Medical and Public Health Resilience

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Health in Sendai Framework
Similarity of disease and disaster

Vulnerability & Capacity

Hazards

Disaster
- Life, Health
- Properties
- Family
- Community
Disaster Risk Reduction

- Know your risk
- Reduce your risk
- Prepared to act

To reduce the disaster risk,

\[
\text{Risk} = \frac{\text{Hazard} \times \text{Vulnerability}}{\text{Capacities}}
\]
Sendai Framework

Four Priorities
Priority 1: Understanding Disaster Risk
Priority 2: Disaster Risk Governance
Priority 3: Investment in Disaster Risk Reduction
Priority 4: Enhance preparedness for effective response and “Build Back Better” in recovery, rehabilitation and reconstruction

Seven Global Targets

Implementations

- d) infrastructure
- e) national and local strategies
- f) International cooperation
- g) multi-hazard EWS

Outcomes

- c) direct economic loss
- b) affected
- a) mortality

Prof. Kimio Takeya
JICA and TU
Health in DRR framework

Sendai Framework described for the first time that disaster affects health of the people.

SFDRR aims to reduce “disasters losses with a significant economic, social, health, cultural and environmental impact”

Why?

Change of Health Risks in disaster

Know your risk
1923 Great Kanto Earthquake

September 1, 1923
11:58:32
M7.9

Cause of Death

- Fire: 86%
- Asphyxia: 11%
- Unknown: 2%
- Drowning: 1%

The buildings should be fire-resistant
Every Sept. 1 is the Disaster Drill Day

Division of International Cooperation for Disaster Medicine
1995 Great Hanshin Awaji Earthquake

January 17, 1995
05:46
M7.3

Cause of Death

- Asphyxia: 83%
- Fire: 13%
- Unknown: 4%

The buildings should be quake-proof
Japanese Association for Disaster Medicine was established
2011 Great East Japan Earthquake

Mar. 11, 2011, 14:46 M9.0

2011 White pages, Japan Gov.

Division of International Cooperation for Disaster Medicine
Change of health risks in Great East Japan Earthquake

<table>
<thead>
<tr>
<th></th>
<th>Injured</th>
<th>Dead and lost</th>
<th>Displaced</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hanshin-Awaji Earthquake 1995</td>
<td>43,800</td>
<td>6,433</td>
<td>307,200</td>
</tr>
<tr>
<td>Great East Japan Earthquake 2011</td>
<td>5,942</td>
<td>19,582</td>
<td>488,000</td>
</tr>
</tbody>
</table>

- Less injuries, but different medical needs lasted longer
- Disruption of traffic and communication made health sector paralyzed
- Complicated radiological disaster
- Mental health of affected people was devastated
- Health facilities were also destroyed by disaster
- Education of disaster medicine was not generalized in health professionals
Disaster related deaths

Ministry of Reconstruction, Mar. 31, 2014
Total 3,089
2018 Japan Floods

Jun. 28-Jul. 9, 2018

Total 222 deaths with unconfirmed missing (Police Department as of Jul. 17, 2018)

Total number of evacuees; 23,000 (Fire Department as of Jul. 8, 2018)
Capacity building of disaster medicine in Japan

Reduce your risk
Disaster Base Hospital

- 725 DBHs in Japan
  - 1 National Disaster Medical Center
  - 788 DMAT providing DBH
  - 271 Emergency Center
  - 54 Radiological DBH
Disaster Base Hospitals in Japan
J-DMAT: Japan Disaster Medical Assistance Team on Training

DMAT not only provide medical care, but also assists the local HQ and Staging Care Unit (SCU) in medical coordination.
Medical Management System

Ministry of Health, Labor and Welfare

DMAT HQ

Disaster Base Hospital

Disaster Base Hospital

DMAT

DMAT

DMAT

Emergency Medical Information System (EMIS)
EMIS Emergency Medical Information System
Building Back Better of National Disaster Medical System in Japan

Wide Area Transportation

Confined Space Medicine

Improved EMIS

Affected Area

Damaged Site

Local Hp

Support of DBH

Disaster Medical Coordinators

Staging Care Unit

SCU

DBH

Distant DBH

Nearby DBH

Division of International Cooperation for Disaster Medicine
Health Resilience of the Society

Know your risk
## Structure of INFORM risk index

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Hazard &amp; Exposure</th>
<th>Vulnerability</th>
<th>Lack of Coping Capacity</th>
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</thead>
<tbody>
<tr>
<td>Categories</td>
<td>Natural</td>
<td>Human</td>
<td>Socio-economic</td>
</tr>
<tr>
<td>Components</td>
<td>Earthquake</td>
<td>Current conflict intensity</td>
<td>Development and deprivation (50%)</td>
</tr>
<tr>
<td></td>
<td>Tsunami</td>
<td>Projected conflict risk</td>
<td>Inequality (50%)</td>
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<tr>
<td></td>
<td>Drought</td>
<td></td>
<td>Aid dependency (25%)</td>
</tr>
<tr>
<td></td>
<td>Flood</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tropical cyclone</td>
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</tbody>
</table>

With more than 50 indicators

LE negatively correlates with INFORM risk

Natural hazard risk and LE

Health related categories of INFORM Risk and LE

- Human Development Index
- Poverty Index
- GINI Index
- Gender Inequality
- Aid Dependency

- Children U5 Mortality
- Children U5 Malnutrition

- Physicians density
- Health expenditure per capita
- Measles immunization coverage

Cluster dendrogram by risk dimensions and LE

<table>
<thead>
<tr>
<th>Cluster</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<tbody>
<tr>
<td>N</td>
<td>13</td>
<td>51</td>
<td>45</td>
<td>74</td>
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<tr>
<td>Hazard &amp; Exposure</td>
<td>7.7</td>
<td>3.5</td>
<td>5.5</td>
<td>2.0</td>
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<tr>
<td>Vulnerability</td>
<td>7.2</td>
<td>4.7</td>
<td>3.5</td>
<td>1.8</td>
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<tr>
<td>Lack of Coping Capacity</td>
<td>7.6</td>
<td>6.4</td>
<td>4.5</td>
<td>2.8</td>
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<tr>
<td>Life Expectancy</td>
<td>61.2</td>
<td>62.8</td>
<td>73.2</td>
<td>77.8</td>
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</table>

Conclusion

From GEJE to all hazard
Change the concept of Risk Reduction

**Needs**
Top 3 priorities for communities (UN Survey)
1. A good education
2. Better healthcare
3. An honest and responsive government

**Paradigm Shift**
Climate Change
Rapid urbanization
Poverty
Lack of resource
Loss of biodiversity

**Change of Risk**
Better access

**Quality of Life**
Resilient Community
Safe School
Mental and Physical
Communication

**Effective Response**
Funding and Development

**Hazard-proof Structure**
Early Warning

**Injury Illness disability**