

# Life, Health and Community after the Massive Earthquake and Tsunami

## Report on the relief work at Otsuchi-cho Town, Iwate Prefecture (25-30 March 2011)

By Masaya Kato on 1 April 2011

### Introduction

I arrived at the shelter in Otsuchi-cho town, Iwate Prefecture, late afternoon on 25<sup>th</sup> March. Iwate is approximately 450 km north of Tokyo – about 9 hours drive from Tokyo. The shelter was arranged at the Terano Kyudojo (indoor archery facility).

I joined the relief mission of the Nagasaki University as a volunteer. Professor Taro Yamamoto of the University, who chairs Department of International Health, entered the affected areas immediately after the quake and prepared the mission from his University to the Terano Kyudojo shelter.

Nagasaki University sent three teams in rotation, one after another, and I was with their third team, which operated from 25<sup>th</sup> to 30<sup>th</sup> March 2011. The team consisted of a physician, a surgeon, a pharmacist, a nurse, a public health worker (myself) and a graduate student. The team worked with the local clinic team of Dr Toshiro Ueta.



Fig 1. (Upper left) Dr Ueta's clinic before Tsunami arrives. Tsunami reached the third floor of the building. (Upper right) Tsunami hits Otsuchi-cho town. (Left) Dr Ueta's building was surrounded by sea water after Tsunami, photographed from the balcony at the fourth floor. (Courtesy of Ms Michiko Ueta)

## Dr Ueta - The local doctor

Dr Ueta and his family are the victims of the massive Tsunami themselves. They were at their four story clinic building when Tsunami hit Otsuchi-cho town on 11<sup>th</sup> March. Some people in the neighbourhood ran into his building and climbed up to the rooftop. Dr Ueta's family followed. There they observed series of huge massive Tsunami waves literally swept away the whole town. They stayed at the building whole night surrounded by water contaminated with oil and many things. Fire occurred in many parts of the town and in the mountain.

It was the following day when Dr Ueta's family and their staff were rescued by helicopter of the Self-Defence Forces. They were taken to the Terano Kyudojo shelter. Dr Ueta acted immediately. He set up a desk and started providing medical services to people in the shelter and in the communities nearby.



Fig 2. Otsuchi-cho town submerged under water after the massive Tsunami and devastated. Water was contaminated with fuel and many others. Fire occurred in many parts of the town. (Courtesy of Ms Michiko Ueta)

## Otsuchi-cho town and Terano Kyudojo Shelter

One the way to Otsuchi town, we saw little damage to the buildings in Tohoku region at least from outside, where Tsunami did not reach. This suggests that many of the houses resisted to the quake even though it had extremely strong magnitude at 9.0. However, the scene completely changed at the line where Tsunami reached. Many places also suffered fire following the Tsunami waves. It was like area hit by the air attack. One of the Nagasaki team members described this is like after the “atomic bomb”.

Otsuchi-cho town had the estimated population of 15,256. According to the local authority of the town, on 25<sup>th</sup> March, 508 people were confirmed dead due to the disaster, 989 people were reportedly missing, and 4,778 people were in the shelter. However, there was no information on the rest of the people – some 9000 people. Thirty six shelters of different sizes were arranged in the town.

At the beginning, the Terano Kyudojo shelter accommodated approximately 580 people<sup>1</sup>. Many moved out of the shelter in the following two weeks. Their family members who live in other part of the country came and took them to live together. On 28<sup>th</sup> March, according to the updated register, 99 households were at

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<sup>1</sup> Based the shelter register created soon after the shelter was opened.

the Terano Kyudojo shelter with the population of 221 people (110 males and 111 females). Fig. 4 shows the age distribution of the shelter residents. This clearly shows the large proportion of the residents is the elderly: 31% of males and 45% of females were at age 65 or older. Fourteen of them (age 65+) were living alone – they were the only one the household.



Fig 3. The center of Otsuchi-cho town two weeks after the massive Tsunami attack. The Otsuchi-cho primary school had fire (lower left) and the Otsuchi-cho hospital was destroyed as the Tsunami waves reached its second floor.

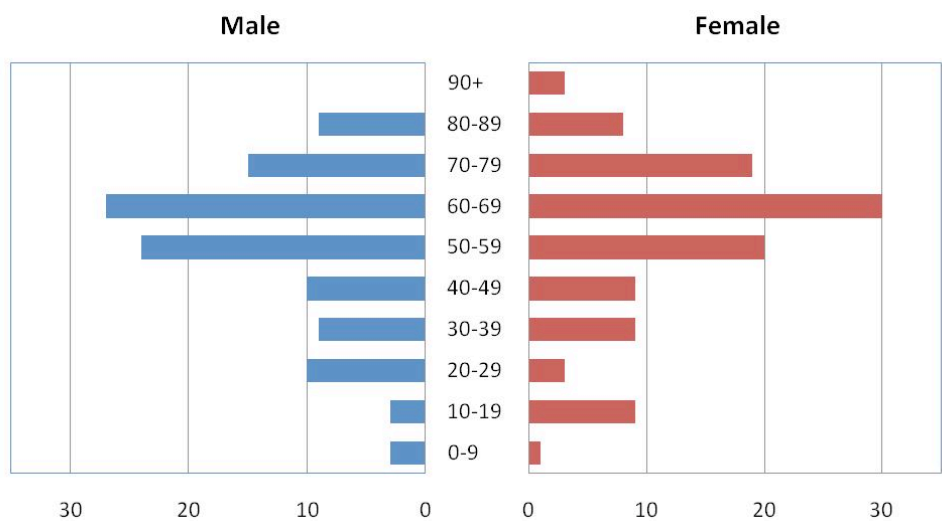


Fig 4. Age distribution of the residents at Terano Kyudojo Shelter (28 March 2011)

## Clinic at the Terano Kyudojo Shelter

The team of Nagasaki University worked with Dr Ueta at the Terano Kyudojo Shelter. The shelter-based clinic served to both residents of the shelter and people who live in the nearby communities. From 26<sup>th</sup> to 29<sup>th</sup> March (until 11 AM), the clinic provided 266 consultations. The table 1 summarizes the breakdown of the consultations. Forty percent of the consultations were with the elderly (65+). The record also suggests three children of age 0-4 visited the clinic from outside the shelter (there were no children 0-4 registered at the shelter).

It was two weeks after the quake when our team arrived, and situation was moving from sub-acute phase into the chronic phase. This shelter-based clinic primarily functioned as primary care site, while a few serious cases were referred to the referral facilities. The doctors estimated about one third of the cases presented due to common cold, and another third requested the routine medication refill for their chronic conditions, e.g. hypertension, diabetes. The remaining third also had chronic conditions and required the medicine refill but they suffered additional symptoms. The doctors reported the increasing trend of cases seemingly related to the physical and psychological stress.

Approximately 100 types of medicines were available. One of the tasks for doctors and pharmacists were to choose the alternatives for the patients' routine medication from the set of available medicines. Some had their medicine book or remaining pills, which was a great help for this task. However, one of the big challenges for doctors was to identify medicines when there was no clue on the routine medication that patients had been taking, especially when all the information were lost with Tsunami. Many elderly patients were unable to tell the name of medicines.



Fig 5. (Left) The clinic at the Terano Kyudojo Shelter. Dr Ueta (left) and Dr Tanaka (right) providing consultation. (Right) Ms. Ikeda, a pharmacist, in front of the pharmacy at the shelter.

**Table 1. Breakdown of medical consultation provided at the Terano Kyudojo Shelter on 26-29 March 2011**

		Number of consultations	Percentage 1)
Total		266	
Date	26 March	90	
	27 March	77	
	28 March	67	
	29 March (-11 AM)	32	
Sex	Female	138	56%
	Male	109	44%
	Data not available	19	
Age	0-4	3	2%
	5-14	8	6%
	15-64	68	52%
	65+	53	40%
	Data not available	134	
Doctor	Dr Ueta	113	43%
	Nagasaki U Doctors (Dr Nakamura + Dr Tanaka)	148	57%

1) Percentage among those whose data were available.

### Increased hygiene measures against Norovirus

In the morning of 27<sup>th</sup> March, a patient presented with severe diarrhoea and nausea. The doctor suspected of acute gastroenteritis caused by Norovirus infection. Soon a few similar cases were also reported from the community. We immediately acted to increase hygiene measures. Noroviruses can be transmitted by faecally-contaminated food or water and by person-to-person contact, and the dehydration can be a problem among some people especially infants, children and the elderly.

In the shelter, tap water was not functioning and there was no running water. The rule for toilet had been to defecate on the newspaper, wrap and place in the big plastic bag. There were big chances that people may have direct contact with the stool by their hand. People were also washing their hand in the water in bucket. We discussed with the community leaders of the shelter and agreed to make following changes.

First, we made chlorine-based disinfectants available at all the toilet facilities around the shelter, while until that time only the alcohol-based ones had been available. Second, we asked to stop washing their hands in the water in the bucket. Third, we introduced plastic bins with a lid which can be opened with the foot to minimize direct contact with the stool and contaminated area. Forth, we also agreed to introduce sandals for toilet and ask people to change the footwear, so that people do not bring contaminated footwear to the living area. Dr Nakamura, the internal medicine physicians from Nagasaki University, was very instrumental.



Fig 6a. Hygiene Measures. (Left) Trash bins with a lid which can be opened with foot. (Right) toilet sandals.



Fig 6b. Hygiene Measures. Chlorine-based disinfectants were made available at all the toilet facilities.



Fig 6c. Hygiene Measures. (Left) Mr. Honda and Ms. Igai preparing the instruction for toilet use. (Right) Community members practicing the new toilet rules involving the elderly.

## **Extremely stressful experiences**

It was obvious that this natural disaster have caused great deal of stress on people, which are likely affecting people's physical and mental health.

Many experienced life-or-death situation themselves when the massive Tsunami attacked the town. The followings are two examples which I heard directly.

Immediately after the earthquake, Mr. A (male, age in 50's) went back home and took his parents out. He drove the car right toward the hill where the community center is located. On the way, there was a primary school building as the evacuation site, but he did not stop there. Mr. A says if they decided to get into the primary school, they might have not been able to survive, as the fire occurred in the school. He got into traffic jam on the way up to the community center. He decided to walk taking his parents. The Tsunami wave was reaching just 2 meters behind them. They reached community center, but soon the forest surrounding the center started to burn. Mr. A and his parents had to walk further to escape to the other side of the mountain in the snow.

Mr. I (male, age in 40's) was attending the emergency meeting which the town mayor convened right after the earthquake. There, Tsunami reached. Mr. I was pushed into the rest room by the wave. The room was filled up with water quickly. He saw the window but he could not open. Water was extremely cold. Water soon reached the ceiling, and Mr. I could not breath. He thought he might not be able to survive. But then, the window opened, and his body started floating out and up. Luckily he came up the surface along the building, and he was able to get to the rooftop. Water was heavily contaminated with oil. He says the smell of the oil remained with his body for a week. Mr. I stayed over night on the rooftop. It was extremely cold. The following day, he was rescued by the helicopter, and taken to the shelter where he immediately started working as the town staff to support the shelter.

In addition, most of people in the shelter had lost their loved ones – dead or still missing. Many are likely suffering from guilty conscience as they could not save others. Many lost literally everything – house, car, television, refrigerator, washing machines, computers, books, photographs. They had already lived in the shelter for more than two weeks with over 200 people without portable water, electricity, television, telephone, and privacy, and they do not know how many more months they have to stay here. Everything is uncertain for the future – where they can find place to live and how they can secure their income.

## **Community Organizing**

Despite such extremely challenging situation, many people were working tirelessly. In the shelter there were no privacy. No place for crying. Instead, people smiled. People spoke humor, and tried to see hope.

Those whose houses still remain started to cleaning up their place. The houses were filled with mud. They had to throw away everything which was soaked with sea water. A lady said she gets very dirty when she goes back home and clean up her house. But "I do not have clothes and shoes to change" she says.

However, what was extremely impressive was that they are already forming the community at the shelter. The shelter residents were divided into five groups. The two leaders were selected from each group. The

group leaders held meetings every night with the shelter leaders to facilitate communication and discuss the rules of the shelter.

New toilet rules to prevent norovirus infection was also discussed among them whether the proposed measures were feasible. One idea was actually rejected in the meeting, which was to use the shoes boxes at the entrance of shelter. They were concerned that people may complain losing their shoes if they have to leave their shoes at the entrance. Once the rules are agreed in the meeting, group leaders communicated with the members in his/her group.

The residents shared the tasks, e.g. to serve the meals to the residents, to clean the floor of the shelter, and to clean the toilet twice a day. They set the rules to regularly open the windows for ventilation. They also had “Radio Taiso” physical exercise every morning.

I felt great deal of potential and hope that such power of the community will definitely facilitate the recovery of the Otsuchi-cho town.



Fig 7. (Upper left) The group leaders started meeting every night with the shelter leaders. (Upper right) Everyone in the shelter shared the tasks to ensure clean environment of the shelter. (Left) People did “Radio Taiso” exercise together at the shelter every morning at 7 am.

### **Reflection on public health work needed in the coming time**

In the coming time, there seems a number of public health works needed in the areas affected by Tsunami. First, there may be the greater chance of the outbreak of the infectious diseases. It may take time for portable water and sewage system to recover. Then, toilet at the shelters and people’s houses may not function. The adequate preventive measures to minimize the transmission have to be strengthened.



Second, as discussed earlier, many people are undergoing extremely stressful experiences. Stress may lead to stress-related disorders and also weakens immune system. The needs for mental health care to alleviate stress may be critical.

Third, attention may also be needed on the nutrition. Thanks to the great deal of support from all over the country and the world, foods are reaching the affected areas. The self-defence forces cook rice for the shelter residents everyday. However, most of the foods they receive are mostly rice, instant noodles and canned food. Supply of vegetables, meats, fish and eggs are still very limited.

As for the local public health authorities, it seems critical to introduce early warning surveillance system. It helps monitor possible public health threats, including outbreaks of infectious diseases and mental health needs. With the early warning signals, the local health authorities will be able to make public health action to minimize the possible consequences.

At the same time, I believe “community” plays the critical roles in promoting people’s health. Like community developed at Terano Kyudojo Shelter, community organizations will be able to plan feasible public health measures and disseminate health messages. Community organization will be able to catalyze mutual support and may function as safety net especially for vulnerable individuals, such as the elderly.

#### Personal views on priority public health work needed in the affected areas

- Good hygiene measures to prevent infectious disease outbreak – Portable water and sewage still not functioning. There are chances infectious diseases, e.g. noroviruses, may spread.
- Mental health care – People experienced and are undergoing extremely stressful conditions.
- Nutrition – Foods are reaching affected areas, but people in the shelter are given rice, instant noodles and canned food everyday. Fresh vegetables, meats, fish and eggs are not available at the shelter.
- Responding to the needs of the elderly – Large proportion of the populations in the affected areas are the elderly, many of whom have had chronic conditions and may be more vulnerable to the impact of disaster.
- Early warning alert response system – Some sort of early warning systems is needed to monitor possible public health threats including above items. I heard Miyagi has already established such system, while Iwate is now in preparation.
- Working with communities - People in the affected areas and at the shelter are already organizing and working as the communities. I believe communities have the power to effectively plan the feasible public health interventions and disseminating health messages.

#### Acknowledgement

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