who died, 40% were male and 60% were female. In Hyogo prefecture overall, 53% were over 60 years old, while in Kobe city alone, this figure was 56.6%.

As regards to the cause of death, suffocation and being crushed to death was by far the most common cause in every age group, accounting for about 80% of the total, or 4,224 cases (see Figure 2). The vast majority of victims died on the actual day of the earthquake, 17th January, with 4,461 people (81.3%) dying that morning, becoming 5,175 people (94.3%) by that evening. As shown in Figure 3, a full 4,330 of the total 5,488 deaths (78.9%) occurred at home, followed by other places, hospitals and clinics.

Figure 1. Number of deaths by age

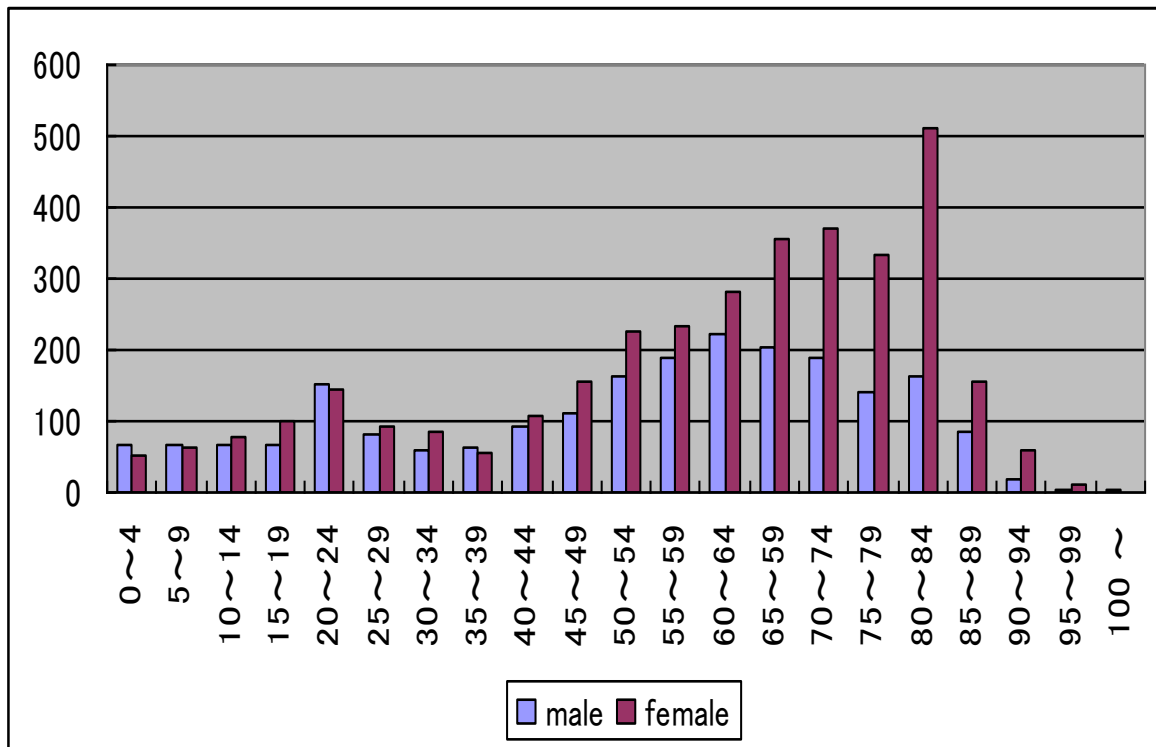


Figure 2. Cause of death by age group

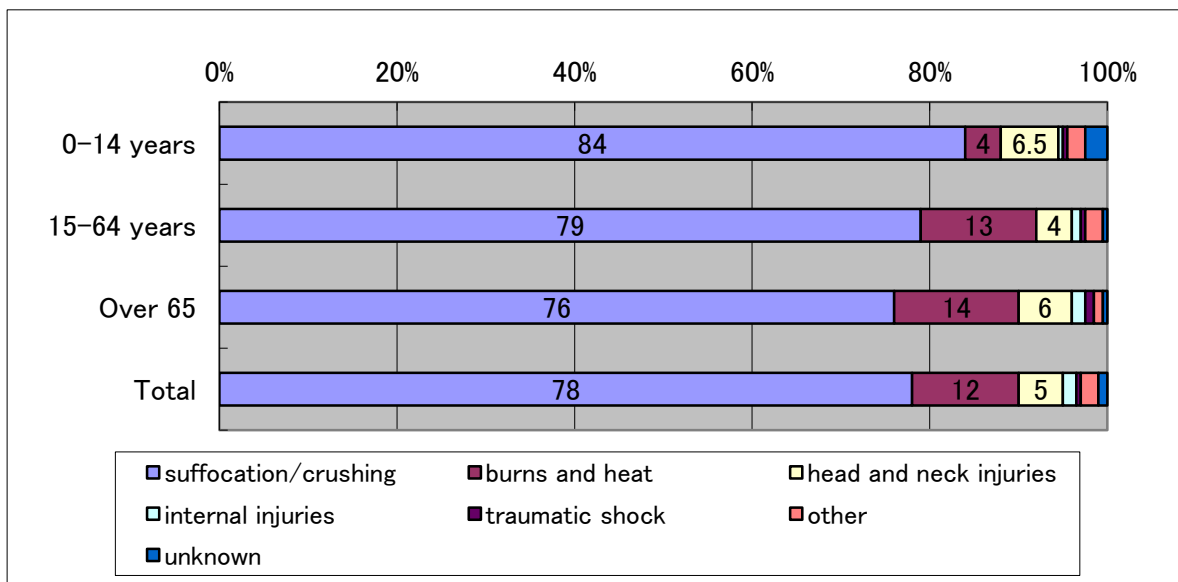
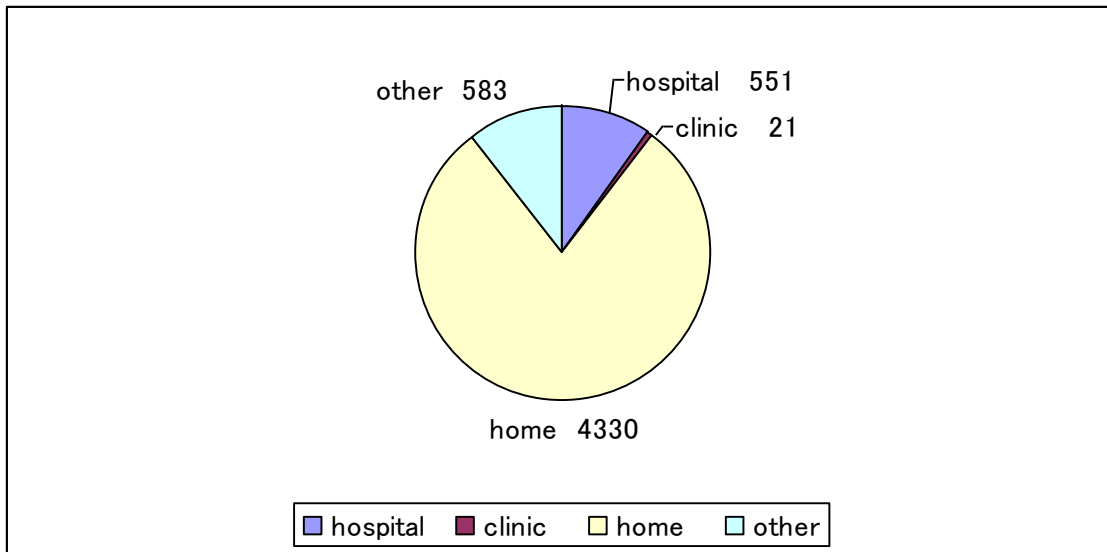


Figure 3. Number and percentage of deaths by place of death

The fact that the earthquake struck before dawn when most people were at home, and the fact that fires were relatively small in scale resulted in the main cause of death as suffocation under the rubbles and people being crushed to death by houses collapsing immediately after the quake.

“Earthquake-related deaths” were also acknowledged, and a further 930 people who died of secondary effects were added to the total, bringing the total of those who died in the disaster to 6400. Elderly people over the age of 60 accounted for 90% of the added “earthquake-related deaths”.

2. The situation of elderly people using the disaster cycle perspective

The situation of senior citizens after the Great Hanshin-Awaji Earthquake can be summarized chronologically as follows.

1) Initial period: from the time of the earthquake to emergency shelter

As described above, the primary cause of death in over 80% of cases was being crushed and suffocation due to the collapse of buildings and furniture. In addition, 92% of victims died before 6:00 am, just minutes after the earthquake. Furthermore, among households receiving welfare benefits, 24.2% suffered the total destruction or burning of their homes, which was more than twice as many as the overall average of 10.7%.

Senior citizens who were saved without major injuries soon weakened due to the harsh life of emergency shelters or life without normal conveniences at home. For elderly people with disabilities, life in the emergency shelter was extremely difficult in many respects, including toilets and meals. There was also a lack of caregivers, and there were cases in which people stayed in their own homes even when these were dangerous to live in. Elderly people were slow to evacuate and, by the time they arrived at the evacuation shelters, all the good spots had been taken, so they ended up on the concrete floors of the corridors or entrance halls, shivering as it was winter time.

At a cold time such as the winter season when even healthy people are susceptible to health problems, living in the emergency shelters, which did not have heating systems, proved too much of a battle against the cold. Coupled with poor nutrition, older persons soon succumbed to pneumonia and died. Suffering severe coughs and high temperatures, the health condition of some elderly people deteriorated to the extent that they were taken to hospital by ambulance,

only to be returned to the evacuation shelter if no radiologic feature appeared on the chest X-ray, as there were no spare beds. When they next went to the hospital, their condition had degraded to severe pneumonia, and they then descended into a vicious circle of in-patient treatment, returning to the evacuation center, becoming ill again and ending up admitted to hospital again.

The toilets at the evacuation center were inconvenient, especially at night when there was a danger of falling, and elderly people, suffering dehydration due to the restrictions on water, as well as diarrhea due to the cold, dried-up boxed meals, soon became very weak. Even healthy older people living in the evacuation shelters were likely to become unable to move and become bedridden. The condition of older people who needed rehabilitation deteriorated as their functional training was suspended or they had lost their auxiliary aids. Elderly people receiving treatment at home found that the caregivers who normally accompanied them on hospital visits could not make it to their homes, and the fact that they could often not get to their usual hospital for reasons such as the breakdown or changes in the transport system, further accelerated their health decline. The existence of this situation demonstrated not only the lack of medical care, but also the inadequacy of necessary everyday care such as regulation of the environment, meals, and hygiene.

Of the 1214 people who consulted the emergency shelter first aid stations, 190 presented stress related ailments, with physical complaints (psychogenic nausea and vomiting) being predominant. Examining the relation between age and the time of the consultation revealed a statistically significant correlation in which the higher the average age, the earlier was the consultation. This suggests that the higher the age, the symptoms of maladaptation to change in the environment surfaced earlier. The average age of those patients who died after the earthquake was 69.2 years, and senior citizens were also the main casualties of secondary damage from the disaster.

2) Mid-term period: life in temporary housing

Elderly and disabled people were given priority in relocation to temporary housing after the Great Hanshin-Awaji Earthquake. Because of that, there was almost no-one available to support their everyday life. The temporary housing was inevitably located a distance away from their previous living environment. At the same time, they needed to go to the hospitals that had all their records, but the round-trip sometimes became such a hassle that some stopped going. In one survey, one year after the earthquake, 22.6% of respondents said that they “had symptoms that concerned them or symptoms of illnesses they were being treated for,” while two years after the earthquake this figure rose to 79.4%. The most common complaint was muscle and joint-related symptoms such as lower back pain and joint pain, and this was followed by people suffering chronic conditions such as hypertension, heart disease, diabetes, and so on. Furthermore, standard temporary housing was difficult for elderly people to live in because even though there were steps, there were no handrails or slopes. There were also elderly people who found it hard to get back to their own house when they went out, because identical temporary housing units lined in identical rows, with up to 1,000 housing units on one site, making it difficult to differentiate individual units.

A survey on health and lifestyle in temporary housing compounds where many senior citizens were accommodated revealed that over 90% of residents had some kind of health problem, with 40% suffering chronic illnesses. The most common was hypertension, but other complaints which were after-effects of the earthquake included lumbago and arthralgia. As far as medical care was concerned, approximately 25% had either not seen a doctor, had difficulty in keeping up with or cancelled treatment or, in cases where they were receiving treatment, had problems with self-care, such as taking medicines properly. 30% of respondents said that they had no contact with neighbors, no-one to talk to and no enjoyment. The people who did go out did so almost entirely with the objectives of ‘shopping’ or ‘seeing the doctor’, and participating in

community activities or pursuing hobbies was extremely low.

3) The long-term period: permanent housing

When it came to the phase of reconstructing lives, many elderly people and other people in weak economic positions that are reliant on pensions, found themselves unable to rebuild their lives on their own, and experienced difficulty getting out of temporary housing. According to a survey of people taking up residence in disaster restoration public housing, senior citizens over the age of 65 comprised 34.4% of residents, and became 3 times the 11.3% in existing public housing. In high-rise accommodation in Nagata ward, the percentage was 70.8%, and the residents' association, which originally comprised 80% of residents, began to gradually fall apart. According to a survey conducted by Kobe University, 50% of the residents had contact with neighbors before the earthquake, but this dwindled to 30.3% in temporary housing, and fell again to 12.5% in permanent housing. In particular, in the section on "worries and problems concerning housing", 31% complained of 'the solitude of iron doors' and 'the difficulty of opening and closing heavy doors', while 20% regretted 'not being able to have a garden', figures, which suggest that structural shortcomings of high-rise building only serve to intensify residents' sense of isolation.

According to a survey which followed senior citizens through from temporary housing to permanent housing, there was a clear development of new stressors in the physical and human environment of restoration housing. Examples were 'loneliness' and 'decrease in contact with neighbors'. Because social isolation was having negative effects on senior citizens, the need for continued nursing care was emphasized.

In particular, in the disaster restoration public housing, the number of people suffering *kodokushi* (lonely death, in which the person dies without being cared for or in the company of a caregiver) in the 9 years following the disaster was 251, which was higher than the figure of 233 in temporary housing. Of this number, 32 committed suicide, and 11 were not discovered for over a month after dying. The number of *kodokushi* deaths in 1994, the year before the Great Hanshin-Awaji Earthquake, was about the same as in 1995. However, after the earthquake, the issue of *kodokushi* became a growing concern because many *kodokushi* deaths occurred in temporary housing or disaster restoration housing units. The causes behind many *kodokushi* incidences in temporary and restoration housing include: (1) difficulty forming new personal relationships in unfamiliar areas; and (2) inability to continue receiving medical care for financial reasons.

IV. RELIEF MEASURES

1. Examples of hands-on activities

1) New ways of living

Among the senior citizens who lost their homes in this earthquake were many who required livelihood support. To meet the needs of some senior citizens who could not manage to live in emergency shelters, temporary housing with care service was established, and measures were put in place to provide emergency short stay programs and suchlike at welfare institutions such as homes for elderly people requiring special care. In the temporary housing providing a care service, each resident had a 6-tatami mat room, toilet, sink and storage for personal use, as well as access to a shared kitchen, living room, dining room, and bathroom. A life support advisor was on site 24 hours a day, and responded to emergencies as well as providing everyday support.

There were two levels of service provided; the 'group home care' type and the 'life support advisor dispatch' type. The group home care type was for elderly people who required some help with bathing, dressing, cooking, and so on. Here, 2 care assistants and 1 nurse were allotted to each unit (usually 14 people) with another 2 care assistants working nights, so that

support for daily living was provided on a 24-hour basis. The 'life support advisor dispatch' type was for elderly people who did not need the level of care provided by the 'group home care' type, but who were judged to have mental or physical trouble coping with life in the evacuation shelter. One life support advisor was allocated to about 30 housing units, with another one for nights, and they were responsible for giving elderly people livelihood advice and guidance, making sure they were safe, helping with housework on an occasional basis, acting as go-between with various organizations and institutions, and other similar support tasks.

In a survey of senior citizens living in this kind of temporary housing providing a care service, 70% of respondents responded that they were satisfied with life in the temporary housing. Particularly highly evaluated features were the kindness of the resident staff (78.1%), the sense of security due to the 24 hour support (68.9%), friendship between residents (41.5%), nurses being close by (31.7%), en-suite toilets (30.6%) and so on. In other words, the reasons for the positive evaluation were that the privacy of individuals was maintained, residents had plenty of opportunity to mix with fellow residents, a 24 hour support system provided protection, and access to support when necessary with everyday living, such as meals, brought peace of mind. This was the first time temporary housing with care service had been provided to senior citizens, and when the time came to move to permanent housing, measures were taken to establish collective housing and expand the Life Support Advisor (LSA) service in Silver Housing (public housing specifically designed for senior citizens).

2) Care activities of nurses

In collaboration with Hyogo University and nursing professional organizations, we started regular visits to the residents of the temporary housing. At the time in the temporary housing, the outlook for rebuilding life was bleak, and there were limits to residents' mutual support. People who were able to rebuild their lives had moved out of the temporary housing, while those without the power to do so, such as senior citizens with health problems and disabled people, had been left behind. Nursing staff went aggressively into these areas, identified people of concern, and visited them regularly even if there were no responses: notes transmitting the message "We're always thinking about you" were consistently left if the residents were out.

Health consultation sessions held in conjunction with various events, and information about people of concern provided by community organization leaders facilitated the process of uncovering those who needed support. Through repeated visits, it was possible to observe changes in complexion, tone of voice, the state of the house, detect any problems at an early stage, and link up with medical institutions. In this way, the weekly individual visits and monthly health consultation sessions at the temporary housing complexes were effective nursing activities in 'assuring a sense of security of being supported' and 'adapting to change'. Through such activities, people living with chronic conditions managed to balance their lifestyle rhythm, take medicines properly, and lead their daily lives with a sense of security. In addition, nursing staff acted as intermediaries in instigating work to remove steps and put in handrails, and pave gravel roads in front of the temporary houses of people using wheelchairs or walking sticks, so that it became possible for these people to care more for themselves.

It was important to provide continuous support for people who were highly physically and psychologically stressed by the repeated movements from temporary to permanent housing. In this transitional period, it was the 'health advisors' who played the lubricating role. The 'health advisor system' was part of a nursing care provision system provided in collaboration with Hyogo prefecture in Kobe city and other areas that had suffered the worst damage. They provided continued support particularly for people with chronic conditions, pregnant women, children, senior citizens, disabled people, and others with special needs. 'Health advisors' were recruited from a pool of potential nursing staff, and about 170 volunteer nurses engaged in these activities. The professional nursing staff worked continuously in a specific locality, and by supporting relations between people, tried to restore a lifestyle where people were assured a sense of security and safety. The mind and body of a person are one inseparable whole, and

mental care alone is unacceptable. In the recovery period, by encouraging relations between residents, victims' sense of friendless isolation is lessened and post traumatic stress disorder (PTSD) is prevented to some extent.

3) Support for community building

The administration set up a 'community center' in every temporary housing complex with over 50 units, and supported residents' association activities. The aim of these centers was to give elderly people and others living in temporary housing, all of whom had suffered great physical and emotional blows from the earthquake, mental and physical care through warm interactions, providing support for regaining autonomy, and a base for community development and volunteer activities.

Nursing professionals put on seasonal events and communal coffee at these 'community centers,' enabling strangers to get to know each other and encouraging people to form relationships and go shopping and take walks together. Sometimes, they also planted flowers in places where people gathered, and tried to create situations in which people could strike up a conversation with each other. Being in contact with others renewed vigor and prevented withdrawal into oneself.

More so, relations between victims were encouraged. For example, public health workers mainly supported 'residents' social meetings,' 'health consultation sessions,' and 'tea parties'. Additionally, the 'memorial day' service to console the spirits of the deceased held every year was very important as a cathartic chance for the victims to pour out their feelings to each other and go through the process of appeasing their anguish. Support systems responded creatively to the particular circumstances of each locality, and a wide variety of programs from hobby groups to health workshops was implemented.

Several measures were taken to try to help people cope with adapting to the frequently changing environments, such as economic support for community activities and, in Minamiashiyahama-danchi, emergency communication devices and a 24-hour LSA (Life Support Advisor). The public-service supporters, the LSA, and the SCS (Senior Citizen Supporter), through their care for individual senior citizen households, performed a role of community support, and were extremely effective in creating a new community.

4) Support for health improvement

The aim of the health measures was to prevent disaster-induced health problems and support victims to restore, maintain, and improve their health through leading a healthy lifestyle. Structurally, disaster-related health problems can be divided into (1) those caused directly by the disaster and (2) those that were latent but surfaced because of the disaster. Health cannot be thought separately from general life problems such as the death of a close one, cuts to lifelines, damage to the home, unemployment, and so on.

Matsumura claims that elderly people are most likely to lose their reason for living when they feel their health is suffering. Shimizu also stresses the importance of grasping people's state of physical and mental health and working to stop the decline of vital functions, citing "the motivation to do something" and "feeling able to live my life as I want to" as most frequent after "physical condition." Disasters wreck the living environment and support systems that sustain the health of elderly people. The health problems of elderly people are often triggered by minor things, and tend to be irreversible. For that reason, it is essential to minimize changes in the living environment as far as possible, and create a system which facilitates the continued use of social resources.

In terms of health improvement, from 1997 to 1998, temporary housing residents susceptible to withdrawal from society were invited to participate in a radio exercise program. Also, sports

instructors were sent to community centers to lead stretching sessions aimed at people over the age of 40. From 1997, when people began to move into disaster restoration public housing, programs were held at the disaster restoration public housing community rooms and similar places, providing medical and health consultations, helping senior citizens to become aware of their own state of health in the changing environment, and learn to be able to care for themselves and live independently. This was conducted through to 2001. These health consultations were later converged into the 'Town Health Care Room' activities whereby the 'Town Health Care Room' was established. This 'own Health Care Room' was designed as a place like the sick room at school, where people could easily go for advice on health problems that were worrying them but were not serious enough to warrant a visit to the doctor. By carrying out disaster preparedness activities like this in the normal course of things, it was hoped that the region's and individual's ability to recover from a disaster would be heightened. The Town Health Care Room activities have started to spread from Hyogo Prefecture Nursing Association to the rest of the country.

Apart from this, Hyogo Prefecture Nursing Association also started up the 'health improvement independent group development project' from 2000 to 2001, in which small groups of residents created opportunities to learn together about health improvement, building a sense of community. And here, health education on issues such as local health problems and preventative measures against the need for nursing care were dealt with.

V. CONTRIBUTIONS FROM SENIOR CITIZENS AFTER THE GREAT HANSHIN-AWAJI EARTHQUAKE

A survey has been carried out which throws light on the formative process and influencing factors of the capacity to cope with life of elderly people living alone in permanent housing provided after the Great Hanshin-Awaji Earthquake. A study using semi-structured interviews with 10 elderly victims found that the formative process of developing capacity to cope with life had 3 stages, namely, the stage of using support provided by others, followed by the stage of mutual support with surrounding people, and then the stage of contribution to the community.

The factors influencing the formative process were found to be the existence of social resources, the existence of mutually supportive neighbors and friends, the existence of a mutually supportive family, the living environment, such as accommodation, and the existence of information. While senior citizens were classified as vulnerable people at the time of the disaster, they also demonstrated a vigorous capability of continuing life in spite of drastic changes in their environment, as well as mutually supporting each other and solving problems independently in temporary and permanent housing. For this to happen, the existence of family and neighbors or friends in the initial phase is essential, and it is important for the local community to be maintained to the greatest degree possible. As mentioned earlier, after moving into permanent housing, the living environment was one in which 'people did not meet people when they went out,' was difficult for creating relationships with neighbors, and was linked to the feeling of isolation of being shut behind iron doors. In that respect, providing temporary housing with care service and accommodation, in which both individual space to ensure privacy and communal space are available, should be good.

What is especially important after a disaster is the extent to which a living environment which facilitates easy contact with neighbors can be created. The provision of a sense of security after a disaster is particularly crucial, and this is affected by the existence of someone to ask for advice when necessary, help at hand in the case of sudden illness, the establishment of daily routine, and so on.

One volunteer newsletter published an article entitled, “The strain of having to keep saying thank you to volunteers.” There were cases of elderly people who, wanting to give something back for all the support they received after the Great Hanshin-Awaji Earthquake, took the initiative to develop their own activities. The specific activities and roles of those involved are described below.

1) Storytelling group providing lessons on disaster for the future

Eight years after the Great Hanshin-Awaji Earthquake, elderly people in the Nagata district, which was badly affected by the disaster, started conducting storytelling for groups of students on school trips. Elementary and junior high school students have no experience of the Great Hanshin-Awaji Earthquake or, if they did experience it, it was when they were very young and they have no memory of the event. Children from outside the region were also included and told what actually happened in Nagata district in the Great Hanshin-Awaji Earthquake, how people coped, how they felt then and how they feel now. Through these storytelling activities, children who have not experienced major earthquakes learn how powerful they can be, and are motivated to think about the necessity of preparing for disaster and ways of coping if one occurs. Storytelling continues and has been sustained through the Disaster Reduction and Human Renovation Institution Museum in Kobe, Japan where volunteer older people narrate and share their stories of resilience and lessons learnt to museum visitors.

2) Support for elderly people

As one way of repaying gratitude to people who helped them in temporary housing and other situations, some relatively healthy elderly people are providing support to other elderly people who need it in the permanent housing. A few specific examples are counseling for elderly people who have moved from temporary housing to group home style housing and have problems they do not want to discuss with staff there, doing washing for elderly people who live alone and need to stay in hospital, and occasionally visiting them in hospital, making lunches for elderly people who cannot cook for themselves, and so on. These activities, relaying the message that someone is thinking of them and making this connect to their actual sense or feeling that they have not been abandoned by everyone is effective for isolated people, especially those who live alone or for those who require support in their everyday lives. At the same time, the elderly people providing the support widen their sphere of activity, improve their own physical fitness, and gain a higher sense of self-efficacy through actually having a role to fulfill. People who have lived through a major disaster are often prone to survivors' guilt, and being old on top of this can easily lead to a loss of hope for the future. However, such activities help to eradicate this negative way of thinking. In this way, it is both important and effective to encourage elderly people to become involved in such activities to the extent they can.

<Specific cases>

- (1) The “*makenai-zou* (we won't be beaten)” project: As a project to support victims in finding a *raison d'être*, the “Temporary Housing Liaison Group” set up the “*makenai-zou* (we won't be beaten)” project from 1997. They asked people from all over Japan to send new towels, which they then transformed into wall decorations formed in the shape of elephants [the activity was based on the fact that the word for elephant, *zou* in Japanese, is a homophone of the emphatic ending *zou*, as used in *makenai-zou* (we won't be beaten), so that the elephant designs represented the determination of victims to recover from the disaster]. These wall decorations were then sold nationwide. Through this project, victims of the disaster could recognize that they were “contributing to society”, and engaged in the experience of working together and supporting each other. This project is still ongoing today.
- (2) Activities of the “senior citizens' clubs.” Focal points for elderly people to live actively through work or hobbies were created. A whole variety of activities, from day service to coffee circles, handicraft classes and calligraphy classes, are in place. 70-year old Mr. K. had been in hospital after a stroke, and had lost his faculty of speech. After coming out of

hospital he lived with his wife, but there was no conversation. He heard about the activities of this workshop on the radio and decided to take part in it. At first, he only listened to the conversation of the people around him, who were all of a similar age. But then one day, a member of the group came over and began talking to Mr. K. with his hand on Mr. K.'s shoulder. For Mr. K., this person's words were the stimulus and incentive he needed to engage in rehabilitation, and he is now able to talk again, even though the words are only single words.

Encouraging older people, who were only on the receiving end of support, to tell stories to the next generation in the form of disaster lessons, or to mutually support each other, or contribute to society, is a way of restoring their pace of life and their energy to live. Systems for supporting these kinds of activities are certainly essential.

VI. SUGGESTIONS REGARDING POLICY

1) Measures for each stage of the disaster cycle

(1) Early period (from occurrence of disaster to 1 month post-disaster: period of safeguarding life)

1. Establishing support groups for people vulnerable in disaster

A department responsible for concentrating on the administration of evacuation support for vulnerable people should be established, information about vulnerable people should be collected, individual plans for evacuation support should be made and filed, and disaster prevention study meetings and emergency training involving elderly people should be carried out.

2. Establishing information systems for evacuation preparation

Although it is difficult to do for an earthquake, in cases where storm and flood damage are predicted, advising ordinary residents to prepare for evacuation would be made possible, and especially, it would allow time for vulnerable people, who need more time to evacuate, to get ready early.

3. Concrete measures for 'individual' plans to provide evacuation support for vulnerable people

For vulnerable people, individual plans need to be devised in advance, in co-operation with families and caregivers, and these need to be revised at regular intervals. For home-based bedridden elderly people and those with chronic conditions requiring artificial respirators and oxygen supply equipment, concrete evacuation plans need to be made in conjunction with relevant parties such as welfare officers, health and welfare centers, fire stations, hospitals and the like, including details on how to get them to hospitals. It is also important to set up back-up systems that provide at least two options for vulnerable elderly people living alone, so that if one option fails, the other one can function.

4. Establishing welfare evacuation centers

Even healthy elderly people who managed to get to the evacuation centers by themselves tended to be late in evacuating and were put in poor environment of the evacuation center, and fell ill. To alleviate this situation, it is necessary to reserve rooms especially for elderly and disabled people in advance, or establish welfare evacuation shelters. Welfare evacuation shelters are like ordinary evacuation shelters, only they have systems providing necessary support such as physical care and medical counseling in place, thus enabling vulnerable people to live with a certain degree of security, whereas otherwise they would be lumped together with everyone else and risk being crushed by the constraints of the lifestyle.

(2) Mid-term period (1-6 months post-disaster: temporary housing)

1. Creating systems for confirming and watching over the wellbeing of residents

In the temporary housing, people are unavoidably thrown into a life of isolation. Many residents were middle-aged or elderly people living alone, and there was concern that illnesses connected to physical and mental exhaustion, or alcohol dependency would worsen. It is thus necessary to support the development of community organizations and autonomous networks of elderly people, to become aware of residents' needs, and to facilitate information exchange amongst welfare officers, volunteers, and other relevant people. Nurses, who are in a position to be able to judge both physical and mental health, are effective as specialist volunteers.

2. Living environment conditions

The areas in which temporary housing were developed were generally reclaimed land or areas scheduled for development, so it is necessary to be fully aware of living environment factors such as heat, cold, noise, vibrations, drainage, and so on. Measures need to be taken against such things as droughts and cold in order to ensure a pleasant everyday environment for elderly people. Also, for elderly people using wheelchairs or walking sticks, there need to be modifications to the environment, such as the asphaltting of gravel roads and the installation of handrails and slopes.

3. Creating support systems for vulnerable and high-risk people

There is a need to adjust housing allocation to physically and mentally weak elderly and disabled people who need welfare and other care. In concrete terms, visually-impaired people should not be allocated units in the middle of a terraced row, physically disabled people should be given units without steps, and elderly people should not be too concentrated in one area and should be allocated to places served by specialist advisors and other staff. In addition, after relocation to the temporary housing, it is necessary to co-ordinate with health centers and other organizations to visit high-risk people such as elderly people living alone, elderly households, disabled bedridden elderly, elderly people with dementia, visually- and aurally-impaired people, and people with TB, severe, or chronic illnesses as early as possible, to assess their health and living situation and to co-ordinate with medical institutions as necessary.

4. Community building

There is a need to create communities where older people can adapt to the neighborhood, relax in relationships with other people, and restore their health. In areas where the there is an imbalance and the concentration of elderly and disabled people is high, this is difficult to achieve. It is important for elderly people to support each other, but it is also important to create mutually supportive and friendly relationships within a wide range of age groups.

(3) Long-term

1. Developing activity plans to heighten a sense of self-efficacy

After moving into permanent housing, elderly people, like everyone else, gradually settle down. It is important for elderly people who have been on the receiving end of support until that point to turn around and start providing support, to the extent they can, to other elderly people who need it. In concrete terms, as mentioned previously, systems to support activities such as the storytelling group or everyday support are indispensable.

2. Creation of places where elderly people and other members of the community can interact

It is important for elderly people to fully live through work and leisure activities and have places, focal points in the community where they can ask for advice on health and everyday problems. Due to such focal points, as can be seen from actual cases of people recovering from illnesses, it is important to support and help each other within a network of human relationships.

Based on surveys with senior citizens after the Great Hanshin-Awaji Earthquake, we would like to suggest the following measures be taken for senior citizens in the case of any future large-scale disaster:

- 1) The whereabouts of senior citizens and disabled people in the community should be known, and immediately after the disaster or in the emergency shelter phase, it is necessary to have a system created that can provide necessary care for senior citizens and others in need (Town Health Care Room).
- 2) When allocating temporary housing and public housing, it is necessary to avoid over-concentration of a specific group, and promote a social mix so that residents can self-manage.
- 3) Accommodation with a family-like environment and a certain degree of support like a group home is effective for elderly and disabled people, and so types of accommodation provided should be diversified and should include group homes.
- 4) For senior citizens provided with restoration accommodation in large-scale high-rise public housing, human resource support is necessary to ensure a sense of security and safety.
- 5) It is necessary to provide human support and a place where individual senior citizens can, in their own way, lead a high quality of life in which their sense that they have some role to play is fostered.

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