Public Education about Tsunami

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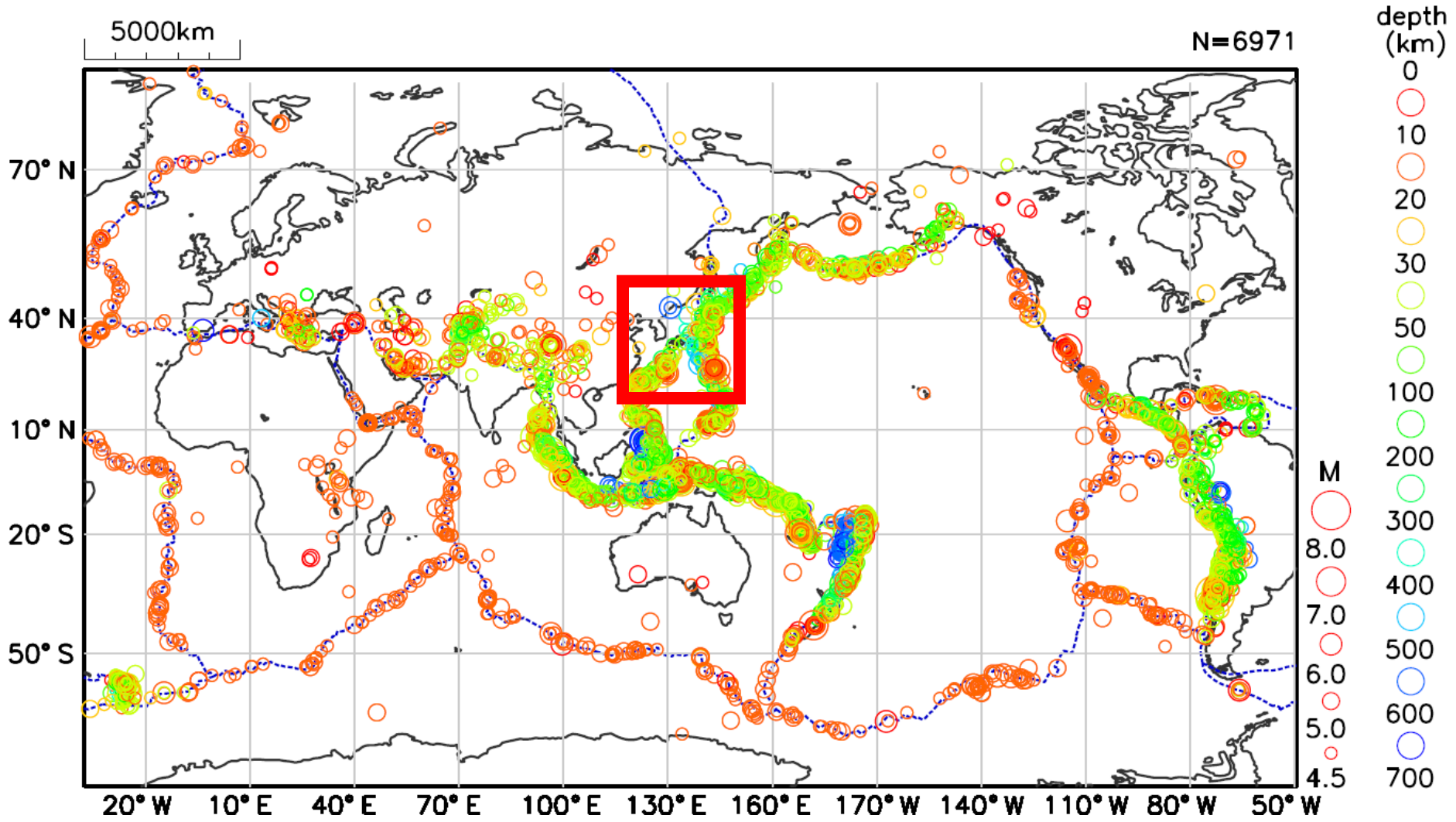
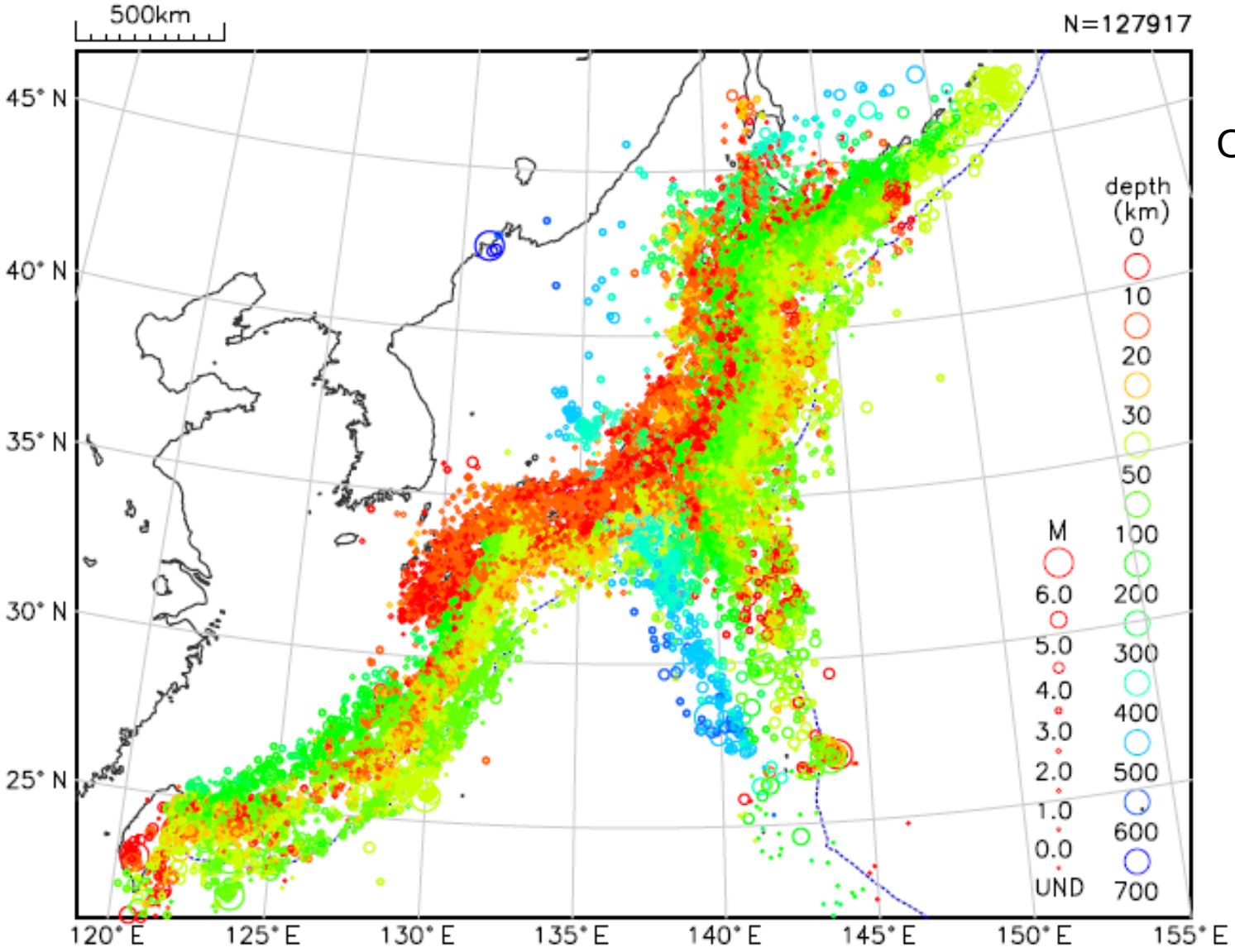
Introduction
- JMA's Tsunami Warning Service -

Global Seismic Activity in 2010



(M ≥ 4.5, Determined by USGS)

Seismic Activity around Japan in 2010



Observed
⇒about 128,000

(Determined by JMA)

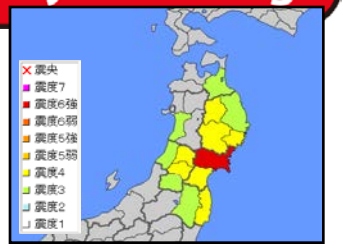
JMA's Response to Local Tsunami

EARTHQUAKE !

Several to a few tens seconds

Earthquake Early Warning

Automatic processing



About 1.5 minutes

Seismic Intensity Information
(regions with seismic intensity of 3 or greater)

Automatic processing

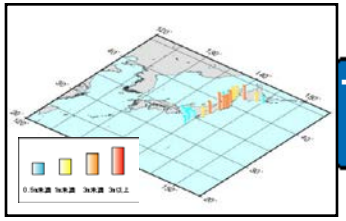
About 3 minutes

Tsunami Warning/Advisory

Tsunami Warning/Advisory(cancel)

When necessary

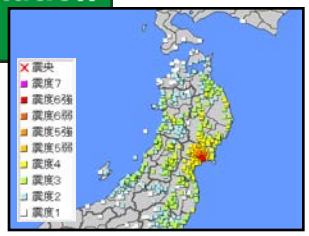
Updated Tsunami Warning/Advisory based on the observation



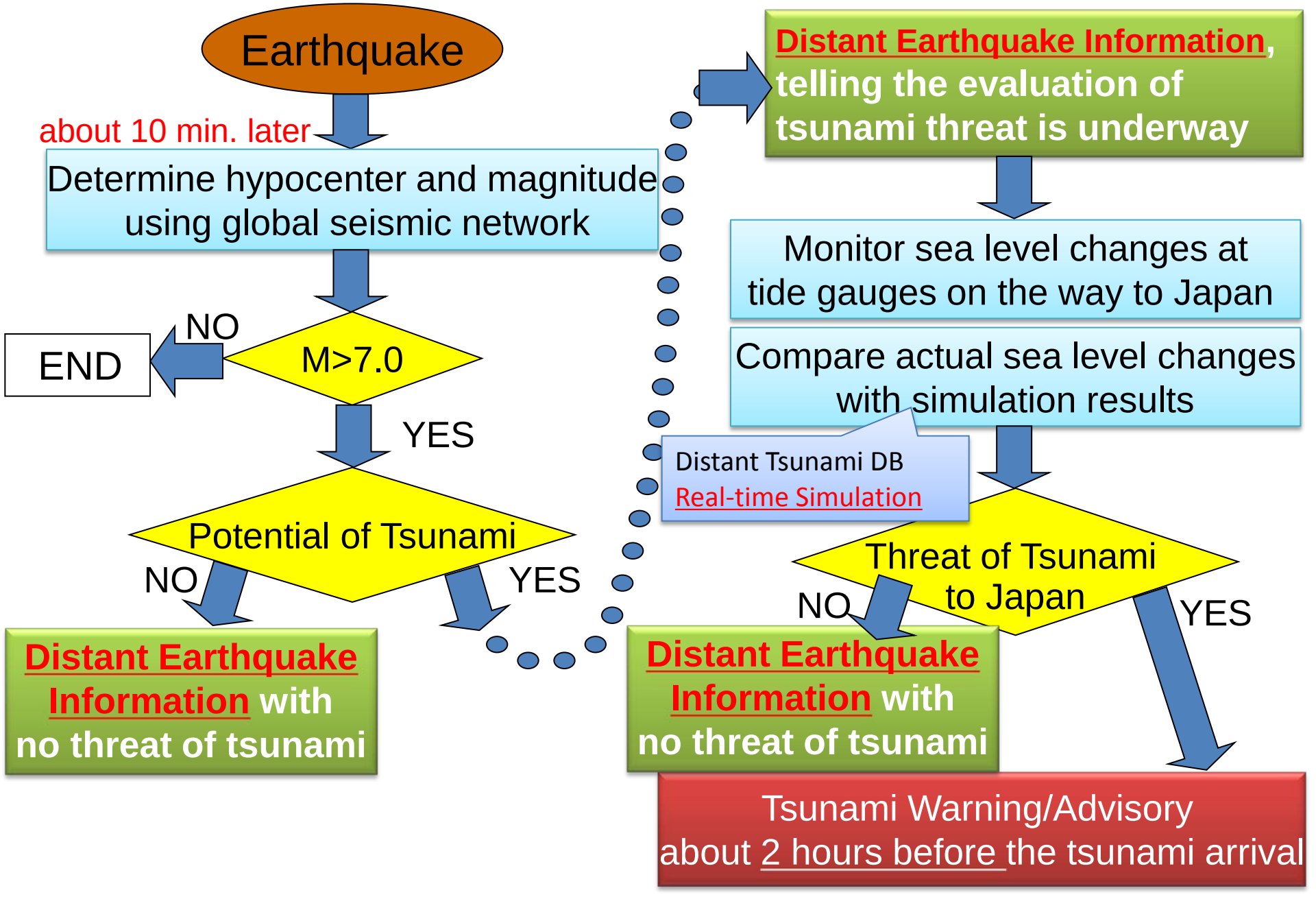
Tsunami Information
(tsunami observation)

About 5 minutes

Earthquake and Seismic Intensity Information
(observed seiemic intensities of each stations)



JMA's Response to Distant Tsunami



Warning Dissemination

Fire and Disaster Management Agency

satellite

JMA
(Either Tokyo HQ or Osaka Sub-center)

Central Government

Dedicated terrestrial line

Local Governments

Police, Fire offices

TV broadcasting

Radio Stations

Loud Speakers Sirens

Residents at risk

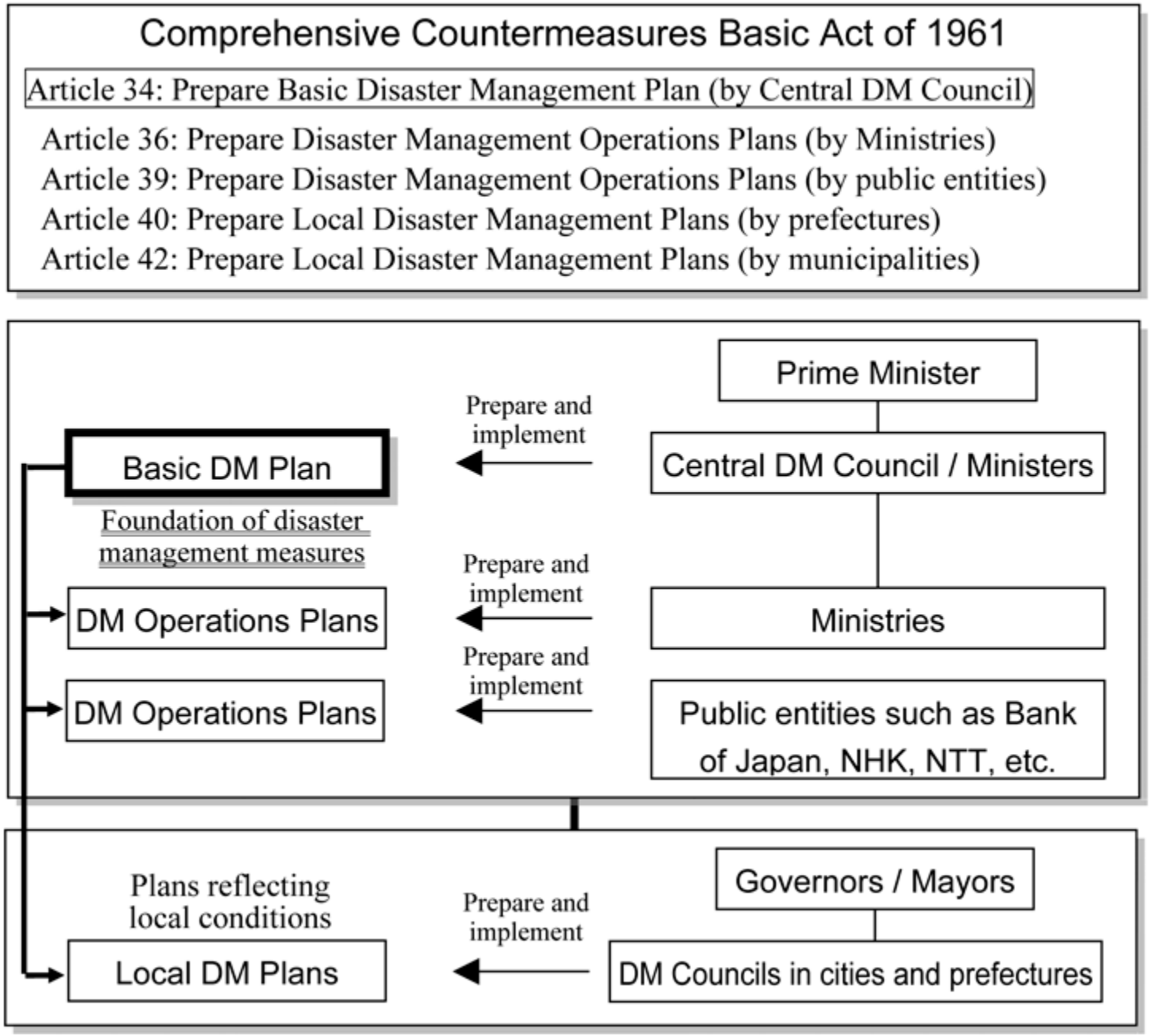
Broadcasting service for mobile devices

The Internet

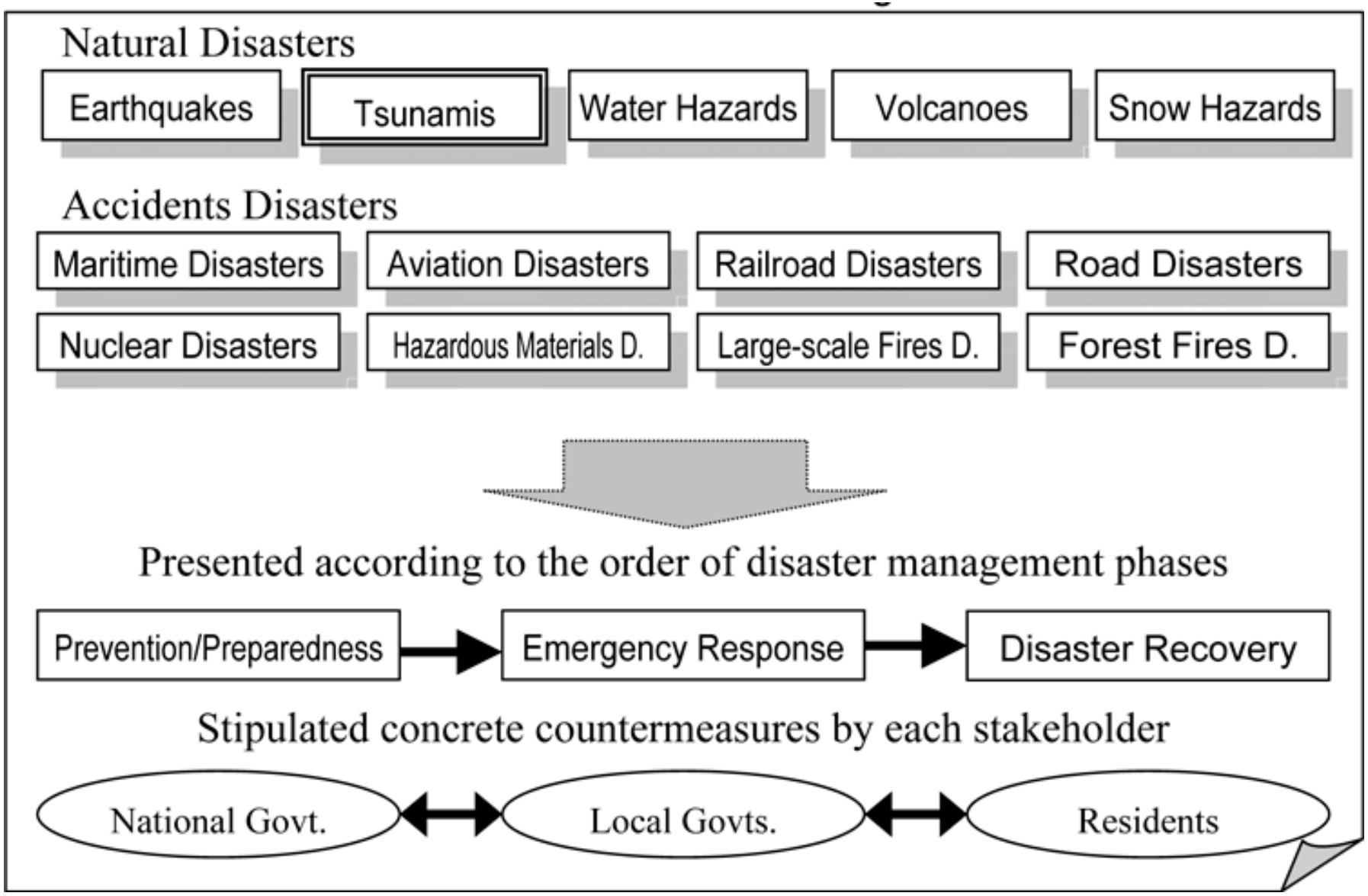
On TV Screen

Basic Disaster Management Plan
- Objective of Public Education -

Structure of Disaster Planning System



Structure of Basic Disaster Management Plan



Public Education in BDMP

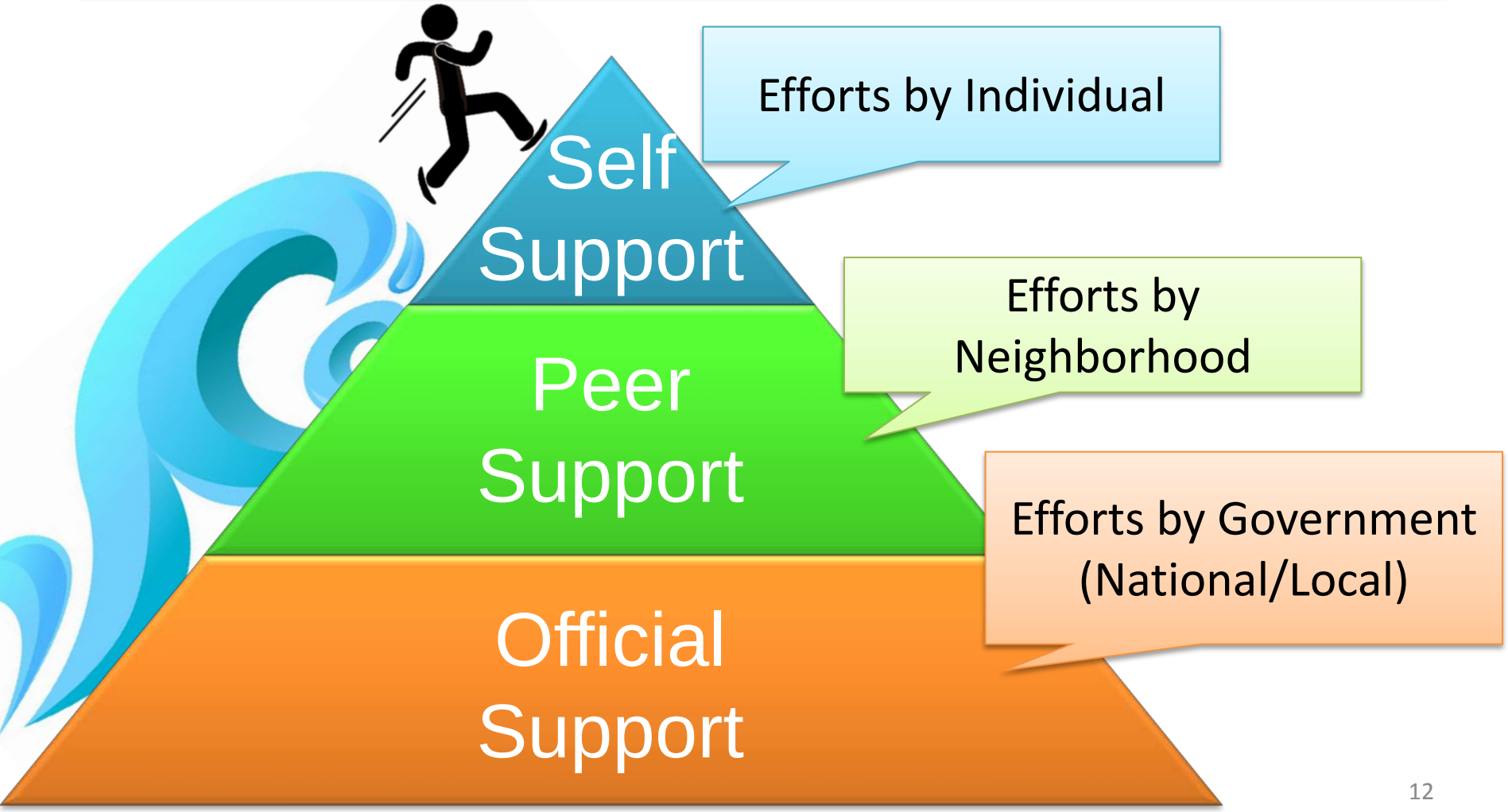
- Given that self support is fundamental for the disaster mitigation, National Govt. and Local Govts. shall attempt to enhance awareness of this concept.

- National Govt. and Local Govts. shall endeavor to enhance residents' understanding of tsunami disaster and mitigation of its impact.

- Residents shall endeavor to join disaster mitigation programs such as evacuation drills conducted by related communities.

Concept of Public Education

Governmental organizations should recognize self support and peer support are indispensable for effective disaster mitigation, and consider fostering them by public education.

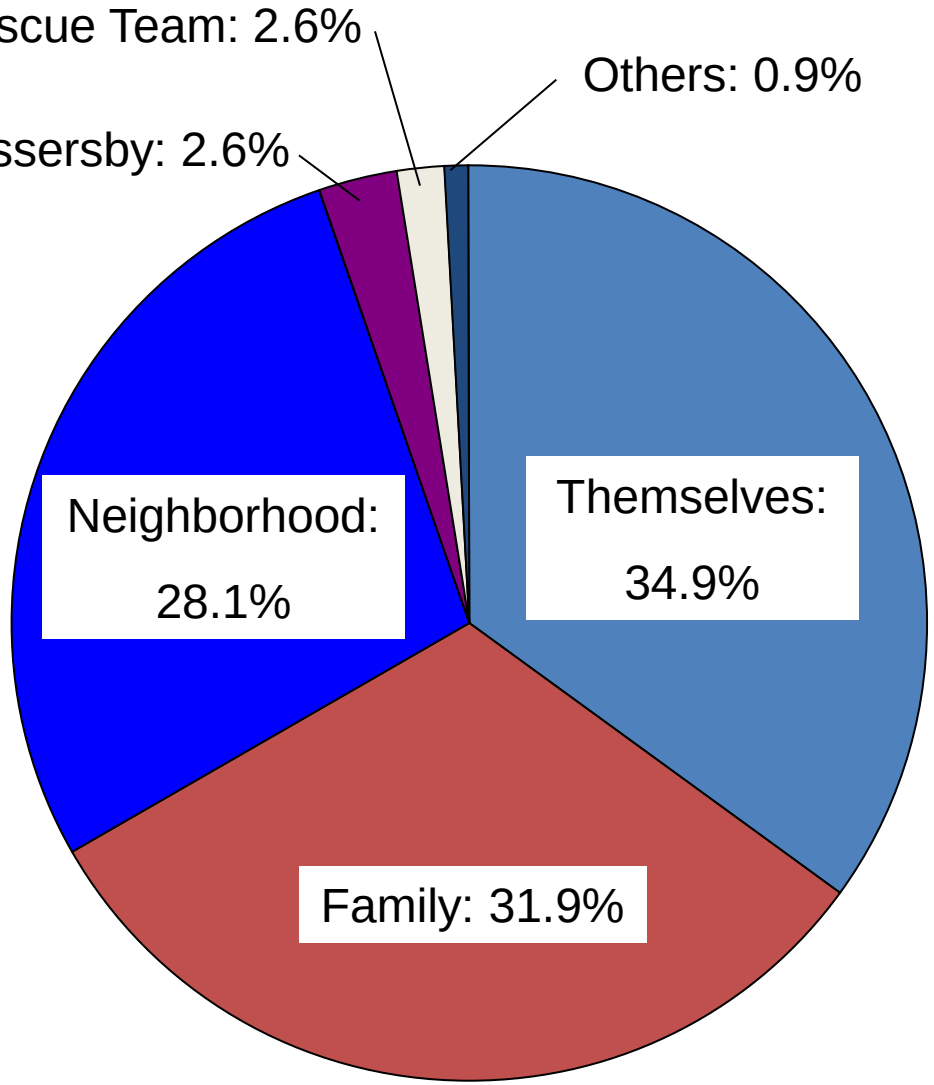


Who rescued people from collapsed houses?

The 1995 Southern Hyogo Prefecture Earthquake (M7.3)

Occurred directly beneath Kobe city, Hyogo Pref. (Depth: 16km)

Killed 6,437 (Crushing: ~80%)

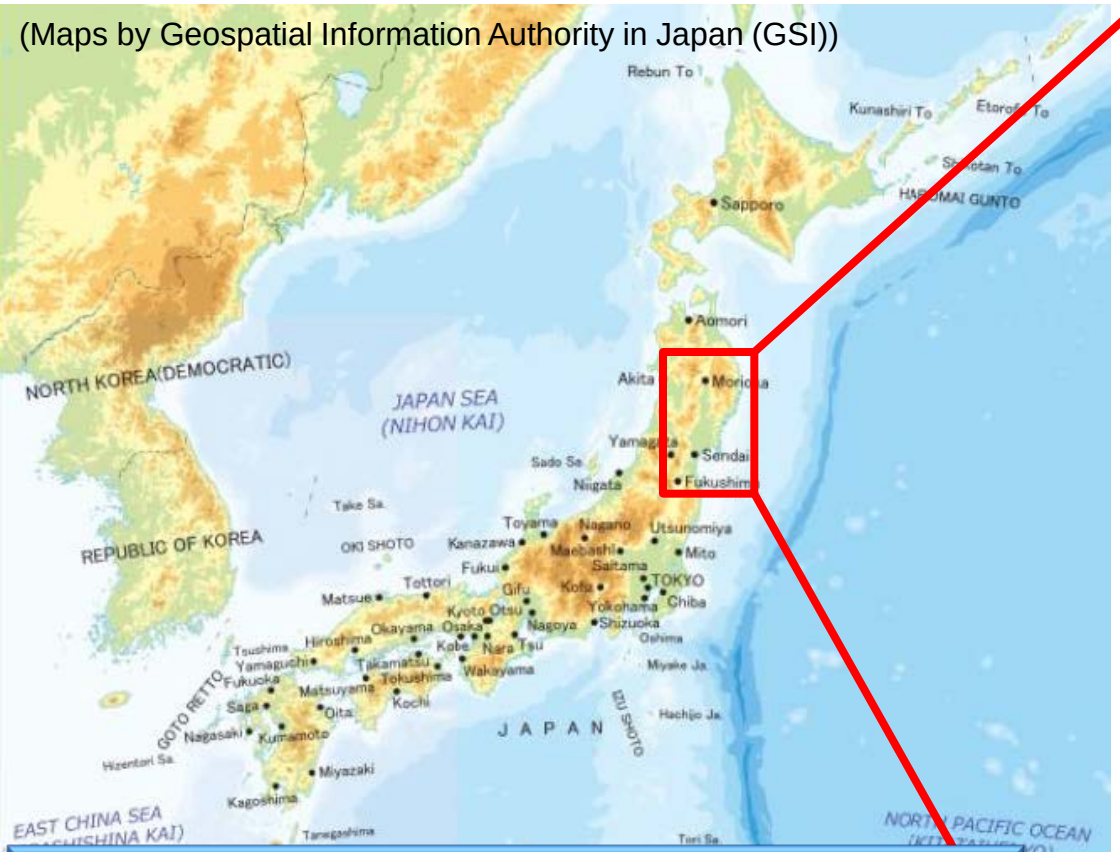


(Japan Association for Fire Science and Engineering, 1996)

Case Study
- Why need Public Education? -

The 2011 off the Pacific Coast of Tohoku Earthquake

(Maps by Geospatial Information Authority in Japan (GSI))



Facts about the 2011 off the Pacific Coast of Tohoku Earthquake (M9.0)

On March 11, 2011, huge tsunamis hit the northeast coast of Japan, and then:

–killed more than 15,800 people;

–has left about 2,600 people still missing; and

–destroyed more than 400,000 buildings.

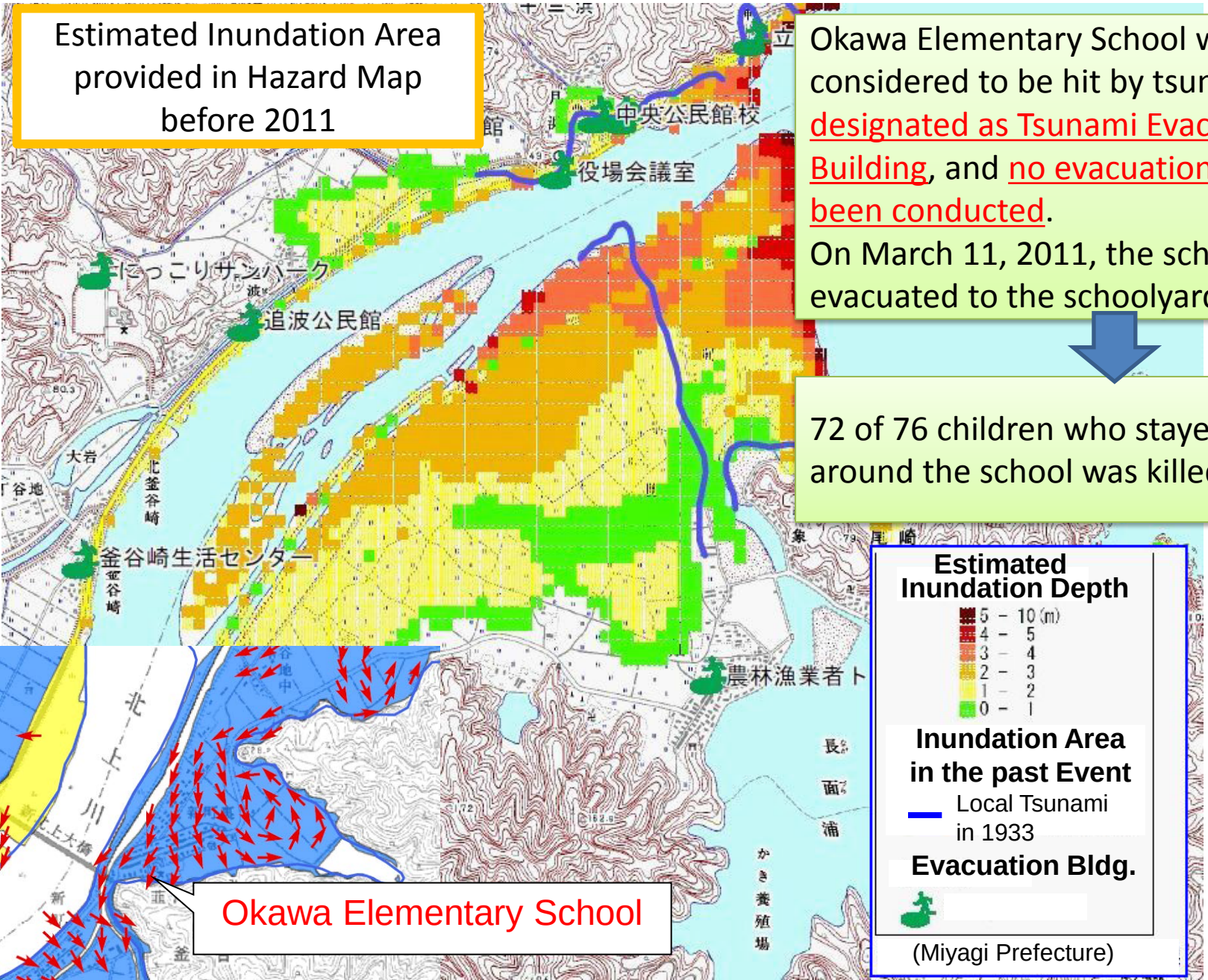
(Data provided by National Police Agency)

Case 1: Tragedy of Okawa Elementary School

Estimated Inundation Area provided in Hazard Map before 2011

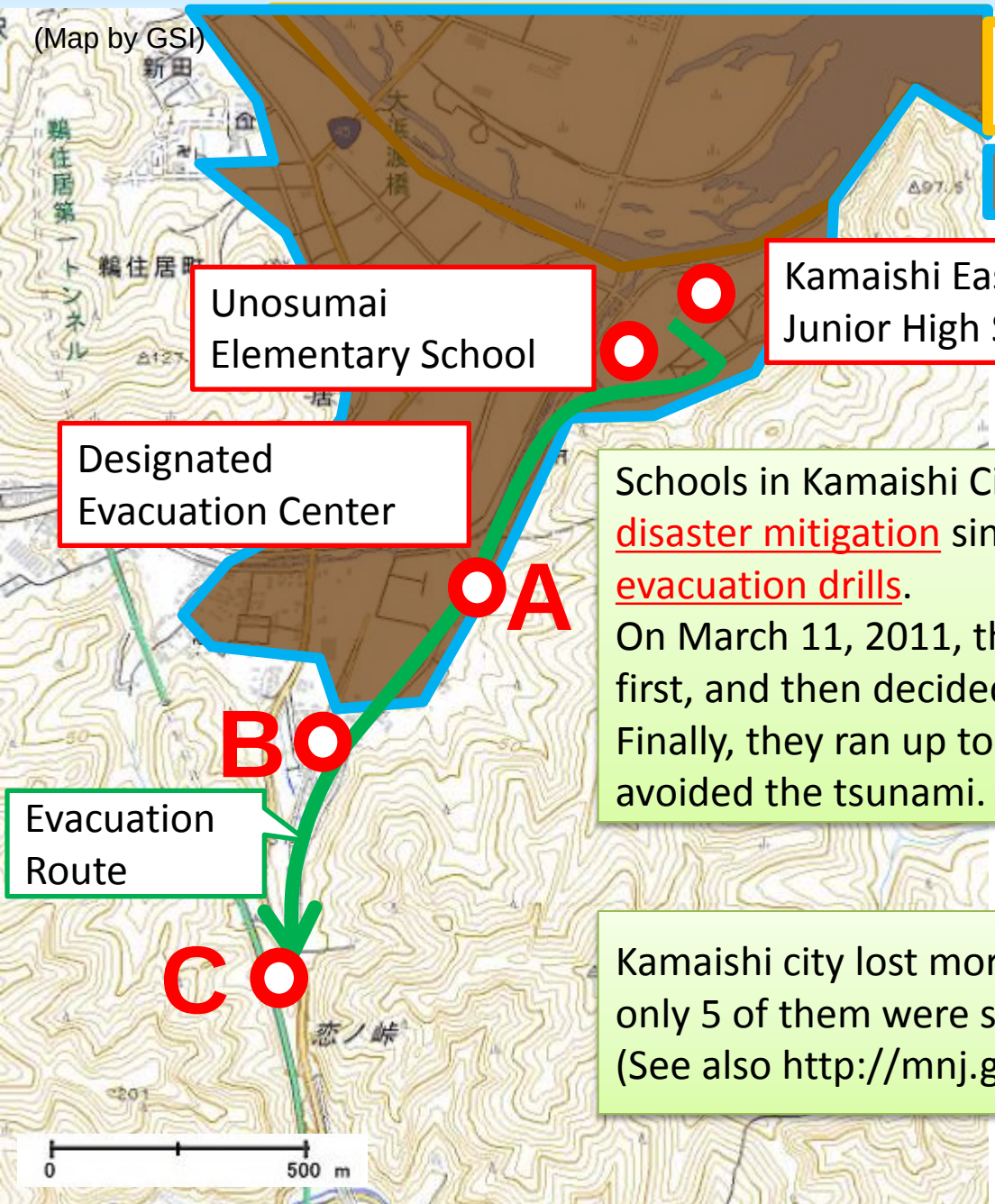
Okawa Elementary School was not considered to be hit by tsunamis and designated as Tsunami Evacuation Building, and no evacuation drills had been conducted.
On March 11, 2011, the school children evacuated to the schoolyard.

72 of 76 children who stayed in and around the school was killed by tsunami.



(Miyagi Prefecture)

Case 2: Miracle of Kamaishi



Schools in Kamaishi City had focused on education for disaster mitigation since 2006, and routinely conducted evacuation drills.
On March 11, 2011, the school children evacuated to “A” at first, and then decided to go further to “B”.
Finally, they ran up to “C” and all of them successfully avoided the tsunami.

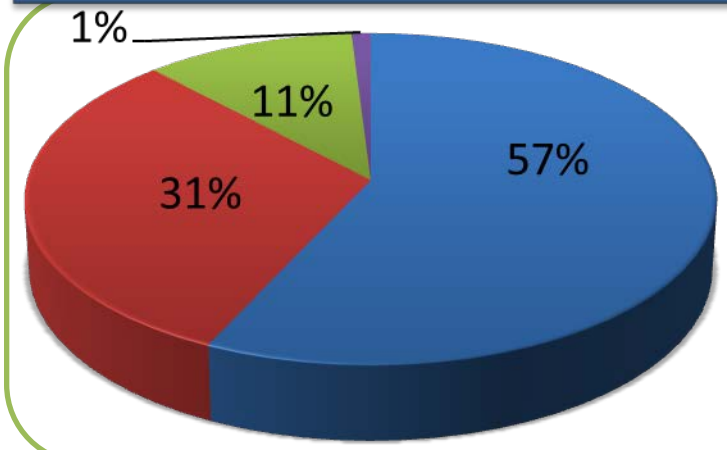
Kamaishi city lost more than 1,000 lives to the disaster, but only 5 of them were school-age children.
(See also http://mnj.gov-online.go.jp/kamaishi.html)

Reference:
Disaster Social Engineering Laboratory, Gunma University

Questionnaire Survey about the Evacuation on 3.11

Q1. When did you evacuate?

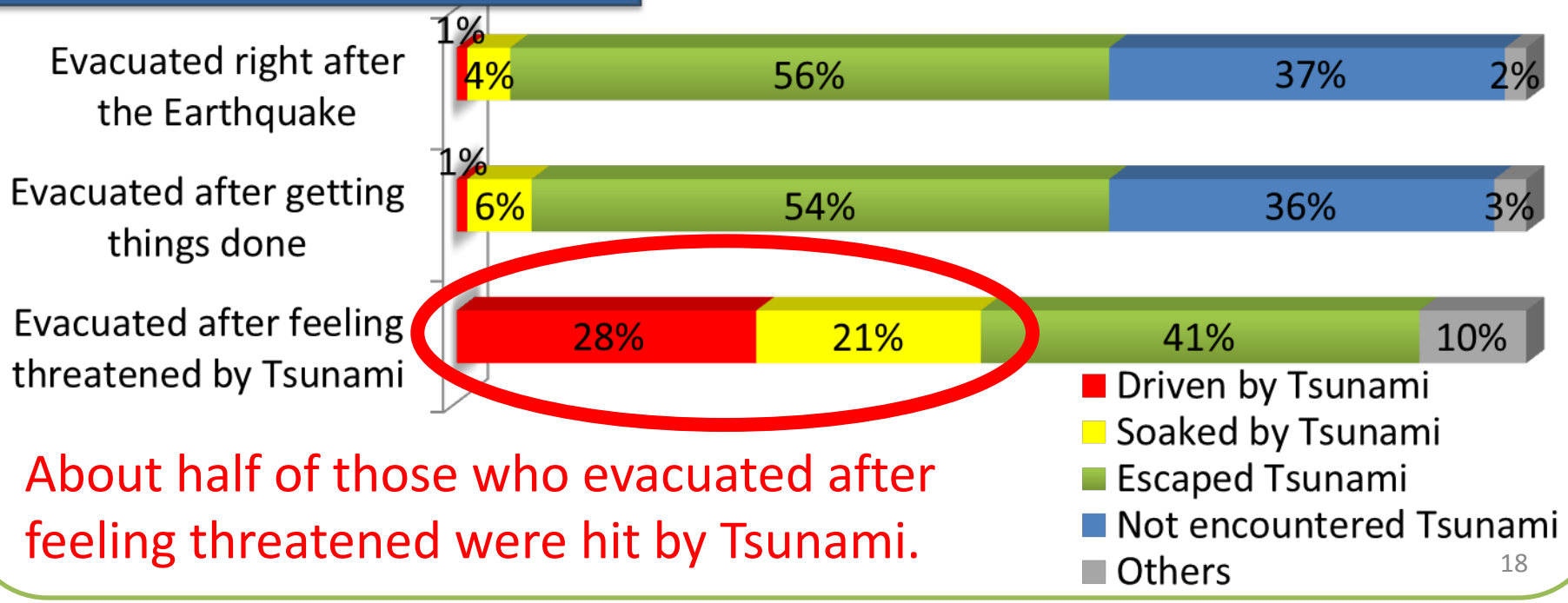
Conducted by Cabinet Office, Fire and Disaster Management Agency, and JMA



■: Evacuated right after the Earthquake
■: Evacuated after getting things done
■: Evacuated after feeling threatened by Tsunami
■: Not evacuated

N=870 (Sufferers in coastal areas of Iwate, Miyagi and Fukushima Pref.)

Q2. Did you hit by Tsunami?

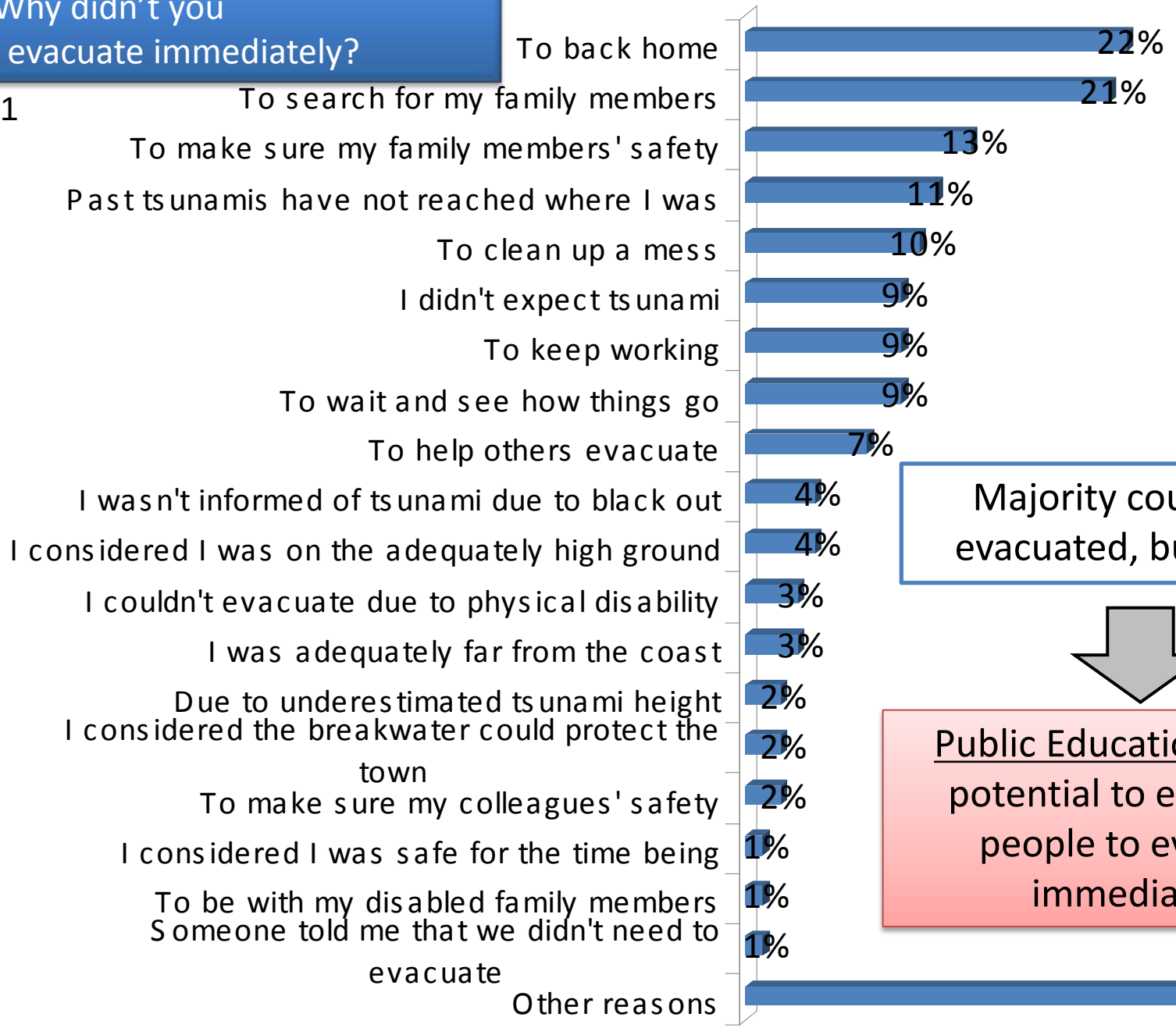


About half of those who evacuated after feeling threatened were hit by Tsunami.

Questionnaire Survey about the Evacuation on 3.11

Q3. Why didn't you evacuate immediately?

N=361



Majority could have evacuated, but didn't.

Public Education has the potential to encourage people to evacuate immediately.

Public Education by JMA
1. Overview

Contents of Public Education

Understanding these topics will improve individual/peer preparedness that can enhance the effectiveness of official services in emergency.

Tools for Public Education

Material (in an easy-to-understand manner) → Lecture (especially to children) → Drill (repeatedly)

Pamphlet / Poster

Video

Workshop

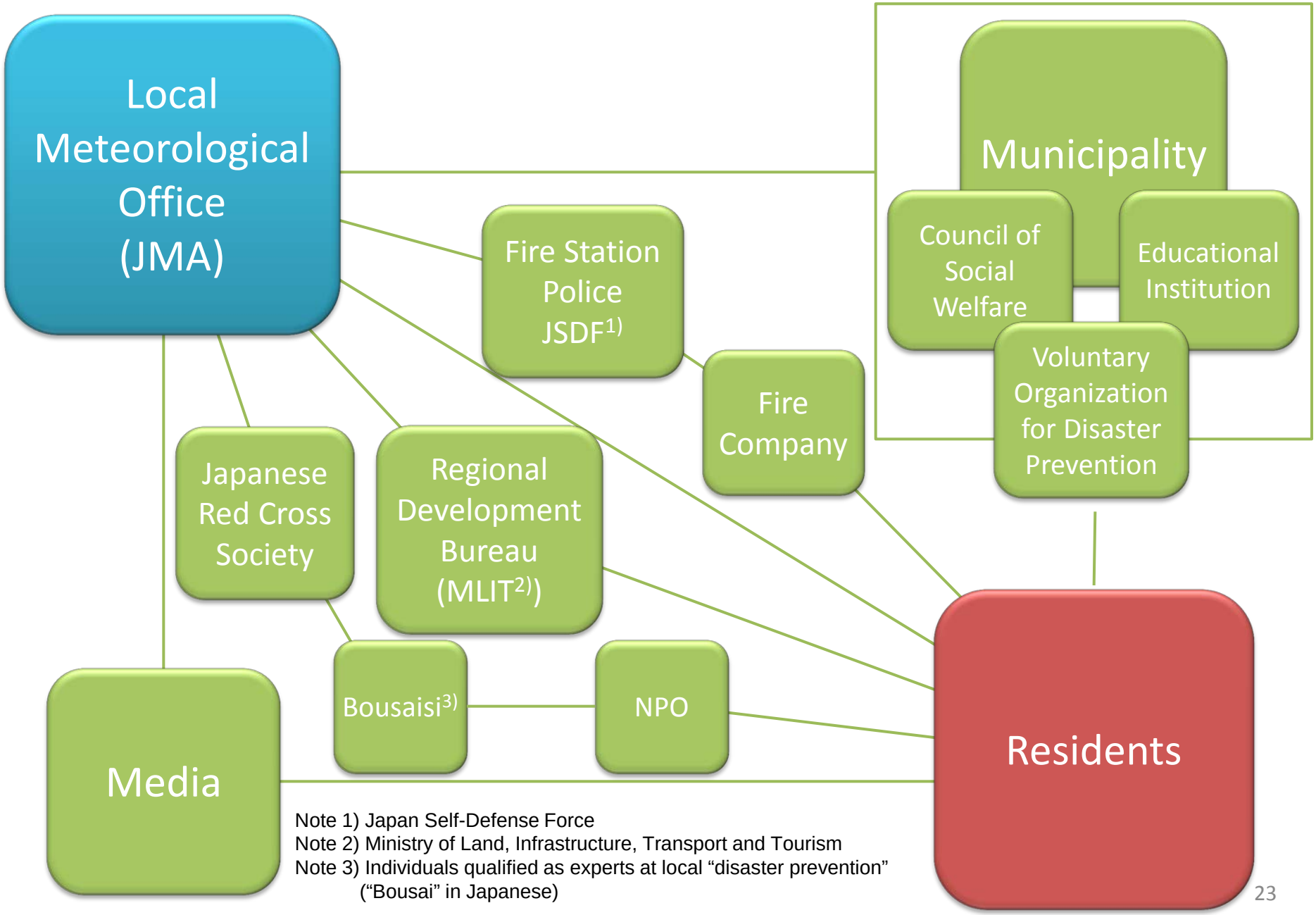
Delivery Lecture

Evacuation Drill at schools

Sample video of Early Earthquake Warning for drill

Drill in a school

Cooperation with Organizations Concerned



Note 1) Japan Self-Defense Force
Note 2) Ministry of Land, Infrastructure, Transport and Tourism
Note 3) Individuals qualified as experts at local “disaster prevention” (“Bousai” in Japanese)

Public Education by JMA
2. Local Disaster Resiliency Enhancement Project

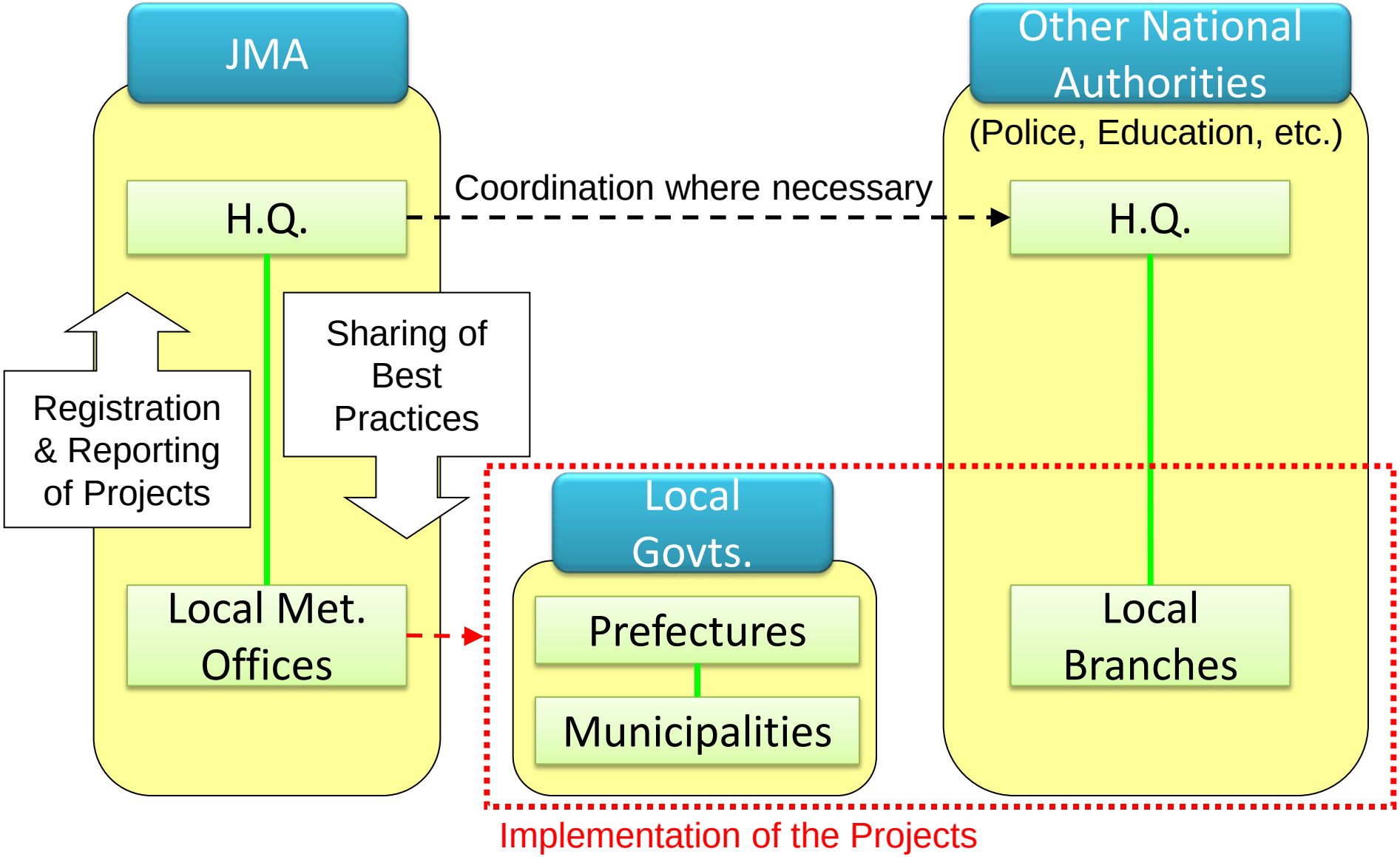
Objective

- Enhancement of local relationship between JMA and related organizations

- Capacity development of future disaster-management leaders in local communities

Outline

Local Disaster Resiliency Enhancement Project

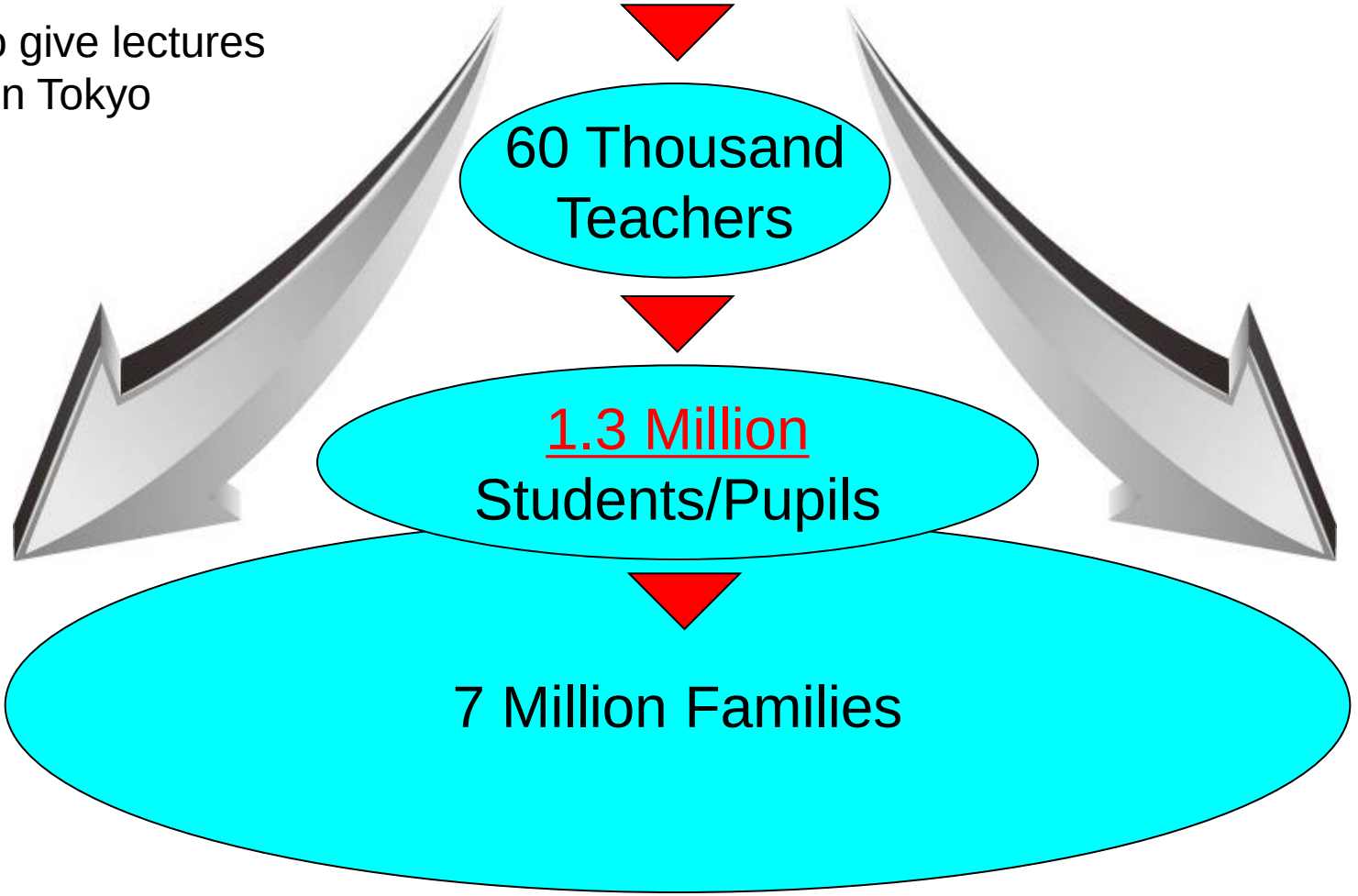


Best Practices @ Tokyo

JMA
Tokyo Regional H.Q.

Tokyo Metropolitan
Office of Education

NOT practical to give lectures
to ALL children in Tokyo



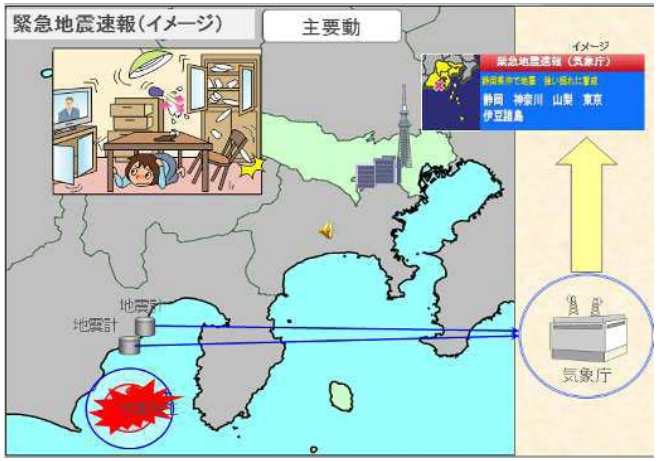
Best Practices @ Tokyo (cont.)

Through the Tokyo Metropolitan Office of Education…

1. Distributed a disaster management education material (60 slides to be used in disaster management class) to ALL public schools in Tokyo;
2. Got the above material contained in “Safety Education Program”, a guidance for ALL teachers in Tokyo, authorized by the Office; and
3. Gave a lecture on the above material in a workshop on school safety, held by the Office and attended by representatives from ALL public schools in Tokyo.

Best Practices @ Tokyo (cont.)

Contents of the material



Earthquake Early Warning Simulator

Animation of Earthquake

Image of the past Event

Evacuation Quiz

JMA's Seismic Intensity

Best Practices @ Tokyo (cont.)

Website of
JMA's Tokyo Regional H.Q.

Practical examples of disaster management class

Feedback from teachers

The material is available

Easy-to-use with specific examples of the talk for each slide

This is exactly what I had wanted!

Public Education by JMA
3. Other Efforts

Cooperation with Japanese Federation of the Deaf (JFD)

- During the Great East Japan Earthquake, death rate of the disabled was twice higher than that of the able-bodied.
- A lot of deaf and hard-of-hearing people were killed by tsunami because they were not aware of Tsunami Warnings.

JMA	JFD
• Public education about disaster prevention • Disaster mitigation	• Encouragement of Social participation and self-reliance of the deaf • Improvement of welfare for the deaf

JMA started to give lectures in disaster prevention workshops held by prefectural branches of JFD, using JMA's delivery lecture service.

- JFD H.Q. encouraged each of its branch to make positive use of JMA's delivery lecture service to enhance education about disaster mitigation.
- JMA H.Q. requested each of its branch to provide JFD's corresponding branch with delivery lecture service.

Cooperation with Japanese Red Cross Society (JRCS)

JMA

- Public education about disaster prevention
- Disaster mitigation

JRCS

- Emergency relief activities and disease prevention activities at disaster sites
- Training of doctors and nurses in preparation for disasters

"LOA regarding cooperation on spread of education for disaster prevention"

■ Purpose

To continuously enhance public education about safety knowledge, such as disaster prevention, with mutual cooperation in order to protect human lives and health from disasters.

■ Expected Outcomes

- Public education materials such as leaflets
- Delivery lecture service for workshops held by JRCS
- Cooperation in school education for disaster prevention at member schools of Red Cross Youth[1)]

Note 1) Red Cross Youth (RCY)
「 Youth organization composed of schools that concur with efforts by JRCS. Activities are lead by preschool, elementary school, junior high school and high school teachers. About 10,000 schools are affiliated with RCY in Japan

Signing ceremony for LOA
March 5, 2014

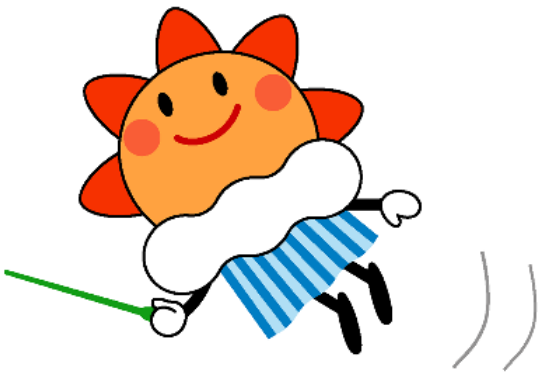
On a final note…

As the Japanese proverb goes :

天災は 忘れた頃に やってくる

(Disaster strikes when you least expect it.)

Thank you for your attention!

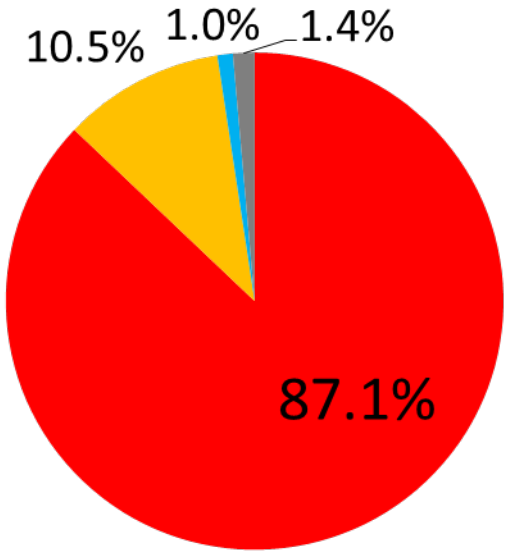


- JMA's website:
  http://www.jma.go.jp/jma/indexe.html
- Leaflet (*Earthquakes and Tsunamis*):
  http://www.jma.go.jp/jma/kishou/books/jishintsunami/jishintsunami.pdf

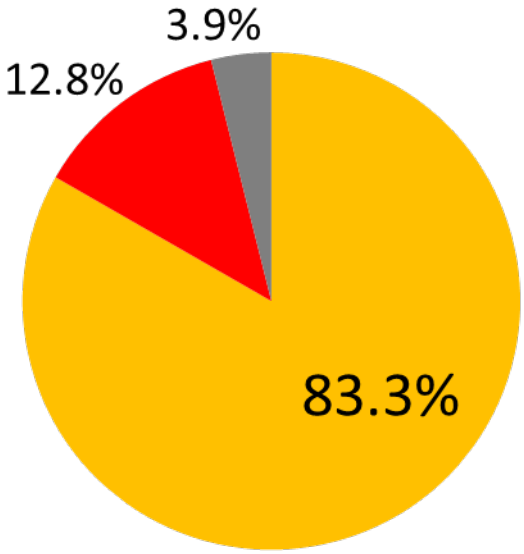
Appendices

Cause of Death in the past Earthquakes

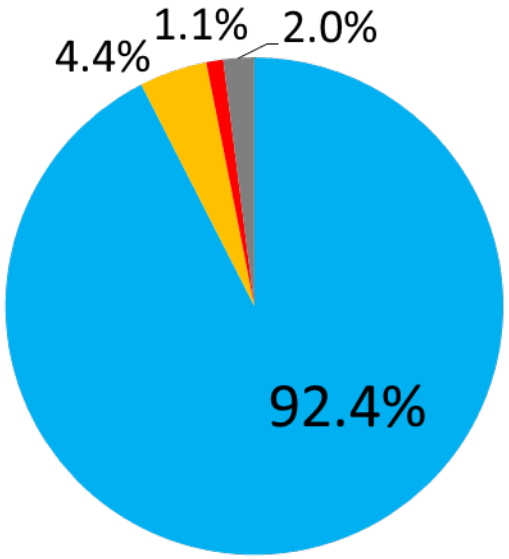
The Kanto Earthquake (1923, M7.9)	The 1995 Southern Hyogo Prefecture Earthquake (1995, M7.3)	The 2011 off the Pacific Coast of Tohoku Earthquake (2011, M9.0)



Data provided by
Japan Association for Earthquake Engineering



Data provided by
Hyogo Pref. Medical Examiners



Data provided by
National Police Agency/Cabinet Office

: Burning : Crushing : Drowning : Others/Unclear

Appropriate evacuation varies with a number of factors:

- Hypocenter location (Intraplate vs. Interplate);
- Time of day (cooking, working, commuting, sleeping …);
- Wind velocity (Fire spread); and
- Building type (Wooden vs. RC houses) etc…

View from Okawa Elementary School

Frequency of Earthquakes around Japan

M	Approx. frequency around Japan
9	Once in several centuries
8	Once in a decade
7	Half-yearly to yearly
6	10-15 times a year
5	10 times a month
4	Several times a day
3	Several tens of times a day
2	10 times an hour
1	1-2 times a minute
	Uncountable

Data provided by National Research Institute for Earth Science and Disaster