Japan Residential EQ Ins. System Evolution and New Approaches in Claim Handling

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Japan Earthquake Reinsurance Co., Ltd.

Presentation Outline

I. Seismic Risk in Japan

II. Residential EQ Insurance System & Its Evolution

III. Reinsurance Structure

IV. New Approaches in Claims Handling

Where are we?

Worldwide Hypocenter Distribution (for Magnitude 6 and Higher Earthquakes) and Plate Boundaries



Source: Formulated by the Japan Meteorological Agency based on earthquake data from the U.S. Geological Survey (as of March 14, 2022) https://www.bousai.go.jp/en/documentation/white paper/pdf/2022/R4 hakusho english.pdf





	日付 Date 1	也震名または震源 Earthquakes or Hypocenters
D	1993.1.15	平成5年釧路沖地震 Kushira-aki Earthquake
2	1994.10.4	平成6年北海道東方沖地震 Hokkaido-Toho-oki Earthquake
3	1994.12.28	平成6年三陸はるか沖地震 Sanriku-Haruka-oki Earthouake
Э	1995.1.17	平成7年兵庫県南部地震(阪神·淡路大震災) Hyogo-ken-Nanbu Earthquake (Great Hanshin-Awajji Earthquake)
5	1997.5.13	鹿児島県薩摩地方 Satsuma region in Kagoshima Prefecture
3	1998.9.3	岩手県内陸北部 Northern region in Iwate Prefecture
7	2000.7.1	新島•神津島近海 Niijima and Kozushima Earthquake
3	2000.10.6	平成12年鳥取県西部地震 Tottori-seibu Earthquake
9	2001.3.24	平成13年芸予地震 Geiyo Earthquake
D	2003.5.26	宮城県沖 Miyagi-ken-oki Earthquake
D	2003.7.26	宮城県北部 Northern Miyagi Earthquake
Ð	2003.9.26	平成15年十勝沖地震 Tokachi-oki Earthquake
3	2004.10.23	平成16年新潟県中越地震 Niigata-ken-Chuetsu Earthquake
D	2005.3.20	福岡県西方沖 Fukuoka-ken-Seihou-oki Earthquake
Ð	2005.8.16	宮城県沖 Miyagi-ken-oki Earthquake
D	2007.3.25	平成19年能登半島地震 Noto-hanto Earthquake, 2007
D	2007.7.16	平成19年新潟県中越沖地震 Niigata-Chuetsa-oki Earthquake, 2007
D	2008.6.14	平成20年岩手・宮城内陸地震 Iwate-Miyagi Inland Earthquake, 2008
Ð	2008.7.24	岩手県沿岸北部 Northern coastal area of Iwate Prefecture
Ð	2009.8.11	駿河湾 Suruga Bay
Ð	2011.3.11	東北地方太平洋沖地震(東日本大震災) Great East Japan Earthquake
2	2016.4.14/4.16	5 平成28年熊本地震 The 2016 Kumamoto Earthquake
3	2018.9.6	平成30年北海道胆振東部地震 The 2018 Kokkaido Eastern Iburi Earthquake

Anticipated Large-scale **Earthquakes**



Source : Cabinet Office, Government Japan (http://www.bousai.go.jp/1info/pdf/saigaipamphlet_je.pdf)

Seismic Hazard Map

Distribution map of occurrence probabilities of ground motions equal to or larger than JMA seismic intensity 6 Lower, occurring within 30 years from the present. (start date : Jan.1st 2020)

Source : The Headquarters for Earthquake Research Promotion, Japan(http://www.jishin.go.jp/)

(Approximate reference)

Which one is more likely to happen?

Maximum Damage (Worst-Case Scenario)

* The results of multiple case were combined to show the maximum height in a given area. Source: Committee for Modeling a Nankai Trough Megaquake, Cabinet Office

Maximum Damage (Worst-Case Scenario)

Damage Estimation from the Tokyo Inland Earthquake

70% Within 30yrs

Source : Cabinet Office, Government Japan (http://www.bousai.go.jp/1info/pdf/saigaipamphlet_je.pdf)

I Residential EQ Insurance System & Its Evolution

Establishment

- Established in 1966 with a government sponsored reinsurance program after the 1964 Niigata Earthquake.
- Operated jointly by government and the private sector based on "the Law concerning Earthquake insurance"
- Even with the government's credit and financial capacity, it is difficult to provide 100% coverage in the event of a major earthquake. Therefore the purpose of earthquake insurance is NOT "complete reconstruction of houses" BUT "stability of life".

Law Concerning Earthquake Insurance (Law No.73, May 18 1966)

(Objective)

Article 1. The objective of this law is to promote the diffusion of earthquake insurance by having the Government reinsure the earthquake insurance liabilities of insurance companies, etc. thereby <u>helping</u> to stabilize the livelihoods of the victims of earthquake, etc.

Position

In-home disaster measures; Anchoring of furniture, Participation in disaster drills
Reinforcing earthquake-resistance of houses

•Risk finance; Saving, EQ insurance, etc.

Local community partnership

•Independent disaster prevention organization ; Initial fire extinction and rescue

Contents

(JPY0.2=TWD1)

Coverage	Residential Buildings and /or Household goods				
Coord of	Fire, Destruction or Flood resulting from Earthquake, Volcanic eruption and Tsunami				
Scope of Cover	*Fire insurance does NOT cover any losses caused by fire resulting from an earthquake, volcanic eruptions and tsunami.				
Underwriting	 Arranged as an optional rider to fire insurance policy. Compulsory for insurers / Non-compulsory for homeowners 				
Amount Insured	 30%~50% of the insured amount of fire insurance policy. Limited to a maximum of JPY 50mil[*]. for a building and JPY 10mil[*]. for household property. (*TWD 10mil.) (*TWD 2mil.) 				
Aggregate limit of Indemnity	 JPY 12 trillion[*] per any one occurrence. (*TWD 2,400bn) Determined on the assumption of the recurrence of the Great Kanto Earthquake (1923). If exceeded, claims payable could be reduced pro rata by the proportion of JPY 12 trillion to the total amount of claims. 				

Payment of insurance claims

"Stepped payment method" has been put in place to deal with the large number of surveys that are expected to be carried out in the event of a major earthquake.

	Residentia	Household property		
Loss category	Amount of loss of or damage to the main structural parts of the building the current value of the building	The area of floor space burnt down or swept away The total floor space	Amount of loss of or damage to the property the current value of the property.	
Total loss	50% ≦ x	70% ≦ x	80% ≦ x	
Large half loss	40% ≦ x < 50%	50% ≦ x < 70%	60% ≦ x < 80%	
Small half loss	20% ≦ x < 40%	20% ≦ x < 50%	30% ≦ x < 60%	
Partial loss	3% ≦ x < 20%	Over floor level of over 45cm above the ground	10% ≦ x < 30%	

Loss category	category Amount of insurance claim paid					
Total loss	100% of amount insured					
Large half loss	60% of amount insured					
Small half loss	30% of amount insured					
Partial loss	5% of amount insured					

Premium

Per one year insurance period and 10 million yen of amount insured (Unit: yen)

Location classifica- tion	Prefecture	Non wooden	Wooden		
1	Hokkai-do, Aomori-ken, Iwate-ken, Akita-ken, Yamagata-ken, Tochigi-ken, Gunma-ken, Niigata-ken, Toyama-ken, Ishikawa-ken, Fukui-ken, Nagano-ken, Gifu-ken, Shiga-ken, Kyoto-fu, Hyogo-ken, Nara-ken, Tottori-ken, Shimane-ken, Okayama-ken, Hiroshima-ken, Yamaguchi-ken, Fukuoka-ken, Saga-ken, Nagasaki-ken, Kumamoto-ken, Oita-ken, Kagoshima-ken	7,300	11,200		
2	Miyagi-ken, Fukushima-ken, Yamanashi-ken, Aichi-ken, Mie-ken, Osaka-fu, Wakayama-ken, Kagawa-ken, Ehime-ken, Miyazaki-ken, Okinawa-ken	11,600	19,500		
	Ibaraki-ken, Tokushima-ken, Kochi-ken	23,000			
3	Saitama-ken	26,500	41,100		
	Chiba-ken, Tokyo-to, Kanagawa-ken, Shizuoka-ken	27,500			

Discounts

based on seismic capacity

<u>10%~50%</u>

Determined by **statistical models based on anticipated seismic events in the future**, rather than historical data on past seismic events. <u>The rates range from 0.73% to 4.11%</u>

The law requires that earthquake insurance premium rates **be kept as low as possible**. 17

	(1004)	Effective Date	Degree of loss	Insurable Proportion	Limit of Cover	Aggregate Limit
	Niigata EQ	June 1, 1966 (Established)	①Total Loss Only	30% of the insured amount of fire insurance policy	Building: JPY 0.9M Household goods: JPY 0.6M	JPY 300B
Evolutiona Changes	ary	May 01, 1972			Building: JPY 1.5M Household goods: JPY 1.2M	JPY 400B
	(1978) Miyogikon aki EQ	Apr. 01, 1975 Apr. 01, 1978		mountainee poincy	Building: JPY 2.4M Household goods: JPY 1.5M	JPY 800B
	Miyagiken-oki EQ	Jul. 01, 1980	①Total Loss ②Half Loss		Building: JPY 10.0M Household goods: JPY 5.0M	JPY 1,200B
	(1987) Chibaken-tohoki EQ	Apr. 01, 1982 Apr. 01, 1991		_		JPY 1,500B
	(1995) Great Hanshin-Awaji EQ Jar Ap Ap (2011) Great East Japan EQ Ap	Jun. 24, 1994				JPY 1,800B
		Oct. 19, 1995				JPY 3,100B
		Apr. 01, 1990	Tatal Loss		y Building: JPY 50.0M Household goods: JPY 10.0M	JPY 3,700B
		Apr. 14, 1999	@Half Loss	From 30% to 50% of		JPY 4,100B
		Apr. 01, 2002	(3)Partial Loss (1)TL, (2)LHL (3)SHL, (4)PL	1 Total Loss 2 Large Half Loss 3 Small Half Loss		JPY 4,500B
		Apr. 01, 2008				JPY 5,500B
		Apr. 06, 2012				JPY 6,200B
	(2016)	Apr. 01, 2014 Apr. 01, 2016				JPY 7,000B
	Kumamoto EQ	Jan.01.2017		④Partial Loss		JPY 11,300B
		Apr. 01, 2019				JPY 11,700B
		, pri 01, 2021				JI 1 12,0000

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TOP 20 Earthquakes

n & Its Evolution			(as of		(JP10.	
Earthquake (Region name)	Date of occurrence	Magnitude	No. of policies	Reinsurance claims paid (million yen)		
1. The 2011 off the Pacific coast of Tohoku	March 11, 2011	9.0	826,110	1,289,404	(TWD	257.88bn)
2. The 2016 Kumamoto	April 14, 2016	7.3	215,642	390,894	(TWD	78.17bn)
3. Fukushima-ken-oki	March 16, 2022	7.4	320,920	265,427	(TWD	53.08bn)
4. Fukushima-ken-oki	February 13, 2021	7.3	245,982	250,905	(TWD	50.18bn)
5. The 2018 Northern Osaka	June 18, 2018	6.1	159,369	124,831	(TWD	24.96bn)
6. The 1995 Hyogo-ken Nanbu	January 17, 1995	7.3	65,427	78,346	(TWD	15.66bn)
7. The 2018 Hokkaido Eastern Iburi	September 6, 2018	6.7	73,871	53,613		
8. Miyagi-ken-oki	April 7, 2011	7.2	31,018	32,414		
9. Miyagi-ken-oki	March 20, 2021	6.9	23,529	18,938		
10. Fukuoka-ken Seiho-oki	March 20, 2005	7.0	22,066	16,973		
11. The 2001 Geiyo	March 24, 2001	6.7	24,453	16,942		
12. The 2004 Niigata-ken Chuetsu	October 23, 2004	6.8	12,610	14,898		
13. Hyuganada	January 22, 2022	6.6	19,642	11,863		
14. Chiba-ken Hokuseibu	October 7, 2021	5.9	16,426	11,007		
15. The 2007 Niigata-ken Chuetsu-oki	July 16, 2007	6.8	7,873	8,251		
16. Miyagi-ken-oki	May 1, 2021	6.8	11,028	8,110		
17. Fukuoka-ken Seiho-oki	April 20, 2005	5.8	11,338	6,430		
18. The 2003 Tokachi-oki	September 26, 2003	8.0	10,553	5,990		
19. Tottori-ken Chubu	October 21, 2016	6.6	7,268	5,620		
20. The 2008 Iwate-Miyagi Nairiku	June 14, 2008	7.2	8,276	5,545		

(JPY0.2=TWD1)

Take-up Rate

Players and Roles in the System

[Earthquake insurance claims paid by year]

Essential Government Involvement

The peculiar insurability problems

Geographical and inter-temporal risk spreading issues

High cost of capital to cover low probability/high consequence risks

Not possible Without fund-raising capacity & credit capability of the government

Government provides financial support by underwriting reinsurance.

As part of its disaster prevention policy, the government will use its credit and financial strength to achieve "low insurance premiums" by breaking even in the very long term, and provide earthquake insurance as a means of self-help efforts.

"Break-even in the very long term" = "Mutual assistance across generations"

"EQ Reinsurance Special Account" was established

Clarifying insurance accounting and Ensuring insurance reliability

Reinsurance Flow

(Private Sector : JER + General Insurers)

Burden Sharing for the 2011 Great East Japan EQ

Revision of Liability Allocation in Special Circumstances

- To avoid excessive burden from consecutive earthquakes on private insurance companies, the amount of private liability in the reinsurance scheme is determined in accordance with the level of private reserve balance.
- When the outstanding amount of the private sector's reserves falls sharply, the government revises the liability allocation to reduce the private sector's liability.

RSV Balance

- ✓ Obliged by law to accumulate all of the insurance premium and the investment profits, after deduction of operational costs.
- ✓ Government reserves are accumulated in the "Special Earthquake Reinsurance Account" and deposited in the fiscal investment and loan.
- ✓ Private reserves are collectively managed and invested in the financial markets by JER.
- In the event that claims payments exceed the reserve balance, the government will temporarily replace the funds by issuing government bonds, etc. and repay them with future reinsurance premium income.

All for the prompt claims payment to policyholders affected by earthquakes.

Real-time Loss Prediction (By individual insurers)

- "cmap" is a website that provides forecasts of the potential damage caused by natural disasters, such as typhoons, torrential rains, and earthquakes. The data is publicly accessible, offering insights for risk assessment and preparedness.
- The number of damaged buildings and the rate of damage are forecasted for each municipality and displayed on a map up to seven days in advance of a typhoon making landfall, or immediately following a heavy rainfall or earthquake.
 It will be used to predict the emount of claims to be peid, and to determine the number of mediately following.
- It will be used to predict the amount of claims to be paid, and to determine the number of mobilizers needed to investigate the loss, and the office space, telephone lines, and other necessary resources required to set up the task force.

Vesta Inc. Predictive Analytics

cmap. dev : Real-time loss prediction (https://cmap.dev/)

*Real-time damage estimation for buildings is based on Aon's patented technology

Comprehensive Damage Assessment based on Satellite and Aerial Photographs

- In the event of a major earthquake, conducting a prompt on-site survey is challenging due to the potential for road closures caused by a range of factors, including tsunamis, land cracks and landslides.
- The GIAJ task force makes use of aerial and satellite images in order to collectively identify areas of total loss, subsequently providing each insurance company with the relevant zip code for that specific area..
- Based on this data, insurance companies are able to process claims without the necessity for on-site inspections.

(*GIAJ: The General Insurance Association of Japan)

KOKUSAI KOGYO Co., Ltd.

Damage Survey by Drones (By individual insurers)

• The utilization of drones has been proven to be an effective method for ensuring the safety and efficiency of surveys conducted in dangerous and inaccessible areas, such as roof damage survey, etc.

Damage Assessment based on the Policyholder's Self-Report (under consideration)

- GIAJ is currently exploring the possibility of implementing a self-reporting option for loss assessment, which would only be applicable in the event of a major earthquake.
- The policyholder is required to provide a description of the damage and its extent on a drawing in accordance with the specified format. Additionally, the policyholder must attach photographs of all damaged areas.
- Following receipt of an insurance self-report, insurers will then **review the report** and **determine the appropriate loss category**.
- A system for online self-reporting is currently being developed, considering the logistical situation that has arisen in the aftermath of the major earthquake.
- The potential of AI to automatically read self-report content and determine loss category, as well as to detect insurance fraud, will be investigated further in the future.

<u>Providing Information on Road Conditions in Affected Areas Using Driving Data</u> <u>from Driving Recorders</u> (By individual insurers)

- Telematics car insurance with a driving recorder is gaining popularity in Japan.
- These drive recorders are designed to sense the impact and shaking of an accident, record images before and after the accident, and automatically notify the insurance company of the accident, along with transmitting the recorded images.
- Following the Noto Peninsula earthquake, some insurance companies provided local governments with maps showing statistical information on the points where the drive recorders sensed impacts due to ground cracks and bumps.
- The local authorities utilized this data to facilitate the repair of road infrastructure and to plan for the deployment of volunteers to the area.

Thank you very much for your kind attention.