



The Great Kanto Earthquake and the Subsequent Progress in Disaster Management and Disaster Risk Reduction Policy in Japan



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1. Policy Progress after the 1923 Great Kanto Earthquake

- Urban reconstruction of the fire-burned areas
- Seismic standards for buildings
- Survey and analysis on the disaster

2. Subsequent Policy Progress

- Typhoon Ise-Wan, 1959
- The Great Hanshin-Awaji Earthquake, 1995
- The Great East Japan Earthquake, 2011

3. Socio-Economic Changes in 100 Years

- Demography
- Media

4. Conclusions

Impact of the Great Kanto Earthquake



Comparison of Three Mega-Earthquakes in Modern Japan

	Great Kanto Earthquake	Great Hanshin-Awaji Earthquake	Great East Japan Earthquake
Date	1 September 1923 Saturday, At 11:58 am	17 January 1995 Tuesday, at 5:46 am	11 March 2011 Friday, at 2:46 pm
Magnitude	M7.9	M7.3	Mw9.0
Death/Missing	Approx. 105,000 people (approx. 90% burned)	Approx. 5,500 people (approx. 70% suffocated/crushed)	Approx. 18,000 people (approx. 90% drown)
Related Death	–	Approx. 900 people	Approx. 3,800 people
Fully Burned/ Destroyed	Approx. 290,000 houses	Approx. 110,000 houses	Approx. 120,000 houses
Economic Damage	Approx. 5.5 billion JPY	Approx. 9.6 trillion JPY	Approx. 16.9 trillion JPY
GDP	14.9 billion JPY	522 trillion JPY	497 trillion JPY
GDP Ratio	Approx. 37%	Approx. 2%	Approx. 3%
National Budget	Approx. 1.4 billion JPY	Approx. 73 trillion JPY	Approx. 92 trillion JPY

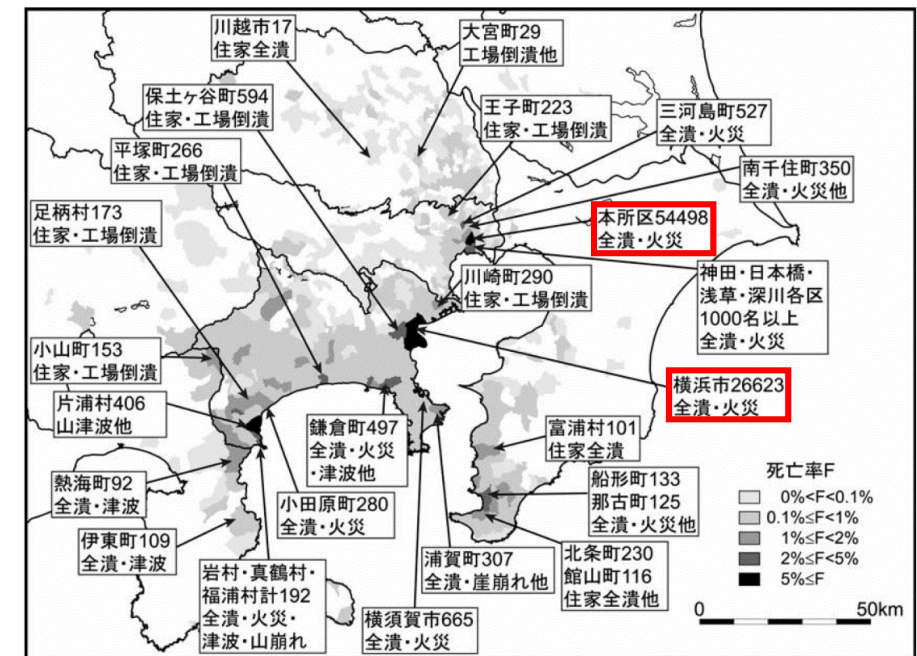
Source: Cabinet Office, based on Moroi and Takemura (2004), Hitotsubashi University, JMA, NPA, FDMA, Reconstruction Agency, National Land Agency, CAO, MOF and Hyogo Prefecture.
 Note: For the Great Kanto Earthquake, "GDP" refers to gross national product.

Causes and Locations of the Damages



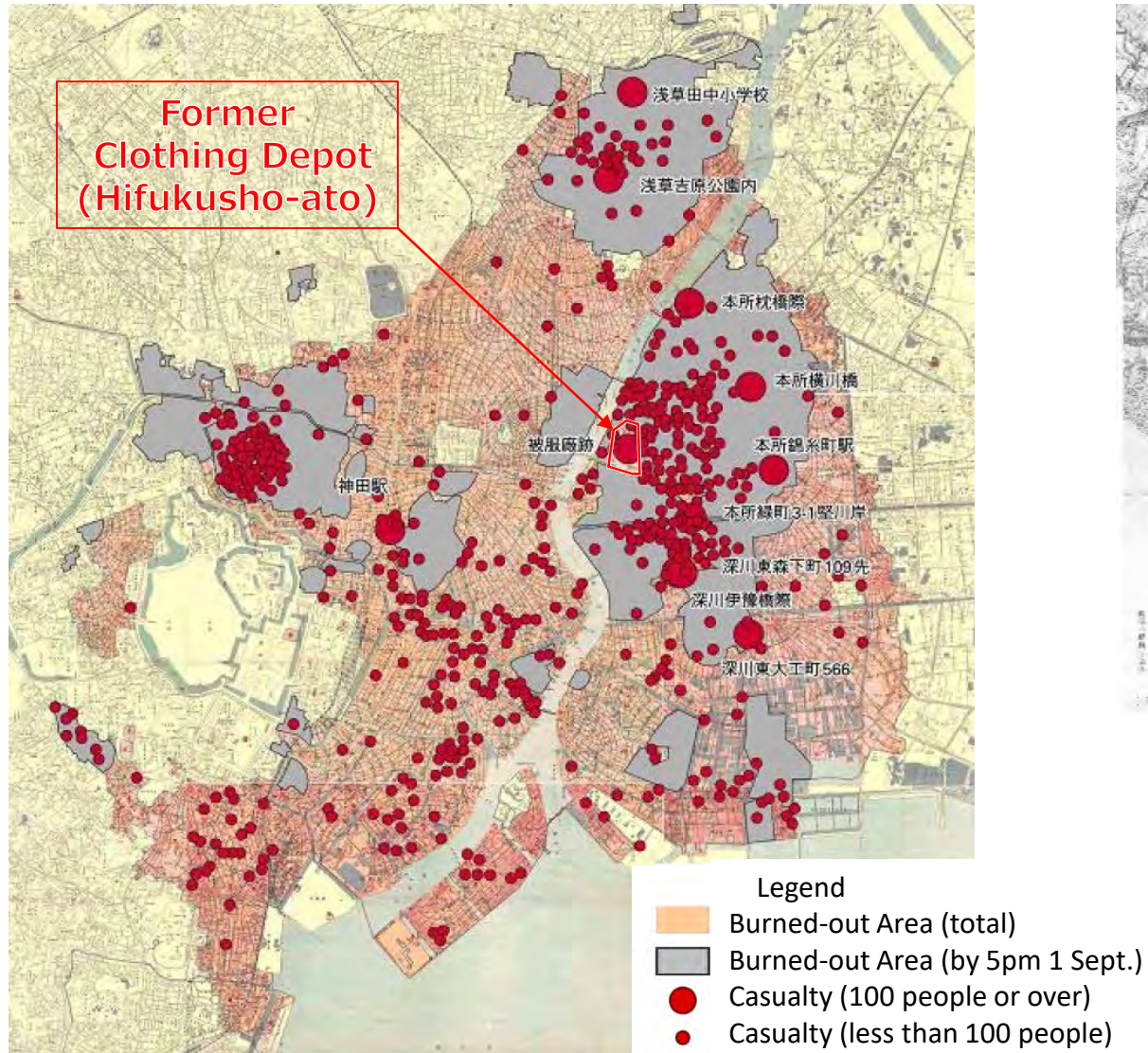
	House Damages		Death/Missing (by causes)			
	Fully burned /destroyed	House collapsed	Burned	Washed out /buried	Damage to factory	Total
Kanagawa	82,530	5,795	25,201	836	1,006	32,838
Yokohama City	30,656	1,977	24,646	0	0	26,623
Tokyo	188,349	3,546	66,521	6	314	70,387
Tokyo City	167,649	2,758	65,902	0	0	68,660
Chiba	13,946	1,255	59	0	32	1,346
Saitama	4,759	315	0	0	28	343
Yamanashi	577	20	0	0	2	22
Shizuoka	3,045	150	0	171	123	444
Other Pref.	181	5	0	0	0	5
Total	293,387	11,066	91,781	1,013	1,505	105,365

Number of Casualties and Fatality Rate

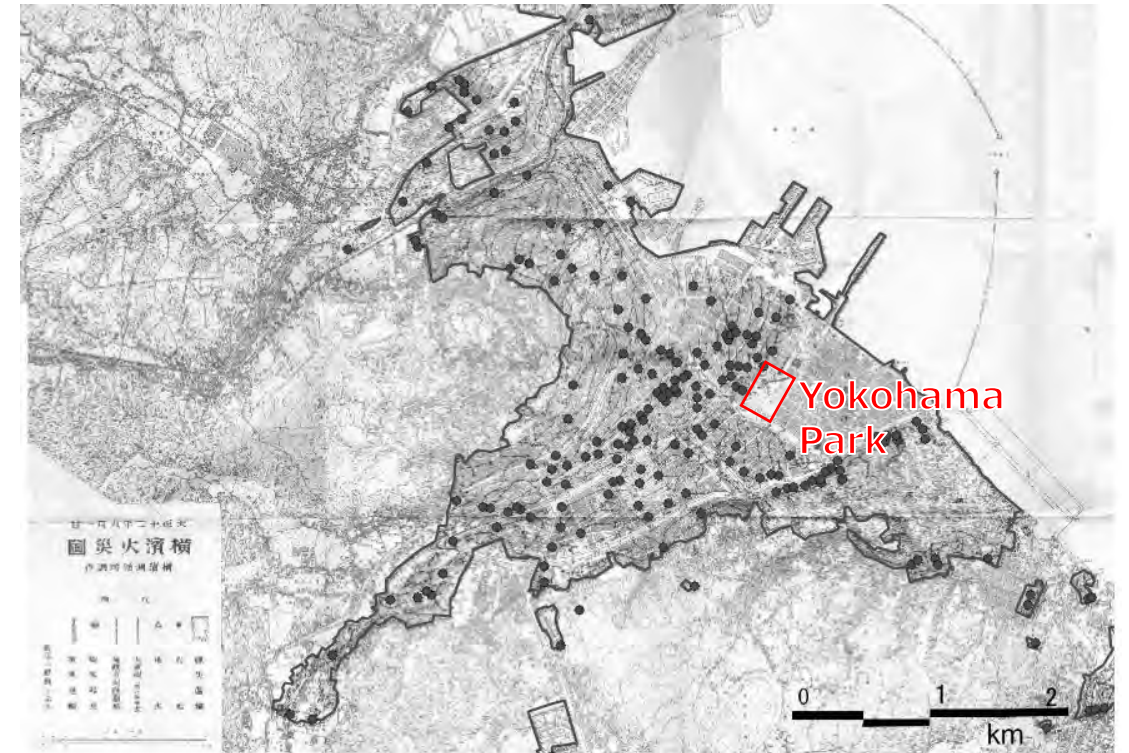


Source: Cabinet Office, based on Moroi and Takemura (2004)

Burned-out Area in Tokyo City (Approx. 34.7km²) and Casualty Hotspots



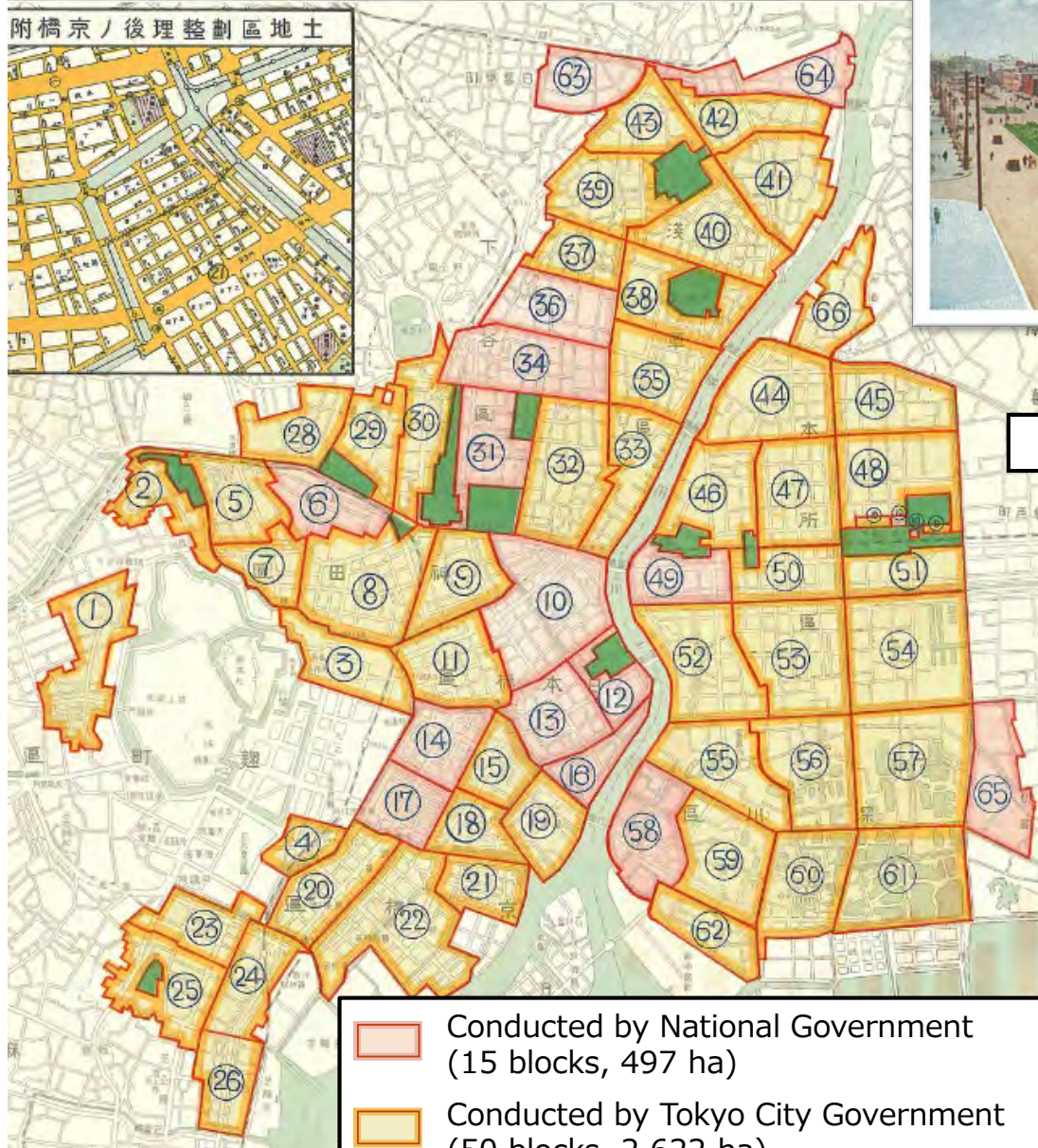
Burned-out Area in Yokohama City (Approx. 10 km²) and Fire Outbreak Hotspots



The Imperial Capital Reconstruction Plan



Land Readjustment Plan



Showa Dori Ave.

Yasukuni Dori Ave.
(Taisho Dori Ave.)

Road Plan





Damage to Office Buildings in Marunouchi District, Tokyo City



Naigai Bldg. (collapsed during construction)



Yusen Bldg. (built in May 1923)



Marunouchi Bldg. (front, built in Feb 1923)
Tokyo Marine Bldg. (behind, built in 1918)



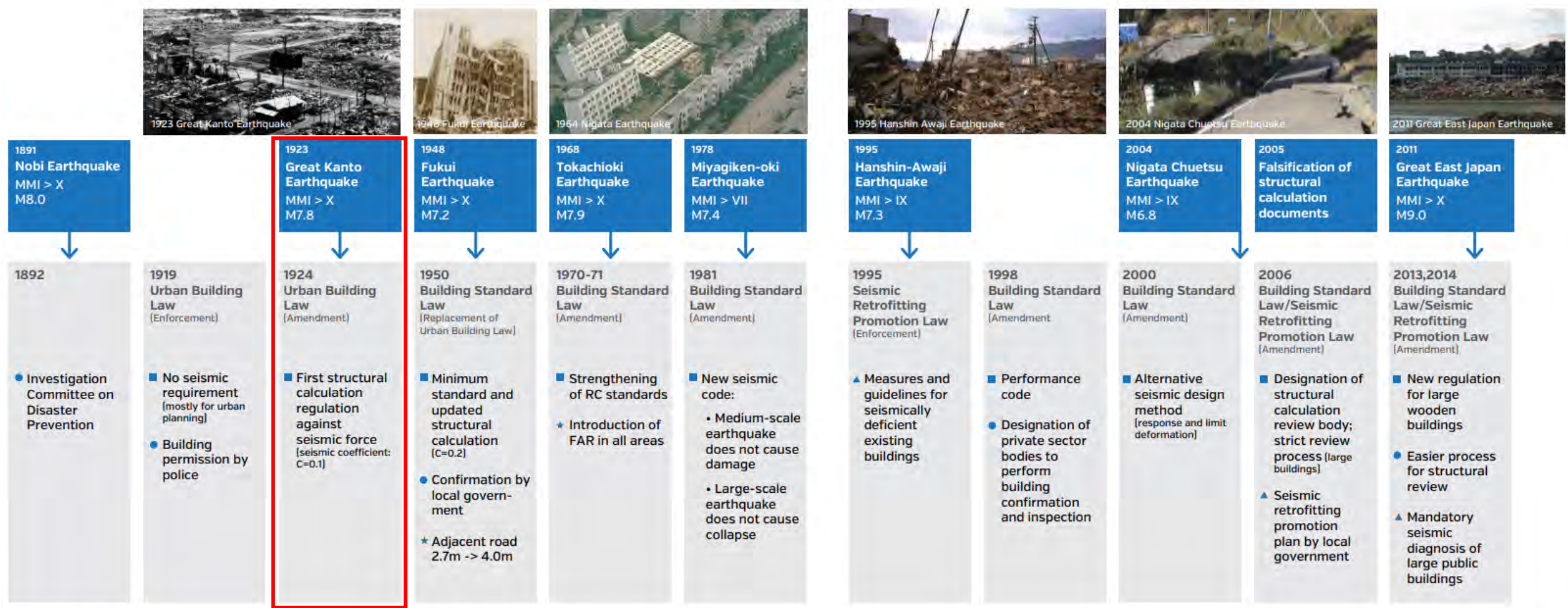
Tokyo Kaikan Bldg.
(built in 1922)



Industrial Bank of Japan (built in 1923)



Incremental Improvements to Seismic Design Standards



■ Building/seismic design
 ● Building confirmation and inspection
 ▲ Retrofitting promotion
 ★ Environmental regulations
 Note: RC= reinforced concrete; FAR= floor area ratio.



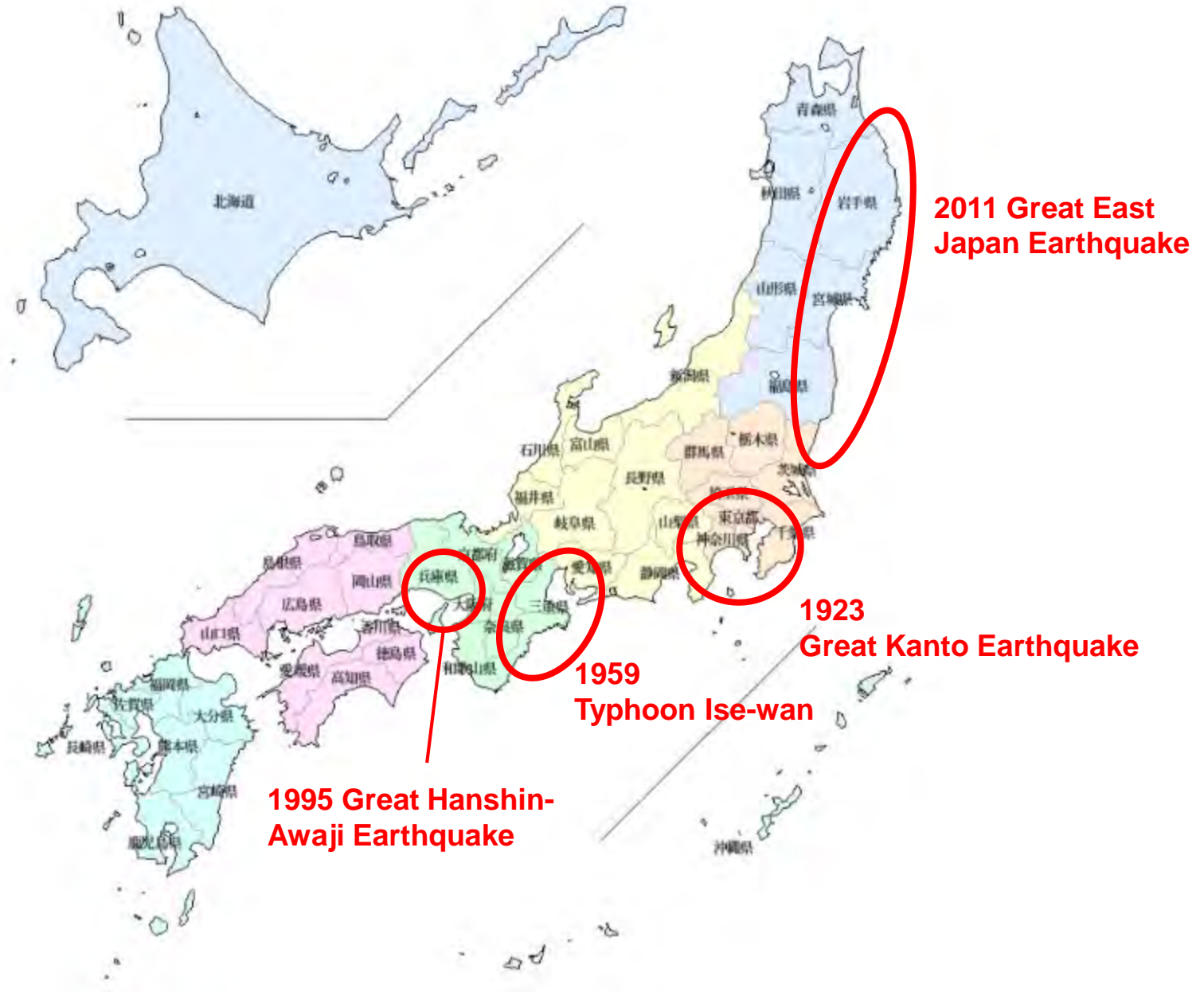
Dynamic Maps of Fire Spread (Study Report by the Seismic Disaster Prevention Committee, 1924)



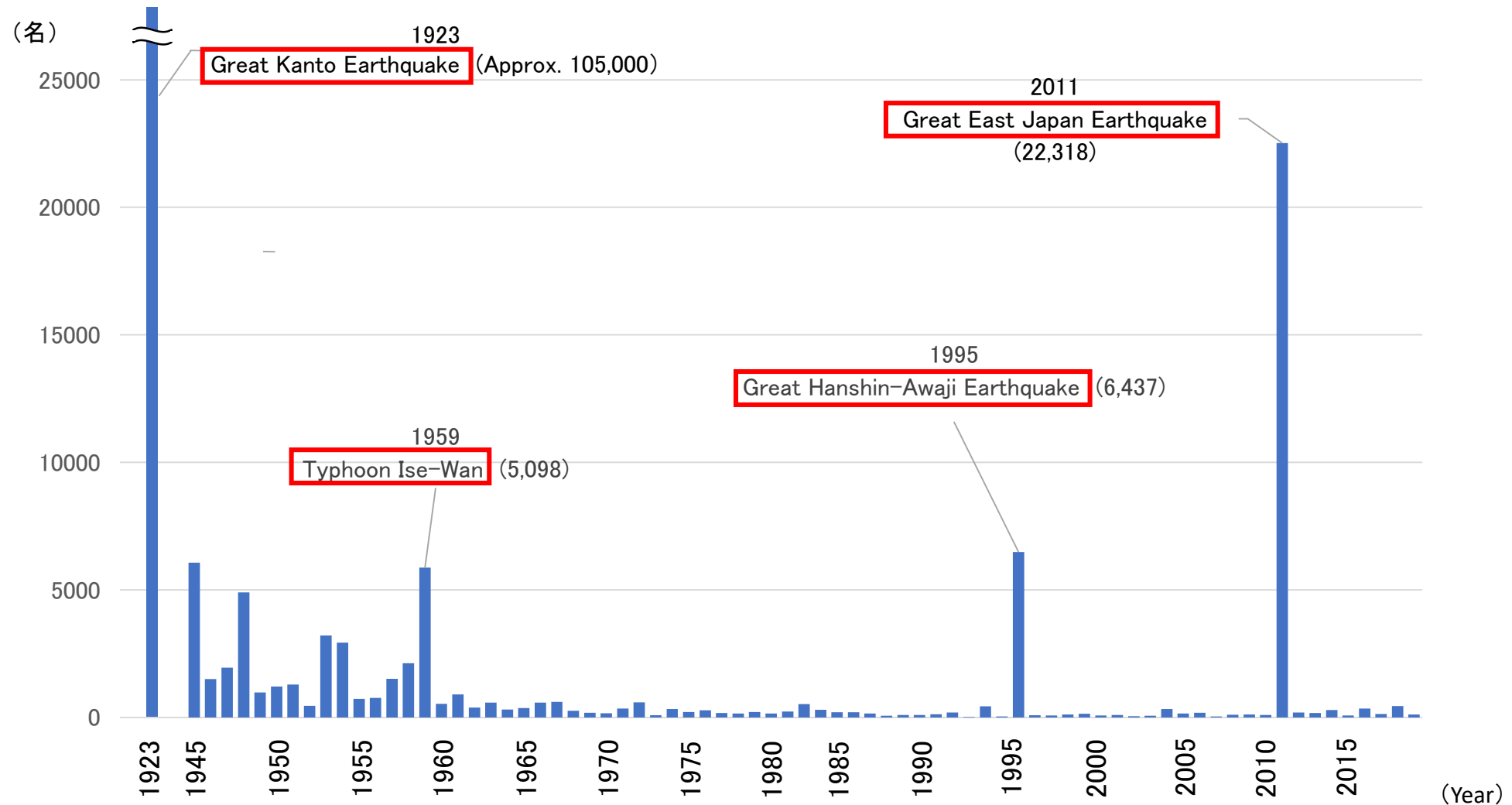
Report Series on the 1923 Great Kanto Earthquake (Central Disaster Management Council, 2006 and 2009)



Four Disasters that Caused Major Damages



Number of Deaths and Missing Persons Due to Natural Disasters



昭20	昭21	昭22	昭23	昭24	昭25	昭26	昭27	昭28	昭29	昭30	昭31	昭32	昭33	昭34	昭35	昭36	昭37	昭38	昭39	昭40	昭41	昭42	昭43	昭44
6,062	1,504	1,950	4,897	975	1,210	1,291	449	3,212	2,926	727	765	1,515	2,120	5,868	528	902	381	575	307	367	578	607	259	183
昭45	昭46	昭47	昭48	昭49	昭50	昭51	昭52	昭53	昭54	昭55	昭56	昭57	昭58	昭59	昭60	昭61	昭62	昭63	平元	平2	平3	平4	平5	平6
163	350	587	85	324	213	273	174	153	208	148	232	524	301	199	199	148	69	93	96	123	190	19	438	39
平7	平8	平9	平10	平11	平12	平13	平14	平15	平16	平17	平18	平19	平20	平21	平22	平23	平24	平25	平26	平27	平28	平29	平30	令元
6,482	84	71	109	141	78	90	48	62	327	148	177	39	101	115	89	22,581	190	173	283	77	344	129	444	155

Typhoon Ise-wan (1959)

- Typhoon Vera (Typhoon Ise-wan) made landfall on September 26 after 6 p.m. in Wakayama Prefecture
- Damage spread across the country, covering huge parts of Wakayama and Aichi in particular, and causing floods due to high tides

○ Human damage		Deaths/Missing Persons:		
	No. of people	5,098		
○ Residential damage		Complete destruction	Partial destruction	Washed away
	No. of homes	35,125	105,347	4,486



Historical Background

- During and after the war, there was a series of damage caused by earthquakes, typhoons, and other disasters, but due to the damages of war, reconstruction did not progress and disaster response took time.

Issues with disaster management laws and systems

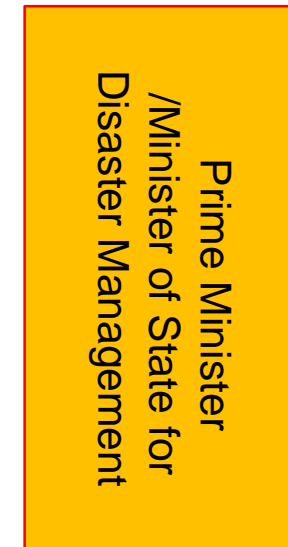
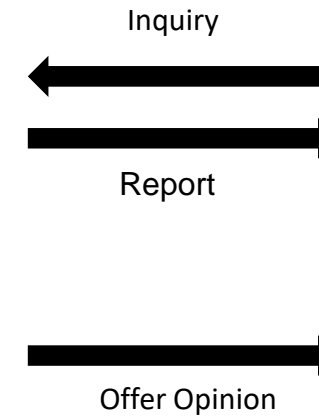
- Unclear division of duties between national government, prefectures and municipalities.
- Poorly-maintained systems for the promotion of comprehensive disaster management governance
- Plans related to disaster management activities were lacking



Enactment of the Basic Act on Disaster Management (November 1961)

- Clarification of duties relating to disaster management ⇒ **Stipulation of duties of national government, prefectures, municipalities and citizens**
- Comprehensive disaster management administration ⇒ **Establishment of the National Disaster Management Council**
- Systematic disaster management governance ⇒ **Production of basic disaster management plans**, which are the comprehensive and long-term plans for disaster management

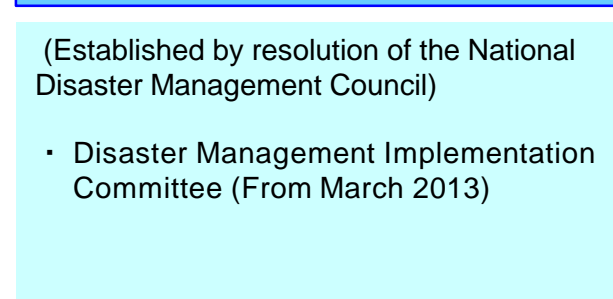
National Disaster Management Council



Officers Meeting



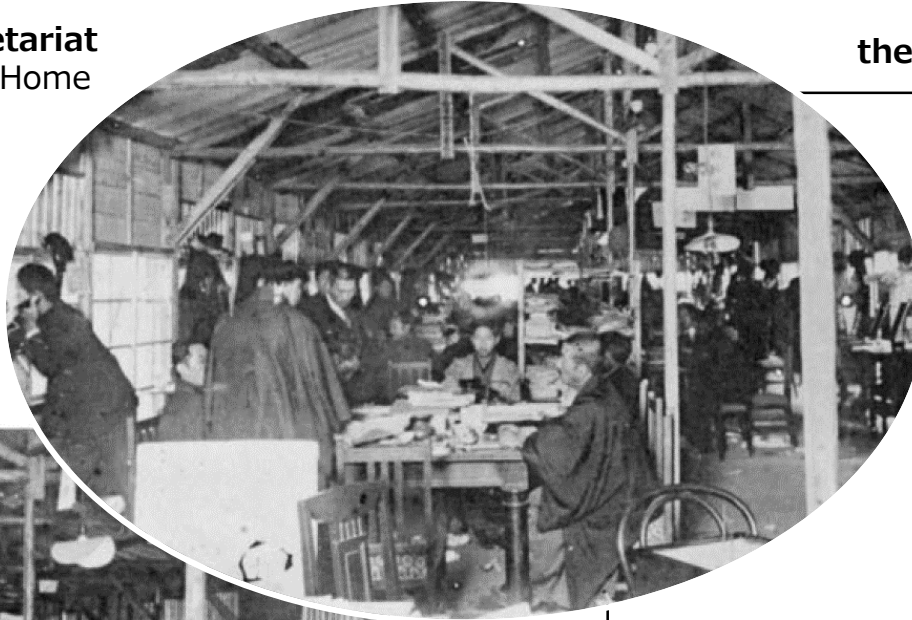
Committees for Technical Investigation



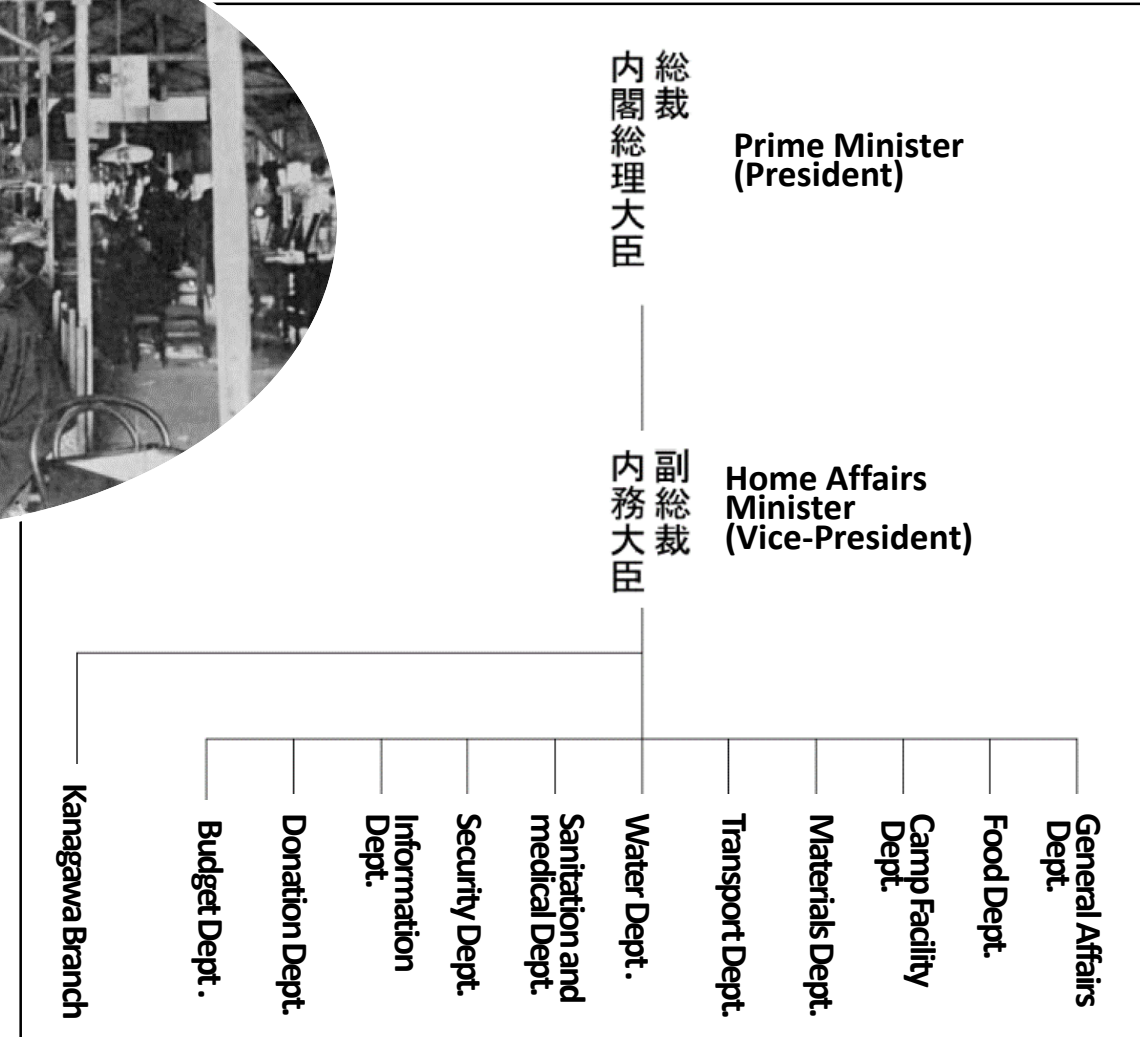
National Emergency Response in 1923 Great Kanto Earthquake



Special Earthquake Disaster Relief Secretariat was set up at a barrack in the courtyard of Home Affairs Minister's Official Residence.



Organization Chart of the Special Earthquake Disaster Relief Secretariat



Great Hanshin-Awaji Earthquake (1995)

- Magnitude 7.3 (seismic intensity 7) earthquake that struck at 5:46 a.m. on January 17, 1995
- Caused huge damage due to the collapse of buildings with inadequate seismic resistance, as well as damage to highways, railroads, harbors and lifelines, etc. (just under 80% of the deaths were caused by the collapse of buildings)
- 1.37 million volunteers from across Japan descended on the disaster area

○ Human damage

	Deaths/Missing Persons:	Casualties
No. of people	6,437	43,792

○ Residential damage

	Complete destruction	Partial destruction
No. of homes	104,906	144,274

(Response based on the Great Hanshin-Awaji Earthquake)

- Enactment of laws promoting proactive seismic diagnosis and repairs
- Enactment of laws to provide financial support and life support to disaster affected peoples
- After major earthquakes, relevant government agencies immediately convene the emergency response team to carry out the initial response

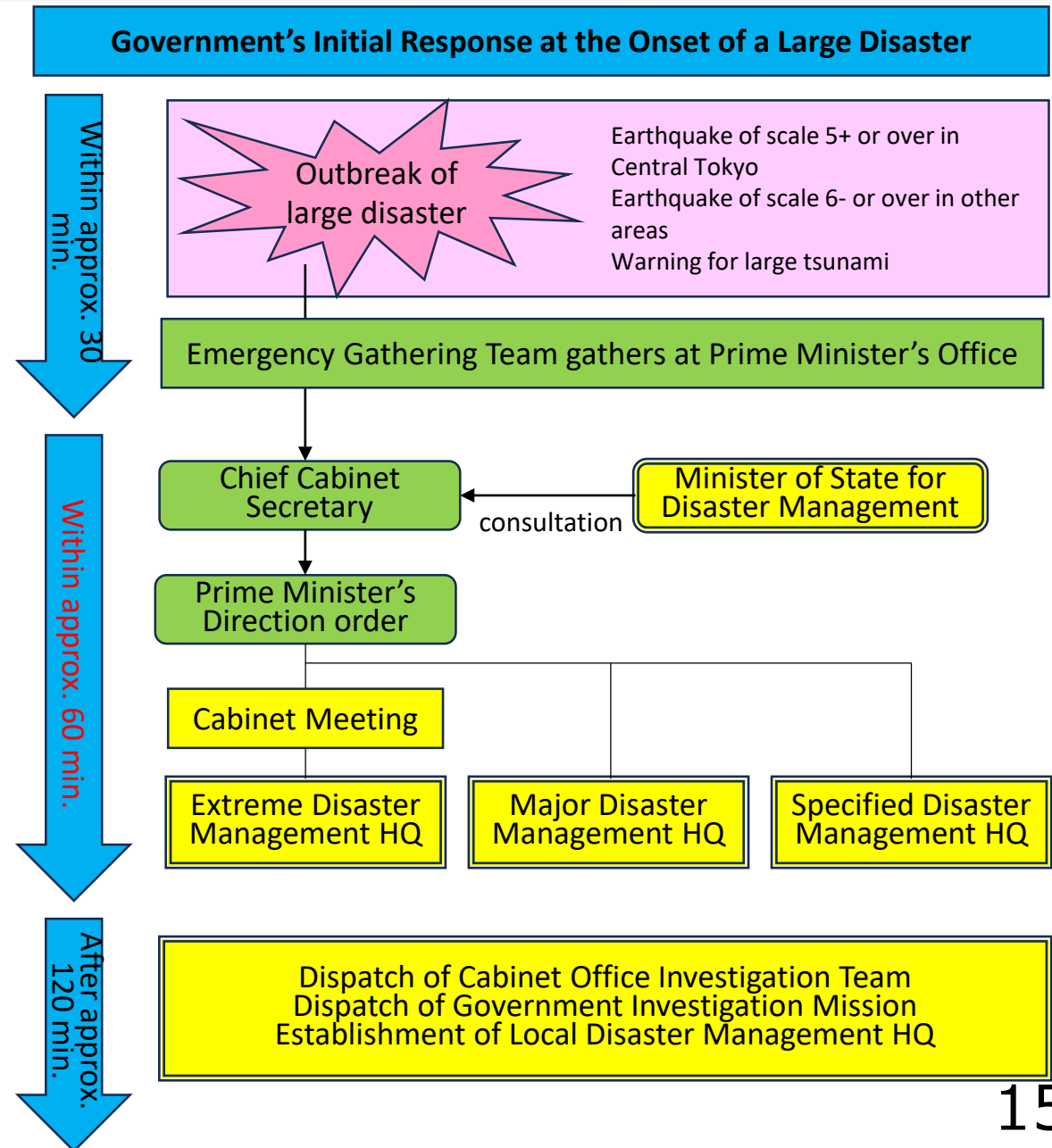
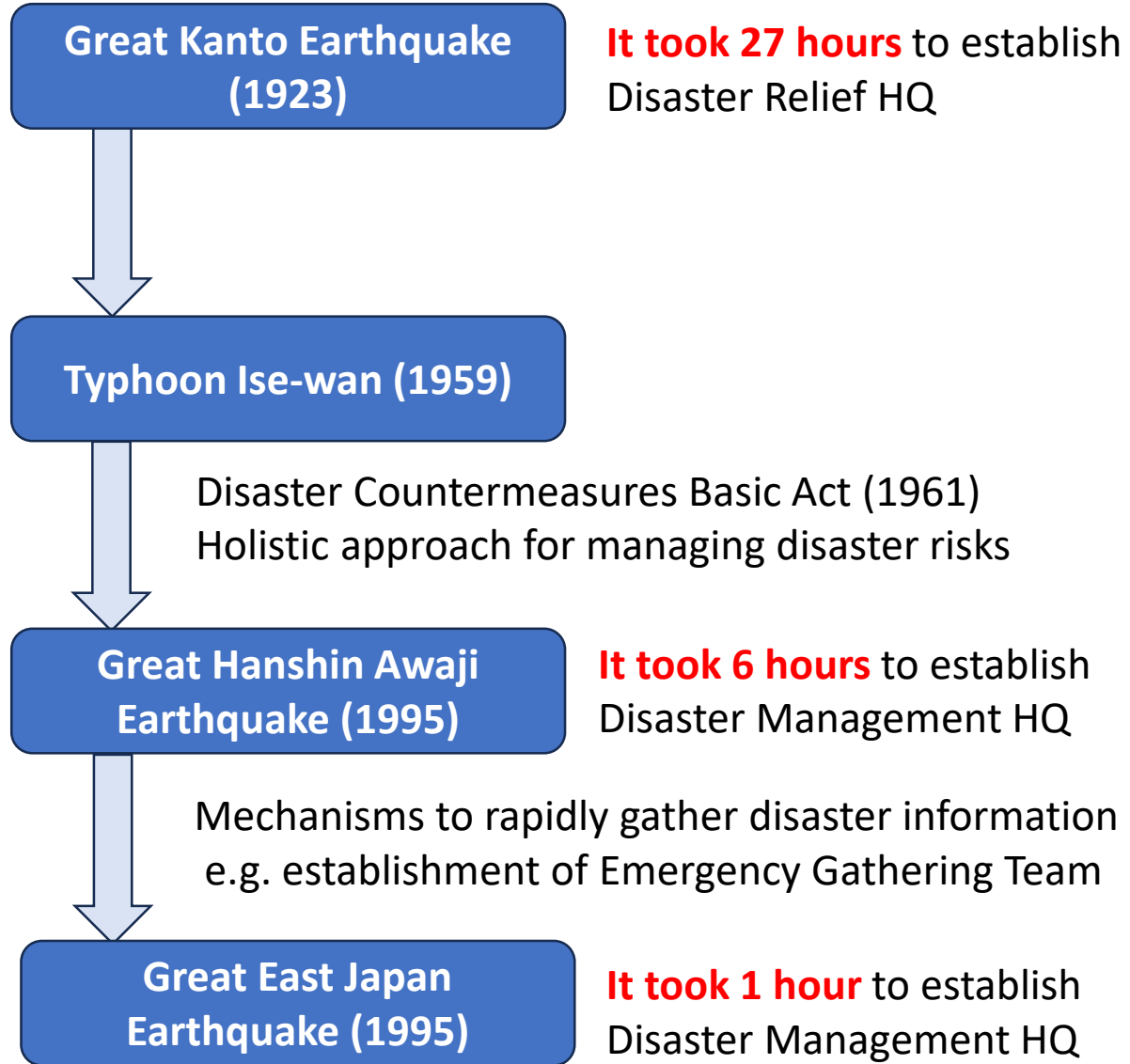


Damage to Port of Kobe



Collapsed 4-storey building (Kobe)

National Emergency Response Coordination System



History of Disaster Volunteers in Japan



	Major Disaster and Volunteer Activities	Trends in Disaster Volunteers	Government's Policy Development
	1923 Great Kanto EQ	<i>"Prehistoric" surge of disaster volunteers</i>	
1st Phase	1995 Great Hanshin-Awaji EQ 1997 Nahotoka heavy oil spill	<ul style="list-style-type: none"> • "1995: Birthyear of Volunteers" 	1995 Revision of the Basic Act on Disaster Management
2nd Phase	2004 Typhoon No. 23 2004 Niigata Chuestsu EQ 2009 Typhoon No. 9	<ul style="list-style-type: none"> • Local social welfare councils lead the management of Volunteer Centers (for individual volunteer workers) 	2004- Committee on Disaster Volunteer Activities
3rd Phase	2011 Great East Japan EQ 2014 Hiroshima heavy rainfall 2015 Kanto-Tohoku heavy rainfall	<ul style="list-style-type: none"> • Volunteer activities by NPOs, NGOs and private companies • Coordination of non-individual volunteers raised as an issue 	2013 Revision of the Basic Act on Disaster Management
4th Phase	2016 Kumamoto EQ 2017 Northern Kyushu heavy rainfall 2018 July 2018 heavy rainfall 2018 Hokkaido Iburi-Tobu EQ 2019 Typhoon No. 15 2019 Typhoon No. 19 2020 July 2020 heavy rainfall	<ul style="list-style-type: none"> • Information sharing meetings in disaster affected areas • Tripartite partnerships among governments, social welfare councils and NPOs 	2018 Guidebook on Coordination with Volunteers and NPOs 2019 Partnership agreement with JVOAD 2023 Revision of the Basic Plan for Disaster Management (to include "Disaster Intermediary Organizations")

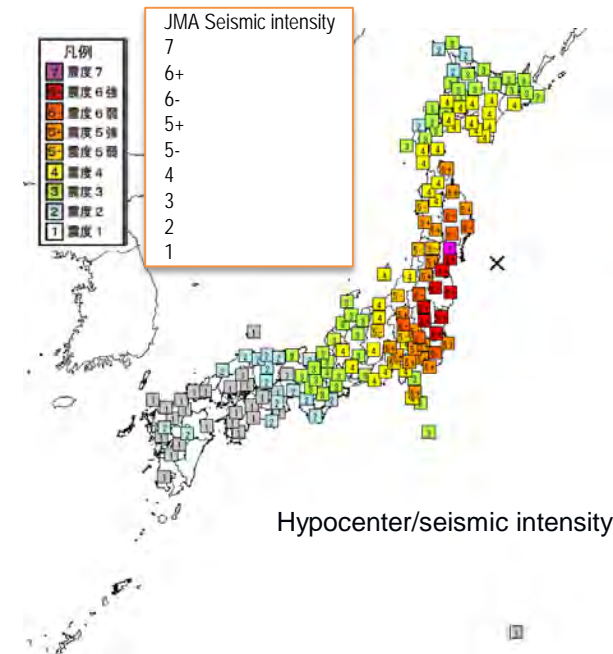
Great East Japan Earthquake (2011)

- Magnitude 9.0 (seismic intensity 7) earthquake that struck at 2:46 p.m. on March 11, 2011
- The large tsunami caused by the earthquake caused extensive damage mainly on the Pacific side of the Tohoku region.

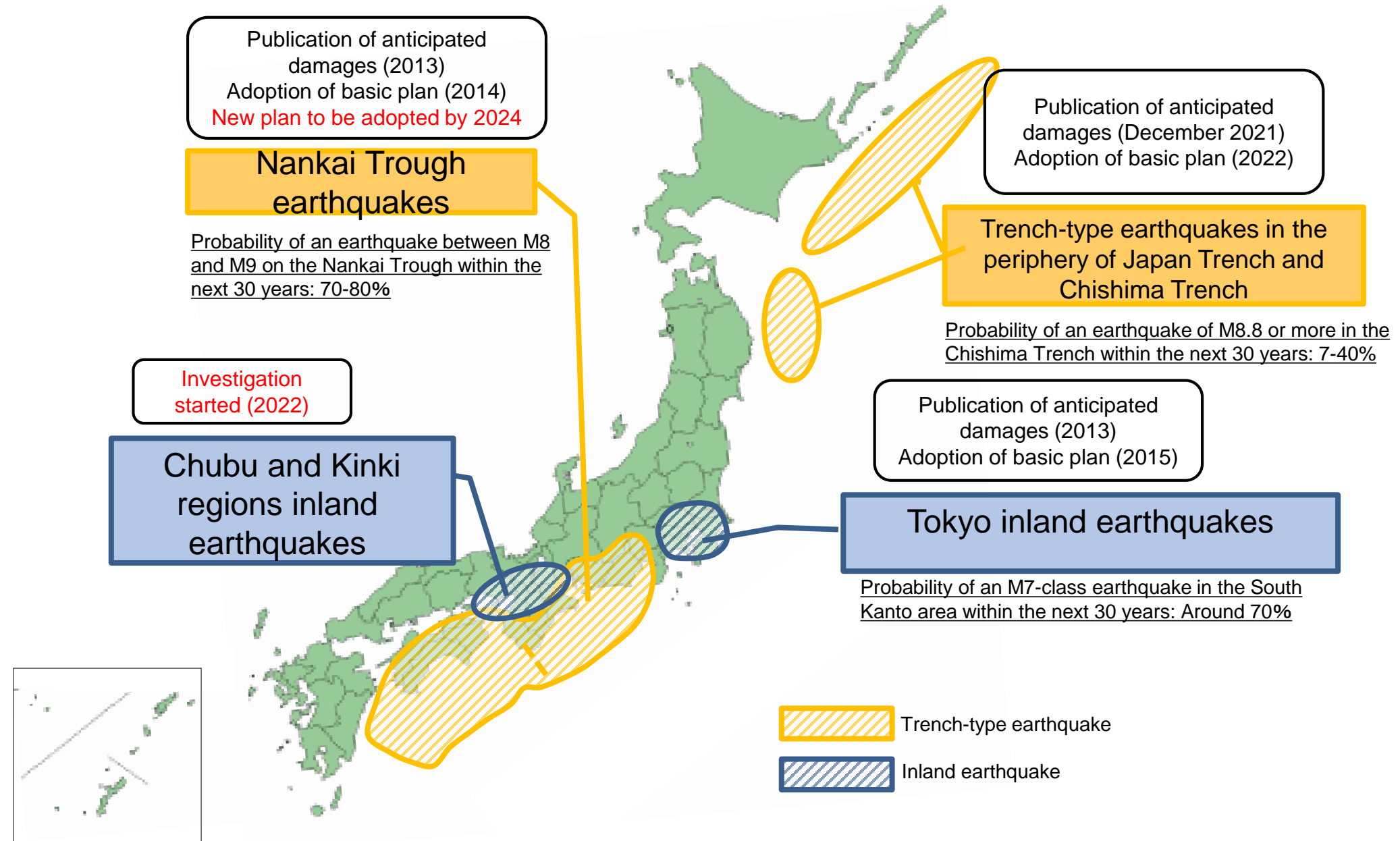
○ Human damage		Deaths	Casualties
	No. of people	22,312	6,242
○ Residential damage		Complete destruction	Partial destruction
	No. of homes	122,006	283,160

(Response based on the Great East Japan Earthquake)

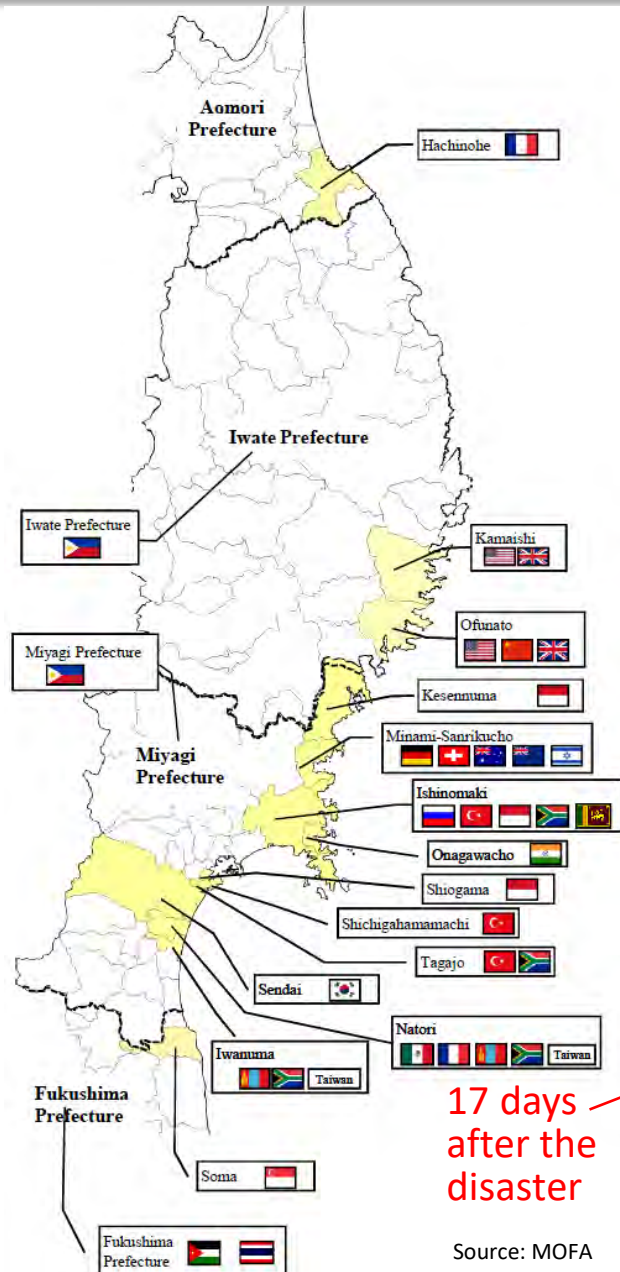
- Reconstruction Agency established by the national government for prompt reconstruction
- Revision of the Basic Act on Disaster Management. for measures such as...
 - ✓ National government can take charge of emergency measures in disaster-struck municipalities
 - ✓ Systems allowing the national government to supply goods to disaster areas (push support)
 - ✓ Prepare a list of those who require special consideration during evacuation.
- In the Pacific seaboard region, in preparation for the Nankai Trough earthquake, which is expected to include a massive earthquake and tsunami, initiatives are being implemented starting with advance countermeasures through to the post-earthquake response and restoration/reconstruction activities



Large-Scale Earthquakes Anticipated in the Future



International Urban Search and Rescue Teams active in 2011



Initial 72 hours

17 days after the disaster

Arrival	Dispatched from	Number of persons	Cooperated by
11 March	-	-	-
12 March	ROK (1 st)	5 (with 2 dogs)	NPA (transport by MOD)
	Singapore	5 (with 5 dogs)	NPA (transport by MOD)
13 March	Germany	41 (with 3 dogs)	FDMA
	Switzerland	27 (with 9 dogs)	FDMA
	United States	144 (with 12 dogs)	FDMA
	China	15	FDMA (transport by MOD)
	United Kingdom	69 (with 2 dogs)	FDMA (transport by MOD)
	New Zealand (1 st)	7	FDMA
14 March	ROK (2 nd)	102	NPA
	New Zealand (2 nd)	45	FDMA
	Mexico	12 (with 6 dogs)	NPA
	Australia	72 (with 2 dogs)	FDMA
	France	134	NPA
	Taiwan	28	NPA
	Russia (1 st)	75	NPA
15 March	Mongolia	12	NPA
16 March	Russia (2 nd)	79	NPA
18 March	Indonesia	15	-
	South Africa	45	NPA
19 March	Turkey	32	NPA
28 March	India	46	NPA
12 May	Sri Lanka	15	-

Source: MOFA

Source: Cabinet Office (edited)

International Aid for the Great Kanto Earthquake, 1923

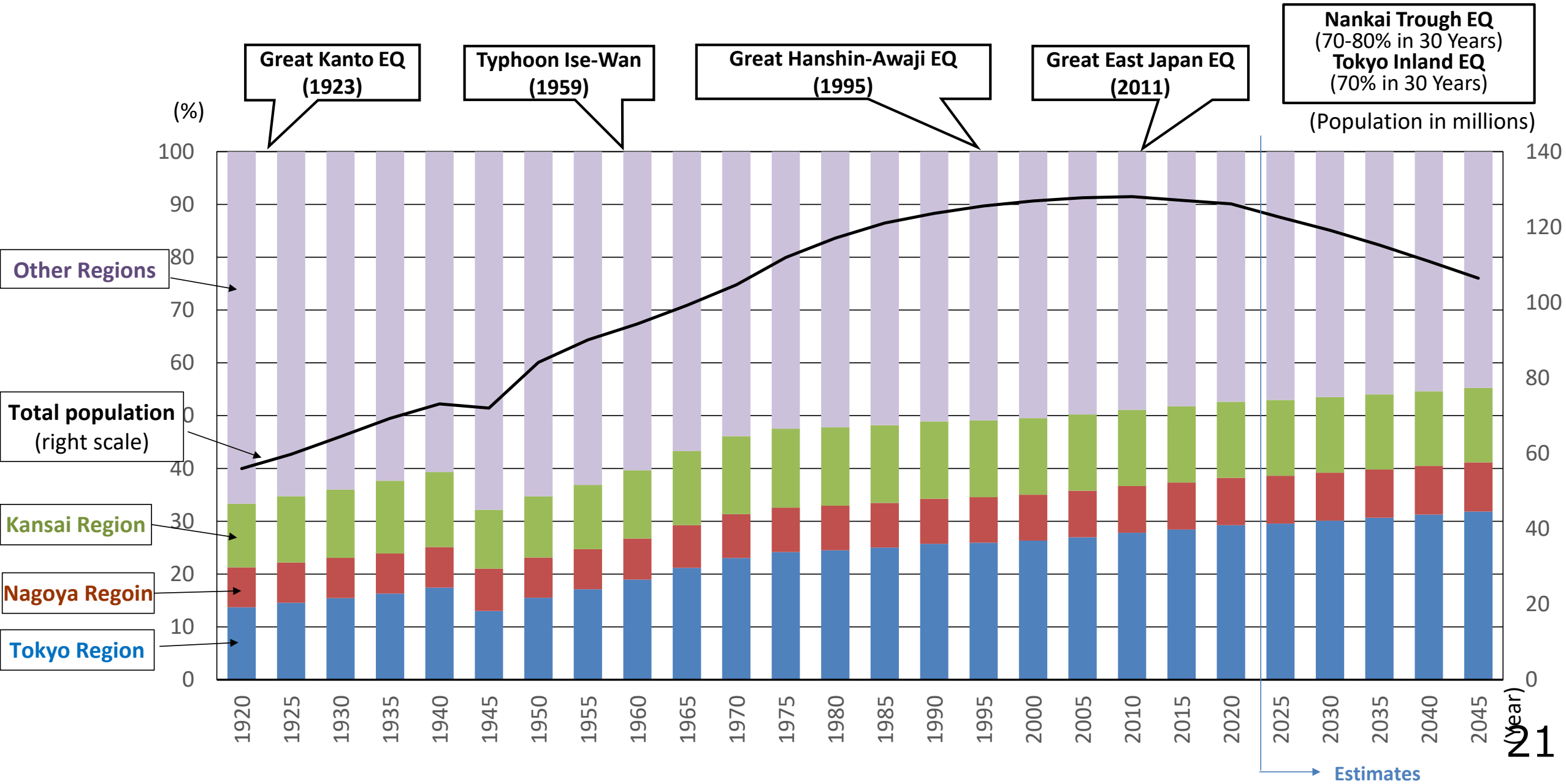


Source: New York Times (1923)

(President) Coolidge Cables Sympathy to Emperor of Japan; Navy Orders Vessels to Yokohama for Relief

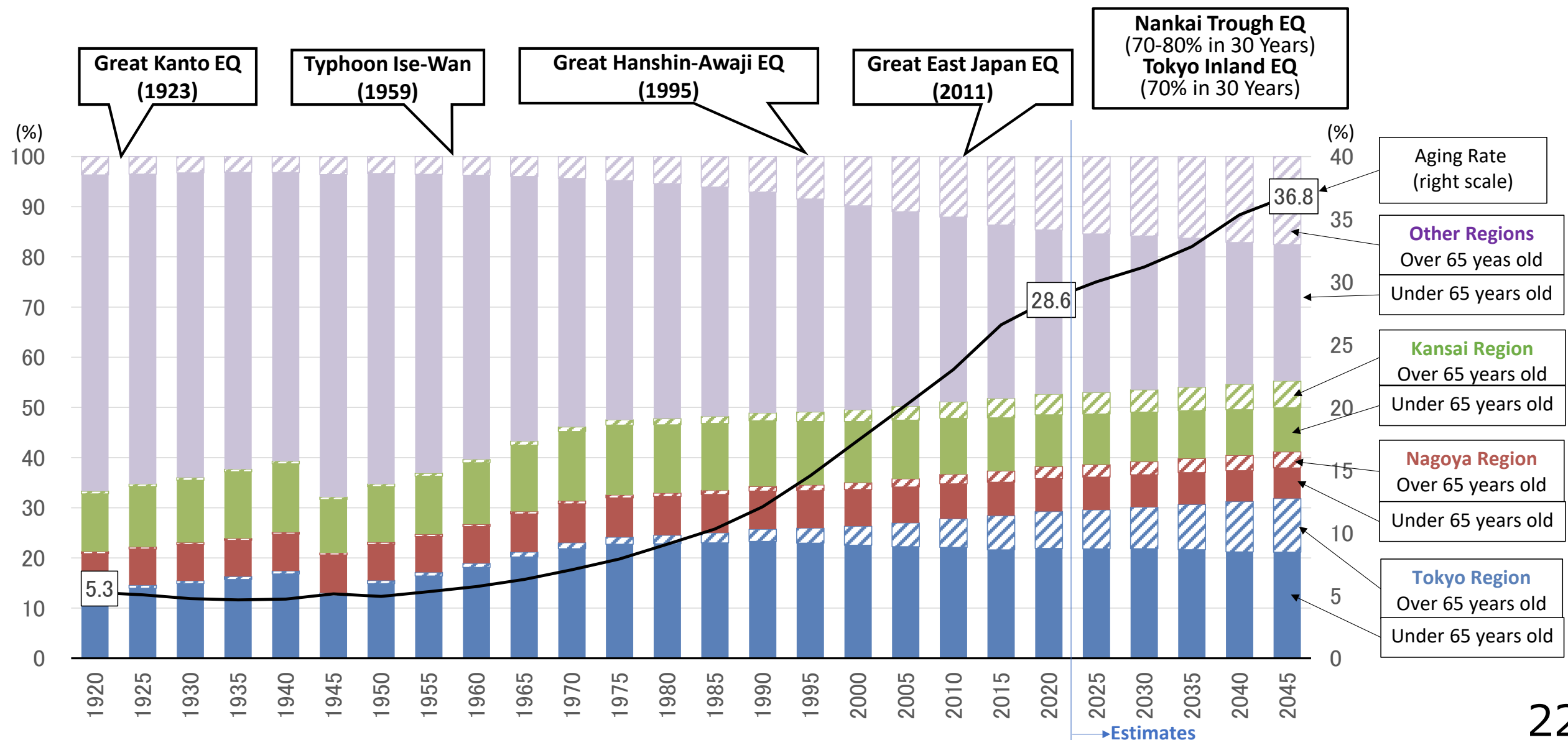
	Great Kanto Earthquake, 1923	Great East Japan Earthquake, 2011
Donations from overseas (A)	22.1 million JPY	22.5 billion JPY
Total donations (B)	64.6 million JPY	342.5 billion JPY
Share (A) / (B)	34%	7%
National budget (C)	1.4 billion JPY	92 trillion JPY
Share (A) / (C)	1.6%	0.02%

Change in 100 Years – Concentration of Population to Tokyo





Change in 100 Years – Aging of Population

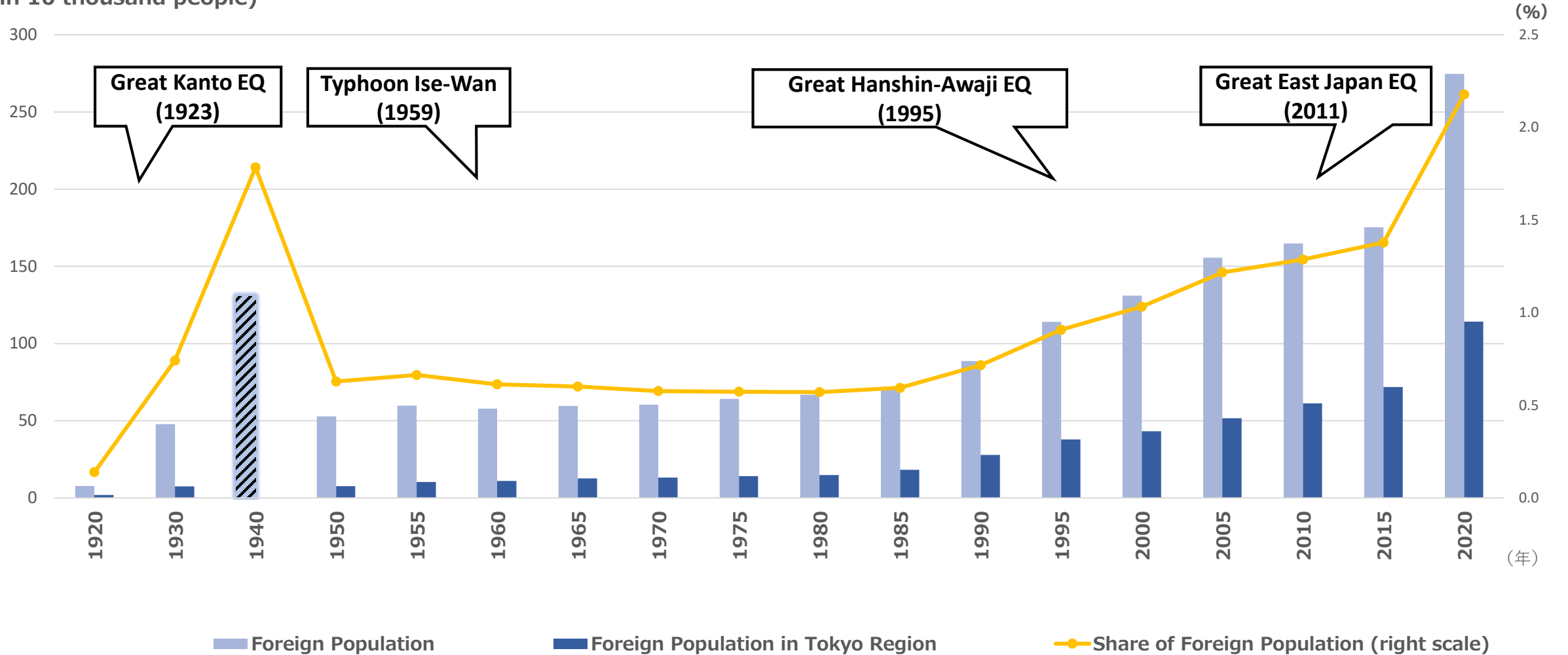




Change in 100 Years – Increase of Foreigners

Number of Foreigners Living in Japan

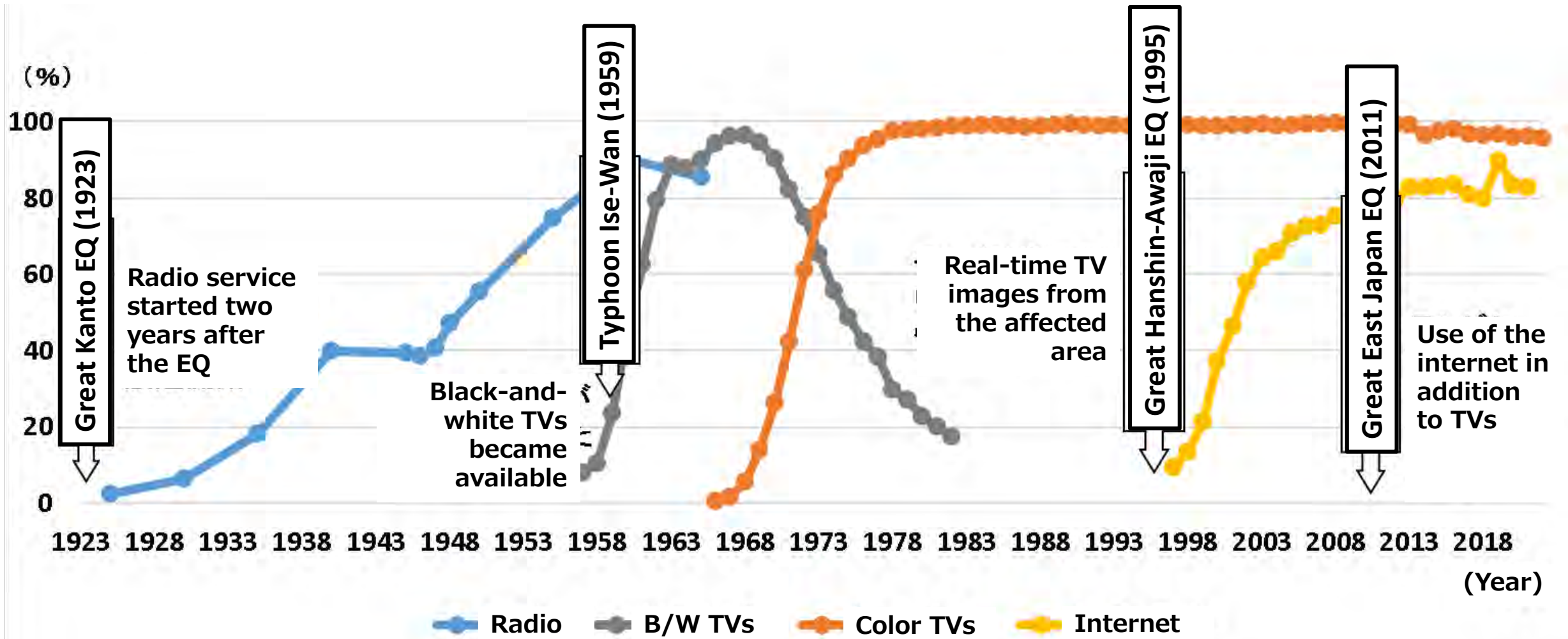
(in 10 thousand people)





Change in 100 Years - Communication Media

Household Penetration Rate





1. Significant progress has been made in disaster management and disaster risk reduction policy after the 1923 Great Kanto Earthquake.
2. The progress in structural measures after the WWII has minimized the number of casualties and people's awareness against large-scale disasters.
3. Some "forgotten" lessons from the Great Kanto Earthquake were reminded at subsequent large-scale disasters.
4. The 2011 Great East Japan Earthquake reminded us that the impact of large-scale disasters cannot be minimized by structural measures and thus disaster management mechanisms must be further strengthened.
5. Documenting a disaster, based on thorough survey and analysis, provides the foundation of policy progress and review.