Counter-disaster Measures for People with Functional Needs Following the Great East Japan Earthquake: Basic Facts, Challenges and Their Solution

Presentation for 2012 EERI Annual Meeting Concurrent Session 5. Preparedness and Response Lessons, Peabody Hotel, Memphis, Tennesee

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Doshisha University

Presentation Outline

1. Counter-disaster measures for people with functional needs in times of disaster: March 2005 to March 2011
2. Casualty Gaps: Basic Facts of the 2011 Eastern Japan Earthquake
3. Observations and Implications
   – Challenge on Identifying People at Risk: Re-think “Correct” Hazard Estimates
   – Challenge on Pre-planning Specially Designated Shelters for People with Special Needs
   – Challenge on Utilizing Personal Information on People with Special Needs in Times of Disasters
1. Counter-disaster measures for people with functional needs in times of disaster: March 2005 to March 2011

Vulnerability as a Function of Hazards, Person & Environment
Kobe PSND (People with Special Needs in Times of Disasters) Mapping Project

Fy2007 to Present
Kobe city (1.5 million population) administration collated separate social service recipient databases, resulting in an integrated database involving one hundred and twenty thousand individuals who were considered being potentially vulnerable in time of disaster.

The database identified **4,411** people with physical impairments in Hyogo Ward (about **108,000** population).

**914 Persons with Disabilities were Residing in Hazardous Areas**
612 (67%) out of 914 PWD in Hazardous Areas Responded to Structured Interview Survey

Variables Measured/Obtained in the Study

Demographics
- Age
- Gender
- Job

Physical Impairment
- Level of Physical Impairments
- Types of Impairments
- Utilized Home Care Service
- Utilized Community Care Services
- Utilized Institutional Care Services
- ADL Level

Physical Immobility
- Movement Assistance
- # of Assistants Required
- Equipment for Movement
- Walking up & down Stairs
- Medical Equipments in Use
- Toilet Use Capability

Social Capital
- ZIP Averages of Neighbors
- Greeting & Chatting
- Engaging in Rec. Activities
- Going Out Together
- Exchanging Gifts
- Visiting Each Other
- Taking Care of Each Other
- Helping Each Other
- Becoming Friends

Social Isolation
- Household Size
- Household Type
- Key Person Category
- Location of Key Person

Housing Fragility
- Type of Structure
- Age of Building
- Building Type
- Number of Floors
- Bedroom Floor
99 Individuals (17%) identified being the most vulnerable.

It is estimated that about 155 (17% of 914 PWPD's in the area) individuals require immediate attention for evacuation & sheltering planning.
Kernel Density Map as a Tool to Sensitize Awareness of and to Induce Responsiveness to PSNDs in Communities
2. Basic Facts of the 2011 Eastern Japan Earthquake:

A) Casualty Gaps between the Total Population and People with Disabilities

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Note: The above table does not include 414 (Age unknown) or 64 (Age and Gender unknown).

Population Pyramid and the East Japan Earthquake Casualties by Gender and Age Group


Number of Deaths (per 100,000) by Age, Gender and Prefecture
Two Independent Survey on PWD Mortality Rates among 29 Municipalities

Table 1: Comparison of Mortality Rates among People with Developmental, Physical, and Mental Disabilities in East Japan Earthquake Disaster

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<thead>
<tr>
<th>Prefecture</th>
<th>Municipality</th>
<th>Population</th>
<th>Dead (PWD)</th>
<th>Dead (Total)</th>
<th>Mortality (PWD)</th>
<th>Mortality (Total)</th>
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<td>0.07%</td>
<td>Not Recorded</td>
<td>Japan Broadcasting Corporation/NHK / Fukuji Network</td>
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<td>50,578</td>
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<td>0.08%</td>
<td>0.08%</td>
<td>0.08%</td>
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Comparison of Total Mortality and PWD Mortality

(Source: Japan Broadcasting Corporation, 2012)
Comparisons of the Total and PWD Mortality Rate Distributions by Prefecture

Regression of PWD Mortality on the Total Population Mortality by Prefecture
Recorded Maximum Tsunami Height / Expected Tsunami Height by Prefecture

Source: Suzuki and Hayashi (2011)

Regression of Residual (PWD Mortality <- Total Mortality) on Recorded-to-Expected Tsunami Height

$F_{1,27}=3.818, p=.061$
2. Basic Facts of the 2011 Eastern Japan Earthquake (2):

B) Casualty Gaps among Different Categories of PWDs

Regression of PWD(Developmental) Mortality on the Total Population Mortality
Regression of PWD(Mental) Mortality on the Total Population Mortality

$y = 1.2x$  
($R^2=.773$)

Regression of PWD(Visual) Mortality on the Total Population Mortality

$y = 1.5x$  
($R^2=.53$)
Regression of PWD(Orthopedic) Mortality on the Total Population Mortality

\[ y = 2.4x \]
\[ (R^2 = .923) \]

Regression of PWD(Auditory) Mortality on the Total Population Mortality

\[ y = 2.4x \]
\[ (R^2 = .833) \]
3. Observations and Implications

A) Challenge on Identifying People at Risk

Re-think “Correct” Hazard Estimates
Tsunami Hazard Map East of Rokugo JHS, Wakabayashi Ward, Sendai City

Tsunami Inundation East of Rokugo JHS, Wakabayashi Ward, Sendai City
Vulnerability as a Function of Hazards, Person & Environment

\[ f(\text{Hazard}, f(\text{Person, Environment})) \]

Person-Environment Profiles

Vulnerability as a Function of Hazards, Person & Environment

\[ f(MPE, f(\text{Person, Environment})) \]

Person-Environment Profiles

= Maximum Probable Event
≠ Maximum Possible Event
Vulnerability as a Function of Hazards, Person & Environment

\[ f(MP_{0E}, f(Person, Environment)) \]

Person-Environment Profiles

≠ Maximum Probable Event

= Maximum Possible Event

“What-if” type of Hazard Magnitude Estimation

B) Challenge on Pre-planning Specially Designated Shelters for People with Special Needs

Need to Expand Disaster Process Time Span in the Disaster Countermeasure Guideline for People with Special Needs in Times of Disaster
“Specially Designated Shelter” Appeared in 3 Major Newspapers

School Gym Shelter at Rokugo JHS, Sendai City

April 6, 2011
Classroom Shelters at Hakken JHS, Sendai City

Nakano (Gamo) Residents on the 2nd Floor Classroom  April 6, 2011

Arahama Residents on the 1st Floor Classroom  April 6, 2011

Specially Designated Shelter at Miyagino Day Service Center for PWD, Sendai City

April 5, 2011
Specially Designated Shelter at Yugakukan Sport Center Gym, Ishinomaki City

http://road.nippon-foundation.or.jp/2011/04/007-fcd1.html

April 24, 2011

Specially Designated Shelters at Shunpoen Special Nursing Home in Kesennuma City

Shunpoen Nursing Home Shelter (April 7, 2011)

Ochiai Nursery School Shelter
Differences in Response

• Sendai City
  – Pre-planned arrangement/compact with social service providers
  – Improvisations in referring elderly depending on physical and cognitive functioning levels
• Ishinomaki City
  – Improvisations initiated by City Hospital doctors/nurses, supported by city officials.
  – Lacked formal logistic support. City officials not aware of specially designated shelter provision from Disaster Relief Act
• Kesennuma City
  – Local service provider initiative/improvisations
  – No logistic support or acknowledgement from the city administration
  – Special nursing home director was afraid of financial burden to run specially designated shelter for an extended period of time.

Observations and Implications

• Municipalities other than Sendai city did not have compacts on specially designated shelter operations with social service providers.
• It took nearly three weeks for Ishinomaki and Kesennuma to formally designate such shelters after the earthquake.
• many local officials were unaware of the special service provision clause of the Disaster Relief Act covering shelters for people with special needs.
• More detailed guidelines for specially designated shelters and temporary housing operation for PSNDs need to be developed in order to address this issue.
C) Challenge on Utilizing Personal Information on People with Special Needs in Times of Disasters

School Gym Shelter at Rokugo JHS, Sendai City

April 6, 2011
Classroom Shelters at Hakken JHS, Sendai City

Nakano (Gamo) Residents on the 2nd Floor Classroom  April 6, 2011

Arahama Residents on the 1st Floor Classroom  April 6, 2011

Registry of People with Special Needs in Times of Disasters

• Disaster Countermeasure Guideline outlined procedures to collate local government data bases to create registry of PSND.
• After the event, many local government officials felt hesitant to release PSND information to NGOs and self-help organizations due to their fear of breaking Personal Information Protection Bylaw.
• This is despite the fact that the Bylaw provides exceptional conditions. The onset of disaster is clearly one of these exceptional conditions.
Observations and Implications:
Seven Months After the Event

• Japan Disability Forum outreached 1,386 individuals with disability after the onset of the earthquake and tsunami disasters as of June 17.

• This number (1,386) accounts for only 2.6 % of 53,511 people who are registered to be PWD in the affected areas in Miyagi prefecture.

• We still do not know the conditions of a large majority of People with Disabilities even one year after the event.