What happened to elderly people in the great Hanshin earthquake

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See p 1144

The great Hanshin earthquake on 17 January 1995 hit the elderly population of an urban society particularly hard. More than half of the fatalities were among those over 60 years old, and in this age group female fatalities were almost double those of men. Surviving elderly people were largely left to their own devices and became relegated to the marginal space in shelters. Elderly people tended not to proclaim their problems, and so their suffering tended to be underestimated. Again, as survivors rebuilt their homes and moved back, elderly people and other vulnerable groups tended to be left behind in temporary accommodation. This tragedy has shown that special attention and continuous care is necessary for elderly and vulnerable people after such disasters.

The great Hanshin earthquake

On 17 January 1995 the great Hanshin earthquake devastated an area 20 km long and 1 km wide, causing heavy damage to Kobe and nearby cities in Japan (table 1). There were nearly 1.6 million inhabitants in this heavily damaged area, and the immediate victims included 5502 dead and 41 527 wounded. By December 1995, the earthquake related death toll amounted to a total of 6308. A total of 394 440 houses were damaged, 100 282 were completely demolished and 108 402 damaged beyond repair. At the time of maximum evacuation, 23 January 1995, there were 317 000 evacuees and 1150 shelters. Up to 49 681 temporary houses had been constructed by 28 August 1995. This earthquake turned out to be the worst natural disaster in terms of its effect on elderly people, and the suffering of elderly people seemed to be different from that in previous disasters.[1 2] This paper describes what happened to elderly people in this earthquake.

Table 1—*Sufferers of the great Hanshin earthquake in Kobe and nearby cities*

	No of cases/1000 population	
	Fatalities	Evacuees
Kobe:	2.61	159
Higashinada-Ward	6.92	363
Nada-Ward	7.03	287
Hyogo-Ward	3.65	216
Nagata-Ward	5.96	377
Suma-Ward	1.74	114
Chuo-Ward	1.86	316
Other wards	0.05	11
Ashiya	4.68	246
Nishinomiya	2.39	109
Takarazuka	0.40	67

What happened to elderly people

FATALITIES FROM THE EARTHQUAKE

According to the 1990 census, people aged over 60 years made up 17.8% of the affected population. The high death rate in these elderly people was obvious from the data from death certificates provided by the Ministry of Health and Welfare[3]: more than half of the fatalities were among people aged over 60 (fig 1). The death rate of people aged 80 and over was six times higher than that of people aged under 50 (fig 2). Female fatalities were almost double those of males among people aged over 60, whereas the ratio of men to women among those aged over 65 in the affected area was 1:1.5.[3] This indicates that elderly women were particularly vulnerable in this disaster.

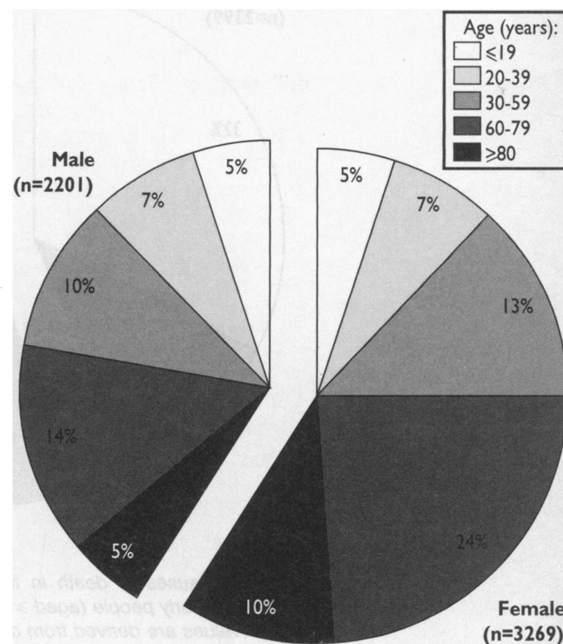

Fig 1—*Total fatalities in the great Hanshin earthquake stratified by sex and age (values are derived from death certificates)*

Figure 3 shows the causes of death in the earthquake: 77% of victims were crushed to death, and a greater proportion of elderly people died from burns or penetrating injuries. Many of the elderly people lived in inexpensive old wooden houses of their own or in tenements. A survey of the heavily damaged areas showed that 41% of wooden tenement houses were demolished, and a further 19% were damaged beyond repair, whereas only 7% of ferroconcrete condominiums were demolished and a further 9% damaged beyond repair.[4] Furthermore, elderly people tended to sleep in ground floor rooms, which were especially prone to collapse in this earthquake.

EARLY DAYS IN SHELTERS

Immediately after the earthquake, people fled from their houses and moved into shelters set up in schools,

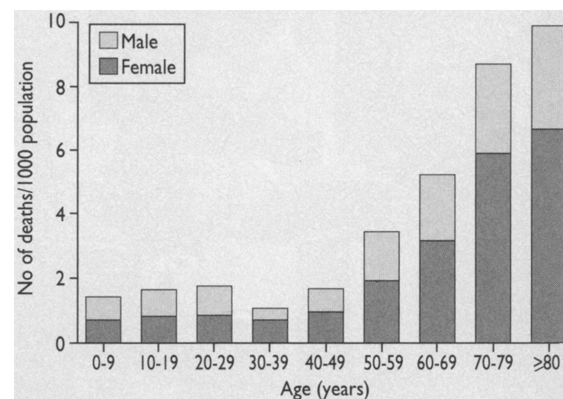

Fig 2—*Proportion of local population that died in the great Hanshin earthquake stratified by age (data on age stratified population are based on 1990 census)*

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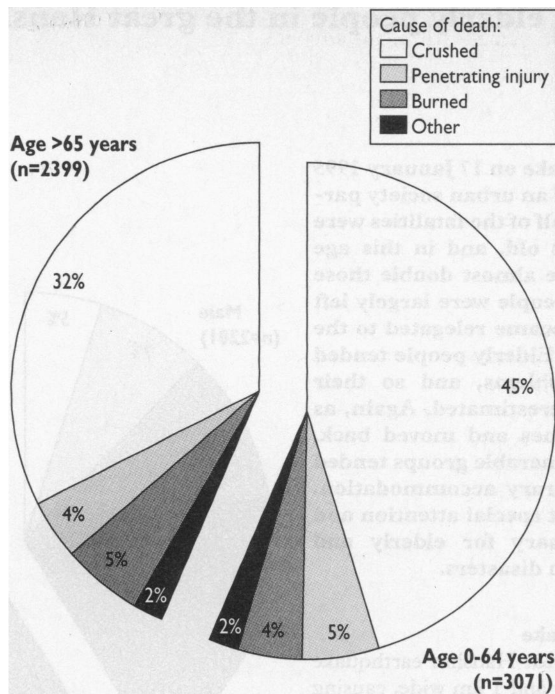

Fig 3—*Causes of death in the great Hanshin earthquake among elderly people (aged ≥65) and among rest of population (values are derived from death certificates)*

gymnasiums, parks, etc. However, the number of evacuees far exceeded the capacity of these designated shelters. Under such conditions, everyone had to find their own way and space, and, consequently, many elderly and disabled people were left behind and relegated to the marginal space in shelters.

Temperatures were below freezing, but heating was not allowed in the shelters as a precaution against fire. Food and water were scarce, and their delivery was erratic because of tremendous confusion in the early days. Furthermore, elderly people restricted their own consumption food and water, partly because they felt constrained to give way to younger people and partly because toilet facilities were scarce and temporary toilets were outside the shelters. The earthquake had destroyed local communities, and elderly people were left with no one that they dared ask for help.

Emergency medical teams were busy treating the many wounded. Elderly people tended not to proclaim their problems unless they were questioned specifically. Thus, the superficial survey by the medical teams failed to notice the problems of elderly people in shelters. Staff in local welfare offices, who usually looked after them, were all occupied in dealing with the many dead bodies. Eventually, many elderly people caught diseases such as "shelter pneumonia" because of the unhealthy environment and dehydration, in addition to the many who developed post-traumatic stress disorders.[5]

After the initial shock had passed people began to return to work, and elderly people were left alone. It was then that their problems were noticed. In many shelters the elderly and disabled people were moved from corridors and doorways into rooms within 10 days. Volunteers and administrators started to pay special attention to them. The most efficient work was exemplified in Nagata-Ward, Kobe. On 31 January the Nagata-Ward network of volunteers was organised by Care-Home Nagata, the Japanese Society for Hospice and Home Care, the Nagata Medical Society, and missionaries, and a home-welfare centre was provided by the municipal office as a secondary shelter for debilitated elderly people by the evening of the same day. This secondary shelter opened with 18 beds on 5 February and was flooded with patients by the next day. This scheme ended on 6 April, when the crisis had subsided.

CONTINUING PROBLEMS

Although the Japanese government set up special temporary houses for disabled and elderly people with 24 hour support by carers in late February, the numbers were too small to accommodate all who needed care.

The temporary houses built after the earthquake are now largely left to elderly people and other vulnerable groups

Many elderly people had to live isolated in ordinary temporary houses. Furthermore, because elderly and disabled people were initially given priority in the distribution of temporary houses, this well intended scheme produced a community of elderly and disabled people living alone. A survey conducted in late September 1995 showed that 40% of temporary houses accommodated elderly families by themselves and a half of them lived alone.

Reconstructing new relationships was hard for elderly people after the loss of lifelong communities. Consequently, a self governing body was founded in only 30% of temporary housing areas by July 1995. By 30 June 1996, a total of 83 people, most of them elderly, were found to have died unnoticed in temporary houses. Suicide by elderly victims occurred at a rate of almost once a month. In addition, some elderly people were found dead in a ditch, presumably because they were lost in a new territory. Although volunteers and administrators had been working in the temporary housing areas, it seems obvious that the suffering of elderly people was underestimated.

These problems are unlikely to be solved in the near future. Evacuees who were able reconstruct their homes by their own resources have returned to their previous

Inexpensive wooden houses were particularly vulnerable in the earthquakepanos pictures)

JIM HOLMES/PANOS PICTURES

People whose homes were destroyed in the earthquake were initially living on the street

and could no longer provide care. What made things worse was that elderly people were left behind with insufficient care for some time after the earthquake. As in many other countries,[1 2] elderly Japanese people tended to feel constrained and did not state their wishes directly.[5] Although they kept silence, their sufferings, such as from post-traumatic stress disorders, were greater than those of other victims of the earthquake.[5] Unless neighbouring people noticed a problem, the sufferings of elderly people and those who could not express their wishes were consistently underestimated.

We will certainly encounter similar or even greater earthquakes in the future, when the percentage of elderly people in the population will be greater than now.[6] We must realise that even a highly organised and affluent society may come to a standstill when it is hit by such a huge disaster. A detailed long term report of the consequences of this earthquake will be needed, and I can only hope that we will learn from this tragedy to be better able to deal with any future disaster and to help those most vulnerable to its effects.

life. Gradually, the temporary homes have been left to the most vulnerable members of society, such as elderly and disabled people and low income families. For example, in June 1996, 49% of these houses were occupied by families over 65 years old, and 28% were occupied by single people aged over 65. Although these evacuees wish to reconstruct their old communities in the ruined area, many will inevitably be forced to move to new settlements for low income families. The wishes of evacuees should be considered to minimise the disruption to their old and new relationships in new settlements. Continuous attention and care will be necessary for these most vulnerable victims of the earthquake.

What have we learnt for the future

In a forecasted disaster children and elderly and disabled people are usually cared for first, hence they become victims to a lesser extent.[1 2] But this was not the case with the great Hanshin earthquake. The scale of this earthquake was beyond all expectations, and the contingency plans for a possible large disaster proved to be totally inadequate. Staff and people who cared for elderly people in ordinary life were themselves victims

Unless specified otherwise, the figures quoted for casualties and damage are based on media reports or press releases by the Fire Defence Board, the Ministry of Health and Welfare, and the National Police Agency. Age stratified population data from the 1990 census were provided from each municipal and town office. This article is dedicated to Mr Tsuyoshi Yamamoto, a pioneer of the volunteer movement in Japan and a member of the Advisory Board of the Japanese Society for Hospice and Home Care, who died at 82 years of age with his wife in this earthquake.

1 Bolin R, Klenow DJ. Response of the elderly to disaster: an age-stratified analysis. *Int J Aging Hum Dev* 1982-3;**16**:283-96.
2 Raphael B. *When disaster strikes. How individuals and communities cope with catastrophe.* New York: Basic Books, 1986.
3 The Statistics and Information Department, Minister's Secretariat, Ministry of Health and Welfare. *The profiles of casualties in the great Hanshin-Awaji earthquake from vital statistics.* Tokyo: Ministry of Health and Welfare, 1995. (In Japanese.)
4 Shiozaki Y. Earthquake and damage of houses. In: Earthquake Study Group of Kobe University, ed. *Records of 100 days of great earthquake.* Kobe: Kobe-Shinbun General Publishing Center, 1995: 49-55. (In Japanese.)
5 Shiro H. Stress and anxiety in disaster. In: Earthquake Study Group of Kobe University, ed. *Records of 100 days of great earthquake.* Kobe: Kobe-Shinbun General Publishing Center, 1995: 167-77. (In Japanese.)
6 Okamoto Y. Health care for the elderly in Japan: medicine and welfare in an aging society facing a crisis in long term care. *BMJ* 1992;**305**:403-5.

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An acquaintance renewed

Our doctor was away and it was the locum who came. The first I can remember was when I got to hospital, the argument going on above my head: mum to one side, a nurse on the other, and the 4 year old that I was lying on a hospital trolley. I remember being carried back into the ambulance: the curved rear doors and the street lights of the Cornish town seen through dark windows as we drove home. But my most vivid memories are of the steam from the kettle which boiled seemingly all night in my room, my parents sitting by the bed and the doctor who through the night appeared out of the steam to see me. The argument centred on whether my mother could stay with me in the hospital where I had been taken with pneumonia. Medical and nursing practice in the early 1950s had hardly recognised what we now take for granted: there was no question of my mother staying. There was equally no chance of my mother leaving her only child in the care of hospital staff, so home we went.

Forty years later I was back in Cornwall, a professor giving a postgraduate lecture to general practitioners. During the coffee break an older member of the audience approached me and I waited for the question about how what I had been saying related specifically to one of his patients. But not this time. "Did I hear correctly that you come from Redruth?"

Confirmation brought the most unexpected of questions: "Were you the little boy whose mother wouldn't let him stay in the hospital?" It transpired that the newly qualified doctor had been doing a brief locum for our general practitioner. He had never discovered what happened to me, but having just looked after another young child with similar symptoms who had died he feared the worst. My astonishment at the accuracy of his memory was matched by his pleasure at seeing that the young patient over whom he had worried that night all those years before had not only survived but gone on into medicine. As he said, we had first met at the very beginning of his career and it was somehow fitting that we should renew our acquaintance towards its end.—PETER RUBIN *is chairman of medicine at the University of Nottingham;* GEOFFREY PHILLIPS *of St Austell is the man with the memory*

We welcome filler articles of up to 600 words on topics such as *A memorable patient, A paper that changed my practice, My most unfortunate mistake,* or any other piece conveying instruction, pathos, or humour. If possible the article should be supplied on a disk.