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**Characterizing the Impact of Population Diversity on Risk Information Delivery
and Accessibility. A Case of Foreigners in the Kanto Region of Japan**

Presentation by: Bismark Adu Gyamfi

PhD Student

Graduate School of Media and Governance, Keio University (SFC)

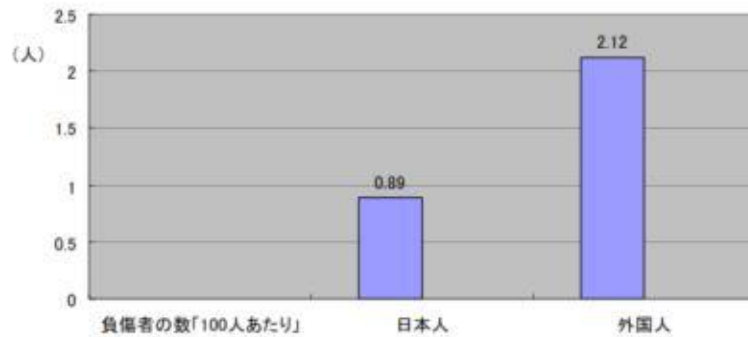
24th September, 2020

Background

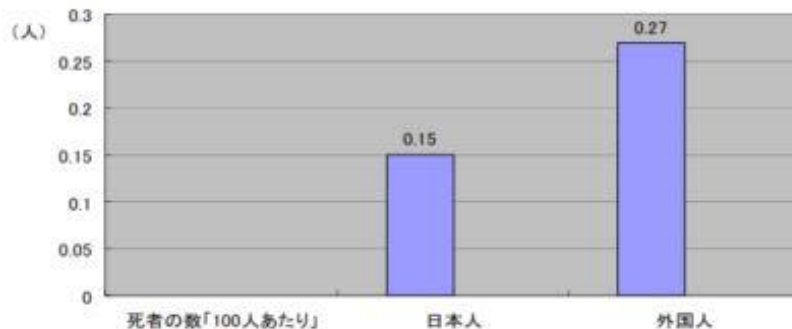
- Japan is a disaster hotspot and every disaster presents **Reflections and Lessons** for further improvement
- Great Hanshin-Awaji Earthquake highlights two major features:

* **High Vulnerabilities of Foreigners to Disasters**

* **Importance of Self-Help and Mutual Assistance**



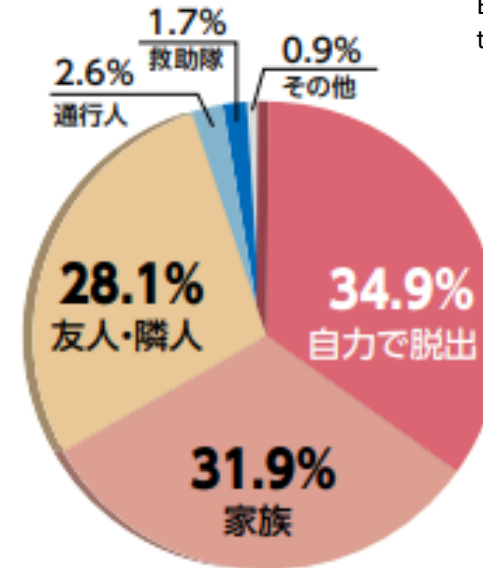
Ratio of Damage per 100 people



Ratio of Deaths per 100 people

■ 阪神・淡路大震災における
生き埋めや閉じ込められた際の
救助主体等

After the Great Hanshin-Awaji
Earthquake When buried or
trapped alive Rescue subject, etc.

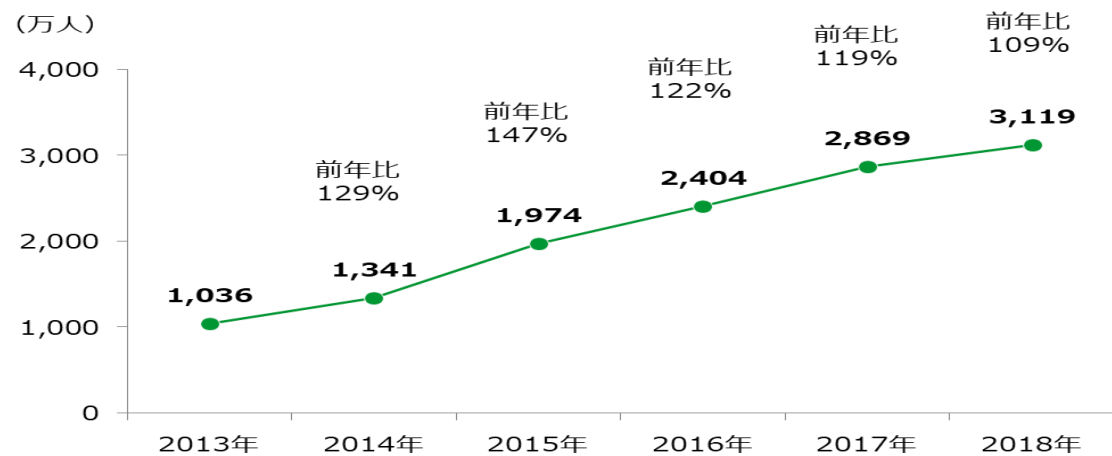
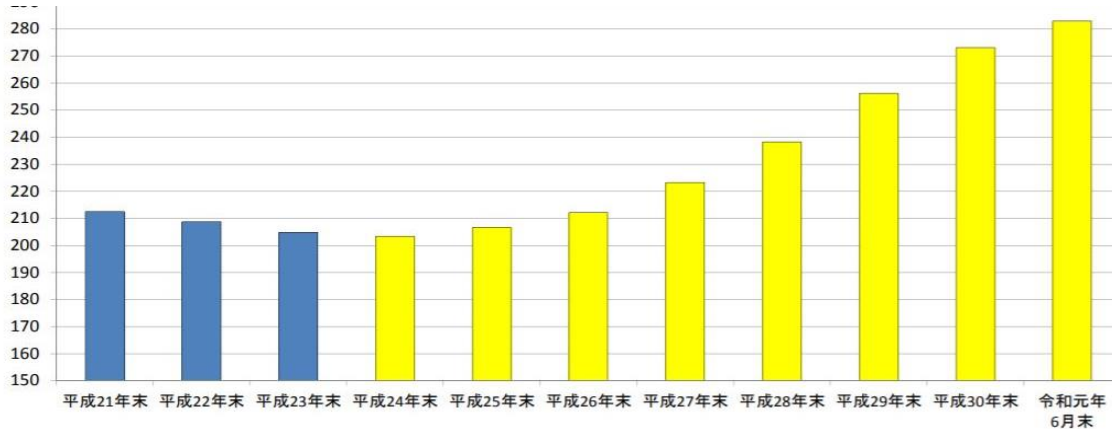


In the Great Hanshin-Awaji
Earthquake, about 80% of the
total rescued were by local
residents in the area.

(社) 日本火災学会 (1996) 「1995 年兵庫県南
部地震における火災に関する調査報告書」 参照

Concerning Issues

Increasing number of Foreigners



*Tourists

出典：日本政府観光局（JNTO）

Recent Disaster & Crisis Occurrence / Prediction of Future disasters

- 2011 – 2019: 21 Major Disasters (Typhoon, Heavy Rains, Earthquake, Heatwave, Volcanic Eruption, Landslide, Heavy Snow, COVID-19)
- Tokyo Inland Earthquake
- Nankai Trough Earthquake

Initiatives – Learning from Past Experiences

(公助 自助 共助)

- Public Relations Office of the Gov. of Japan
- Cabinet Office, Gov. of Japan
- Ministry of Internal Affairs and Communication
- MLIT

災害時に命を守る一人一人の防災対策

文化共生推進計画

Cultural coexistence
promotion plan



- *Self Help*
- *Mutual Help*
- *Public assistance*



Resilience to Disasters
(Self-Prepared)



情報難民ゼロプロジェクト

Zero Information Refugee
Project

Concerning Issues from Previous Studies

1. Heightened Vulnerability of Foreigners

- Awareness of the evacuation site (33%)
- Awareness of hazard maps (13%)
- Regarding disaster prevention activities (training) (30% had experience in participation)

外国籍住民を交えた地域防災のあり方～地域防災力の向上を可能にする枠組みとは？～ 片岡 博美, 2016 (Ideal way for regional disaster prevention with foreign residents)

2. Highly associated with language barriers

Japanese language barrier hinders the participation and accessibility of disaster risk information and awareness (Kawasaki, Henry and Meguro, 2018)(HADA, 2020)

3. Contention about a broader use of “foreigners” for generalization

- category “foreigners”, which puts permanent residents, tourists, housewives, and international students into the same box in Japan creates blur lines to understanding disaster vulnerabilities
- foreigners skilled in Japanese language demonstrates similar information gathering behavior as Japanese nationals (Kawasaki, Henry and Meguro, 2018)
- language capacity, cultural, and religious differences potentially affect disaster response and preparedness (Gómez, 2013)

Research Questions

- Does defragmentation of “foreigners” into other units offers better understanding of diversity and vulnerabilities in Japan?
- How could diversity affect risk information delivery and accessibility
- How do these contribute to disaster risk awareness and knowledge

Objective

- To understand disaster prevention and preparedness through risk information gathering in a diverse population

Why Kanto Region – Study Area



a. High Presence of Foreigners (47% of National total)

b. Disaster History

Kanto heavy rain, 2015

Ibaraki Northern Earthquake, 2016

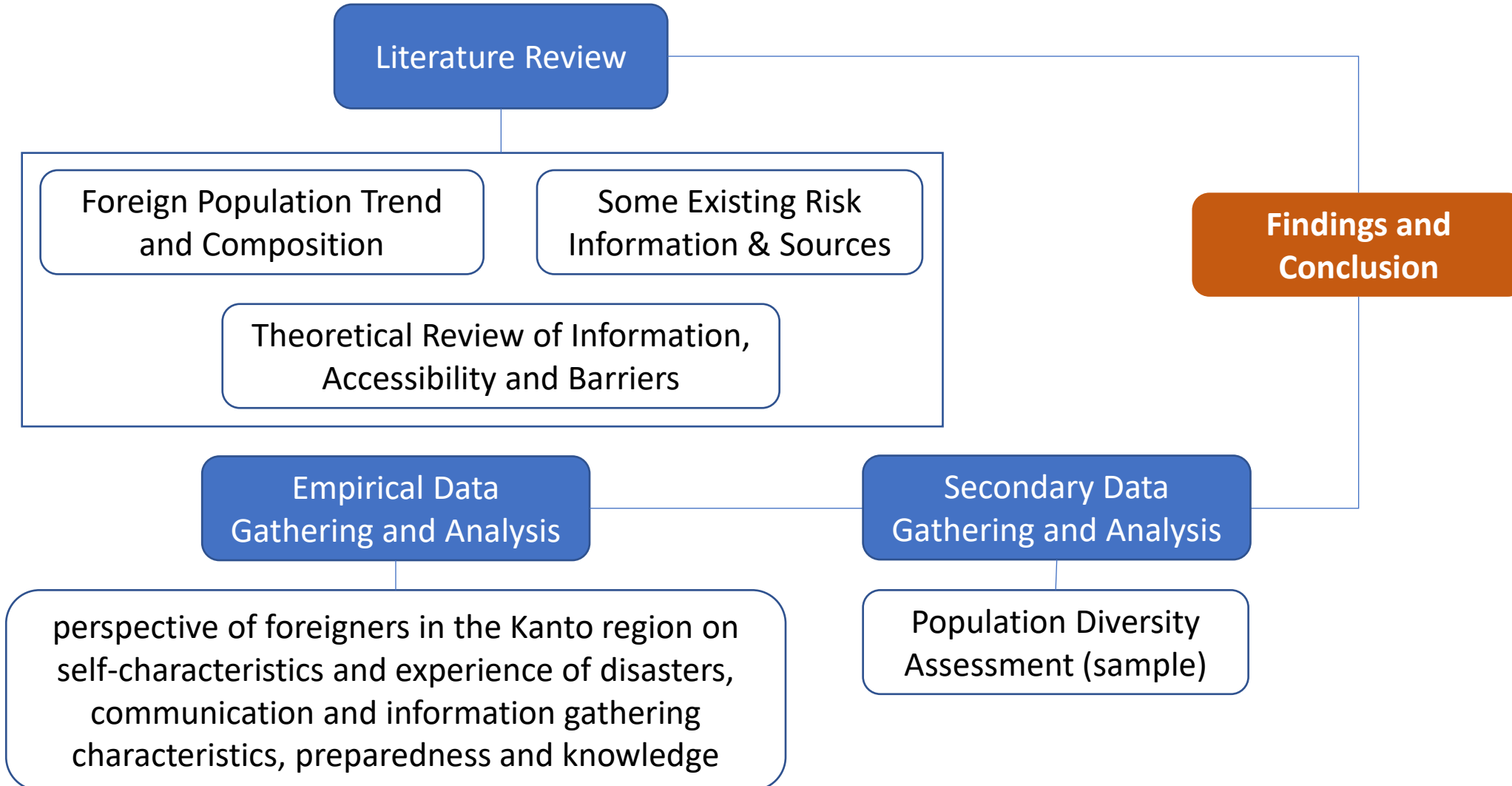
Typhoon No. 15, 19, 21, 24, 26,3

Large-scale avalanche in Nasu Town, Tochigi Prefecture(2017)

c. Other Characteristics

- By number of foreign workers: Tokyo, Kanagawa, and Saitama
- Cluster of Foreign Communities: Toshima Ward (Vietnamese and Myanmar) Koto Ward (Indians), Adachi City (Filipinos), Shinjuku Ward (Chinese, South Koreans)
- Highest number of International Schools: 100 international Schools (Ministry of Land, Infrastructure, Transport and Tourism City Bureau Town Development Promotion Division, 2017)
- By Tourism: Tokyo, Kanagawa, Chiba (JTB, 2019)

Approach



Methodology

A. Online Questionnaire Administration – Empirical Data

1. Questionnaire design

were gathered through a combination of open and closed-ended questions, as well as multiple-choice questions with predefined answers to offer respondents the possibility to choose or rank

2. Pre-test

The questionnaire was pre-tested amongst selected students in Global Resilience and Innovation Laboratory, Keio University SFC to reduce errors and ensure respondents understanding of the questions. This was conducted in September 2019

3. Questionnaire Administration

Survey Monkey online platform. The online link shared on Facebook, LINE app, and via e-mail of acquaintances. This period was from October to December 2019

3. Sorting and Analysis

315 respondents received. Sorted and imported to SPSS for analysis

b. Understanding Diversity – Secondary data


(Sample Case with Tokyo Metropolitan Area)

Entropy index (h) measures “average difference between a unit’s group proportions and that of the system as a whole” whilst the isolation index “provide some measure of the probability that a member of one group will meet or interact with a member of another group” (Forest, 2005)

$$h = - \sum_{j=1}^k P_{ij} \log(P_{ij})$$

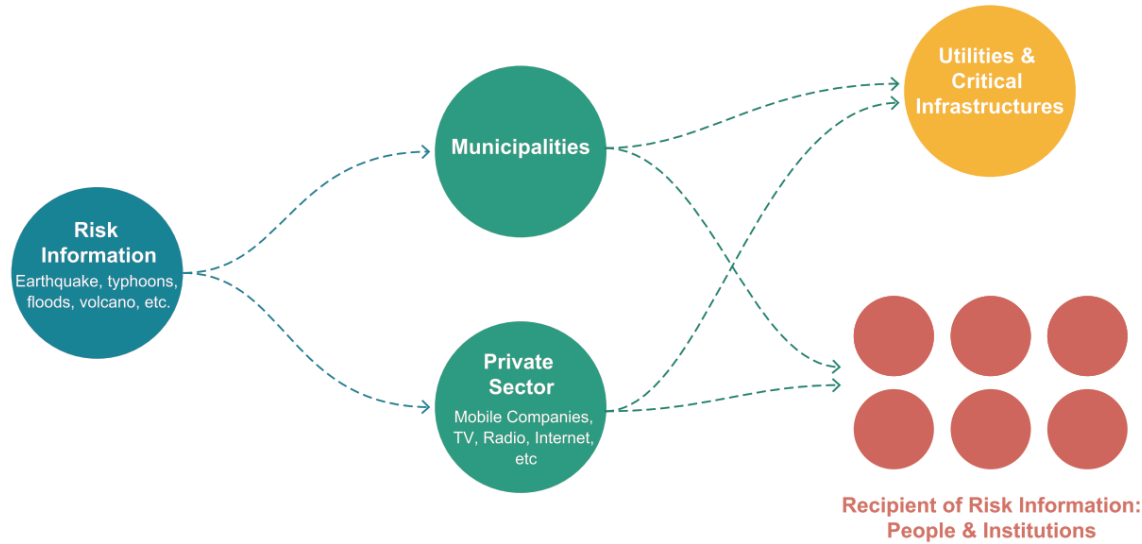
Where k represents the number of nationalities including foreigners and Japanese, P_{ij} = proportion of population of j th nationality in city i . this proportion is calculated by $\frac{n_{ij}}{n_i}$ where n_{ij} represents number of population of j th nationality in city i and n_i is the total number of population in the city

Theoretical Review

Example	Keywords Definition	Output	Redefined definition keywords
Feicheng Ma, 2015	Information is defined as “that which causes probabilistic distributions to change”, “intelligence required by decision-making” and “ that which eliminates uncertainties ”	Knowledge and to act upon	Information that is aimed at eliminating disaster uncertainties
Robert M. Losee (1998)	Information is prima facie something that flows between a sender and a receiver		Flow (effectively communicated)
Youssef (2005)	Effective information communication: a process of transmitting ideas, information, attitude (by the use of symbols, words, picture, figures) from a source (who is the originator of the message) to a receiver, for the purpose of influencing with intent		With the purpose of influencing individuals to reduce exposure and vulnerability
Redefined definition keywords in context			
UNISDR, 2009	Public awareness as the “extent of common knowledge about disaster risks, the factors that lead to disasters and the actions that can be taken to reduce exposure”	Resilience	Disaster Resilience Communication
Massa, 2016	Information processing, presence of physical obstacles, choices in semantics....		Barriers to Communication
Burnett, Jaeger and Thompson, 2008	geography, technology, individual traits such as physical or cognitive abilities and disabilities, language competence, and technological literacy		Challenges to Information Accessibility

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Existing Risk information and Sources

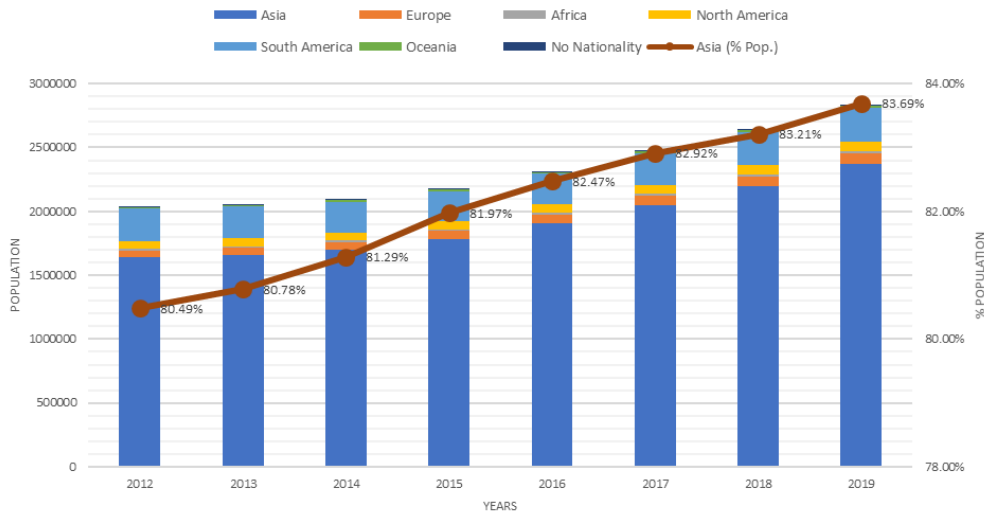


Source: World Bank. 2019.

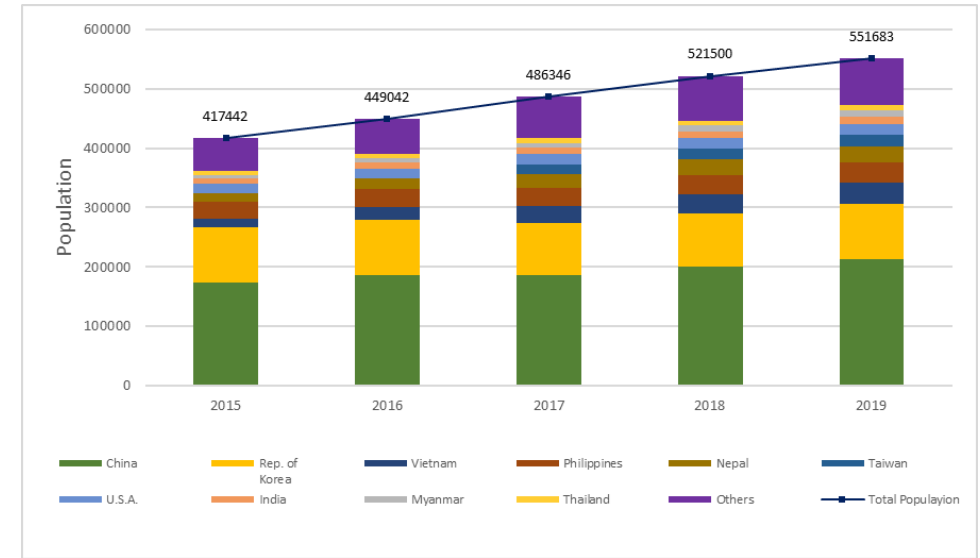
- **Local governments** are responsible for the day-to-day administration of settlements from towns to cities and are highly responsible for producing and issuing disaster and risk information

Task	Hazard monitoring, forecasting and prediction, disaster risk assessment, communication and preparedness activities
Actors	Warning issuer, warning communicator, and warning recipient (national government, local government, utilities and firms, citizens)
Medium	Hardware, such as measuring instruments, computers, servers and communications equipment, and software for data collection, forecasting and prediction, assessment, and communication. And Other means
information	Lead time, risk level, predicted impact, evacuation (shelter) information, and other precautionary information

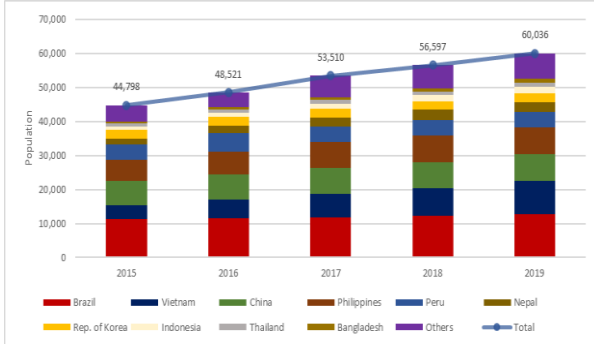
Results – Composition of Foreign Population



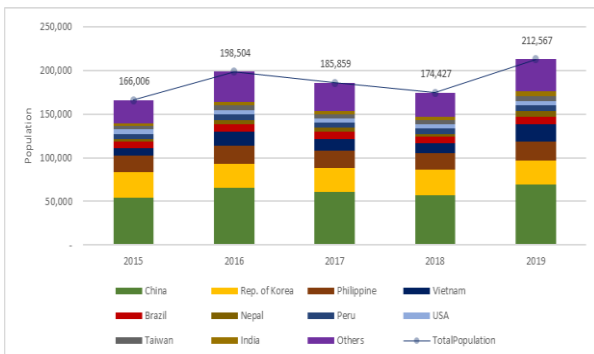
Foreign Population Composition in Japan



Foreign Population Composition in Tokyo Area



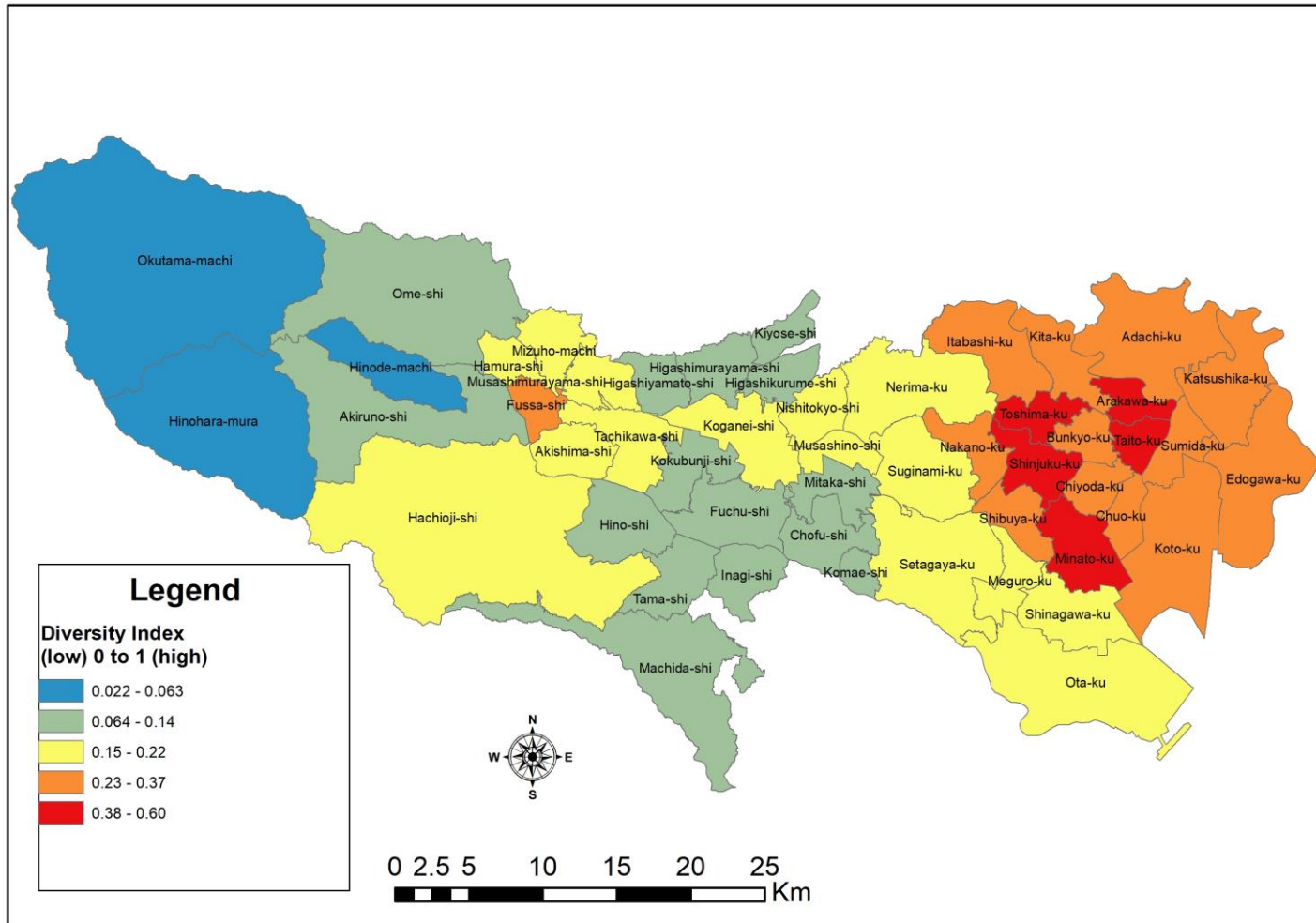
Foreign Population in Gunma Prefecture



Foreign Population in Kanagawa Prefecture

- Increasing Foreign Population and in Nationality Coverage
- Dominance of Foreigners from Asian region
- Composition in pattern change from Tokyo Area to other Prefectures in Kanto Area
- The top ten countries with high foreign population are China, Republic of Korea, Vietnam, Philippines, Nepal, Taiwan, the US, India, Myanmar and Thailand respectively

Results — Diversity Foreign and Local Population

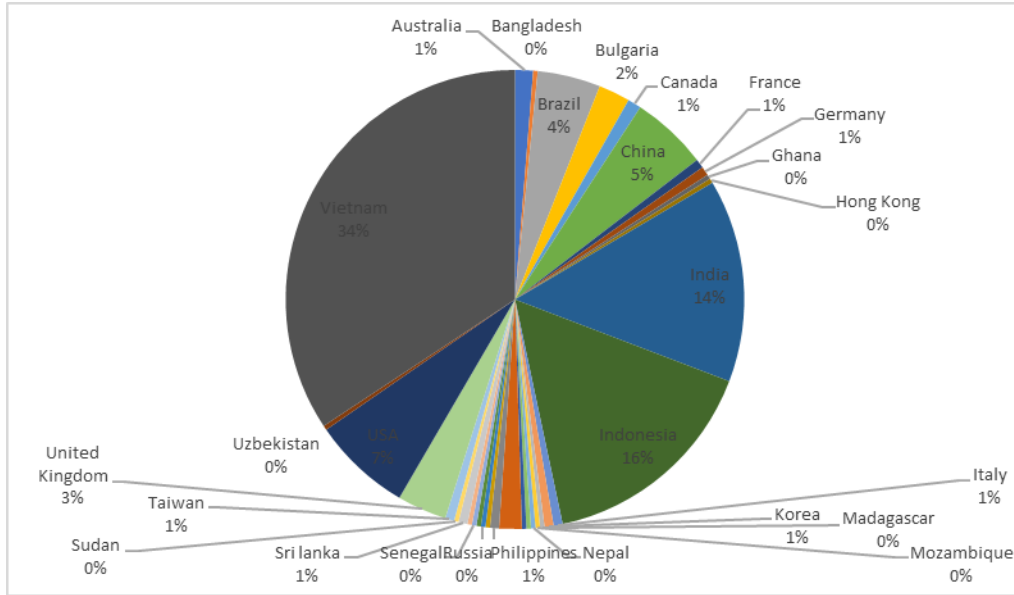


- Overall Diversity is 20.17%
- Diversity from East (Special wards) to West
- High Diversity in some areas around 60%

Reasons: high presence of English-speaking hospital, International schools, and other foreign related assisted initiatives (Ministry of Land, Infrastructure, Transport and Tourism City Bureau Town Development Promotion Division, 2017)



Results — Survey of Foreigners

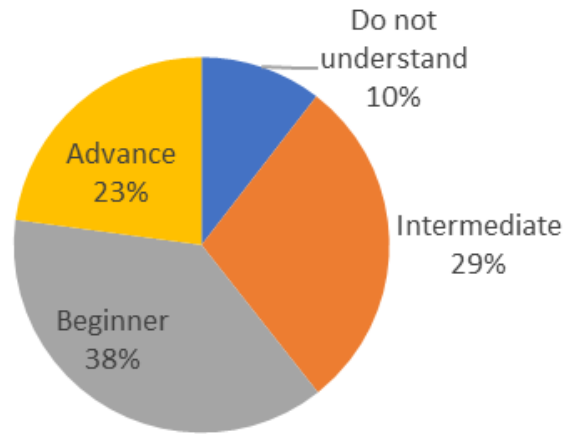


Duration of Stay in Japan		Visa Status							Total
		Dependent	Japanese (Acquired)	Permanent Resident	Spouse or child of Japanese national	Study	Training	Visitor	
Less than 1 year	Count	6	0	1	1	65	6	1	88
	% within Years in Japan	6.8%	0.0%	1.1%	1.1%	73.9%	6.8%	1.1%	100.0%
	% of Total	1.9%	0.0%	.3%	.3%	20.6%	1.9%	.3%	27.9%
More than 1 year, Less than 5 years	Count	10	1	1	6	42	5	0	106
	% within Years in Japan	9.4%	.9%	.9%	5.7%	39.6%	4.7%	0.0%	100.0%
	% of Total	3.2%	.3%	.3%	1.9%	13.3%	1.6%	0.0%	33.7%
More than 5 years, Less than 10 years	Count	1	0	1	7	3	0	0	43
	% within Years in Japan	2.3%	0.0%	2.3%	16.3%	7.0%	0.0%	0.0%	100.0%
	% of Total	.3%	0.0%	.3%	2.2%	1.0%	0.0%	0.0%	13.7%
Over 10 years	Count	1	1	35	12	0	0	0	78
	% within Years in Japan	1.3%	1.3%	44.9%	15.4%	0.0%	0.0%	0.0%	100.0%
	% of Total	.3%	.3%	11.1%	3.8%	0.0%	0.0%	0.0%	24.8%
Total	Count	18	2	38	26	110	11	1	315
	% within Years in Japan	5.7%	.6%	12.1%	8.3%	34.9%	3.5%	.3%	100.0%
	% of Total	5.7%	.6%	12.1%	8.3%	34.9%	3.5%	.3%	100.0%

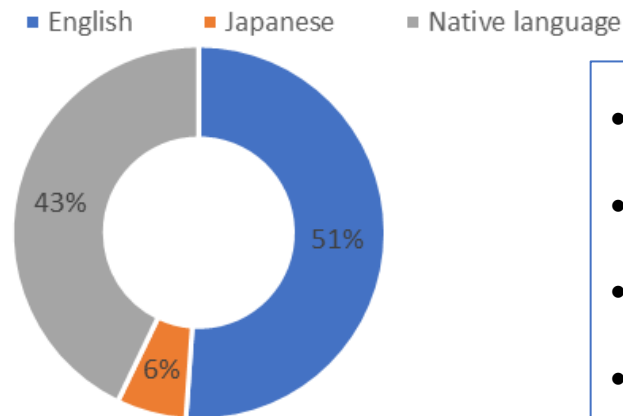
- Diverse Nationality (respondents from more than 20 different countries) from 315 respondents
- Duration of residency is associated with Visa type
- Many foreigners with work and study visa, indicating potential long stay in the country (now, 30 have been in the country for one year or less)

Results — Survey of Foreigners

Preferred language and information source



Japanese Language Proficiency



Language use on SNS

			In which language do you mainly use the internet?					Total
			English	Japanese	Native language	No Answer	Other(Specifically)	
Facebook	Count		104	10	99	1	10	224
	% of Total		33.0%	3.2%	31.4%	.3%	3.2%	71.1%
Random Internet	Count		17	0	11	0	0	28
	% of Total		5.4%	0.0%	3.5%	0.0%	0.0%	8.9%
LINE	Count		7	1	2	0	0	10
	% of Total		2.2%	.3%	.6%	0.0%	0.0%	3.2%
Newspaper	Count		1	1	0	0	0	2
	% of Total		.3%	.3%	0.0%	0.0%	0.0%	.6%
NHK news	Count		1	0	0	0	0	1
	% of Total		.3%	0.0%	0.0%	0.0%	0.0%	.3%
TV	Count		10	2	2	0	0	14
	% of Total		3.2%	.6%	.6%	0.0%	0.0%	4.4%
Twitter	Count		18	2	6	0	1	27
	% of Total		5.7%	.6%	1.9%	0.0%	.3%	8.6%
Wechat	Count		1	0	2	0	0	3
	% of Total		.3%	0.0%	.6%	0.0%	0.0%	1.0%
Weibo	Count		0	0	1	0	0	1
	% of Total		0.0%	0.0%	.3%	0.0%	0.0%	.3%
WhatsApp	Count		5	0	0	0	0	5
	% of Total		1.6%	0.0%	0.0%	0.0%	0.0%	1.6%
Total		Count	164	16	123	1	11	315
		% of Total	52.1%	5.1%	39.0%	.3%	3.5%	100.0%

- A substantial number can understand Japanese but 38% do not
- Reflective in language use of in daily life and risk information gathering (knowledge)
- English and Native language are preferred for information
- Social media is a preferred source of all types of information (English and Native language still preferred)

Results – Survey of Foreigners

Disaster experience in Japan and home country

Experience of Natural Disaster in Home Country			Experience of Natural Disaster in Japan		Total
			No	Yes	
	No	Count	35	115	150
		% within Experience in home country	23.3%	76.7%	100.0%
		% of Total	11.1%	36.5%	47.6%
	Yes	Count	23	142	165
		% within Experience in home country	13.9%	86.1%	100.0%
		% of Total	7.3%	45.1%	52.4%
Total		Count	58	257	315
		% within Experience in home country	18.4%	81.6%	100.0%
		% of Total	18.4%	81.6%	100.0%

Disaster experience and drill participation

Experience of Natural Disaster in Home Country			Participated in Local Disaster Drills		Total
			No	Yes	
	No	Count	101	49	150
		% within Experience in home country	67.3%	32.7%	100.0%
		% of Total	32.1%	15.6%	47.6%
	Yes	Count	118	47	165
		% within Experience in home country	71.5%	28.5%	100.0%
		% of Total	37.5%	14.9%	52.4%
Total		Count	219	96	315
		% within Experience in home country	69.5%	30.5%	100.0%
		% of Total	69.5%	30.5%	100.0%

- There is high level of experience (82%) in Disasters but mostly in Japan. Only 52% experience from home country
- But low participation in disaster drills or exercise in Japan (only 31% participation)
- No disaster experience, never participated in drills (32%)

Results – Survey of Foreigners

Duration of Stay in Japan and Disaster experience

Duration of Stay in Japan			Participated in Local Disaster Drills		Total
			No	Yes	
Less than 1 year	Count		71	17	88
	% within Duration of Stay		80.7%	19.3%	100.0%
	% of Total		22.5%	5.4%	27.9%
More than 1 year, Less than 5 years	Count		74	32	106
	% within Duration of Stay		69.8%	30.2%	100.0%
	% of Total		23.5%	10.2%	33.7%
More than 5 years, Less than 10 years	Count		27	16	43
	% within Duration of Stay		62.8%	37.2%	100.0%
	% of Total		8.6%	5.1%	13.7%
Over 10 years	Count		47	31	78
	% within Duration of Stay		60.3%	39.7%	100.0%
	% of Total		14.9%	9.8%	24.8%
Total		Count	219	96	315
		% within Duration of Stay	69.5%	30.5%	100.0%
		% of Total	69.5%	30.5%	100.0%

How prepared per experience and knowledge

			Location of Evacuation Site		Total
			No	Yes	
prepared	No	Count	56	27	83
		% within prepared	67.5%	32.5%	100.0%
		% within Location of Evacuation Site	44.8%	14.2%	26.3%
		% of Total	17.8%	8.6%	26.3%
	Yes	Count	69	163	232
		% within prepared	29.7%	70.3%	100.0%
		% within Location of Evacuation Site	55.2%	85.8%	73.7%
		% of Total	21.9%	51.7%	73.7%
Total		Count	125	190	315
		% within prepared	39.7%	60.3%	100.0%
		% within Location of Evacuation Site	100.0%	100.0%	100.0%
		% of Total	39.7%	60.3%	100.0%

- Level of participation in drills does not correspond to duration of stay
- People feel prepared for disasters (74%) but evidence of knowledge of action is low (knowledge of evacuation site = 40%)

Findings

local government disseminate disaster information to foreigners through the

- distribution of pamphlets and brochures.
 - Production of disaster prevention and hazard maps into multiple languages, particularly English.
 - Foreign language version of disaster prevention map/hazard map websites are also provided
-
- Foreign nations are increasing and depict high level of diversity in many communities. Communities shows different levels of heterogeneity
 - Disasters in Japan are the first experience to some foreigners
 - Language preference is important in information accessibility and dominates the preferred source and type
 - Duration of stay in the country is important factor in experience, preparedness and general disaster knowledge
 - **Disjoint in information Delivery sources and Preferred sources and diversity playing a role**

Implication

Risk Information Delivery Lapses – Playing Language catch-up



Potential increase invulnerability

It's an earthquake! What should I do? (In 12 Languages) - Multilingual Disaster Prevention Video

This video is aimed at foreign residents who have never experienced an earthquake and gives them helpful advice and information. It covers how to prepare for an earthquake and what to do when one occurs, all explained simply. You can watch it on YouTube.



12 languages

6 languages

(Leaflet) Important Points about Disaster Response Drills (Available in 6 Languages)



Multilingual Disaster Prevention Pamphlets: "Advice for Protecting Yourself in an Earthquake" (Available in 11 Languages)

This pamphlet is aimed at foreign residents who don't have any prior knowledge or experience of earthquakes. It has information related to earthquake preparation and what to do in the event of an earthquake. It is presented in an easy to understand way and includes illustrations.

Color, 8 pages

Content :

- Let's Learn About Earthquakes/ Problems Encountered in the Great East Japan Earthquake



11 languages

- Despite many efforts, increasing number and diversity is affecting provision of risk information to meet demand (maximum in others is 12 languages), **preferred language, English and Native**

Rippling Implication

- **Potential loss of trust in official warnings and fake news proliferation (mis-information):** majority of foreigners in Japan still rely on inter-ethnic, acquaintances, inter-circles, and social media for risk and resilience information. Per existing studies, these situations are vulnerable to infiltration and influx of fake and misinformed news and information. The traits of foreigners in Japan make it easier for the acceptance of such misinformation or fake news. According to studies, factors such as age, culture, education and gender and rumor mongering within circles and networks are the major elements that fuel fake news acceptance and the proliferation of mis information.
- **Potential lapses in Intercultural Communication Competence:** further detachment of risk information communication between authorities and the foreigners' population could impact on disaster vulnerability reduction and the effort to promote multicultural coexistence, effective disaster information dissemination (under the Zero Refugee Project) as well as disaster response and recovery

Conclusion and way forward

- Defragmenting “foreigner” in Japan give an insight to the level of diversity and the preference for information type, source and various disaster experiences.
- Although collectively, foreigners may be regarded having information gap, sections with Japanese language abilities, different visa status and duration of stay describe the uniqueness in each category and offer better understanding to meeting the needs of each groups
- This is an opportunity to progress risk information delivery through a “target approach” because we know the preferences as well as the areas within communities that are diverse or highly heterogeneous.
- The scope of language could be increased or the available should target areas with high percentage of population with the same language

Limitations

- Respondents may be limited to represent all foreigners in the Kanto area but offer insight to understanding the phenomenon.
- Time constraints in data collection, and further analysis

Acknowledgement

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Thank you

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Keywords: *Population Diversity, Risk Information Delivery, Risk Information Accessibility*

Bismark Adu-Gyamfi¹, Rajib Shaw²

1,2 Graduate School of Media and Governance, Keio University (SFC), Postal Code 252-0882, Endo, 5322, Fujisawa-shi, Kanagawa, Japan