外国人のための災害対応の改善方策:
情報提供の補完性とニーズの実態把握

Improvement of Disaster Response for Foreigners in Japan:
Complementarity in Information Provision and Needs Assessment

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Table of Content

Table of Content

1. 研究の背景と目的｜Introduction

Natural disasters and impact on tourism

- Various type of crisis in the world threaten tourism industry
- Increase of natural disasters is noticeable recently
- Hurricane Katrina in 2005/ Haiti Earthquake in 2010/ Great East Japan Earthquake in 2011/ Nepal Earthquake in 2015/ Kumamoto Earthquake in 2016 etc.

Figure 1 Type of disasters in tourism industry
(Source: Google search)

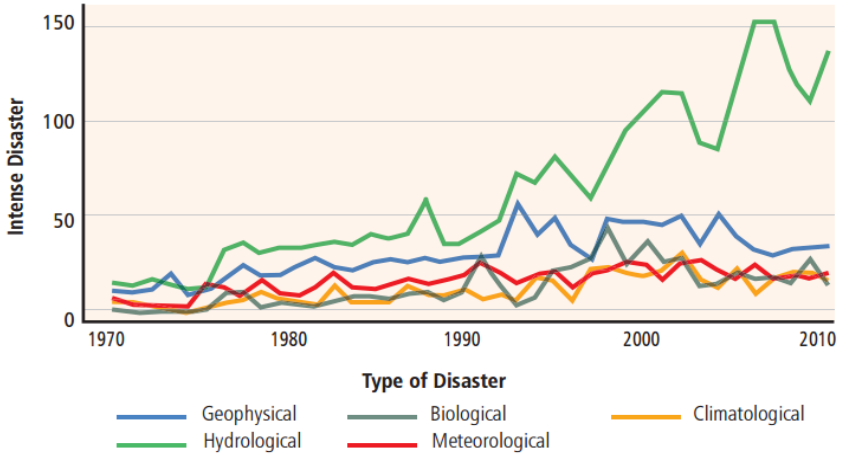


Figure 2 Global frequency of intense natural disasters
(Source: Centre for Research on the Epidemiology of Disasters. Emergency Events Database. http://www.emdata.be/.)

1. 研究の背景と目的｜Introduction

Responding to disasters is called “disaster management”

- A multidisciplinary area (including public relations, business management, psychology, sociology, etc.) which involves management of the following stages before, during, and after the crisis

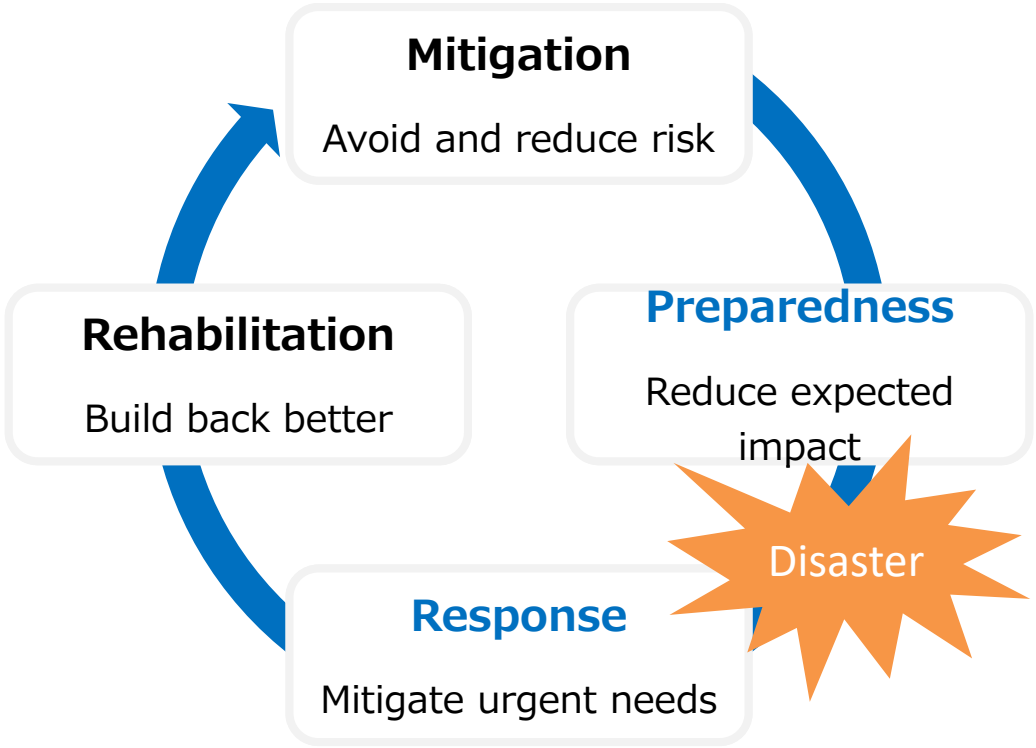


Figure 3 Crisis management cycle
(Source: Modified from Tomasini *et al*, 2009.)

Tomasini, R., and Van Wassenhove, L.N. (2009). Humanitarian logistics. Palgrage Macmillan, Basingstoke.
Altay, N., and Green, W.G. (2006). OR/MS research in disaster operations management. European Journal of Operational Research, 175(1), 475-93.

1. 研究の背景と目的 | Introduction

Research scope

Disaster response phase

- 1st day
- 72 hours – immediate disaster response
- 1st week
- 2nd week
- 1 month

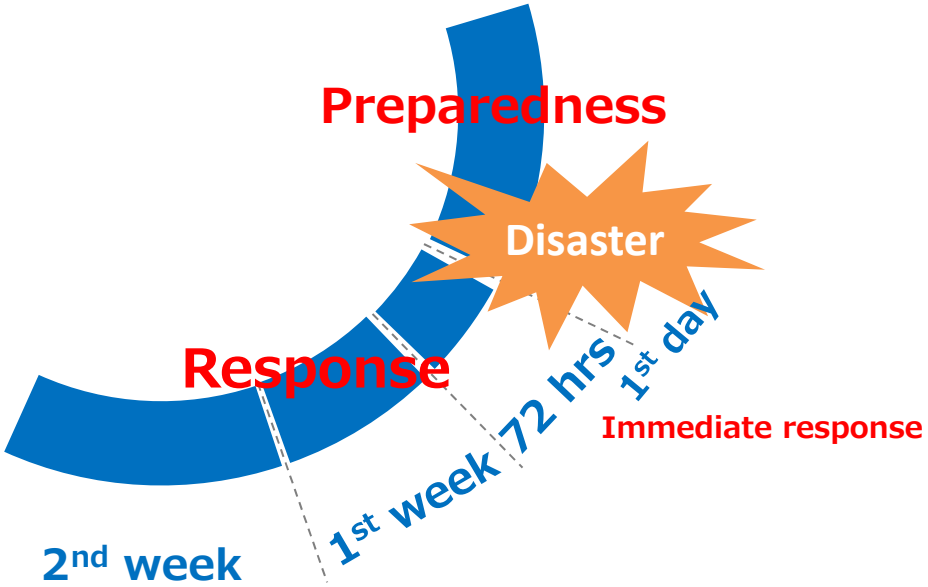


Figure 4. Phases in disaster response

Type of disasters

- Man-made disasters
- Natural disasters
  - Earthquake
  - Typhoon
  - Tsunami
  - Land slide
  - …

Fig 5. Destruction of houses in Haiti Earthquake (Source: Google)

1. 研究の背景と目的｜Introduction

International tourists in top 25 countries in the world

Table1. Ranking of inbound arrivals in top 25 countries
インバウンド数ランキング(2014年)

Unit: thousands
Source: UNWTO

1	フランス	83,700	14	タイ	24,780
2	米国	74,757	15	ギリシャ	22,033
3	スペイン	64,995	16	カナダ	16,528
4	中国	55,622	17	ポーランド	16,000
5	イタリア	48,576	18	マカオ	14,566
6	トルコ	39,811	19	韓国	14,202
7	ドイツ	33,005	20	オランダ	13,926
8	英国	32,613	**21**	**日本**	**13,413**
9	ロシア	29,848	22	ハンガリー	12,139
10	メキシコ	29,091	23	シンガポール	11,858
11	香港	27,770	24	クロアチア	11,623
12	マレーシア	27,437	25	スウェーデン	10,750
13	オーストリア	25,291			

1. 研究の背景と目的 | Introduction

Policies for Japan as tourism-oriented country

- Tourism one of the pillars of Japan's growth strategy
- Expected to contribute to the recovery from the Great East Japan Earthquake in 2011.
- Expected target by 2020: inbound visitors as 4,000万人, 消費額 as 8兆円
- **Strategy for promoting tourism-oriented country (観光立国推進基本計画を閣議決定)**

  (1) Development of national economy|国民経済の発展

  (2) Improve international mutual understanding| 国際相互理解の増進

  (3) Enhancing the safety of people's lives| 国民生活の安定向上

  (4) Preparation for risks related to disasters, incidents, etc. | 災害、事故等のリスクへの備え

1. 研究の背景と目的｜Introduction

In perspective of tourism and disaster management,

- In many ways, it is natural to handle ‘nationals’ as their disaster management target.
- However, **foreigners** as a vulnerable population in the country should be also considered.

Necessity in targeting foreigners in tourism disaster related policies

Why:
- Securing the trip and developing safety for destination
- Providing more effective disaster provision for the country policy makers

What:
- Heterogeneity in risk and safety perceptions among foreigners (Seabra et al., 2013)
- Difference in needs of foreigners and information provided in the country

1. 研究の背景と目的｜Introduction

Lessons from disasters: difficulties of foreigners for information

- Confusion in information finding and place
- May not speak and/or read host language at destination
- Unfamiliarity of circumstances (place, people, transportation, etc.)
- Differences in experience
- Unmatched information by different provider
- Nationalities and individual characteristics
- Unawareness of disaster preparedness and response systems and measures

Foreigners in Japan

Foreign residents (在日外国人)

日本に定着居住している外国人（在日韓国・朝鮮人、在日中国人、在日台湾人、在日ブラジル人、在日フィリピン人、在日ペルー人等）を**「在日外国人」**
短期滞在者（在日米軍関係者、在留資格を持たない者を含む）を**「来日外国人」（英：visiting aliens）**と言う。

International tourists (訪日外国人)

国籍に基づく法務省集計による外国人正規入国者数から**日本に居住する外国人**を除き、これに外国人一時上陸客等を加えた**入国外国人旅行者**のことである。

1. 研究の背景と目的 | Introduction

Trend of foreign residents in Japan

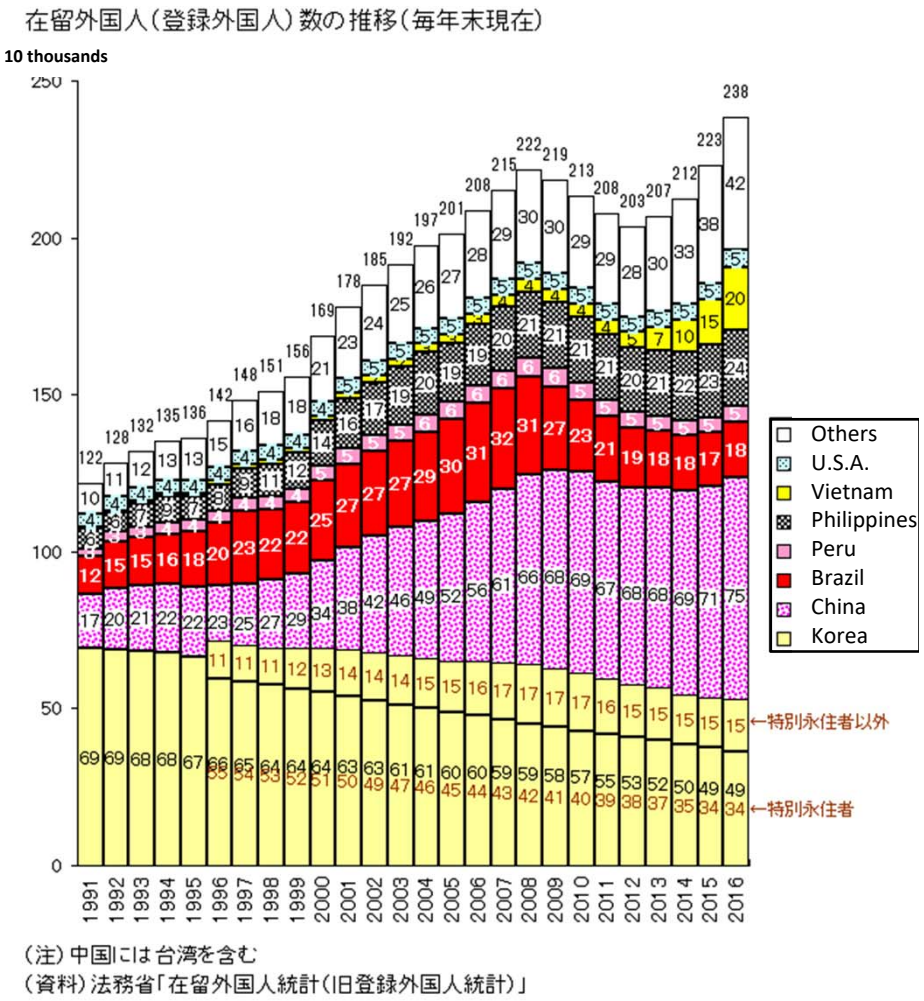


Figure 6. Trend of foreign residents in Japan

Table 2. Foreign residents in 1996 and 2016

	1996	2016	Increase rate
Total	**1,415,136**	**2,382,822**	**1.7**
Korea	657,159	485,557	0.7
China	234,264	748,290	3.2
Brazil	201,795	180,923	0.9
Peru	37,099	47,740	1.3
Philippines	84,509	243,662	2.9
Vietnam	10,228	199,990	19.6
U.S.A.	44,168	53,705	1.2
Others	145,914	422,955	2.9

- Continuous growth in foreign residents in Japan
- It is as double as the number in 1996.

1. 研究の背景と目的｜Introduction

Japan's continuous increase of international tourists

- Continuous economic growth in Asia and the Pacific (UNWTO)
- Recent competition between tourism destinations

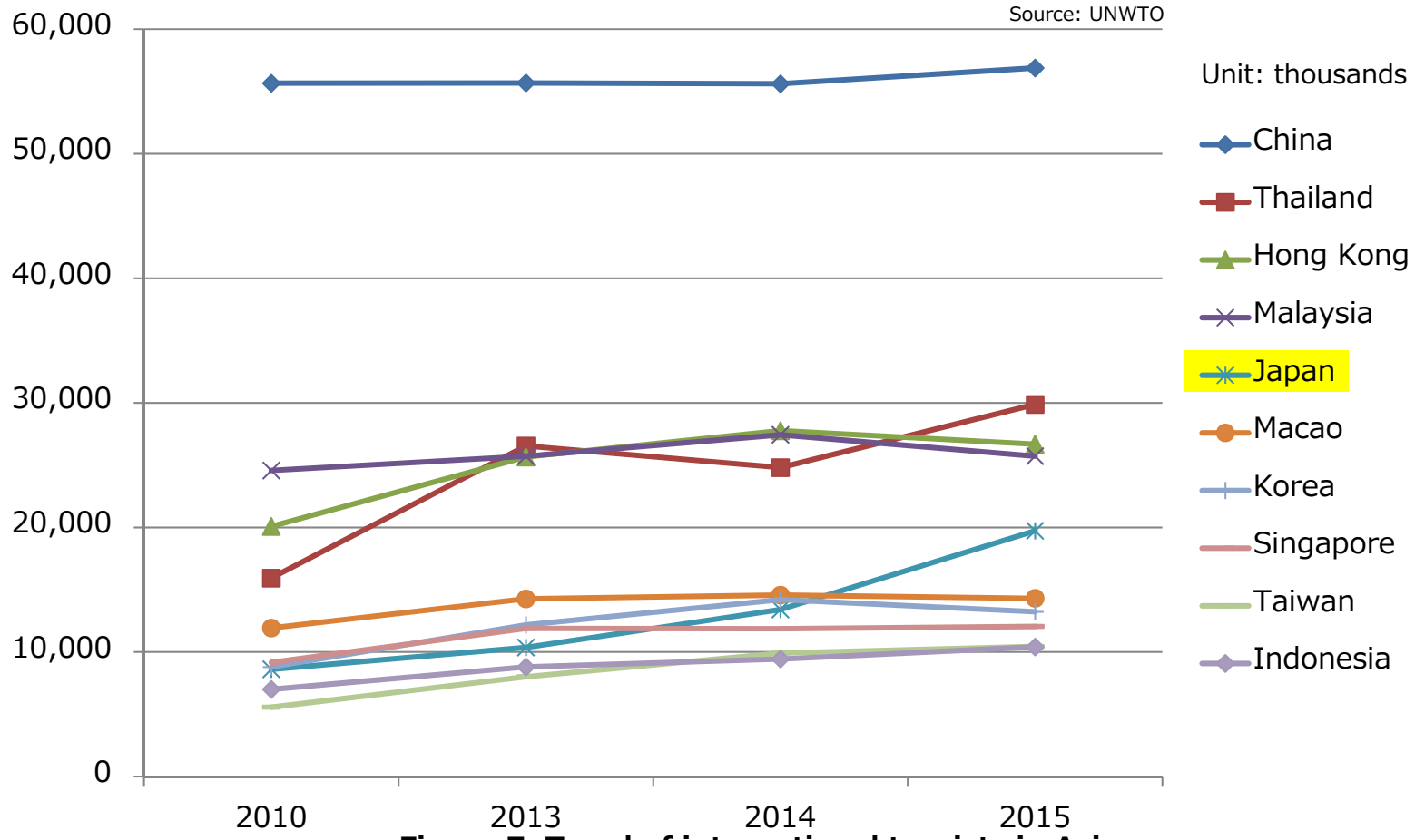


Figure 7. Trend of international tourists in Asia

1. 研究の背景と目的｜Introduction

Trend of international tourists in Japan

- Continuous growth in both inbound and outbound tourists
- In 2017, it is expected to reach nearly 28 million visitors.

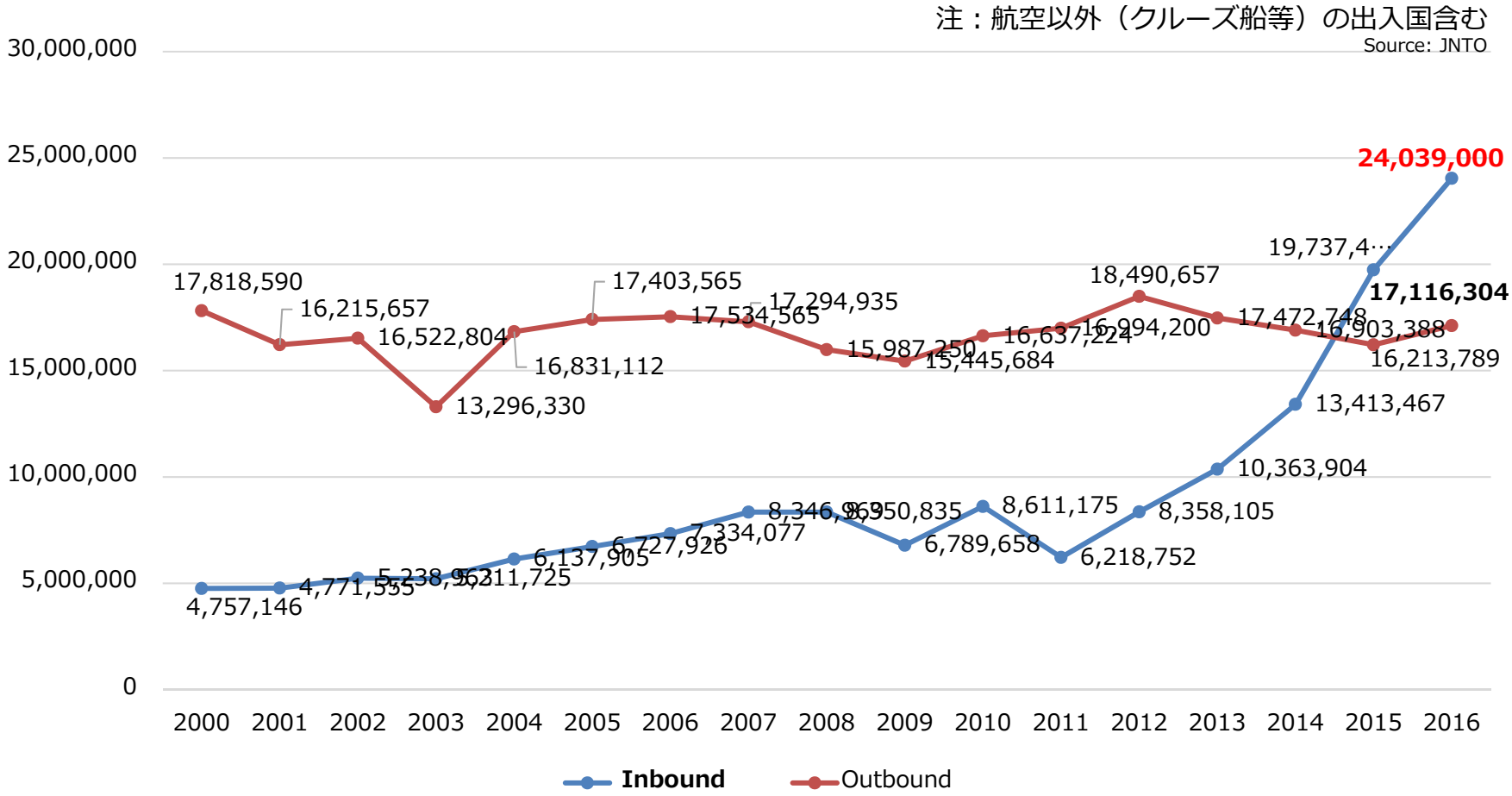


Figure 8. Trend of inbound and outbound visitors in Japan

1. 研究の背景と目的 | Introduction

Trend of international tourists in Japan

- China, Korea, Hongkong, Taiwan, and Thailand are the top 5 countries.
- This consists over 70% of total inbound tourists
- There was sharp drop in 2011 Great East Japan Earthquake and rebounce

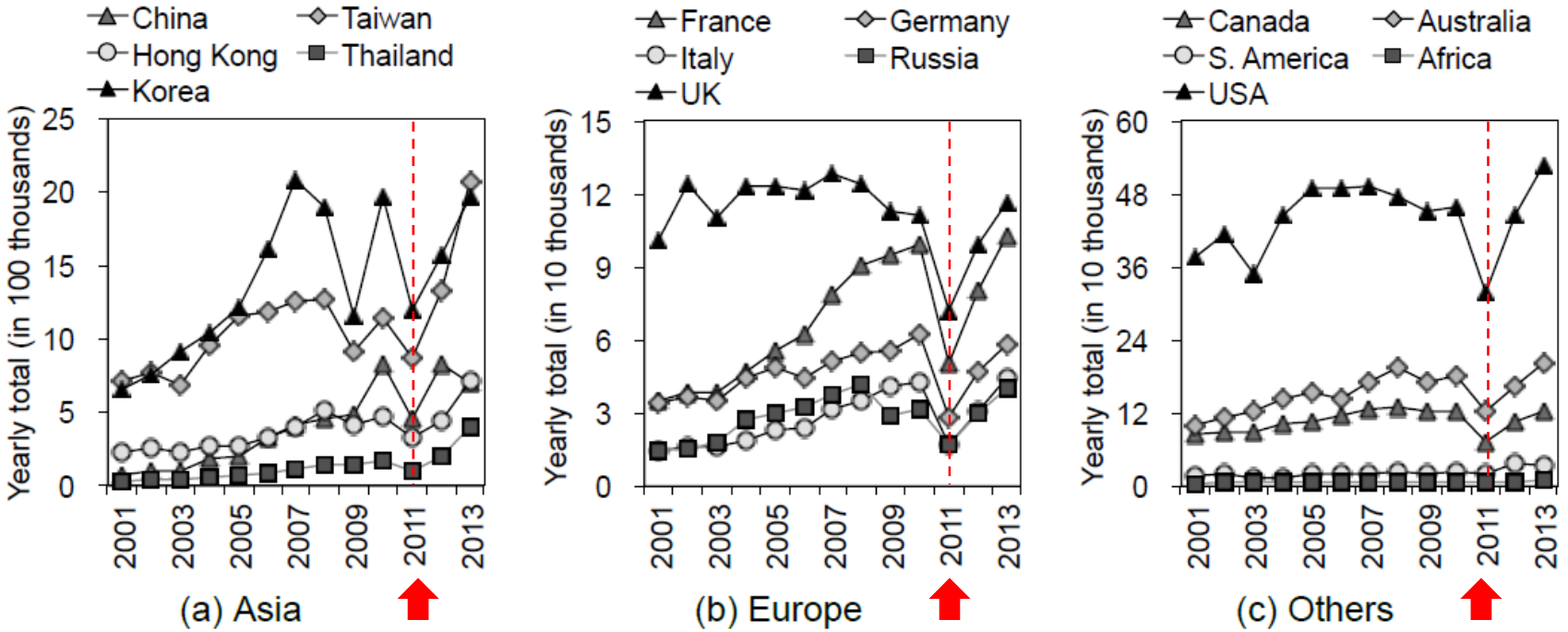


Figure 9. Number of international tourists visiting Japan from 2001 to 2013 by region and country of origin (data source: JNTO, 2014; JTMC, 2014, adapted from Henry and Kawasaki, 2014)

1. 研究の背景と目的 | Introduction

Information needs of foreigners in case of disasters

- Survey on foreigners in Great East Japan Earthquake in 2011 (JTA, 2016)
- Needs on understanding the situation and what kind of action should be made
- Different information is required for different response phase
- Question: 災害発生時に必要としていた情報内容と知りたかった時期

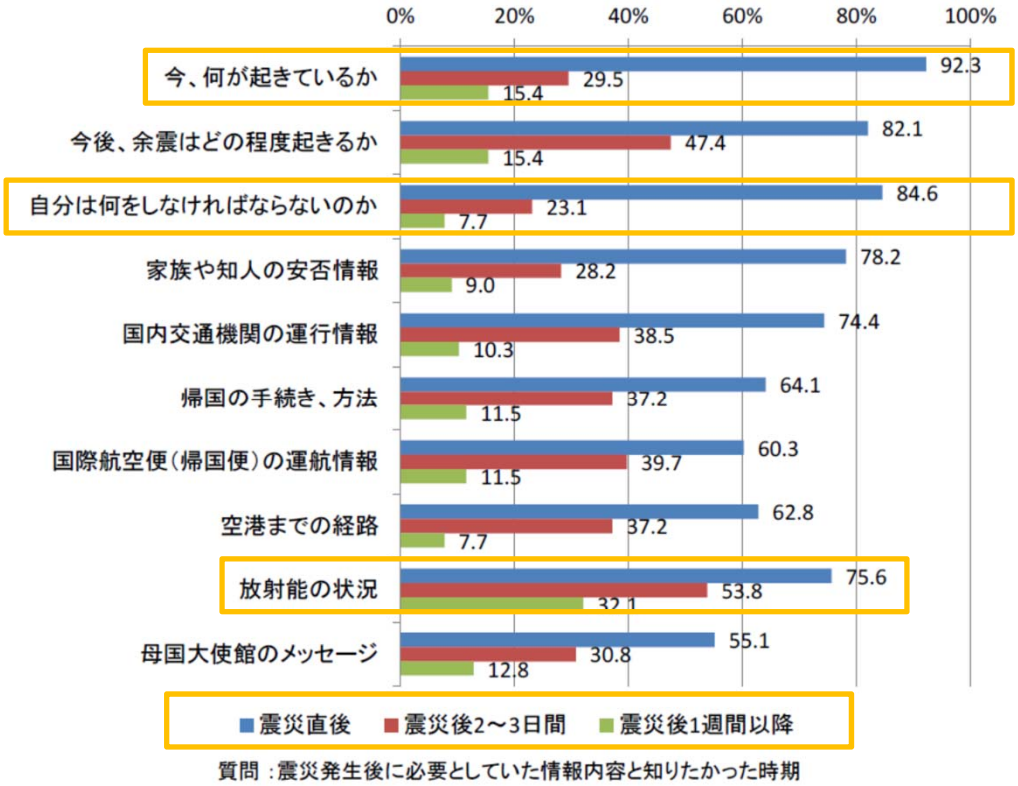


Figure 10. Information content and time needs in aftermath of disasters

JTA (2016) Survey on foreigners regarding disaster information provision

1. 研究の背景と目的 | Introduction

Expected responses by Japan during the stay by foreigners

- Survey on foreigners visited Japan by online questionnaire (DBJ&JTBF, 2017)
- Most of countries – evacuation inducement by English and other languages speaking person
- Most responses are related to multi-languages and information provision

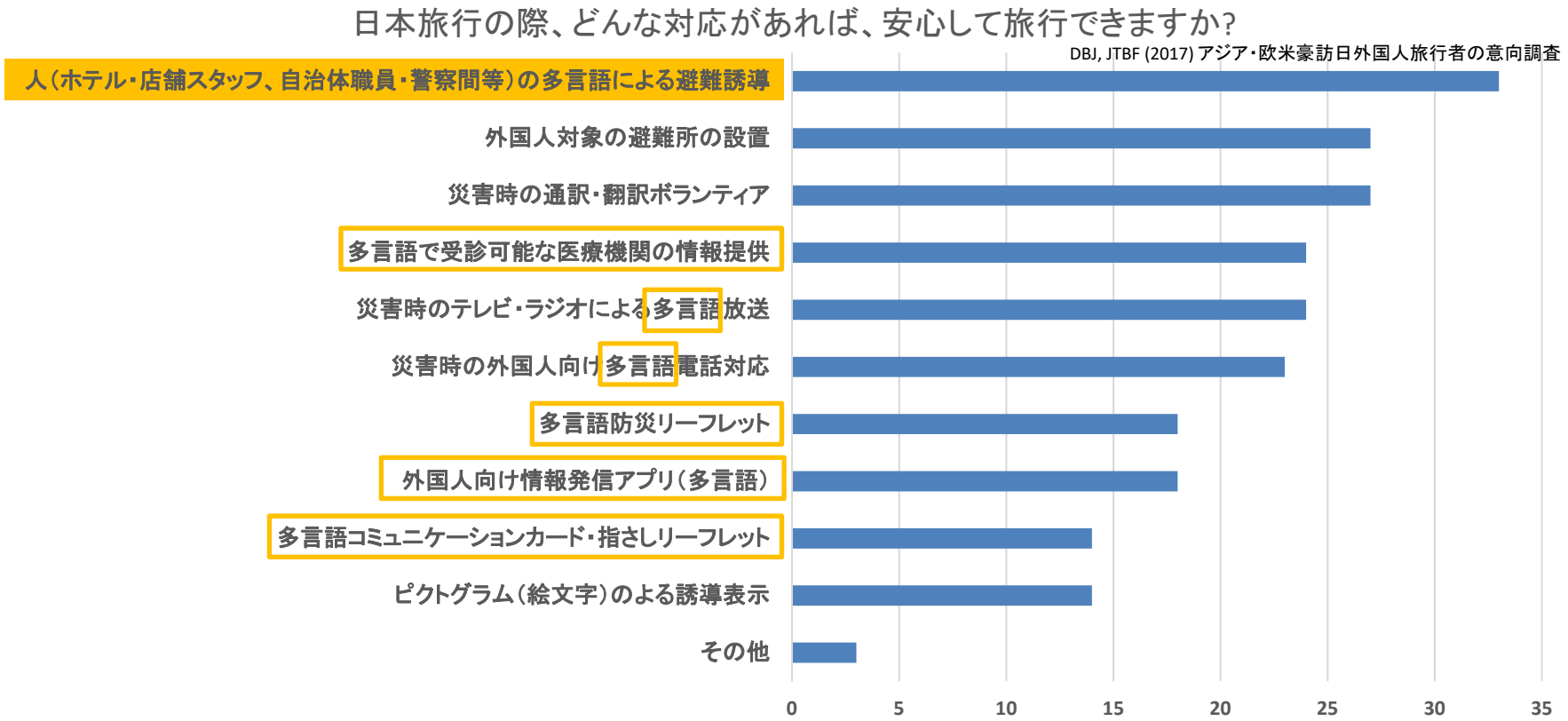


Figure 11. Expectation on response to secure safety during their stay

1. 研究の背景と目的 | Introduction

How do foreigners collect information before/during the visit?

- Most of countries – rely heavily on “Tourist Guidebook”
- Changes in during the visit – “information center” and information gathering in person through communication

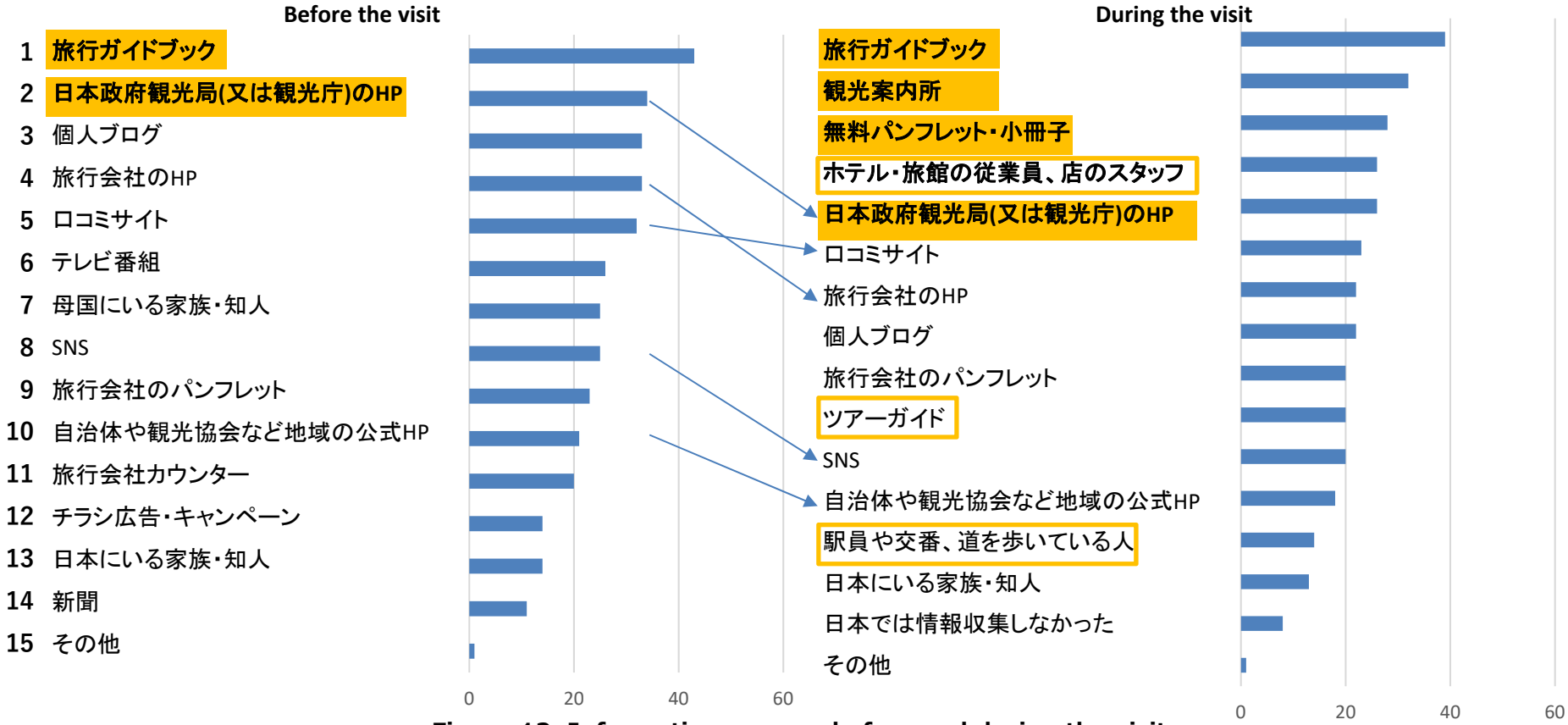
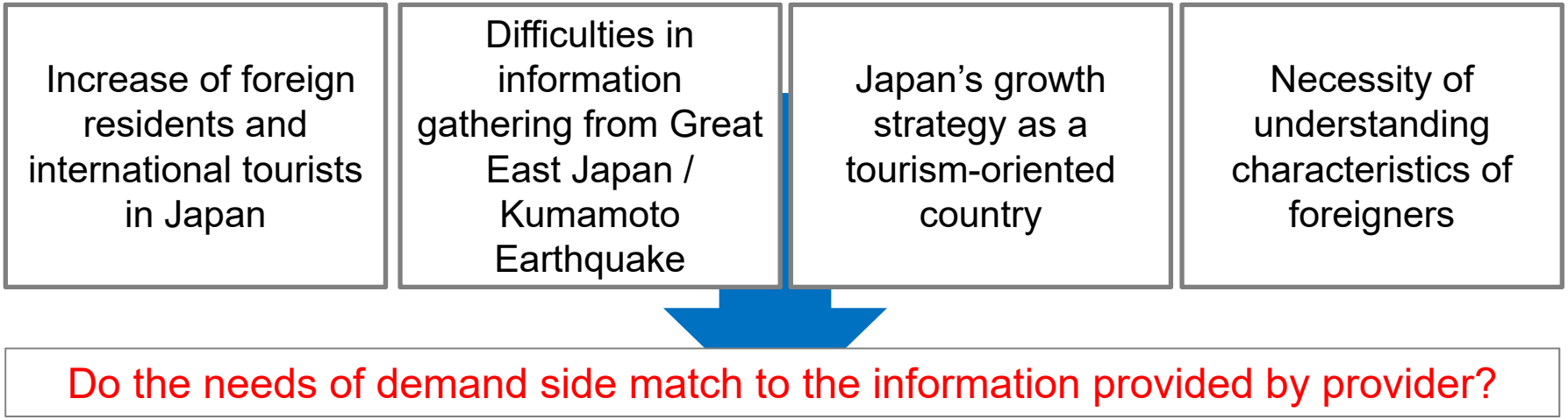


Figure 12. Information sources before and during the visit

DBJ, JTBF (2017) アジア・欧米豪訪日外国人旅行者の意向調査

1. 研究の背景と目的｜Introduction

Research question and objective



Research objectives

1. To investigate needs of foreigners (foreign residents/ international tourists) during the disasters →**Demand side**
2. To understand current disaster information system of stakeholders for foreigners (foreign residents/ international tourists) in Japan →**Supply side**
3. To propose policy implications after understanding the gap between the two

1. 研究の背景と目的｜Introduction

Research framework

1. Introduction

2. Literature review
- Disaster response and tourism
- Foreigners and tourism in Japan
- Information provision and content

Demand

3. Disaster information needs investigation: demand perspective
- **Information collection behavior and characteristics**
- **Foreign residents** & international visitors

Supply

4. Present state of disaster information provision: supplier perspective
- **Understanding current disaster information system in Japan**
- Interviews on stakeholders

Table of Content

2. Disaster information needs investigation in the 2011 GEJE
東日本大震災時の需要側のニーズ

Purpose of analysis

To investigate needs of foreigners (resident aliens/ international tourists) for during the crisis →Demand side

Great East Japan Earthquake

- **Date and Time**: 11 March 2011 14:46
- **Magnitude**: 9.0 (interim value; the largest earthquake recorded in Japan)
- **Type:** large-scale emergencies (earthquakes/tsunami/nuclear power plant accident)

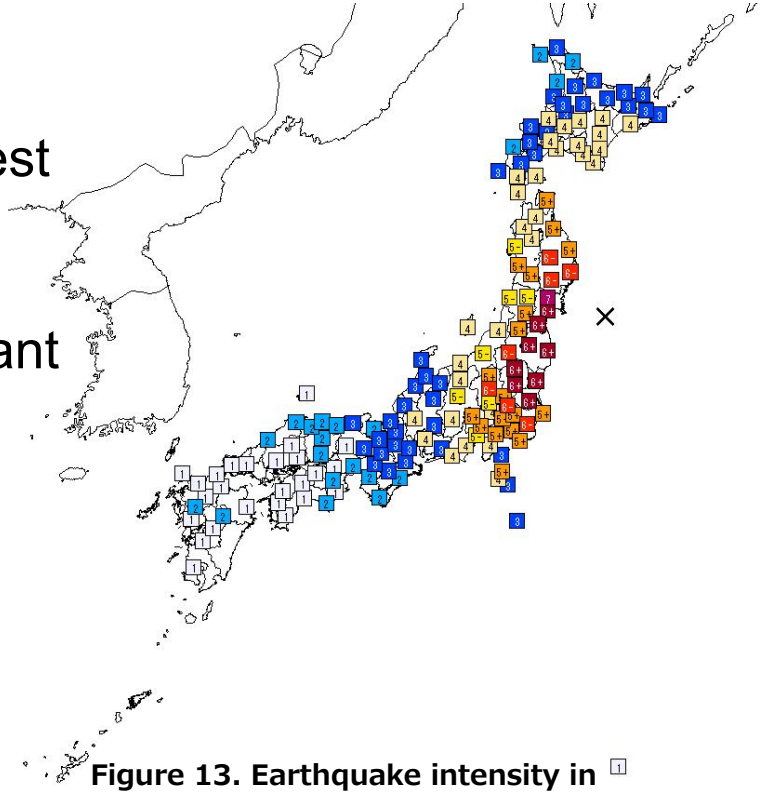


Figure 13. Earthquake intensity in Great East Japan Earthquake

http://www.data.jma.go.jp/svd/eqev/data/2011_03_11_tohoku/index.html

2. Disaster information needs investigation in the 2011 GEJE
東日本大震災時の需要側のニーズ

Information provision in Great East Japan Earthquake

Immediate response phase (first 72 hours)

3/11 On the first day — Government declaration

- **2:46 PM** Magnitude 8.9 earthquake 231 miles northeast of Tokyo, Japan at a depth of 15.2 miles
- **8:15 PM** Japanese government declares emergency for nuclear power plant near Sendai, 180 miles from Tokyo.
- **9:35 PM** 4 nuclear power plants closest to the quake are shut down.

3/12 On the second day — Information for living and evacuation

- **11:20 AM** At least 6 million homes -- 10 percent of Japan's households are without electricity, according to the country's ambassador to the US.
- **12:32 AM** Stores begin to run out of food, water and gasoline as masses of residents of northern Japan stream south from their earthquake-stricken hometowns.
- **8:18 PM** Evacuation area around Fukushima Daiichi nuclear power plant extended to 20 kilometers (about 12.5 miles.)

3/13 On the third day — Evacuation

- **12:03 AM** More than 83,000 people living within 3 miles of two power plants begin a government-ordered evacuation.

http://edition.cnn.com/2011/WORLD/asiapcf/03/12/quake.tsunami.timeline/index.html

2. Disaster information needs investigation in the 2011 GEJE
東日本大震災時の需要側のニーズ

Details of survey dataset

To investigate information needs on type and time dynamics of foreign residents

Table 3. Dataset details

Method	Internet based method
Period	End of May ~ End of June, 2011 (after Great East Japan Earthquake)
Target	**Foreign residents and Japanese in Kanto Region** (Tokyo, Ibaraki/Tochigi/Gunma/Saitama/Chiba/Kanagawa/Yamanashi)
Request and response method	• Foreign students center and faculty members in 48 universities in Kanto region, Embassies/enterprises/organizations in Tokyo • Telephone, mailing survey URL to contact address, sharing through social media and websites • Respondents are required to access assigned URL directly via online
Language	• **9 languages** • Japanese • English, Chinese, Korean, German, Portuguese, Nepalese, Thai, Vietnamese
Number of samples	1,357 samples (74 countries, Japanese: 497, **Foreign residents: 860**)

Survey data is provided by Takahashi, Henry, and Meguro (2011) from University of Tokyo.

2. Disaster information needs investigation in the 2011 GEJE
東日本大震災時の需要側のニーズ

Survey content

Table 4. Dataset questions - 1

	Questions
Information collection behavior in disaster response	What information sources did you **trust the most** during the two weeks following the earthquake? (mark all that apply)
	What information sources did you **trust the least** during the two weeks following the earthquake? (mark all that apply)
	During the two weeks following the earthquake, **which media did you use** to acquire information and in what language? (mark all that apply)
	In the case of this earthquake and tsunami disaster, **by which media would you have preferred to receive** disaster-related information? (mark all that apply)
	What types of information were most important for you during the first day, first week, and second week after the earthquake? (mark all that apply)
	What types of information were **unavailable, unclear, or difficult for you to understand** during the first day, first week, and second week after the earthquake? (mark all that apply)
	In general, **what were the reasons** why the above information was unclear or difficult to understand? (mark all that apply)
	When faced with unclear or difficult to understand information, **what media did you utilize** in order to clarify or better understand that information? (mark all that apply)
	At the time of the disaster were you familiar with the Japanese Earthquake Early Warning System?
	Were you able to properly receive information regarding the rotating blackouts?

2. Disaster information needs investigation in the 2011 GEJE
東日本大震災時の需要側のニーズ

Survey content

Table 5. Dataset questions - 2

	Questions
Impact of information on decision making	Within the two weeks after the earthquake, **did you choose** to remain in the Kanto area, relocate to another area of Japan, or leave Japan? What was the reason for your choice? (mark all that apply)
	At the time when you made your choice, **how useful, if at all, was disaster-related information** in making that choice?
	If you chose to relocate to another area of Japan or leave Japan, **within which time period** after the earthquake did you make your choice?
Attribute information	Nationality, age, income, occupation, gender, residence area
	Residence years in Japan, Language ability of English and Japanese
	Are you married to a Japanese national, or do you have access to someone who can quickly translate Japanese for you?

Survey data is provided by Takahashi, Henry, and Meguro (2011) from University of Tokyo.

2. Disaster information needs investigation in the 2011 GEJE
東日本大震災時の需要側のニーズ

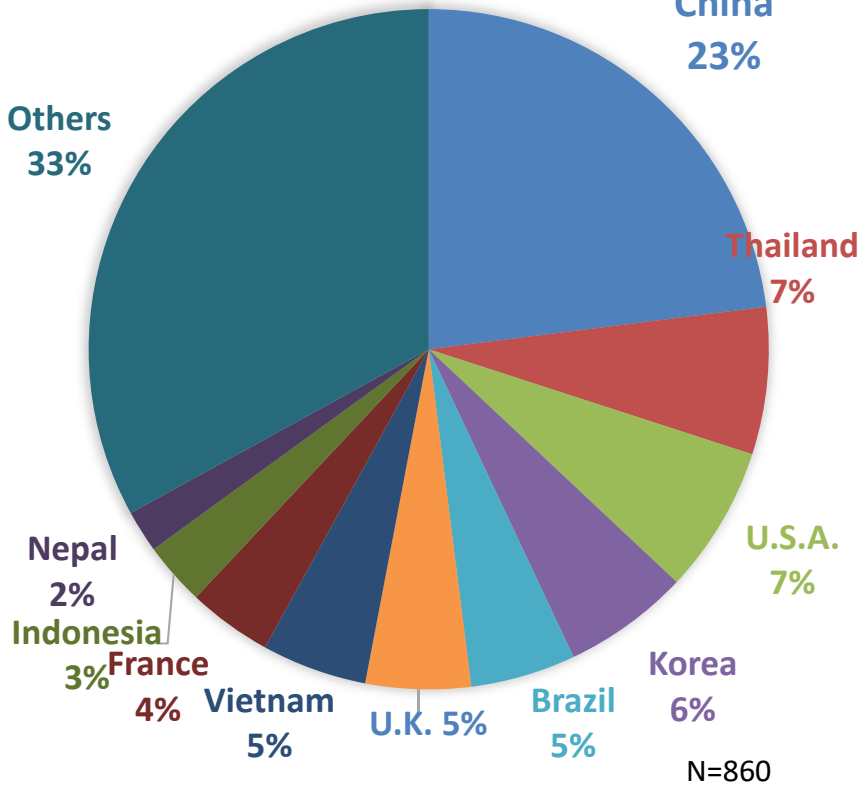


FIGURE 14. NATIONALITY

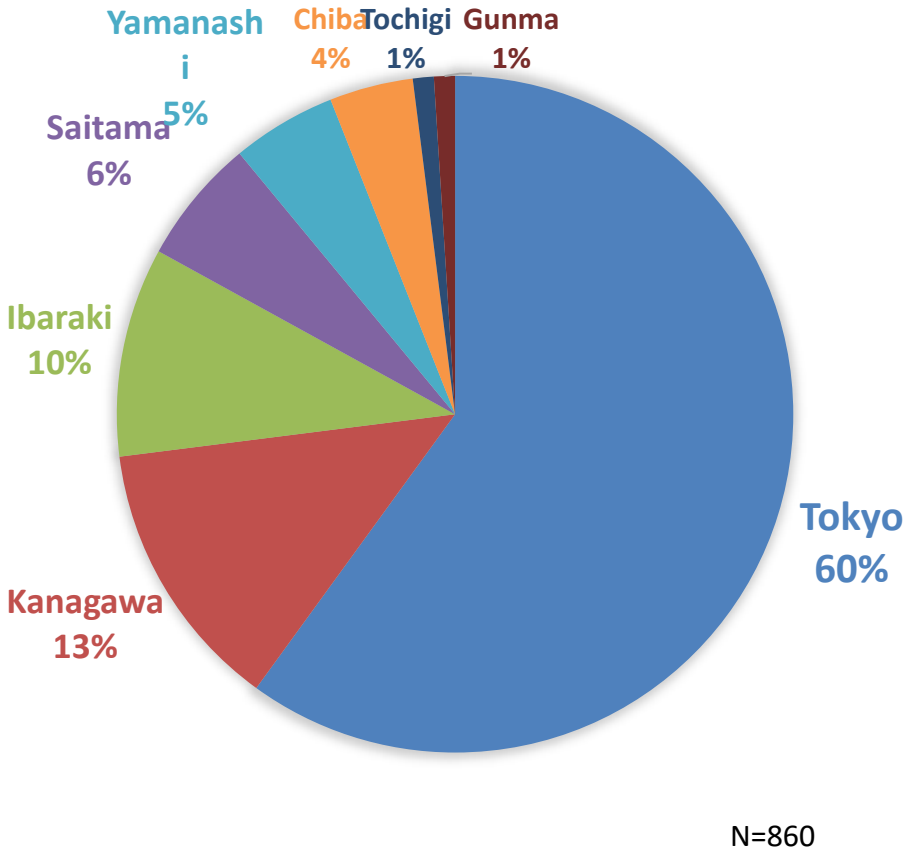


FIGURE 15. PLACE OF RESIDENCE

Survey data is provided by Takahashi, Henry, and Meguro (2011) from University of Tokyo.

2. Disaster information needs investigation in the 2011 GEJE
東日本大震災時の需要側のニーズ

Type of information in disaster response

- Individuals are asked to reply for which kind of information they thought it was important during disaster response in different time phase
- Type of information in disaster response can be grouped as the following table.

Table 6. Information type in disasters

Safety of family, friends, etc. School & business continuity	**Private life**
Earthquake & tsunami characteristics	**Disaster oriented information**
Earthquake & tsunami damage	
Radiation level & risk	
Government response	**Government**
Evacuation & shelters	**Information for living**
Food & water supply	
Electricity & other utilities	**Infrastructure**
Transportation systems	

2. Disaster information needs investigation in the 2011 GEJE
東日本大震災時の需要側のニーズ

Survey question and answer distribution

What types of information were most important for you during the first day, first week, and second week after the earthquake? (mark all that apply)

	Private life		Disaster oriented information			Government	Information for living		Infrastructure	
	Safety of family, friends, etc. (i=1)	School & business continuity (i=2)	Earthquake & tsunami characteristics (i=3)	Earthquake & tsunami damage (i=4)	Radiation level & risk (i=5)	Government response (i=6)	Evacuation & shelters (i=7)	Food & water supply (i=8)	Electricity & other utilities (i=9)	Transportation systems (i=10)
The first day (t=1)	687	151	344	410	255	235	235	326	267	392
The first week (t=2)	279	305	307	438	678	416	235	542	411	427
The second week (t=3)	156	273	145	215	611	365	134	398	338	293

2. Disaster information needs investigation in the 2011 GEJE
東日本大震災時の需要側のニーズ

Importance of different types of information in different time phase

- Similar tendency can be found on safety information.
- Regarding food/water, utility, transportation information, and continuity of business/school, foreigners tend to think more of importance on the first week.

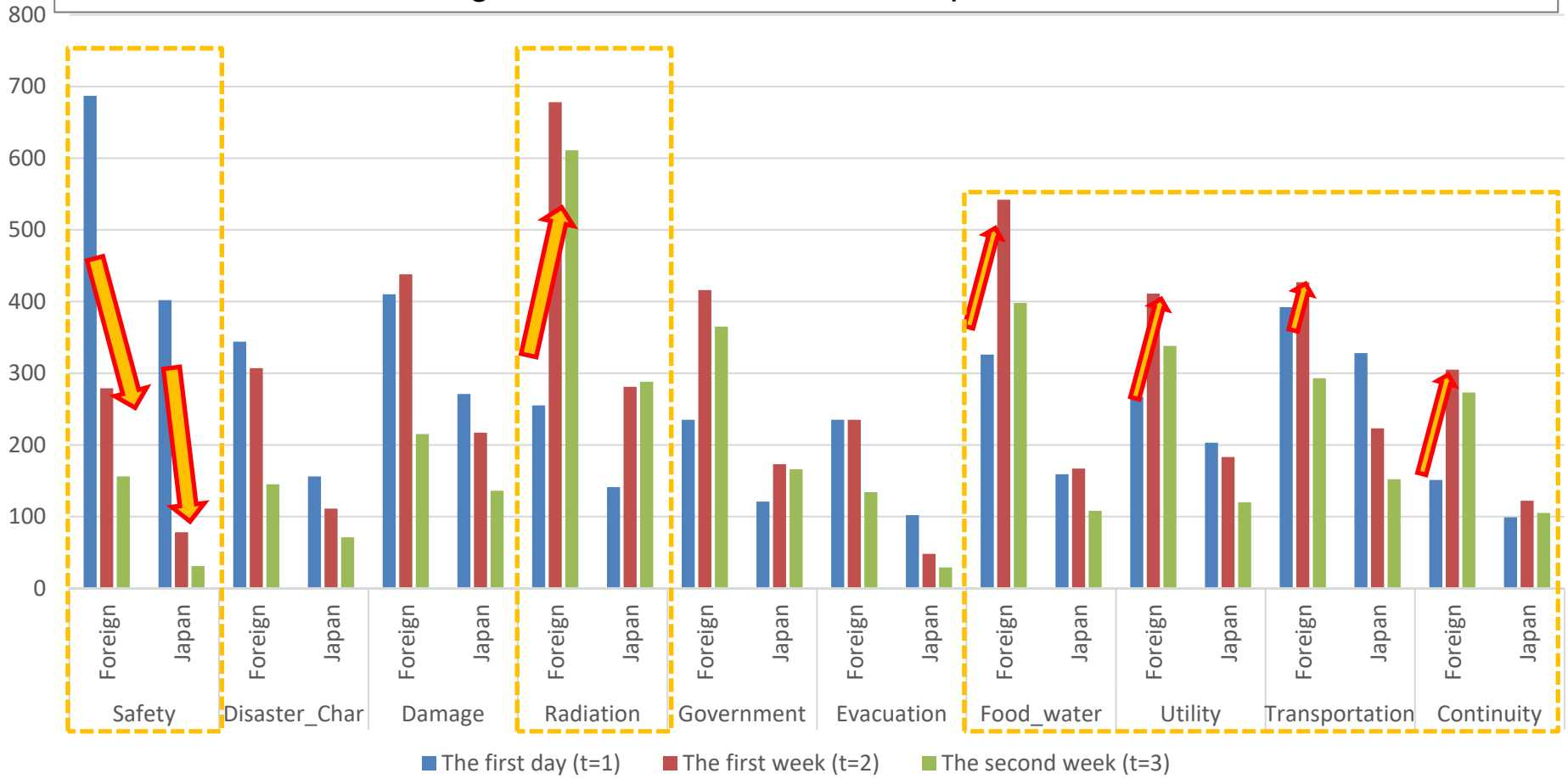


Figure 16. Responses of foreigners and Japanese on different type of information

2. Disaster information needs investigation in the 2011 GEJE
東日本大震災時の需要側のニーズ

Importance of different types of information in different time phase

- Foreigners tend to think disaster oriented information is important in 1st week.
- Information for living and infrastructure show different tendency.

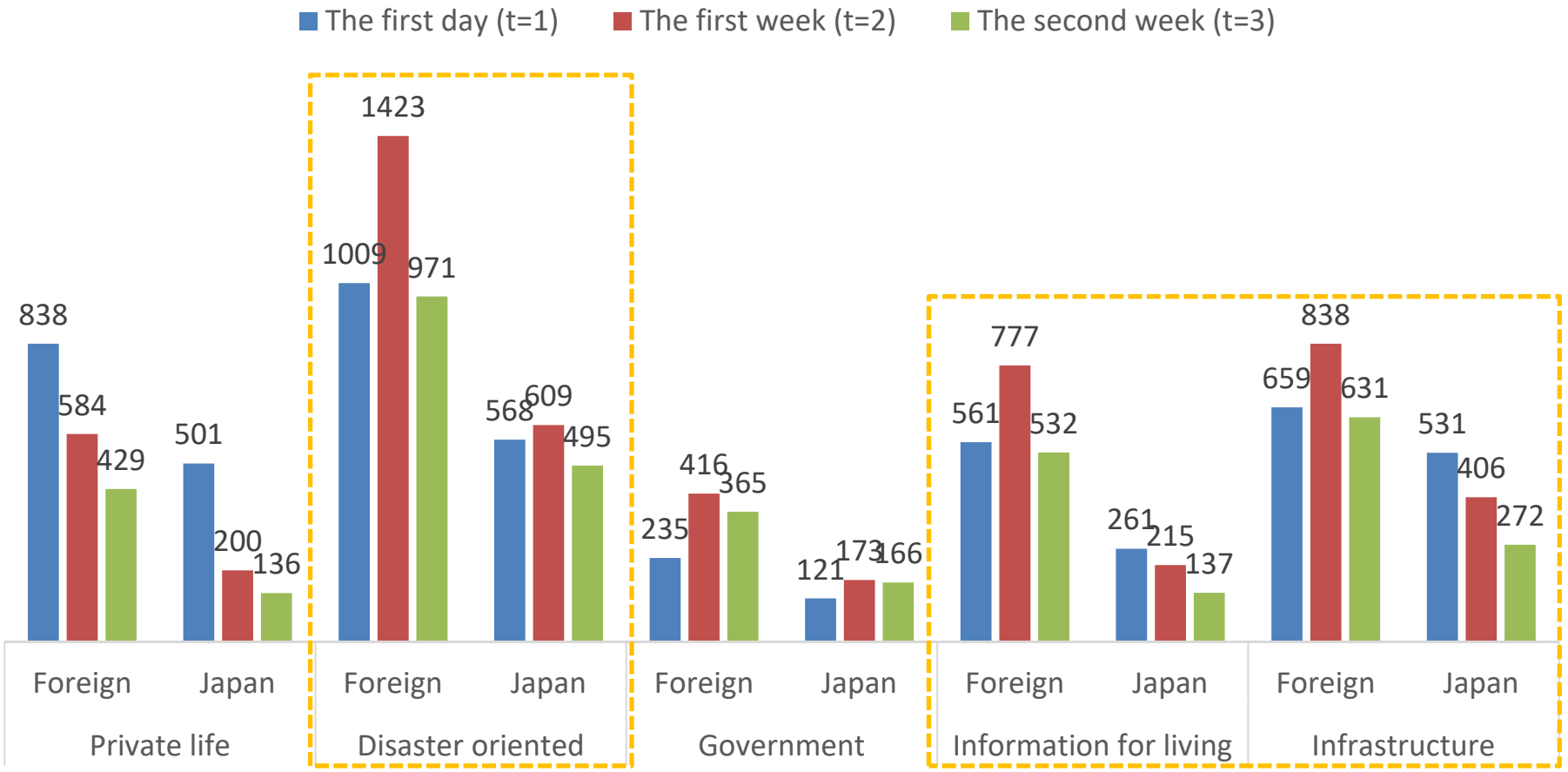
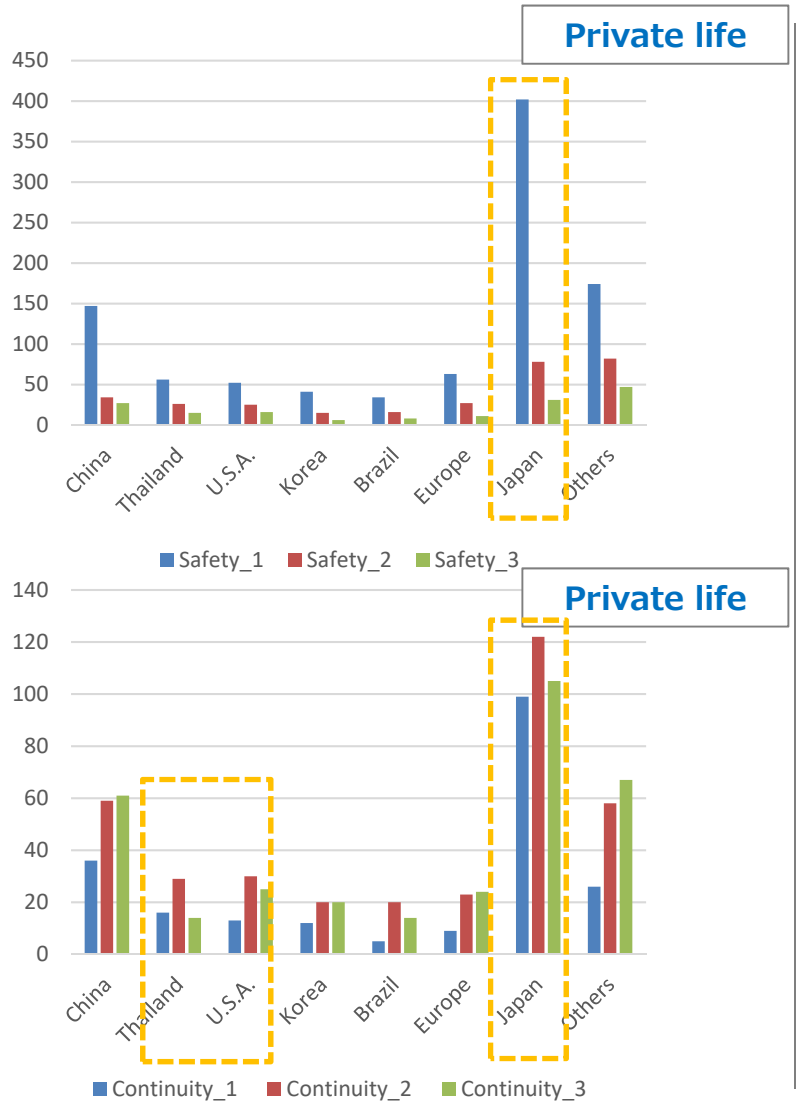
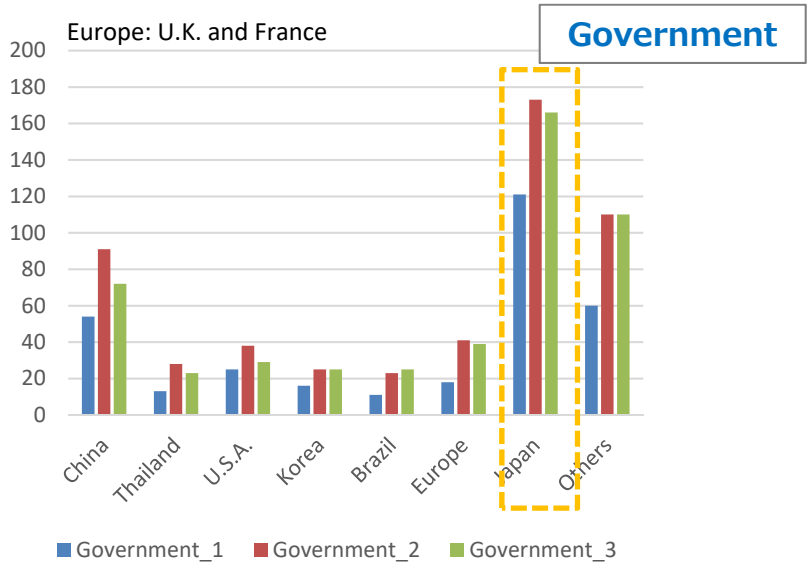


Figure 17. Responses of foreigners and Japanese on different grouping of information

2. Disaster information needs investigation in the 2011 GEJE
東日本大震災時の需要側のニーズ

Importance of different types of information in different time phase

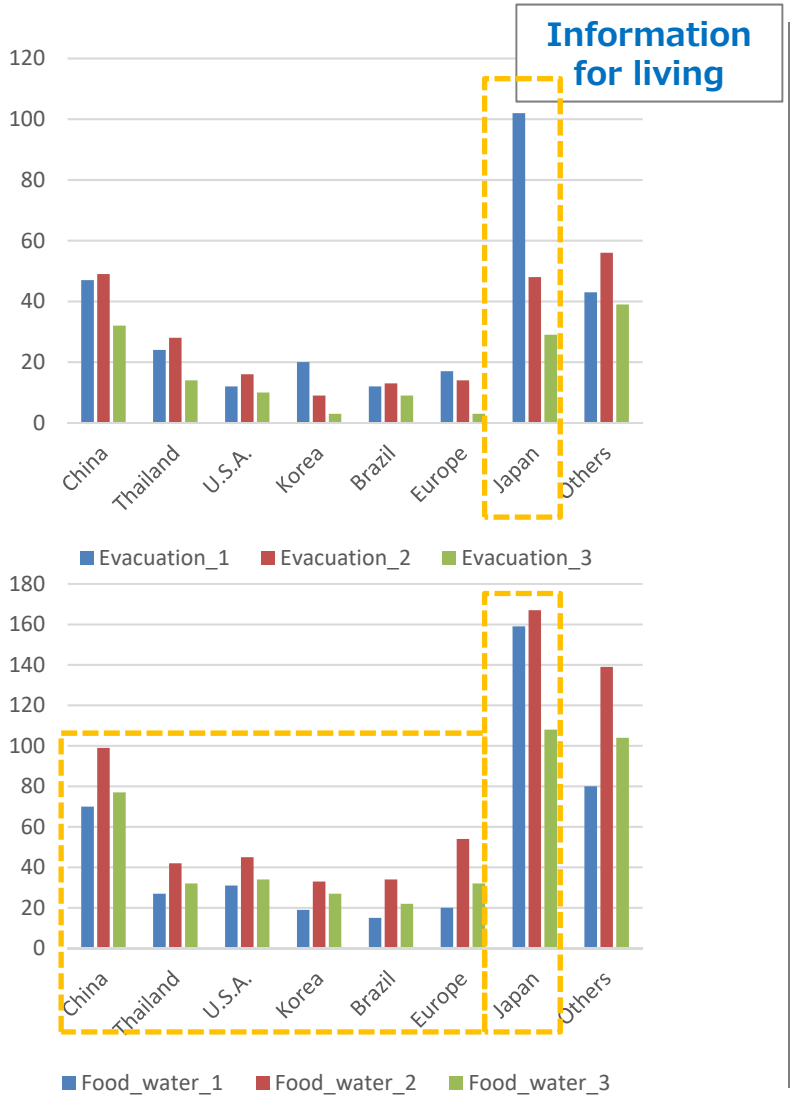


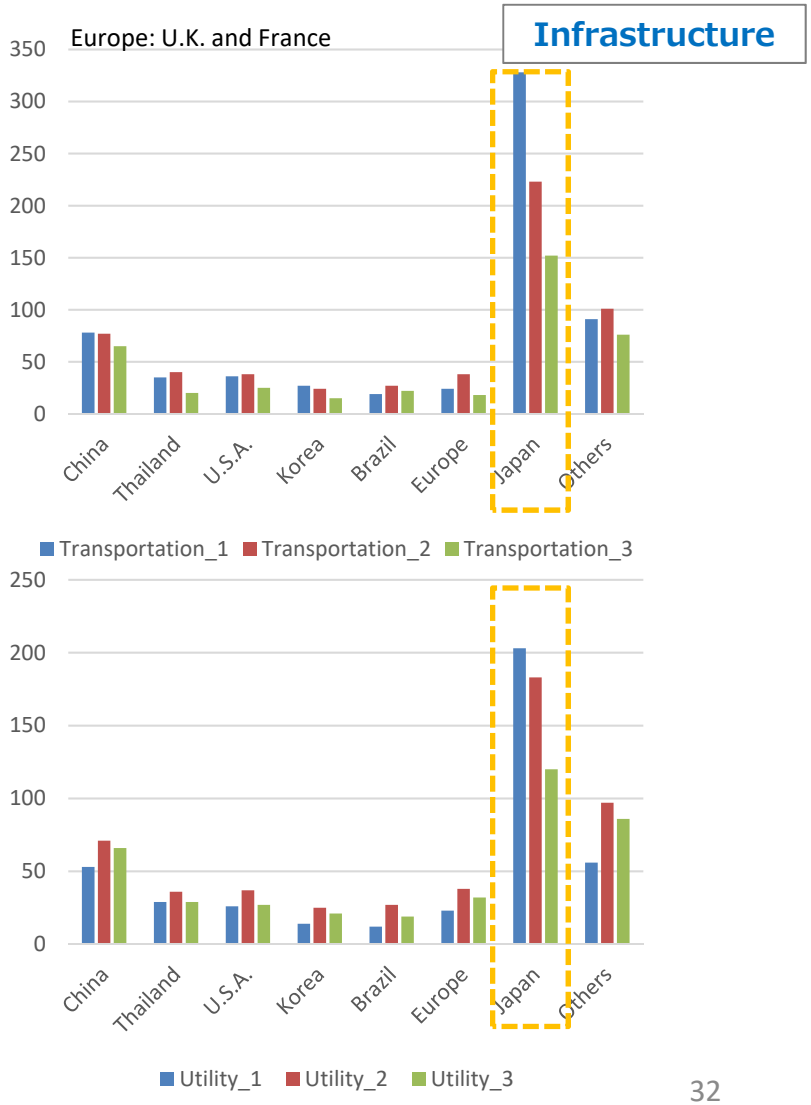


- Regarding safety of family and friends, all nationalities tend to share the similar tendency.
- Regarding continuity of school and business, Japan and Thailand and U.S.A. share similar pattern.
- Regarding government response, Japanese tend to think more of importance on this information.

2. Disaster information needs investigation in the 2011 GEJE
東日本大震災時の需要側のニーズ

Importance of different types of information in different time phase

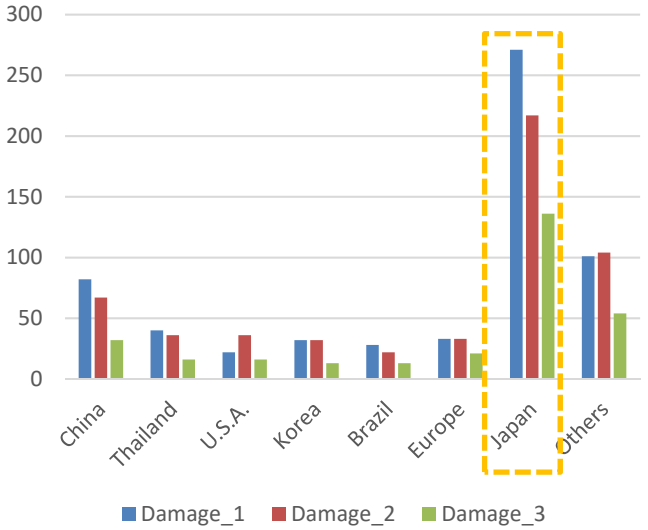


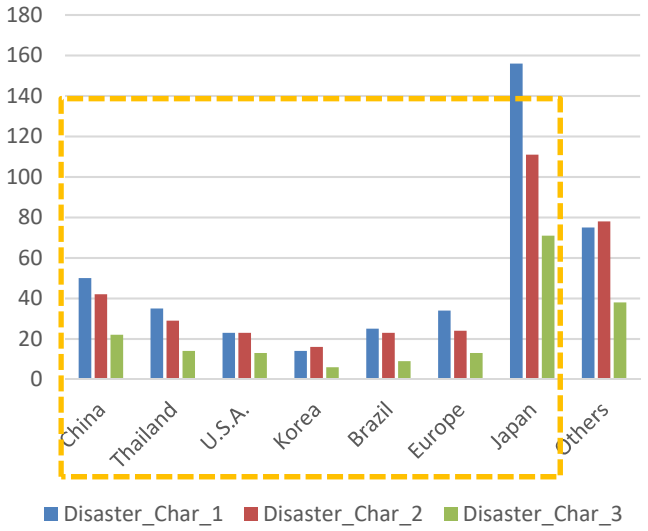


2. Disaster information needs investigation in the 2011 GEJE
東日本大震災時の需要側のニーズ

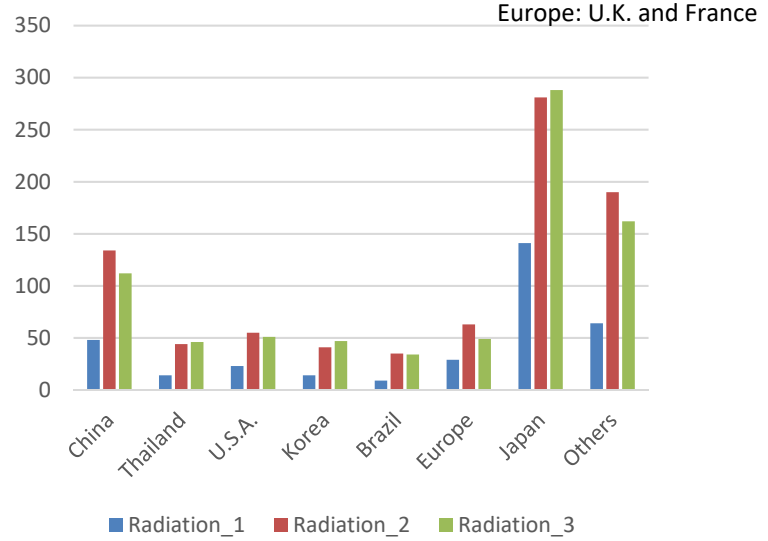
Importance of different types of information in different time phase

Disaster oriented information





Europe: U.K. and France



- Regarding disaster damage and disaster characteristics, importance of information seemed to decrease across different nationalities.
- While radiation accident was unique and sensitive, all nationalities thought importantly of this information in the first week and second week.

2. Disaster information needs investigation in the 2011 GEJE
東日本大震災時の需要側のニーズ

Modeling framework: binary logit model

What types of information were most important for you during the first day, first week, and second week after the earthquake? (mark all that apply)

	Private life		Disaster oriented information			Government	Information for living		Infrastructure	
	Safety of family, friends, etc. (i=1)	School & business continuity (i=2)	Earthquake & tsunami characteristics (i=3)	Earthquake & tsunami damage (i=4)	Radiation level & risk (i=5)	Government response (i=6)	Evacuation & shelters (i=7)	Food & water supply (i=8)	Electricity & other utilities (i=9)	Transportation systems (i=10)
The first day (t=1)	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No
The first week (t=2)	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No
The second week (t=3)	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No

→ Investigate information needs dynamics in different time phase during disaster response

2. Disaster information needs investigation in the 2011 GEJE
東日本大震災時の需要側のニーズ

Modeling framework: binary logit model

- Each respondent has 10 different options to select
- Each choice is assume to be independent

Safety of family, friends, etc. (i=1)	School & business continuity (i=2)	Earthquake & tsunami characteristics (i=3)	Earthquake & tsunami damage (i=4)	Radiation level & risk (i=5)	Government response (i=6)	Evacuation & shelters (i=7)	Food & water supply (i=8)	Electricity & other utilities (i=9)	Transportation systems (i=10)

Yes V_{Yes}^{it} No V_{No}^{it} …

$$P_{Yes}^{it} = \frac{exp(V_{Yes}^{it})}{exp(V_{Yes}^{it}) + exp(V_{No}^{it})} = \frac{1}{1 + exp(V_{No}^{it} - V_{Yes}^{it})}$$

$$\Delta V^{it} = V_{No}^{it} - V_{Yes}^{it} = \theta_1^{it} x_1 + \theta_2^{it} x_2 + \theta_3^{it} x_3 + \cdots$$

- P_{Yes}^{it}: probability for selecting information i at time phase t
- $\theta_1^{it}, \theta_2^{it}, \theta_3^{it}$ … : coefficients of explanatory variables
- x_1, x_2, x_3 … : explanatory variables

2. Disaster information needs investigation in the 2011 GEJE
東日本大震災時の需要側のニーズ

Expected explanatory variable

Residence years	Less than 1 year	?
	1 to 3 years	+
	3 to 6 years	+
	6 years or more	+
Language proficiency	Japanese (reading/writing) – Native/ Advanced/Intermediate/Basic	?
	Japanese (speaking/listening) - Native/ Advanced/Intermediate/Basic	?
	English - Native/ Advanced/Intermediate/Basic	?
Marriage/access to translate	Married to a Japanese national	-
	Have access to someone who can translate	+
Age	29 or lower	?
	30-39	-
	40-49	?
	50-59	?
	60 or higher	-
Gender	Male	?
	Female	?
Occupation	Japanese company employee	?
	Overseas company employee	?
	Japanese government employee	?
	Overseas government employee/military	?
	Japanese educational institution employee	?
	Freelance/self-owned business/housemaker	?
	Student	-
Income level	Less than 3.3 million yen	?
	3.3 to 6.95 million yen	?
	6.95 to 9 million yen	?
	More than 9 million yen	?

Example of estimation result: Radiation level & risk (i=5), N=860

	The first day (t=1)	The first week (t=2)	The second week (t=3)
res_1yr_to_3yr	**-0.42.**	0.24	-0.02
res_3yr_to_6yr	-0.13	0.13	0.12
res_6yr_more	-0.01	-0.36	0.18
English_advanced	0.20	-0.21	0.10
English_intermediate	0.34	**-0.63.**	0.04
English_basic	**0.73.**	-0.27	-0.03
Married_Japanese	0.35	-0.12	0.06
Access_translate	0.02	0.18	0.05
age_20_29	-0.03	**0.91***	**0.79.**
age_30_39	0.00	**0.77.**	**0.93***
age_40_49	-0.17	**1.46***	**1.16***
age_50_59	0.53	**1.36.**	**1.06.**
age_60_69	-1.42	-0.13	-0.37
Female	-0.29	-0.08	0.01
Occ_Overseas_employee	0.39	**-0.78.**	0.06
Occ_Japanese_government	**0.98.**	-0.21	1.09
Occ_Overseas_government	0.14	0.80	**1.74****
Occ_Japanese_educational	-0.06	0.00	0.51
Occ_Freelance_self_owned	-0.07	-0.21	-0.10
Occ_Student	0.19	-0.40	0.36
Occ_House_maker	**1.66****	0.59	1.03
Country_Brazil	-0.71	0.11	0.58
Country_China	-0.32	**-0.78****	**-0.50.**
Country_France	-0.13	0.95	-0.31
Country_Indonesia	0.64	**-1.26***	**-1.20****
Country_Korea_South	-0.33	-0.31	**1.03***
Country_Vietnam	0.04	**-1.18****	-0.06
Country_United_Kingdom	**0.65.**	-0.29	-0.41
Country_United_States_of_America	0.19	-0.18	0.36
Country_Nepal	-0.65	-0.81	-0.44
Country_Thailand	-0.57	**-0.68.**	-0.06
R^2	0.06	0.08	0.08

- Regarding age group, the first day did not show significance.
- The first week and second week showed significance especially on 40-49 aged group.

- Difference on first day and other time phase
- China, Indonesia, Korea, and Vietnam showed significance.

Significance codes:
- 0 '***'
- 0.001 '**'
- 0.01 '*'
- 0.05 '.'

2. Disaster information needs investigation in the 2011 GEJE
東日本大震災時の需要側のニーズ

Conclusion

Disaster information needs investigation: type and time phase

- Regarding safety of family and friends, all nationalities tend to share the similar tendency with decrease of importance as time passes by.
- Regarding disaster damage and disaster characteristics, importance of information seemed to decrease across different nationalities.
- While radiation accident was unique and sensitive, all nationalities thought importantly of this information in the first week and second week.
- Especially on radiation information, the first week and second week showed significance especially on 40-49 aged group.
- Different nationalities had discrepancies on information seeking behavior.

Table of Content

3. 最近の供給側の情報提供｜ Recent information provision by supply side

Purpose of analysis

To understand current disaster information provision of stakeholders for foreigners (resident aliens/ international tourists) in Japan

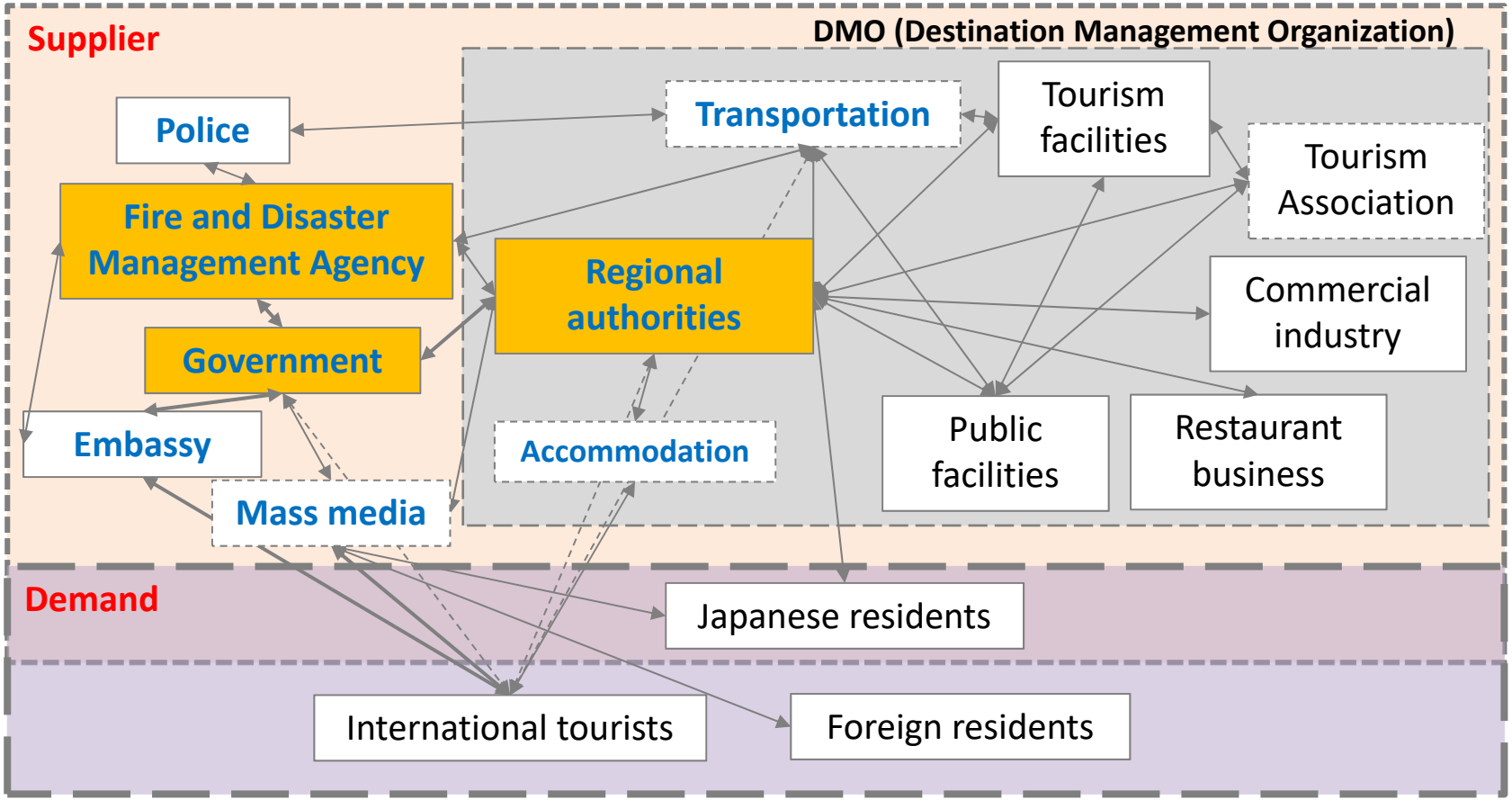


Figure 3 Crisis information stakeholders in tourism

3. 最近の供給側の情報提供｜ Recent information provision by supply side

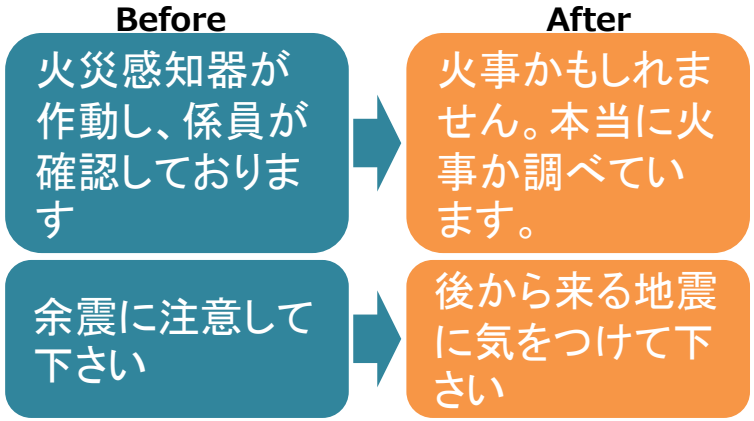
Government : Fire and Disaster Management Agency (FDMA)

Intangible necessity - language barrier
Providing information in friendly Japanese(やさしい日本語):

Evacuation guidance in friendly Japanese

	Content
Target	Station, hotel, stadium, etc.
Planning	Trial experiment by the end of this year Initiative starting from Martch, 2018
Language level	Japanese language ability : 1 year residence
Principle	Slowly and exactly Learning “Plain English” as well Enhance understanding of Japanese as well

Source: https://www.2020games.metro.tokyo.jp/multilingual/references/easyjpn.html
http://human.cc.hirosaki-u.ac.jp/kokugo/ejpamphlet2.pdf



Example of friendly Japanese

3. 最近の供給側の情報提供｜ Recent information provision by supply side

Government : Fire and Disaster Management Agency (FDMA)

Intangible necessity - language barrier
Emergency Board (外国人用救急ボードの作製)

Emergency board

	Content
Target	Foreigners who are injured
Planning	Started from October, 2016 Preparation to 2020 Olympics Reported that 9,800 foreigners were emergency transported in 2015.
Language level	Not able to communicate in Japanese
Principle	**5 languages:** English, Chinese, Korea, Spanish, Portuguese Illustration of symptoms Pointing with fingers

Example of emergency board

Source: http://www.news24.jp/articles/2016/09/08/07340447.html

3. 最近の供給側の情報提供｜ Recent information provision by supply side

Government：Fire and Disaster Management Agency (FDMA)

Intangible necessity - language barrier
Multiple-languages translation application (多言語翻訳アプリ)

Multiple-languages translation application

	Content
Target	Fire departments Foreigners who are injured
Planning	Started from April, 2017
Language level	Not able to communicate in Japanese
Principle	**15 languages:** including English, Chinese, Korea, etc. Detailed illustration of symptoms 46 sentences and voice Enables communication

http://www.saga-s.co.jp/articles/-/88973
佐賀新聞、2017年4月26日

Example of application image

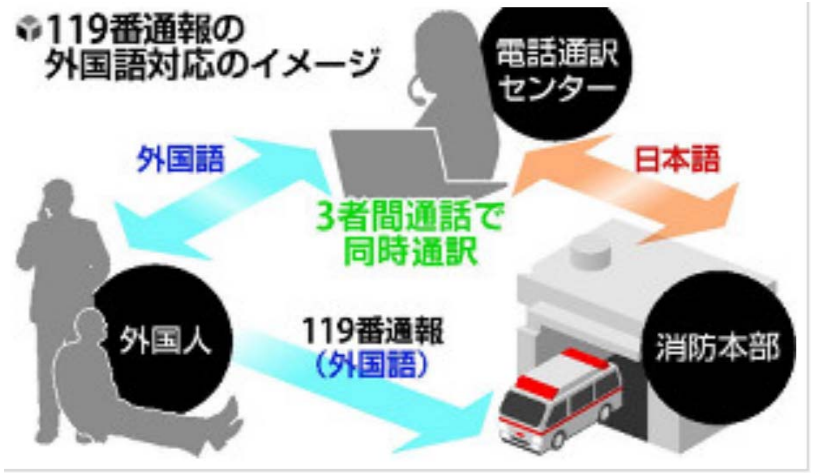
3. 最近の供給側の情報提供｜ Recent information provision by supply side

Government：Fire and Disaster Management Agency (FDMA)

Intangible necessity - language barrier
Simultaneous interpretation (同時通訳システム)

Emergency simultaneous interpretation

	Content
Target	Foreigners who are injured
Planning	Preparing 24 hour response system
Language	Not able to communicate in Japanese
Principle	**5 languages:** English, Chinese, Korea, Spanish, Portuguese Foreigner call → connected to interpreter directly Dialogue between three people



Example of system

http://www.yomiuri.co.jp/feature/TO000299/20170218-OYT1T50057.html#
読売新聞、2017年02月18日

3. 最近の供給側の情報提供｜ Recent information provision by supply side

Government：Fire and Disaster Management Agency (FDMA)

Intangible necessity – language and knowledge
Disaster drill for foreigners(外国人向け避難訓練)

Disaster drill for foreigners

	Content
Target	Foreigners (foreign residents)
Planning	Initiative trial drill within end of 2017 Extend to Stadium/Haneda Airport/ Hotels and Ryokan, etc. by 2019
Language	Not able to communicate in Japanese
Principle	• Easily understood Japanese • Digital signage • Pictogram Cooperation with local authorities, companies, etc.

Example of foreigners drill

日経新聞、2017年10月25日, https://www.nikkei.com/news/image-article/?R_FLG=0&ad=DSXMZO8243110027012015CC0001&dc=1&ng=DGXLASDG27H0V_X20C15A1CC0000&z=20150127

3. 最近の供給側の情報提供｜ Recent information provision by supply side

Regional authorities in destination

Intangible necessity – language and knowledge
Disaster drill for foreigners(外国人向け避難訓練)

Foreigners drill in different destinations in Japan

	大分･別府	東京	京都
Target	International tourists	International tourists	International tourists
Content	Disaster characteristics Shelter information	Disaster characteristics Shelter information	Shelter information Evacuation points 10 days planning
Language	**3 languages:** Japanese, Korean, Chinese	3 languages: Japanese, English, Chinese	**3 languages:** Japanese, English, Korean, Chinese
Tool	Facebook Translation Telephone response	Disaster drill Application Assistance planning	Disaster drill Pictogram card Manual

Table 7. Example of friendly Japanese

朝日新聞、2017年10月30日

3. 最近の供給側の情報提供｜ Recent information provision by supply side

Government：Japan National Tourism Organization (JNTO)

Intangible necessity - language barrier
Application “Safety Tips” (災害情報提供アプリ)

Content on safety tips

	Content
Target	International tourists
Planning	Initiated from October, 2014
Language	Not able to communicate in Japanese
Principle	**4 languages:** English, Chinese, Korea, Japanese Communication and behavior chart Earthquake and tsunami alerts Links to embassies and JNTO HP

Example of safety tips image

http://www.yomiuri.co.jp/feature/TO000299/20170218-OYT1T50057.html#
読売新聞、2017年02月18日
http://gw.rcsc.co.jp/appinfo/safety.html

3. 最近の供給側の情報提供｜ Recent information provision by supply side

Government：Ministry of Internal Affairs and Communications (MIC, 総務省)

Intangible necessity - language barrier
Coordination for assisting foreigners in disasters
(災害時外国人支援コーディネーター)

Content on the coordination system

	Content
Target	Foreign residents
Planning	Initiated in 2017
Language	Varies accordingly
Principle	Matching the needs Role assignment Local authorities coordination Relation to other relevant organizations

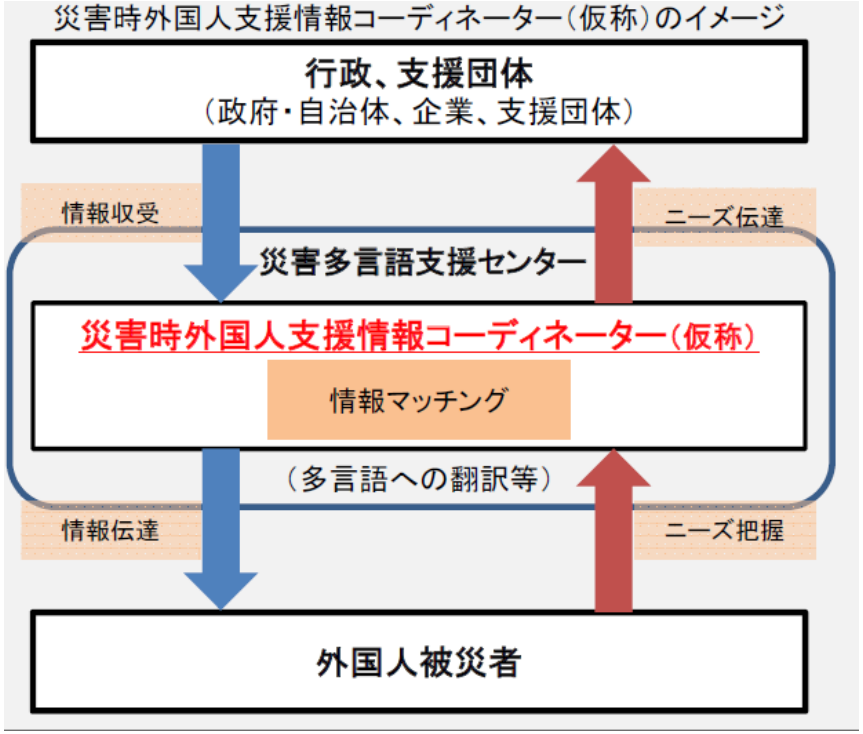


Image of coordination of gap identification

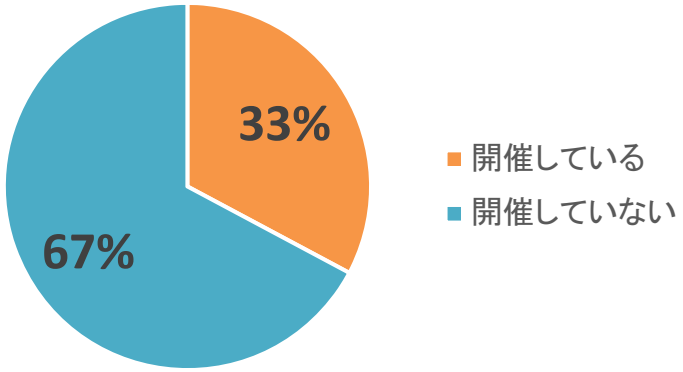
http://www.soumu.go.jp/main_content/000488936.pdf

3. 最近の供給側の情報提供｜ Recent information provision by supply side

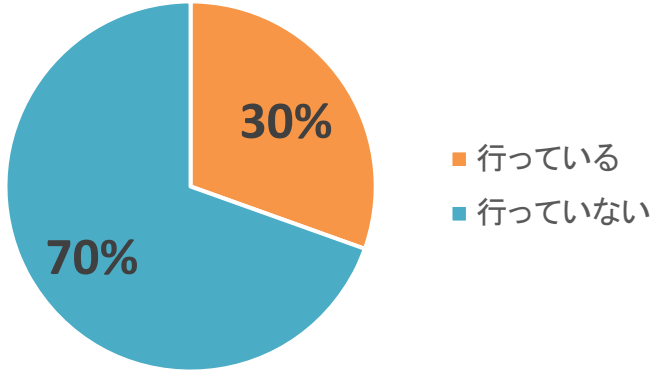
Government：Ministry of Internal Affairs and Communications (MIC, 総務省)

Intangible necessity - language barrier
Coordination for assisting foreigners in disasters
(災害時外国人支援コーディネーター)

外国人を対象とした
防災訓練を開催しているか



外国人住民に対し、被災時における
避難所の利用について周知しているか



調査対象：都道府県・政令指定都市・312市区町村及び各都道府県の地域国際化協会
有効回収率：82.9% (353/426)

- 33% of governmental bodies replied that they are not targeting specific response for foreigners
- 30% of governmental bodies replied that they are providing information for shelter use for foreigners

総務省（2017）、「災害時の外国人住民への対応に関するアンケート」により作成

3. 最近の供給側の情報提供｜ Recent information provision by supply side

Conclusion

- Densely concentration on enhancement of language problem
- Translation efforts and easily understood Japanese
- Less attention on coordinating across different organizations
- Needs dynamics of foreigners in different time phase should be considered

		Stakeholder involved in crisis management			
		FDMA	Japan Tourism Agency	Destination authorities	MIC
Preparedness	Creating and exchange of training material	■	■	▒	▒
	Providing manuals in multiple languages	■	■	▒	▒
	Development of strategic scenarios	▒	▒	▒	▒
Response	Coordination of crisis management team	▒	▒	▒	■
	Situation awareness and analysis	■	■	▒	▒
	Mass media management	▒	▒	▒	▒

(Modified from Sigala, 2012.)

Table of Content

4. 結論・今後の予定｜Conclusion and future works

Conclusion

Do the needs of demand side match to the information provided by provider?

Research objectives	Limitation	Conclusion
To understand current disaster information system of stakeholders for foreigners international tourists in Japan →**Supply side**	✓ Stakeholders are limited to governmental bodies mainly ✓ Further information can be collected by semi-structured interview	✓ Most organizations focus on translating information in multiple languages ✓ It is necessary to consider coordination between different organizations
To investigate needs of foreigners during the disasters →**Demand side**	✓ International tourists survey should be conducted ✓ Model can be improved by incorporating variables like safety perception.	✓ Common needs like disaster characteristics and damage share similar importance among nationalities. ✓ Regarding radiation information, all aged groups thought important in first week and second week.
To propose policy implications after understanding the gap between the two	✓ At the moment, the analysis needs further investigation to draw concrete implications.	✓ Understanding time dynamics of foreigners should be reflected to supply side.

4. 結論・今後の予定｜Conclusion and future works

Complementarity suggestion: Information provision and social media use

- Evaluation of information provision effectiveness of supplier
- Much demand on safety confirmation from demand side
- Potential use of social media as a communication tool for disaster response

Disasters	Platform	Details of social media utilization
The 2010 Haiti Earthquake	**Facebook Ushahidi crisis map**	A total of 12,000 translators were recruited The map was used to track cholera outbreaks 6 months after **The system was widely used by relief organizations.**
2010 Christchurch Earthquake / 2011 June Christchurch earthquake	**Twitter**	**to send a coordinated flow of recovery information to residents** A symposium after the disaster about social media in the disaster discussed creating an “Emergency 2.0 Wiki.”
Hurricane Irene	**SMS, social network**	The US Federal Emergency Management Association (FEMA) SMS and social networks to keep in touch with family and friends instead of phone

(Modified from Shaw, 2012)

4. 結論・今後の予定｜Conclusion and future works

Thank you very much for kind listening.

ご清聴ありがとうございました。

We would like to acknowledge to Prof. Kawasaki, Henry and Meguro from University of Tokyo for providing the valuable survey data and use of it for research purpose.