What to do when an earthquake occurs

—To Foreign Students in Tokyo, Japan—

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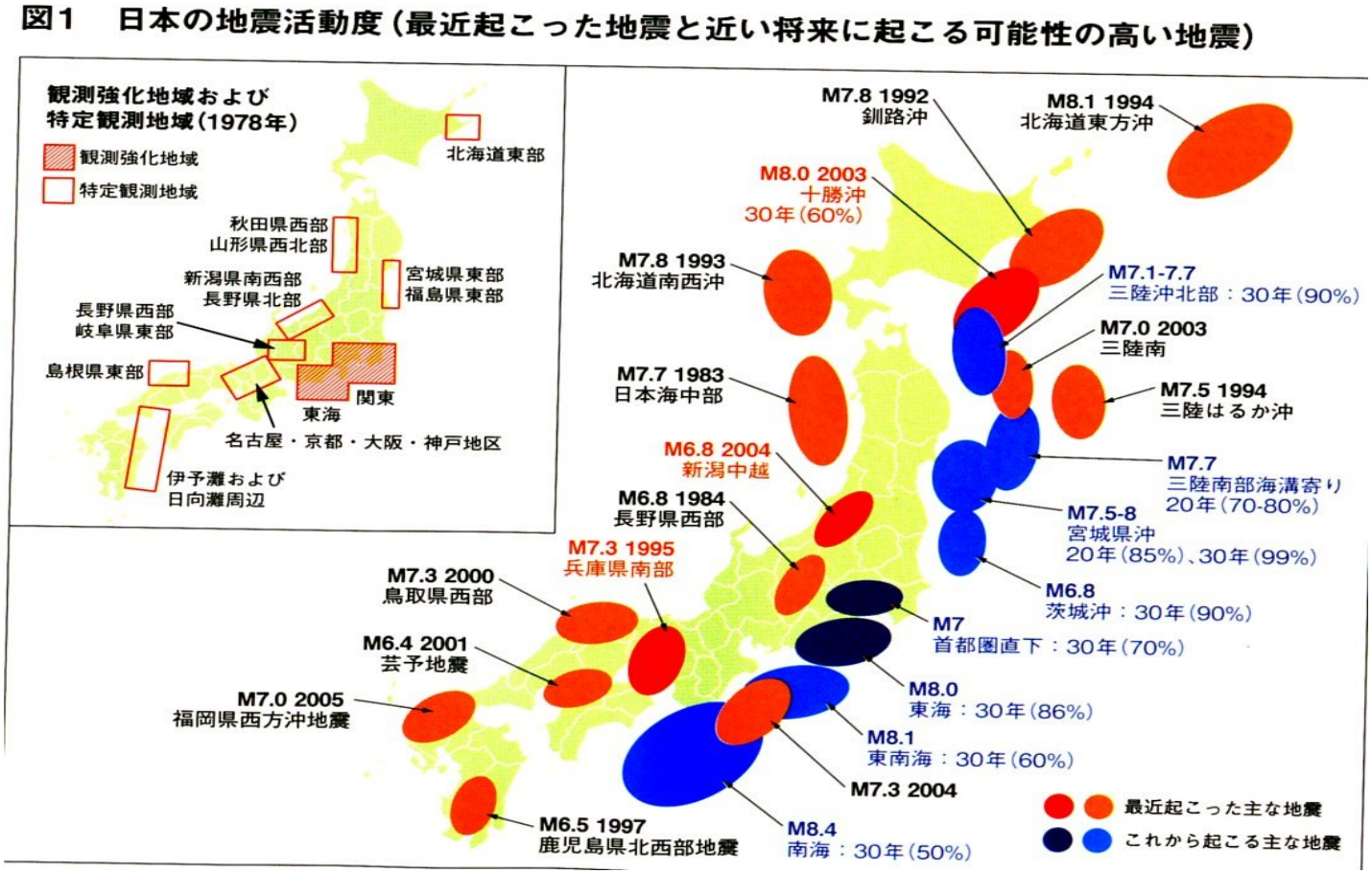
From 1990s, Japan entered into the era where occurrence of earthquakes are frequent.

(Red marble = occurred; Blue = predicted)



Magnitude and Shindo (Seismic intensity)

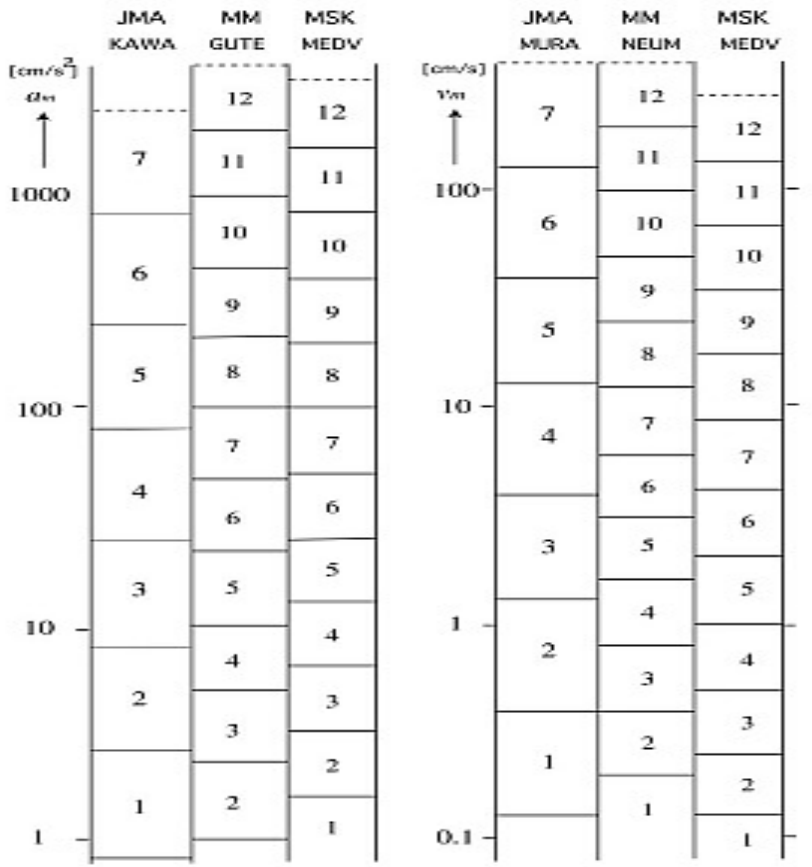
- Magnitude is the scale of an earthquake at the place of origin.
- Shindo (Seismic intensity) is the scale of earthquake at your place. There are 3 shindos: Japanese (JMA), US-EU(MIM), International (MSK). See the next table for comparison.

- **8~ giant earthquake**
- **7~ big scale earthquake**
- **5~7 middle scale earthquake**
- **3~5 small scale earthquake**

1 Japanese shindo upgrading means 32 times bigger energy.

2 upper grade means 32 ×32 = 1000 times bigger energy.

Comparison of shindo (seismic intensity) among Japanese (JMA), US-EU(MIM) and International (MSK)



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A. Preparation before an earthquake

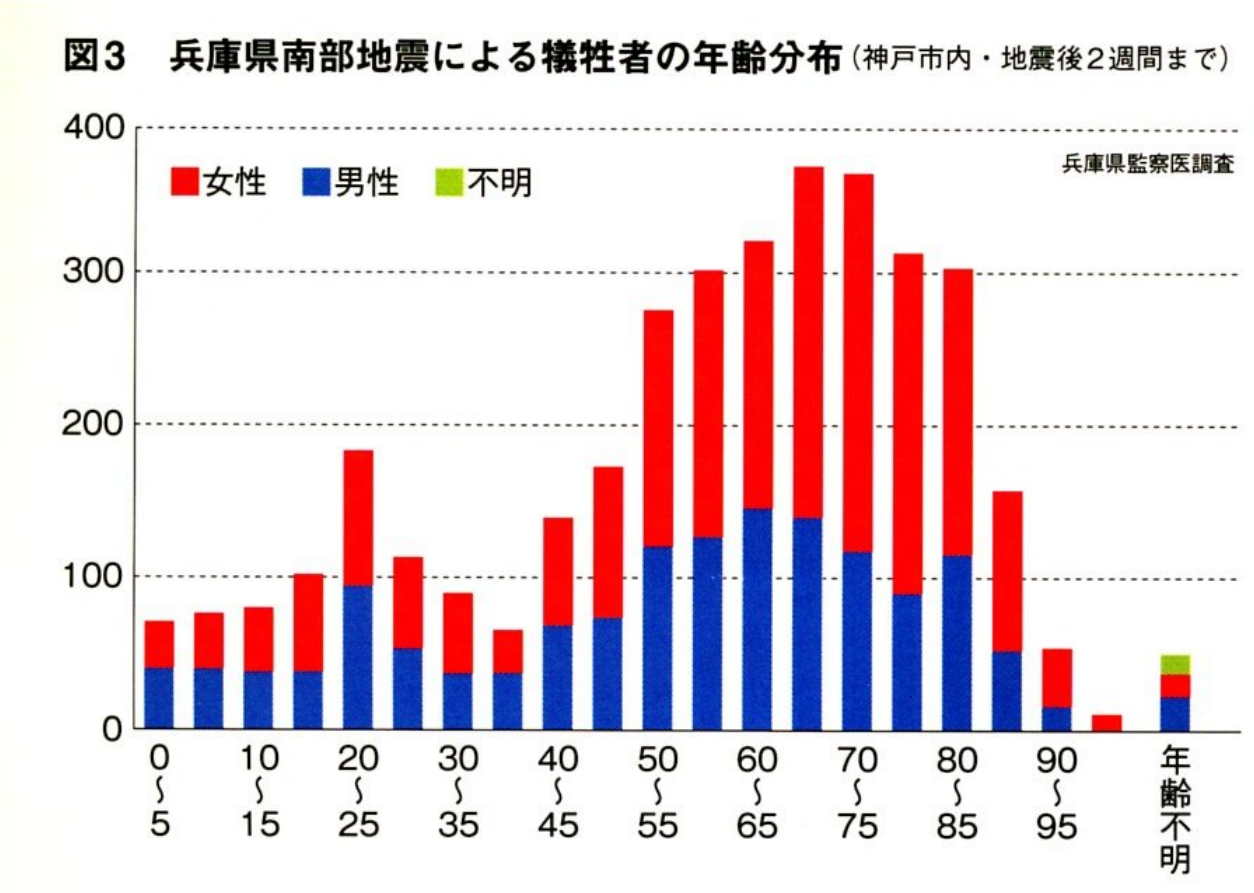
1. Strength of buildings

- The biggest factor of the earthquake damage depends upon the strength of buildings.
- Hanshin big earthquake in 1994: M7.3. Dead people account to 6,433 (92% within 15 minutes due to the collapse of buildings). Fully and half destroyed houses numbered to as much as 250K.
- Chuetsu (Niigata) big earthquake in 2004: M6.8. Dead people recorded were 51 (16 due to collapse of buildings and landslides).
- The difference came from the strength of houses. In Niigata prefecture, because of heavy snows, houses are constructed to be more durable.
- Kanto big earthquake in 1923: M7.9. Dead people recorded were more than 100K. 43% of Tokyo was burnt out. If the strength of houses were the same with the present era, the fire damage would have been cut into half. Far more people could have fled if there were less torn buildings and houses.
- There were so many deaths and casualties brought by the earthquakes in Pakistan, Iran and Turkey because of the weak structures of the houses.

In Hanshin big earthquake, majority of dead people were aged because they lived in old houses. The death rate of young people in their 20s was also high because they lived in cheap apartments.

(Picture by Prof. Meguro Kimiro of Tokyo Univ.).

The high death rate of young people in their 20s due to living in cheap apartments (Red=women. Blue=men)



(Table prepared by Prof. Meguro Kimiro of Tokyo Univ.).

Preparing water and food is important. Preparing communication measures is also important. But a far more important thing is to live in a strong house.

Conditions of durable buildings.

- Buildings that have been constructed after May 1981 = The Government made new standards for anti-earthquake devices starting this period.
- Buildings with more walls. Less open spaces at the sides.
- All walls of the second floor should be directly above the walls of the first floor.
- The building is square or rectangle and is not so complex in shape. Building with less extensions.
- No existence of damage like cracks.

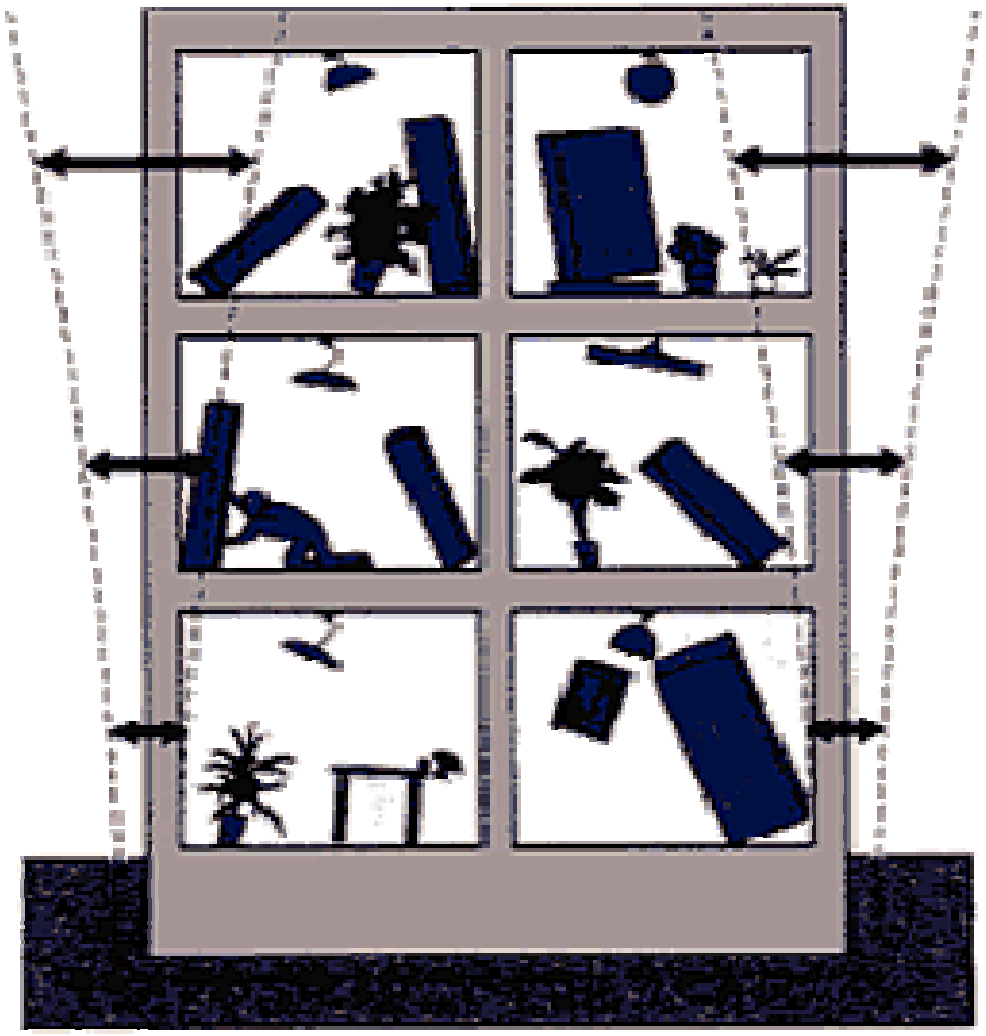
Some of concrete buildings are not good

A. Preparation before an earthquake

2. Preventing Furniture from falling down

- Northern Miyagi Prefecture earthquake in July 2003: M6. Fully and half collapsed buildings recorded to 3000. Dead person 0, injured persons 674.
- Reasons of injury: Falling Furniture 54%, Falling glasses 13%, collapse of the house 1%
- Incidence of falling furniture and items that transpire at the time of evacuation account to 24%(were not moved during the quake.) (in the municipality of Yamoto)
- In Hanshin big earthquake, many were killed by the falling of heavy and tall furniture.

High possibility of Furniture falling down



Preventing Furniture from falling down

One prescription is to fix furniture to the wall.

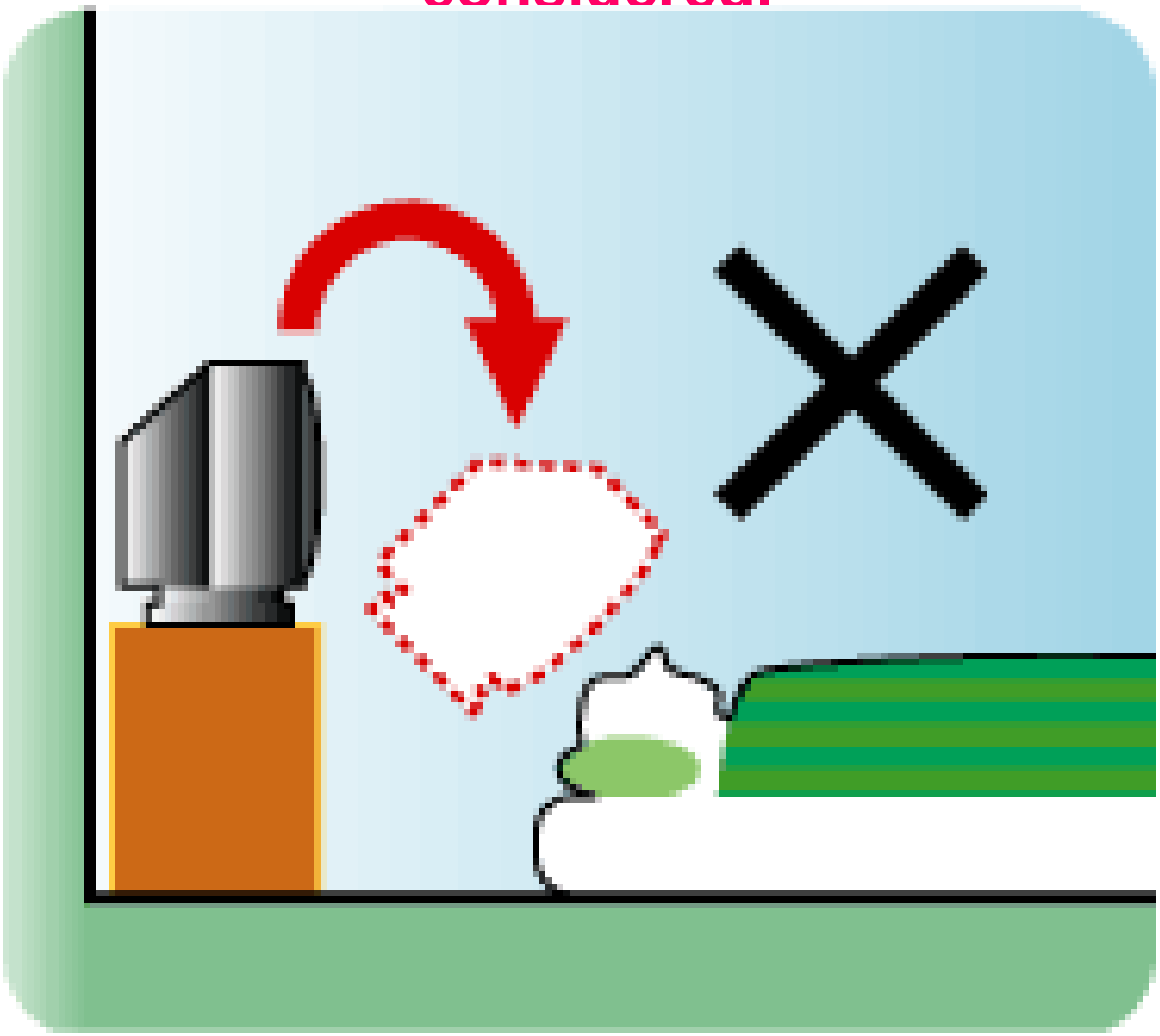
Way of fixing furniture

If not properly fixed to the wall, furniture can fall in a medium scale earthquake.

Especially dangerous is the kitchen

Spreading towel is quite effective for preventing glasses from sliding.

Proper fixing is not enough in the event of a big earthquake. Minimizing furniture in the bedroom is best. At least, the space for the fall of furniture should be considered.



A. Preparation before an earthquake

3. Preparing training and goods

- The most important thing is **DIG**=災害実地訓練。Disaster Training（災害）、Imagination（想像）、Game（ゲーム）.
- Discuss actual possibilities on what to do in the event of an earthquake: from preparation of food etc., emergency, how to communicate, how to go back home, where to evacuate among family members and try the exercises. Imagination of the actual cases is very important.
- Train yourself going under a table or desk within 2-5 seconds. This kind of training at schools reduces thousands of casualties.
- When Sri Lanka and India were hit by a giant tsunami last December, the first rescue team came from nearby communities. You can rely on community associations to a certain degree.

What should be prepared at the time of evacuation during a big scale earthquake?

- 3 liters of water/person/day for 3 days = 9 liters + 9 days food (at room) including 3 days food (at the time of evacuation).
- Generally, it takes 3 days before the rescue teams come.
- Flashlight, tarpaulin
- Money, bank card, pass book, VISA card, passport, medicine
- Transistor radio and its batteries, gloves, plastic bag, wet tissue,
- Underwear, toilet paper, towel, socks, tooth brush, soap, comb, shaver, lighter, candle, writings, notebook, dictionary, camera, umbrella, watch, nail clipper, ear pick, slippers
- Paper cups, paper dish, fork and spoon, knife, can opener, plastic wrap

B. Emergency Measures

at the time of an earthquake

(Prof. Meguro's Recommendations -1)

1. The first big quake takes about 1 minute. Go under the table or desk for protecting your head.
2. Even in a small quake, extinguish the fires (at the kitchen, stove) immediately.
3. Don't go out of the building. Many people were killed inside the building in the past big earthquake. But still inside is safer than outside.
4. Open the door and keep alternative exits (Sometimes, doors can't be opened after a big quake and you are locked.
5. When you are hit by a quake while outside, go to open spaces or enter any strong building.

The first big quake takes about 1 minute.
Go under a table or desk
to protect your head.

(Picture from the book of Prof. Meguro Kimiro of Tokyo Univ.).

Keep water under a table/desk

Open the door and keep an exit.
Prepare a fire extinguisher.

(Prof. Meguro's Recommendations-2)

6. When in a shopping center and other places where many people gather, don't panic and follow the instruction of the staffs.
7. Cars should slow down gently, park at the left side of the road. Don't go out until the quake stops. Cars are not to be used after a big quake. When you leave the car, make sure to close the windows, leave the key attached and keep the door unlocked.
8. Moving vehicles will prevent fire engines and rescue teams from passing. Evacuation should be by foot (bike? Motor bike?).
9. Be careful and evade the possible points of landslide.
10. Don't believe rumors. Collect credible information from the media and government institutions.

Other notices

1. At Hanshin big earthquake in Kobe City, 1,300 buildings were severely damaged and demolished (8% of the total 4-storey buildings). Many people were killed inside. But still, staying inside the buildings are far safer than going outside.
2. Basement is safe because of the concrete construction. The problem is the panic. The emergency lights are to be operated within one minute after the quake. There should be exits every 60m.
3. Subway has a system with 10 hours light operation after a power failure. Sometimes on old rails (like Ginza-sen, Marunouchi-sen, etc.), there are third rail streaming 600v power where its dangerous to walk.
4. Generally speaking, don’t go closer to a vending machine, walls are made of block and utility pole. They can possibly fall down.
5. In the streets of tall buildings and arcade, be careful of falling objects and debris. Walk while protecting your head with bags.

Tactical Measures after an earthquake for the Rehabilitation of daily life

1. Contacting family members

① Using cellular phone

② Using cellular mail

③ Using 171 (telephone corporation NTT's Disaster message exchange program)

④ Using call box (the system is separated).

Only green colored telephone. You need 10 yen coin at the time of power failure (100 yen or tel. card don't work). Red colored and pink colored telephone for common use is the same with home telephone.

① Using cellular phone

In the event of a big earthquake, because of the massive use of telephone and priority being given to official use, 80% of communication access is limited in ordinary telephones. (Still you have a 20% possibility to be able to contact).

② Using cellular mail

- Oftentimes though, the cellular mail is separated from the phone system and have no limitations. In Chuetsu earthquake at Niigata, it worked well. But at the Tokyo earthquake in July this year, it didn't work well because of the new type like「FOMA」,「Vodafone 3G」, (KDDI)「CDMA 1X」. The system of the new types doesn't separate phone and mail system.
- Preparations to separate the two systems are set to be finalized by spring 2006.

③ Using 171 (telephone message)

- **The telephone message system of NTT begins to work only in earthquake hit areas with more than 6 shindo (seismic intensity).**
- **Call 171**
- **At the time of recording message, press 1 and input your telephone number. At the time of recording, you should record the exact date and time.**
- **From the same telephone number, you can add new messages 10 times.**
- **To listen to a message, press 2 and input the telephone number you want to call.**

Collecting exact information

From Media

- **Switch on the TV.**
- **In case of power failure, prepare a transistor radio with supplementary batteries.**

- **Use internet**

  For example, Asahi Newspaper updates its news every 3 hours or so (http://www.asahi.com/). English page, however, might not be the case.

Information from government institutions

- Tokyo Metropolitan Government homepage **has disaster information at the top left in Japanese. Ask any person who can understand Japanese to read it.**
- Fire station **staffs have the responsibility to any natural disaster. They have information.**

- **Others:**
- Convenience stores **are expected to work as safety stations in coordination with the local government. They have digital wireless telephone system to deliver items 9 times a day and may have better information.**

Those who have difficulty to return home
(Stranded persons)

- It is predicted that between 3.6M to 6.5M people will have difficulty to return home if an earthquake of more than 6 shindo (seismic intensity) hits Tokyo in daytime.
- If your home is within 10km from your location, you can return. If more than 20km, it is difficult. Every 1km from 10km distance, more 10% of people can’t return. Women wearing high heels can walk a maximum of 4km. On Sundays, you are recommended to try walking back and remember the road home.
- Better way is to look for a bicycle to borrow. Motor bikes might be stopped so as not to obstruct operation of official vehicles.

From Prof. Meguro's 10 recommendations on walking home

1. Discuss with family members about return route.
2. The route should be major roads where you can access more information and safety.
3. Toilets should be identified before hand: in parks, convenience stores, gas stands, etc.
4. Train yourself to walk everyday, say 1.5 hours or so.
5. Prepare things to bring like water, confectionary in walking back home.
6. If possible, go back with colleagues.
7. Collect information before going back.

Don’t take narrow roads to avoid falling objects caused by aftershocks

Medical treatment

1. Medical treatment should be practiced in the “First Aid Center” largely in parks.
2. Or contact the Tokyo Metropolitan Health and Medical Information Center

   Tel. 03-5285-8181

   Time from 9:00 a.m. to 8:00 p.m.

To evacuate or not

1. If your home is a strong concrete building, it won't be necessary to evacuate. Emergency shelters (elementary schools and community centers) and open space like parks are often times insufficient to accept many people.
2. Considering the possibility

   to stay at home,

   prepare water for

   3 days and food for

   9 days with portable

   cooking stove.

Tokyo Metropolitan Government Consultation Service for Foreigners

Foreign Residents' Advisory Center (Southern side, 3rd floor,
First Main Building of the Tokyo Metropolitan Government)
2-8-1 Nishi Shinjuku, Shinjuku-ku, Tokyo 163-8001

- There are foreign language-speaking volunteers of various languages.
- **Language Date of consultation Time & Telephone number**
- **English** Monday – Friday 9:30 a.m. to 12:00 noon 1:00 to 5:00 p.m. **03-5320-7744**
- **Chinese** Tuesday and Friday 9:30 a.m. to 12:00 noon 1:00 to 5:00 p.m. **03-5320-7766**
- **Korean** Wednesday 9:30 a.m. to 12:00 noon 1:00 to 5:00 p.m. **03-5320-7700**
- *National holidays are excluded from consultation days.

The Process of Rehabilitation and Reconstruction

(of housing and livelihood)

- Generally speaking, for the rehabilitation of “life line” (Japanese English), like power, water service, gas, telephone, public transportation, drainage etc, at least 3 days are needed.
- At the time of Hanshin big earthquake, it took

  7 days to recover power and 3 months to recover water service and gas.

- Before the recovery of water, Tokyo metropolitan government served water at “emergency shelters.”

For more information in English

- Tokyo Metropolitan government prepares English guide on how to prepare for a big earthquake.

  http://www.metro.tokyo.jp/ENGLISH/index.htm
- → Guide for Foreign Residents

  → Earthquake Survival Manual (PDF) (86pp)

  http://www.seikatubunka.metro.tokyo.jp/index3files/e-honbun.pdf

- Shizuoka Prefectural Earthquake Preparedness Education Center

  http://www.e-quakes.pref.shizuoka.jp/english/index.htm