

Medical and Public Health Resilience

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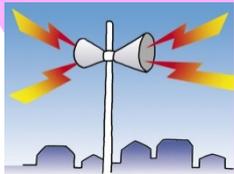
SFDRR

Health in Sendai Framework

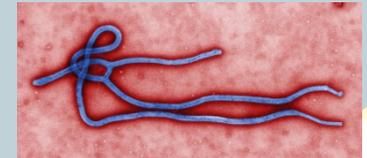
Similarity of disease and disaster



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,

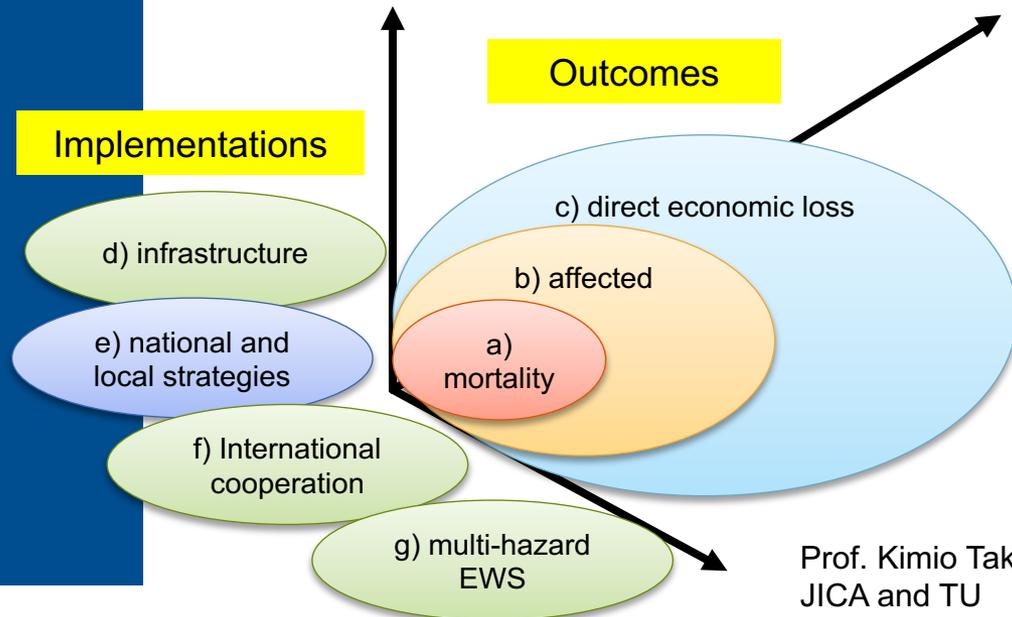
$$\text{Risk} = \frac{\text{Hazard} \times \text{Vulnerability}}{\text{Capacities}}$$

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

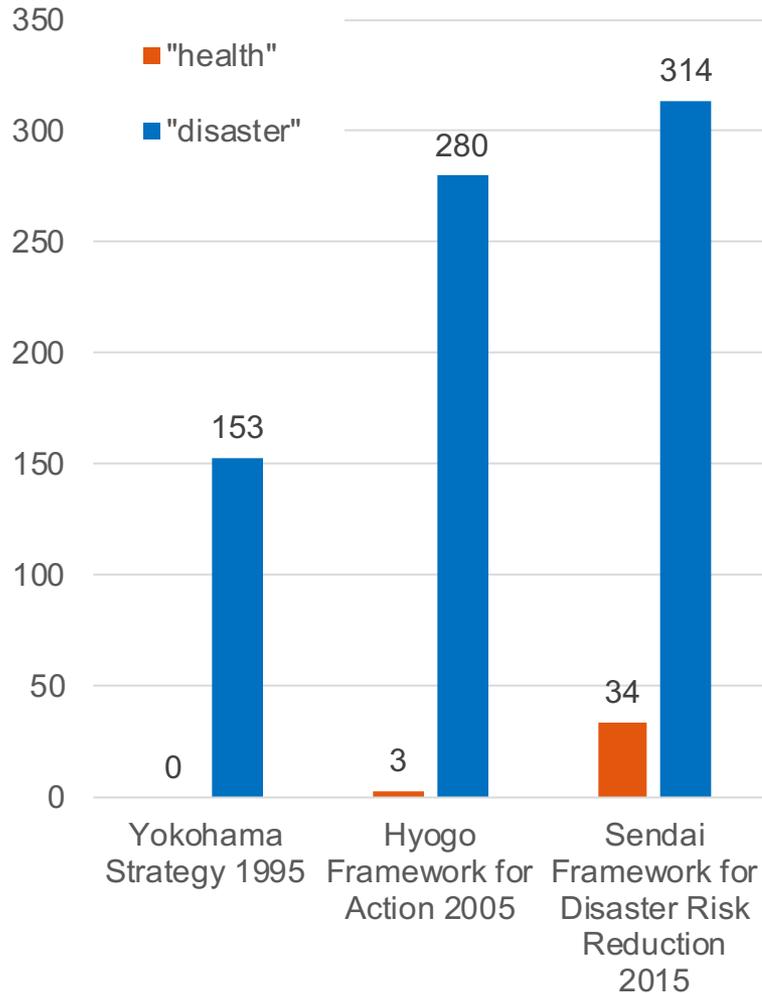
Seven Global Targets



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?

Egawa (2018) J Disaster Res 13(6): 1049-1061



Know your risk

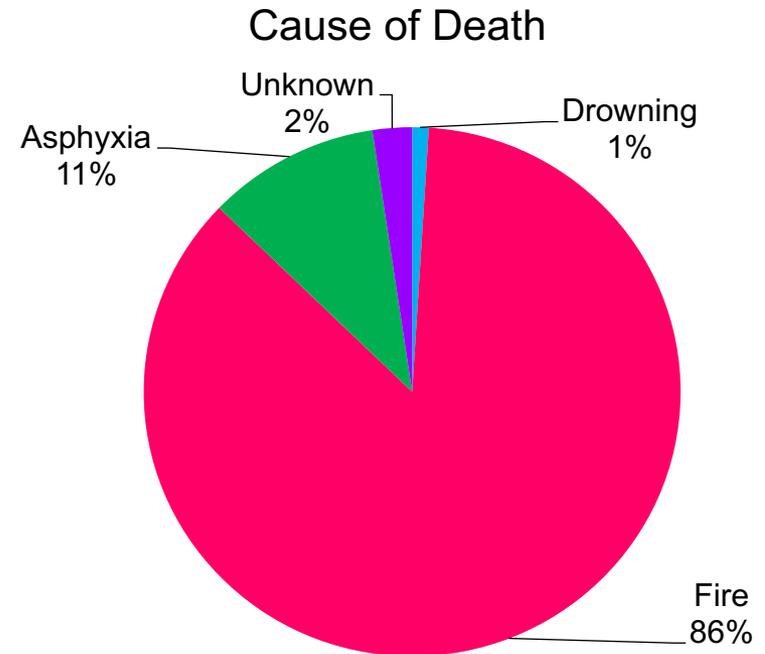
Change of Health Risks in disaster

1923 Great Kanto Earthquake

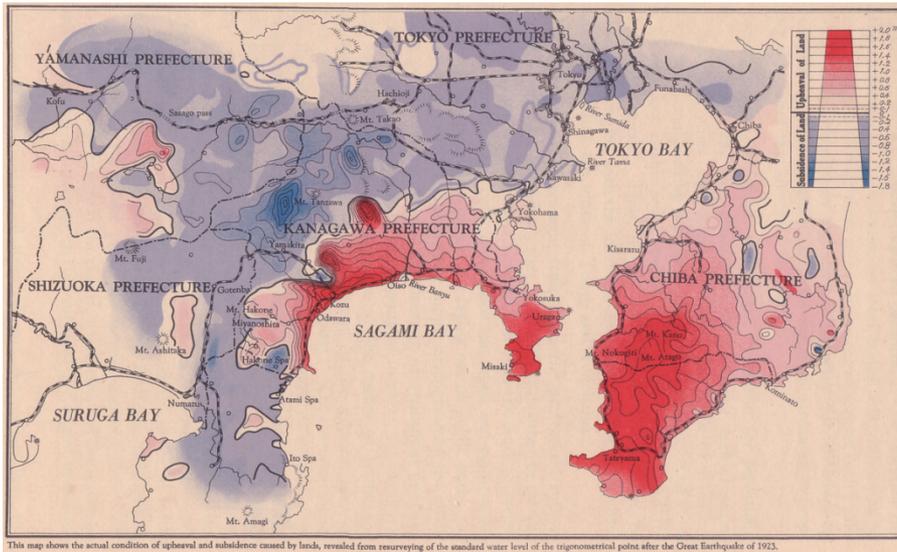
September 1, 1923

11:58:32

M7.9



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



1995 Great Hanshin Awaji Earthquake

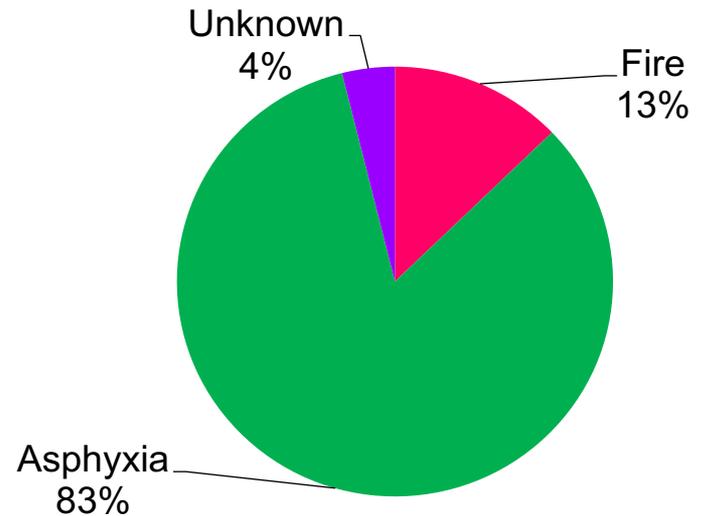
January 17, 1995

05:46

M7.3



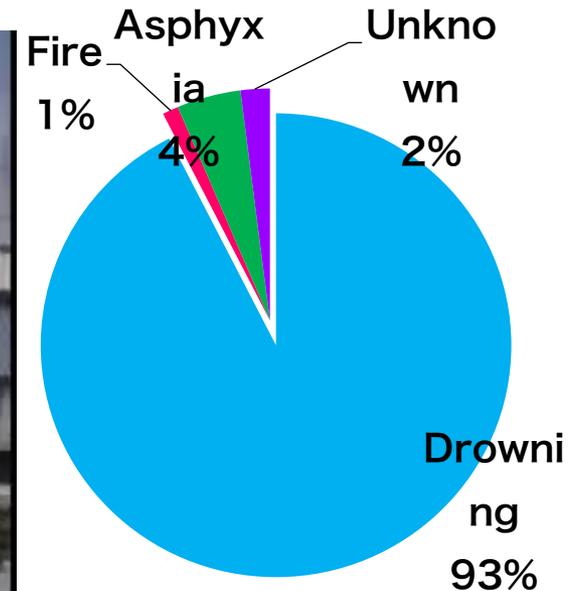
Cause of Death



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.

Change of health risks in Great East Japan Earthquake

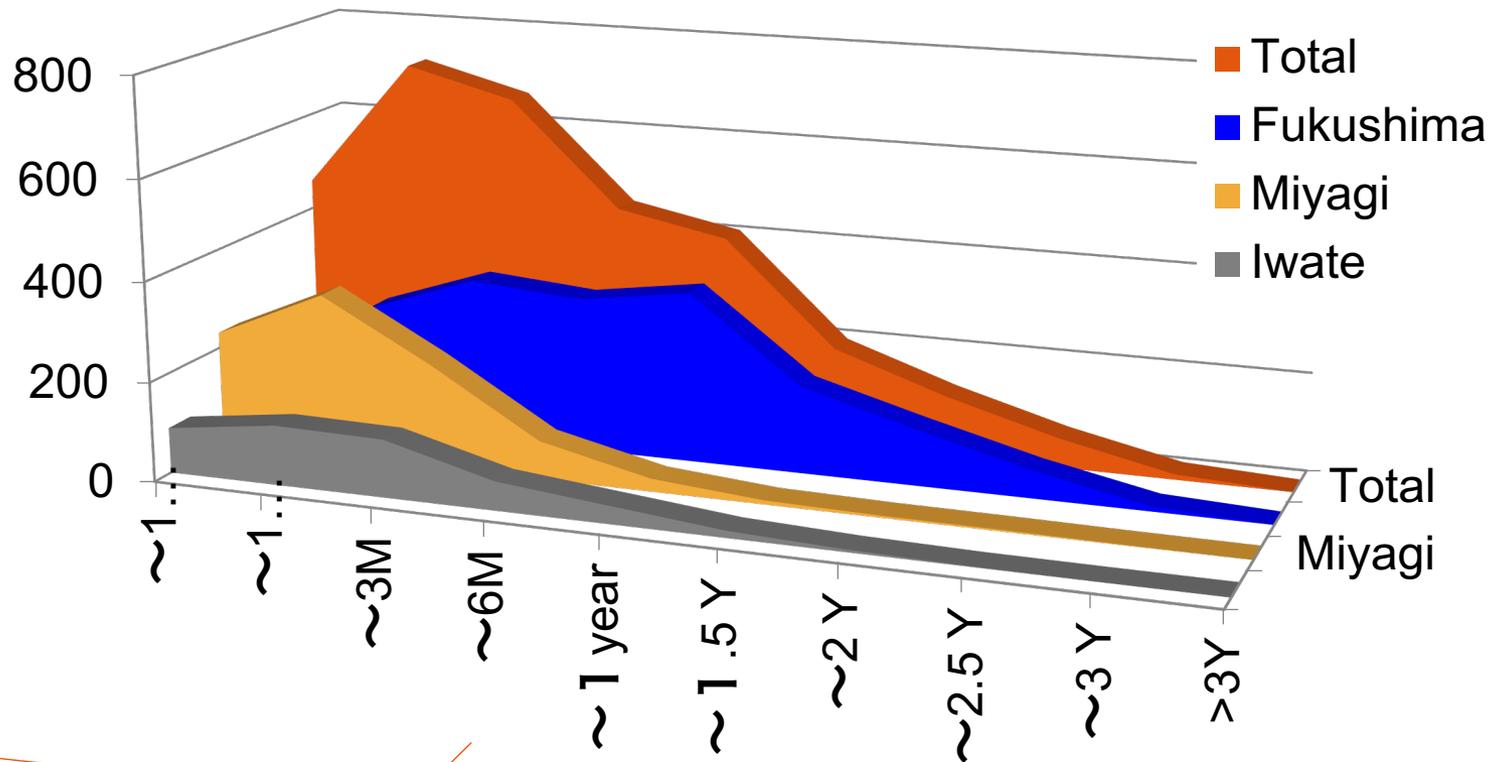
	Injured	Dead and lost	Displaced
Hanshin-Awaji Earthquake 1995	43,800	6,433	307,200
Great East Japan Earthquake 2011	5,942 ↓	19,582 ↑	488,000

- 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

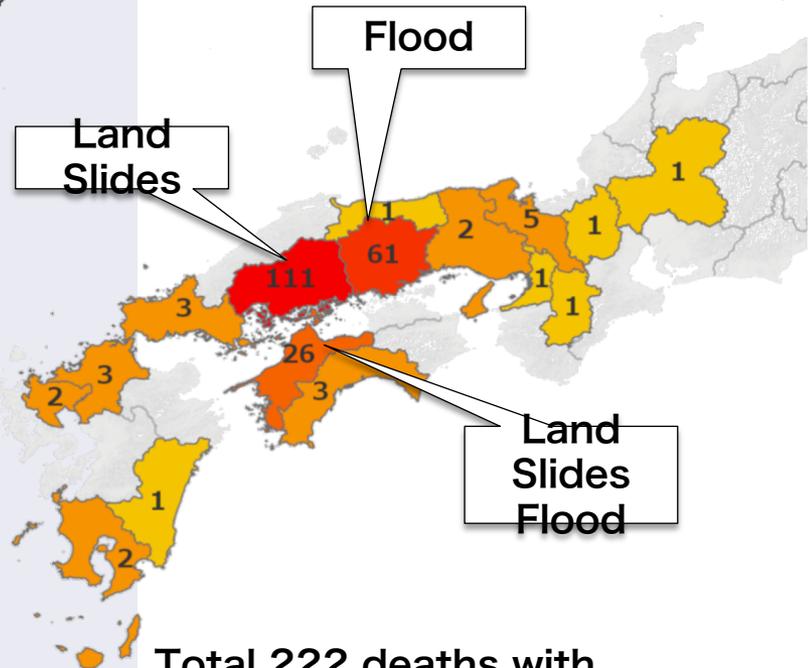
Ministry of Reconstruction, Mar. 31, 2014

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)

300 km

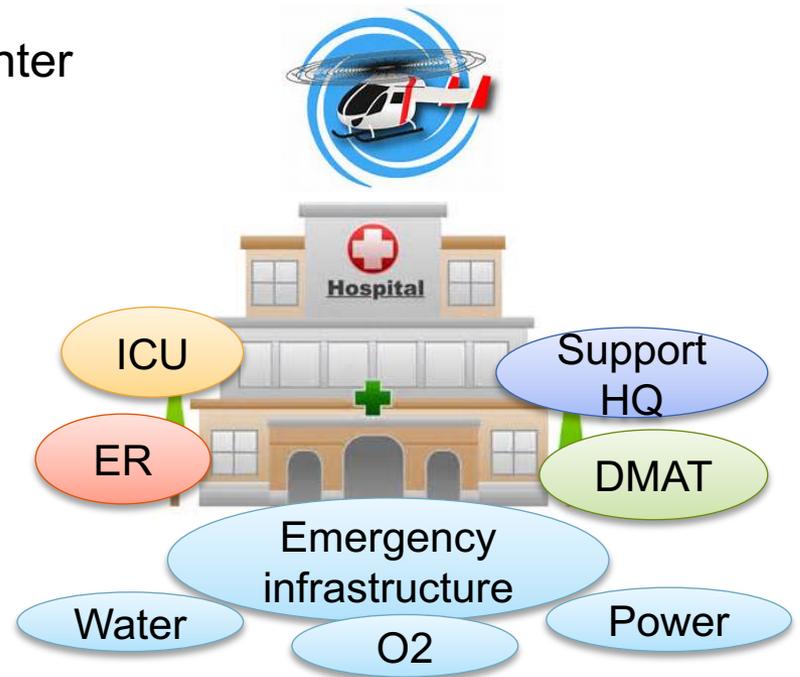


Reduce your risk

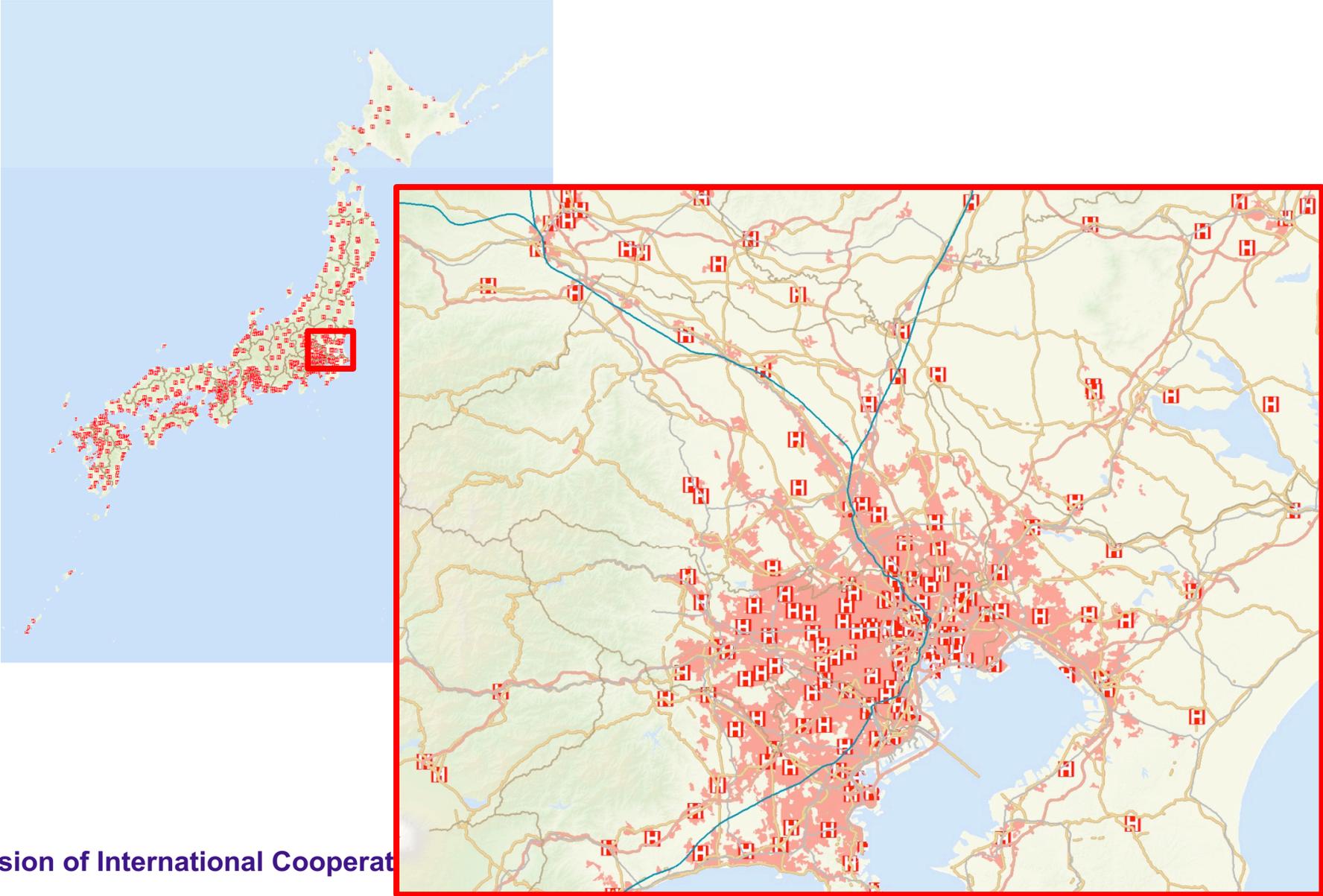
Capacity building of disaster medicine in Japan

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



Staging Care Unit



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

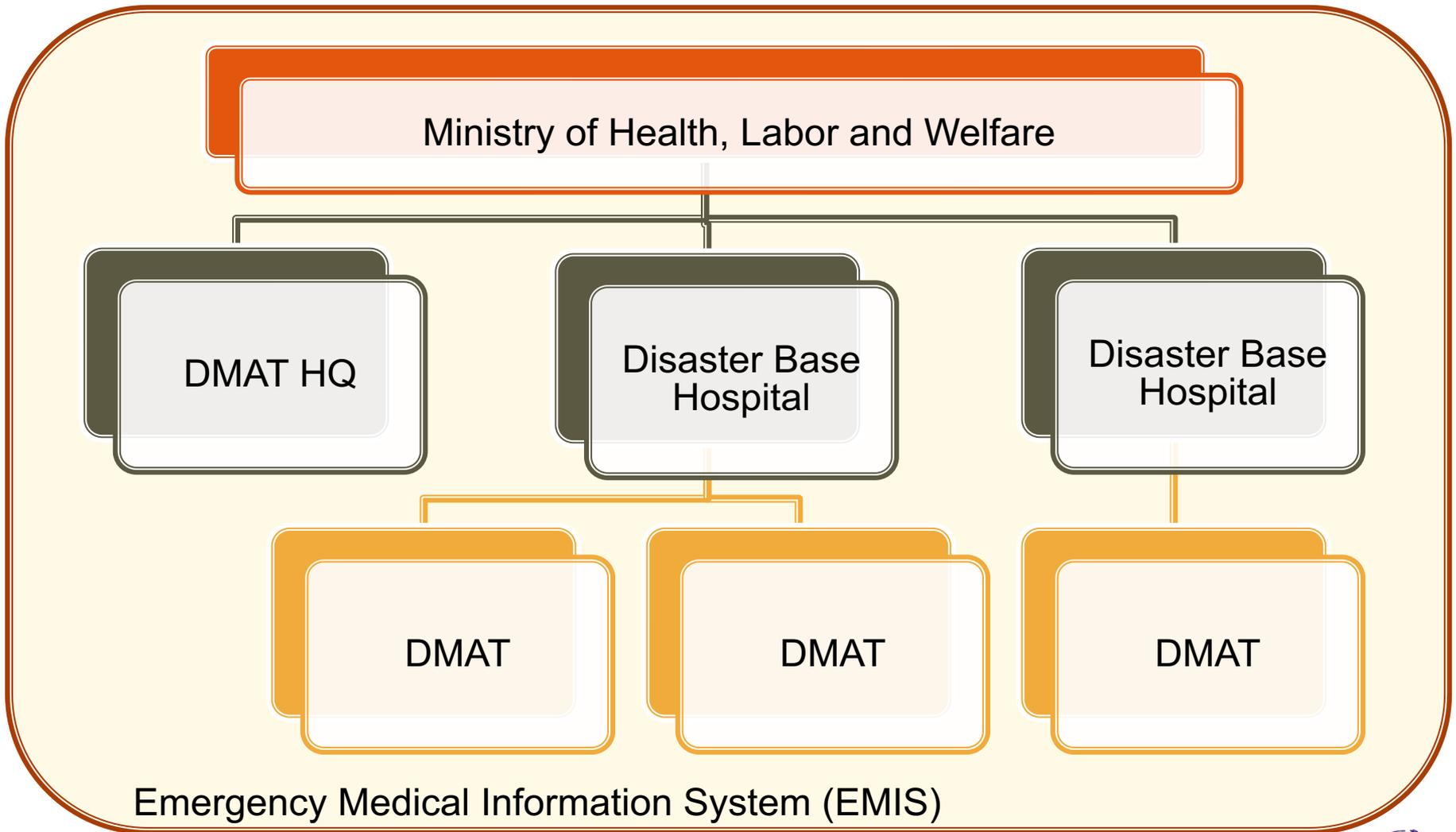


Confined Space Medicine

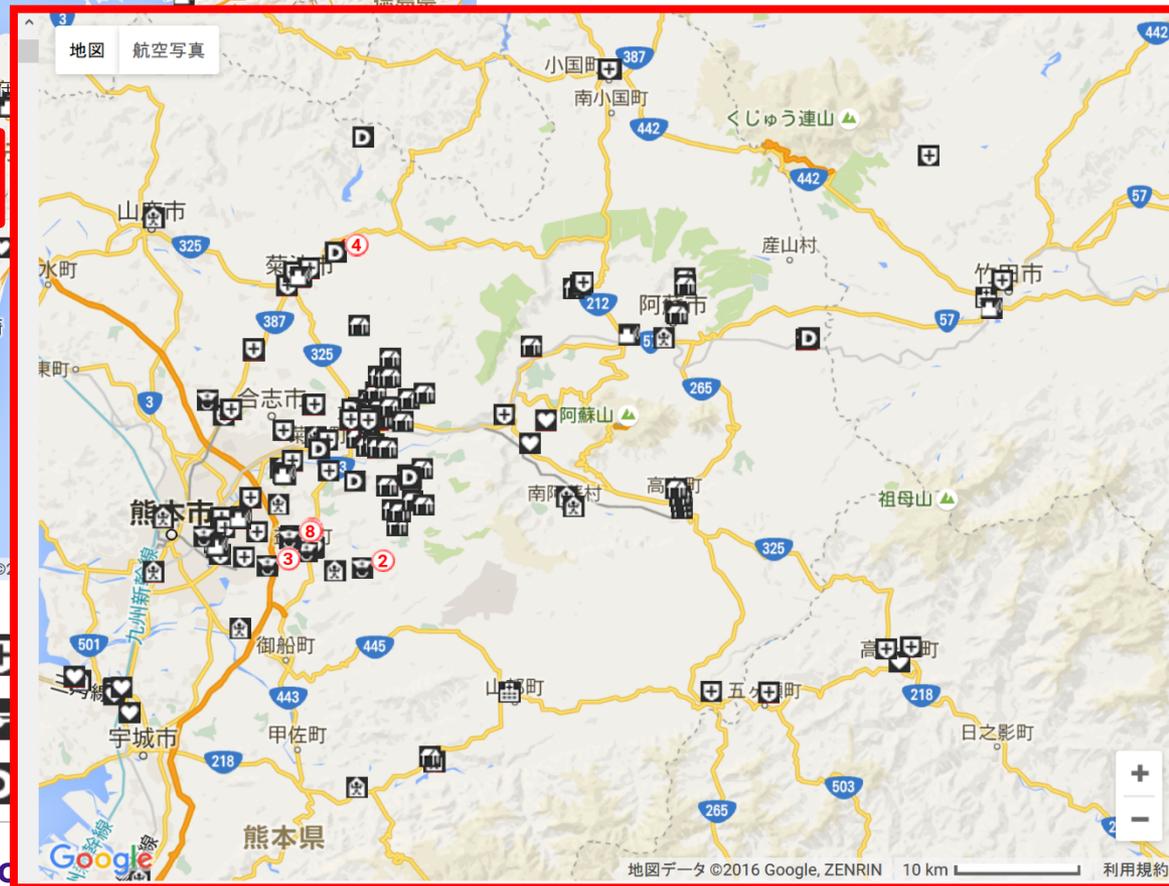
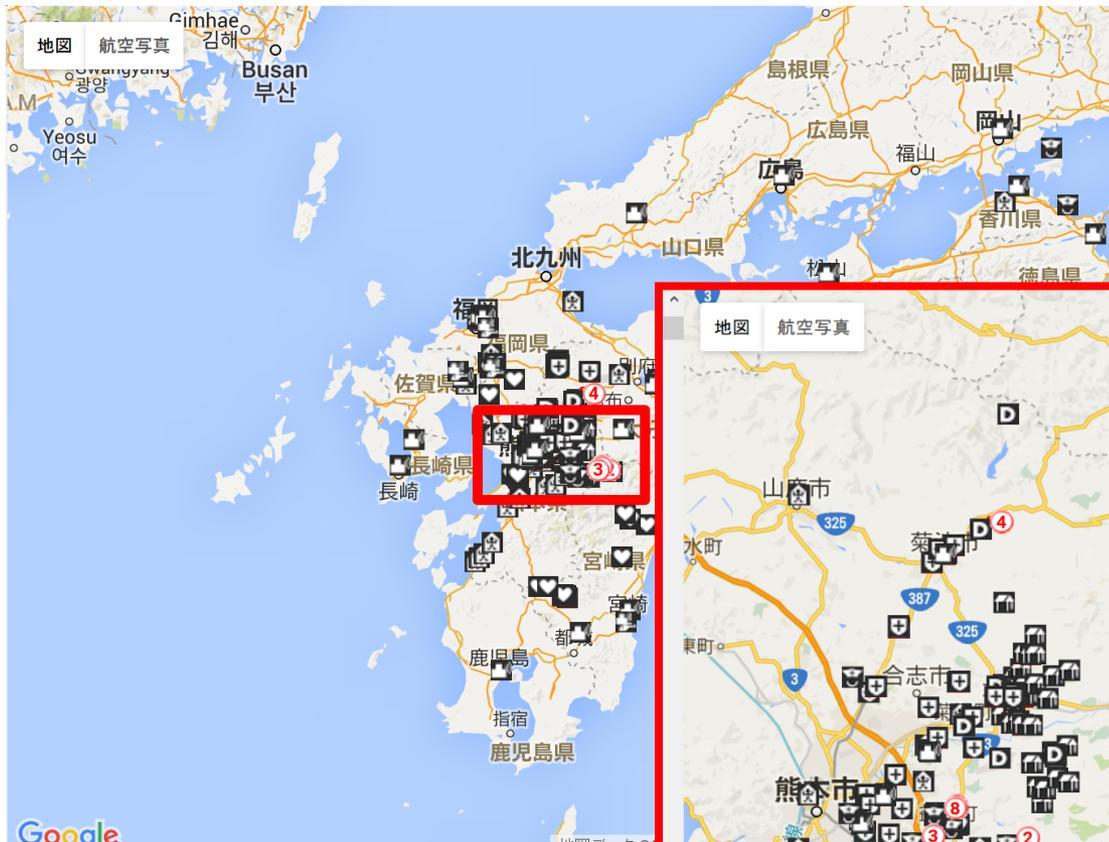


Wide Area Transportation

Medical Management System



EMIS Emergency Medical Information System



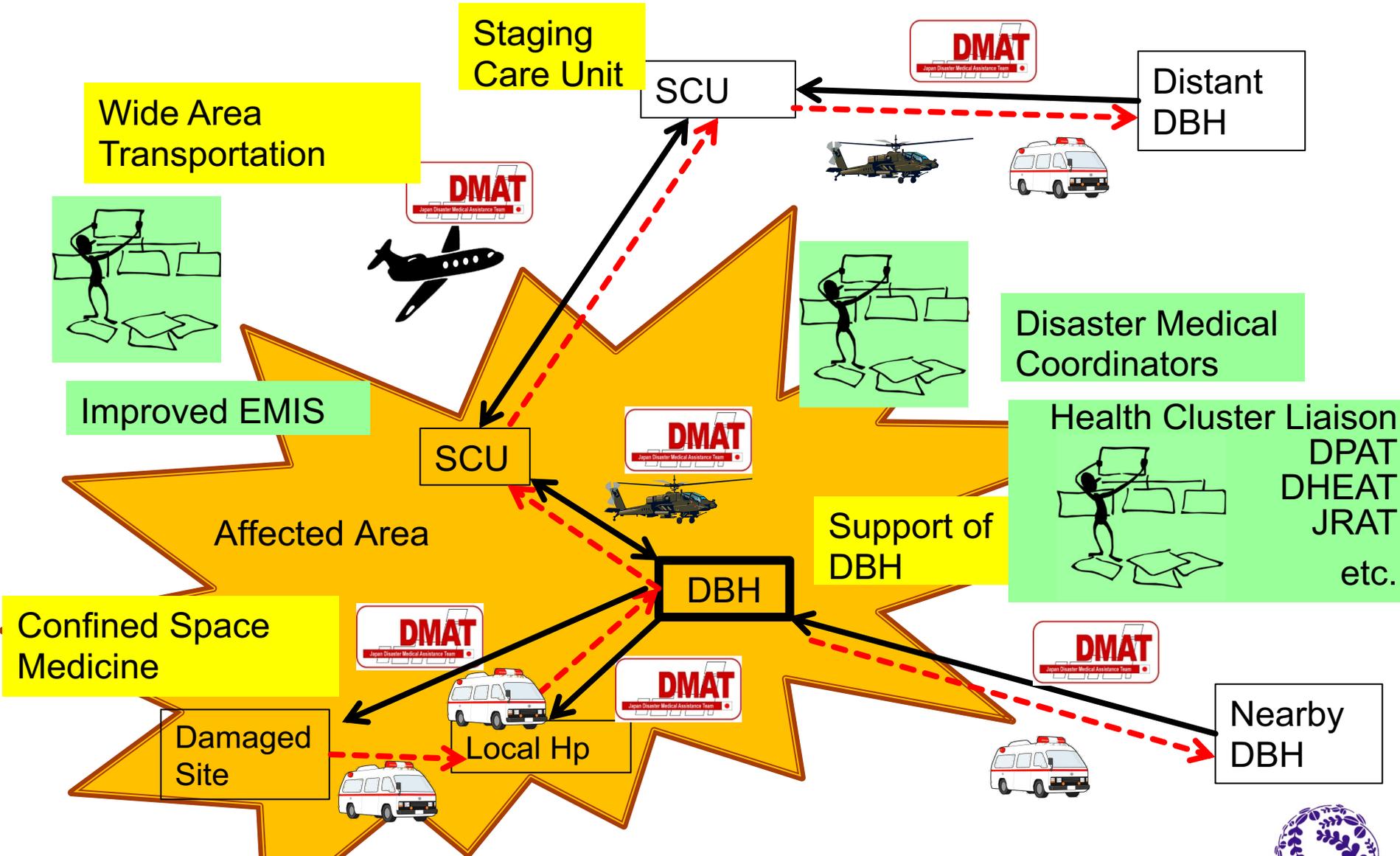
Google

地図データ ©

マークの説明

	災害拠点病院		
	本部・参集拠点 ・医療搬送拠点		本部・参集拠点
	救護所		その他活動場所

Building Back Better of National Disaster Medical System in Japan

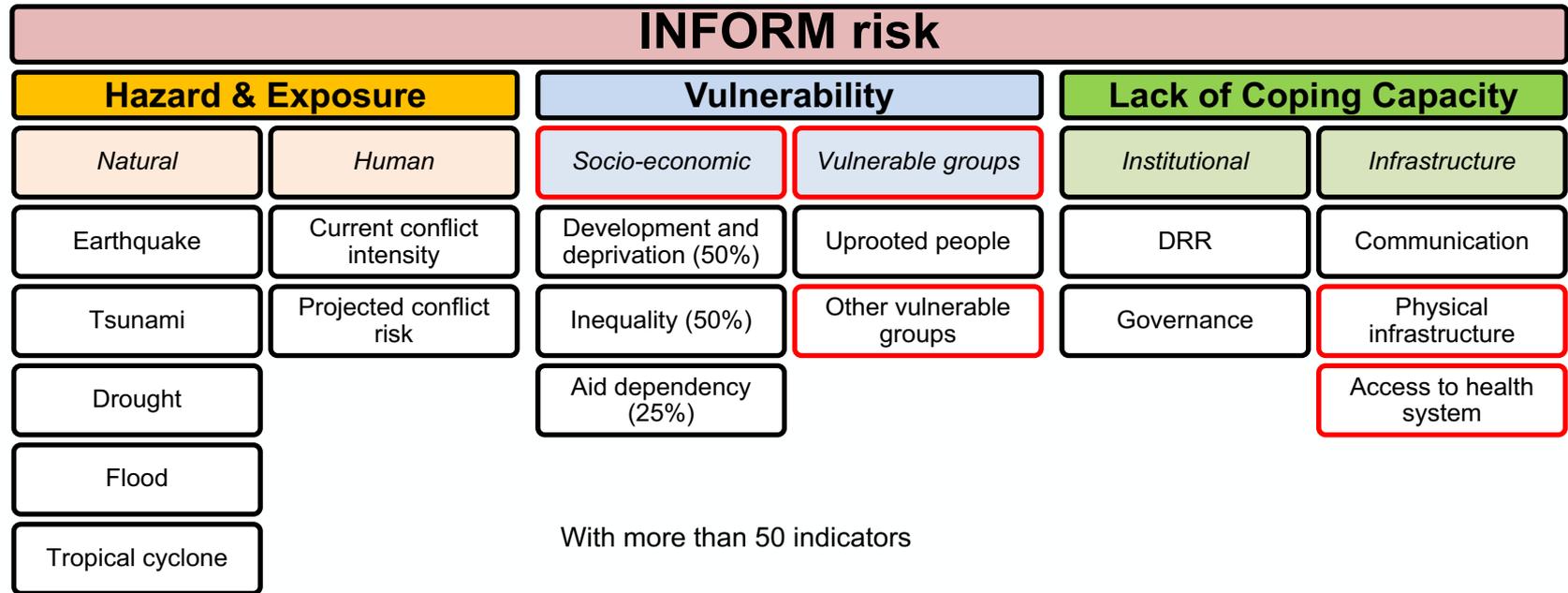




Know your risk

Health Resilience of the Society

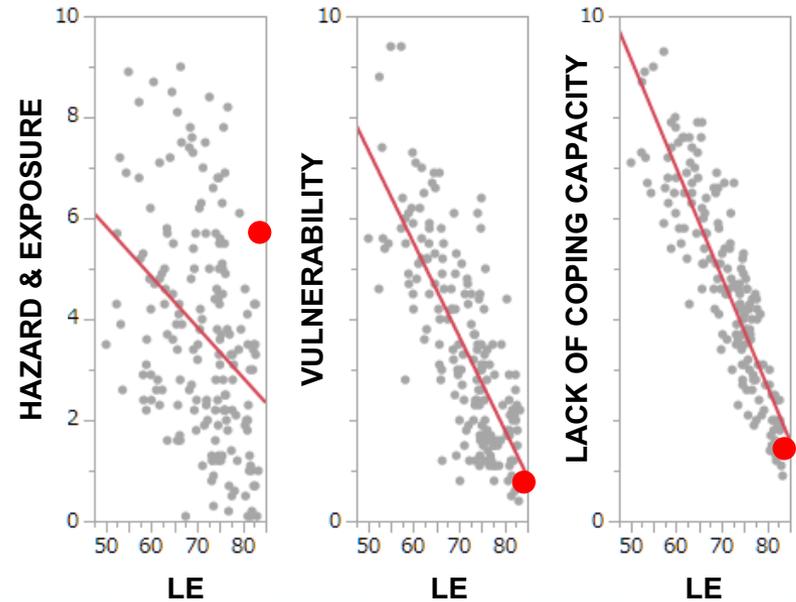
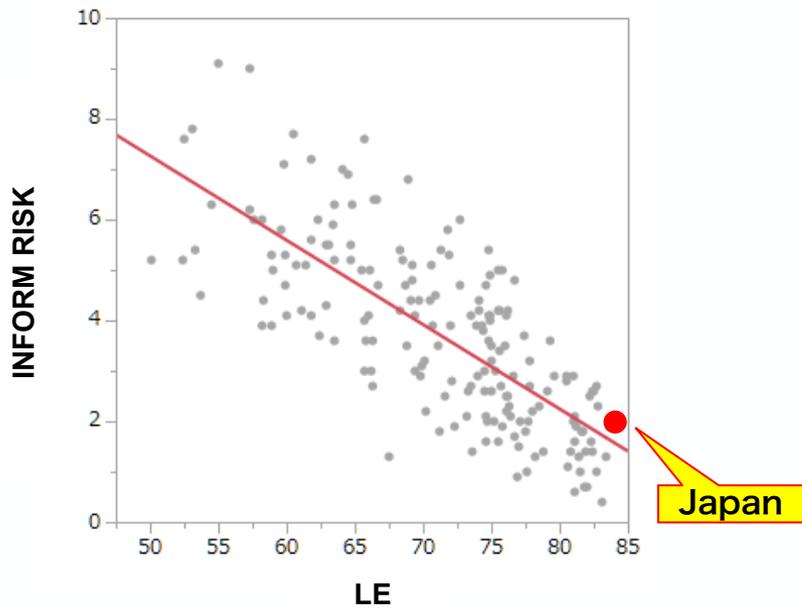
Structure of INFORM risk index



Egawa (2018) J Disaster Res 13(6): 1049-1061



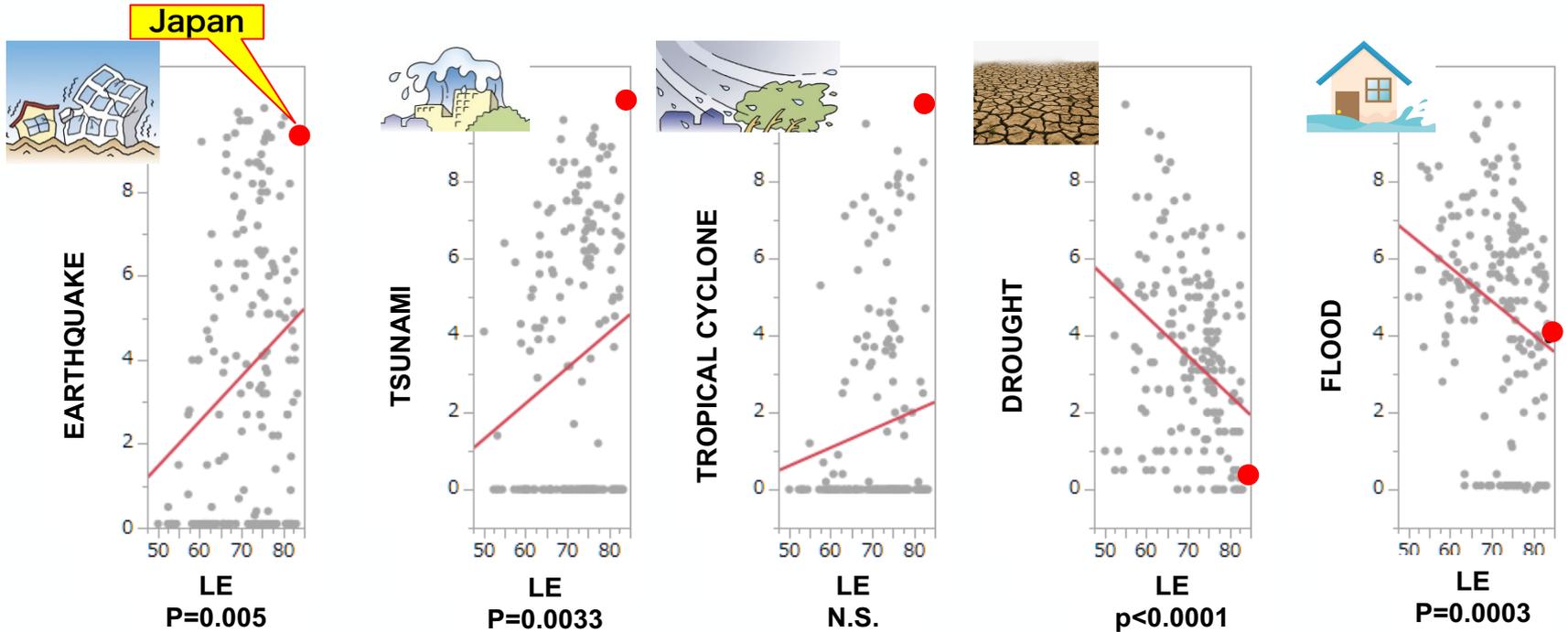
LE negatively correlates with INFORM risk



Egawa (2018) J Disaster Res 13(6): 1049-1061



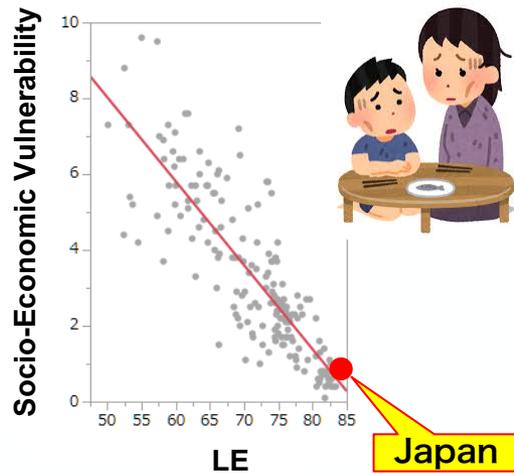
Natural hazard risk and LE



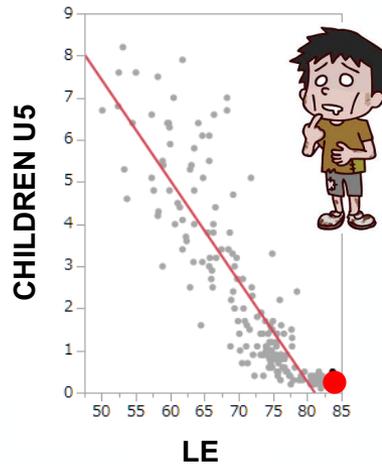
Egawa (2018) J Disaster Res 13(6): 1049-1061



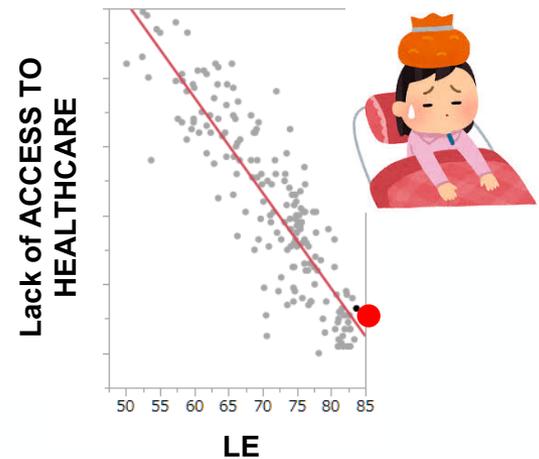
Health related categories of INFORM Risk and LE



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



- Children U5 Mortality
- Children U5 Malnutrition

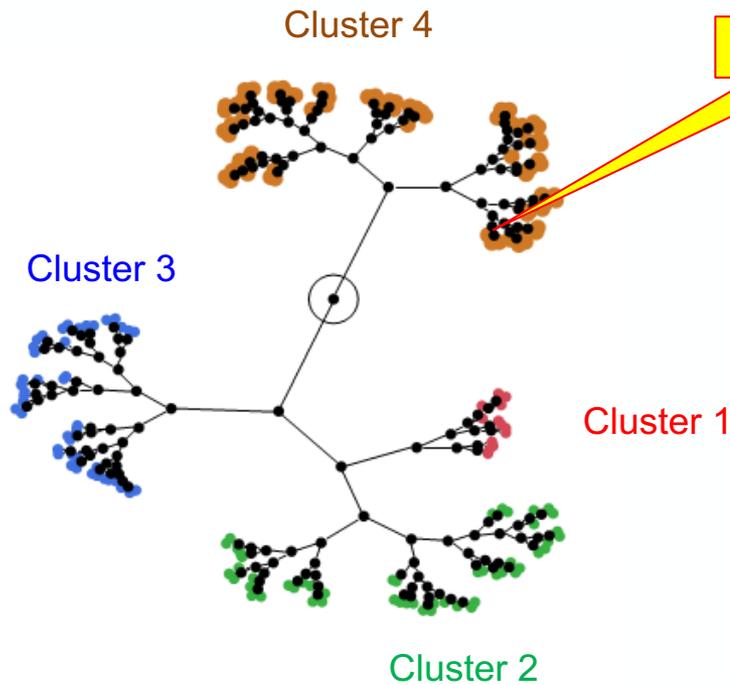


- Physicians density
- Health expenditure per capita
- Measles immunization coverage

Egawa (2018) J Disaster Res 13(6): 1049-1061



Cluster dendrogram by risk dimensions and LE



Cluster	1	2	3	4
N	13	51	45	74
Hazard & Exposure	7.7	3.5	5.5	2.0
Vulnerability	7.2	4.7	3.5	1.8
Lack of Coping Capacity	7.6	6.4	4.5	2.8
Life Expectancy	61.2	62.8	73.2	77.8

Egawa (2018) J Disaster Res 13(6): 1049-1061





From GEJE to all hazard

Conclusion

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

Resilient
Community

Safe Hospital

Effective
Response



Hazard-proof
Structure

Safe School



Early Warning

Mental and
Physical



Communication
Funding and
Development

