



Disaster Risk Reduction Literacy as the Foundation for Successful Inclusive BOSAI Implementations

Prof TATSUKI Shigeo

Inclusive-BOSAI Research Center

Doshisha University



Disaster Risk Reduction Literacy as the foundation for Successful Inclusive BOSAI Implementations

APMCDRR (Asian Ministerial Conference on DRR)

Partner Event: ID558

**Building Resilient Communities by Investing in DRR Literacy for
Proactive Actions focusing on “Leave No One Behind”**

Brisbane, Australia, September 21, 2022

Shigeo Tatsuki

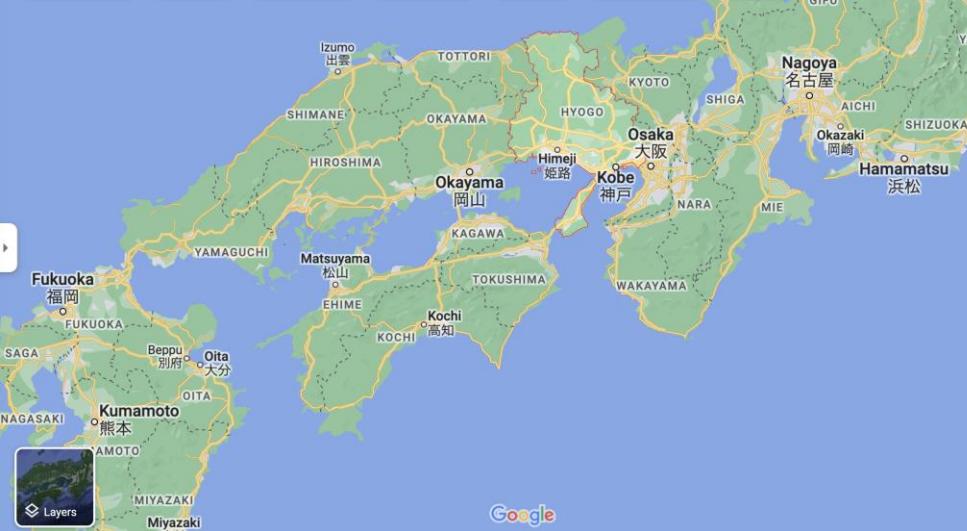
Doshisha University, Kyoto, Japan

3 Constructs of DRR Literacy



3 Constructs of DRR Literacy





The 2015 Hyogo Prefecture Survey on Preparedness
(N=1,103)

Empirical Evidence #1

Weather to Retrofit Your House?

(YES)

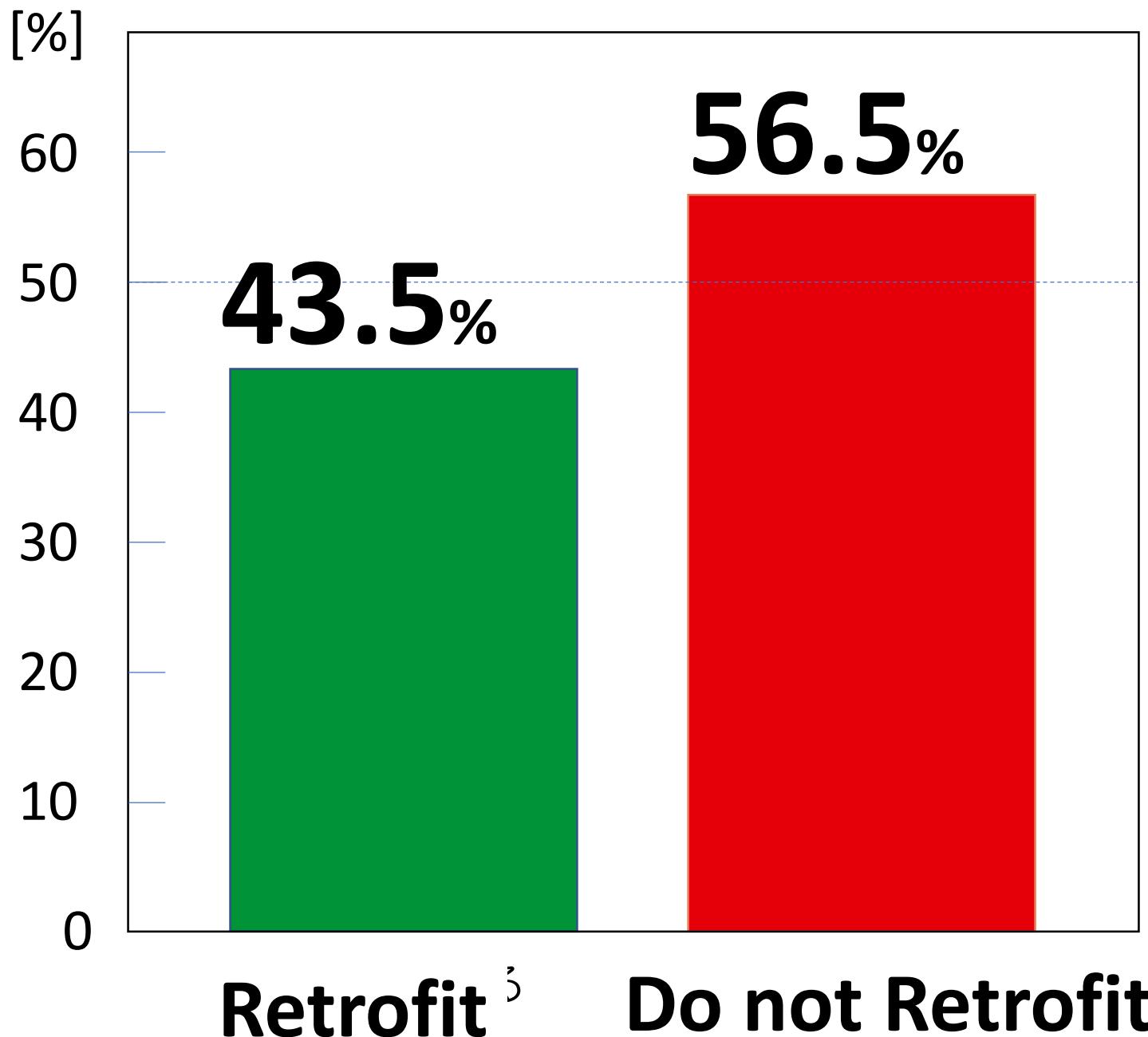
Cost of 2.5 million yen (\$25,000)

No House Damage due to EQ

(NO)

50% Chance of EQ Damage

Cost of 5.0 million yen (\$50,000)



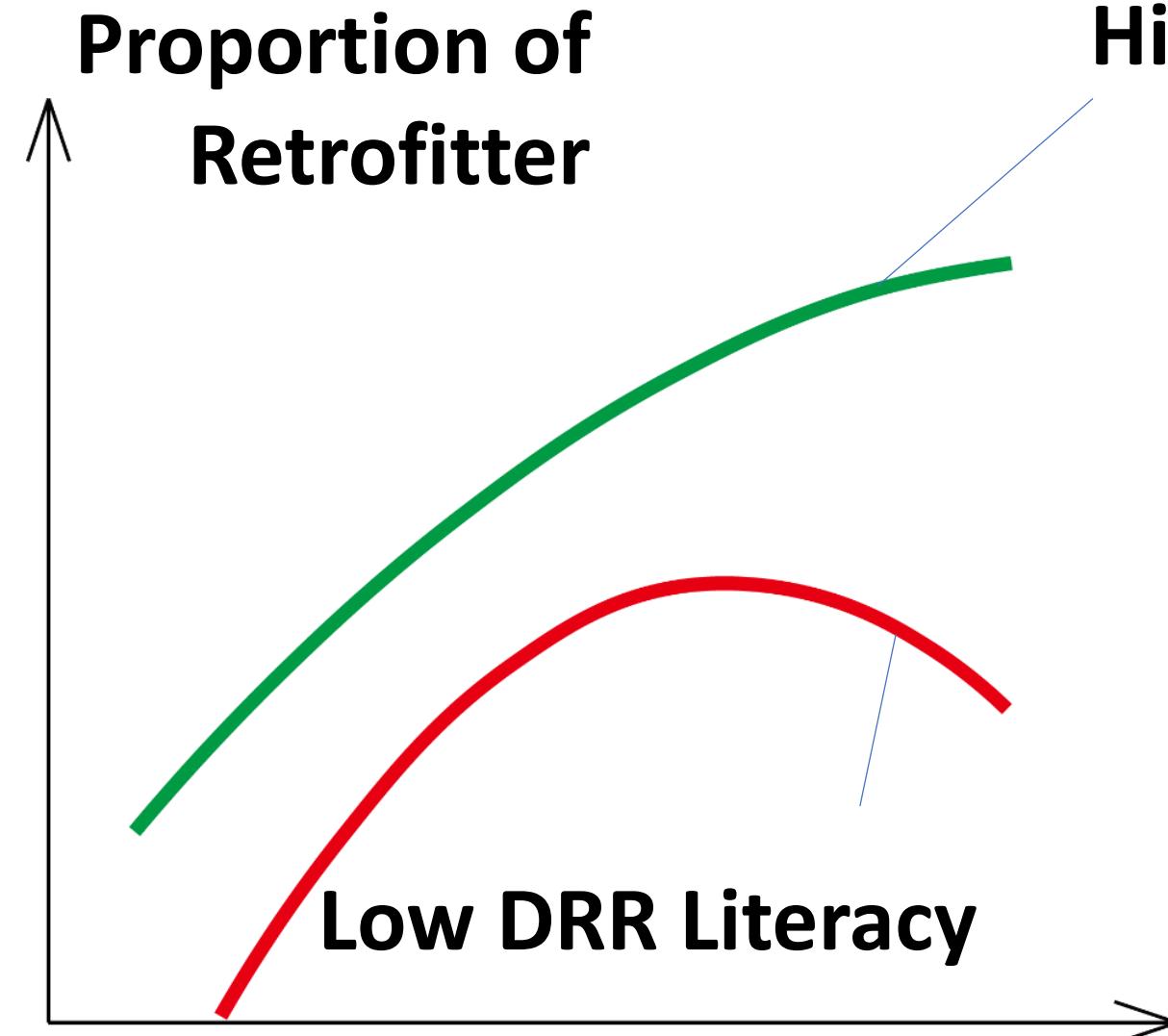
Hyogo Pref. Disaster
Preparedness General Survey

Time of Survey
2015

Population
Residents of Hyogo
Prefecture 20 + years old

Respondents
N=1,103

Kawami, F., Hayashi, H., & Tatsuki, S. (2016). A Study of Nonlinear Interaction Effects of Disaster Risk Reduction Literacy with Seismic Hazard Risk, Physical and Human Damages Perception on Risk Avoidance Behavior: Report of 2015 Hyogo Prefecture Survey on Preparedness. *Journal of Social Safety Science*, 29, 135-142.

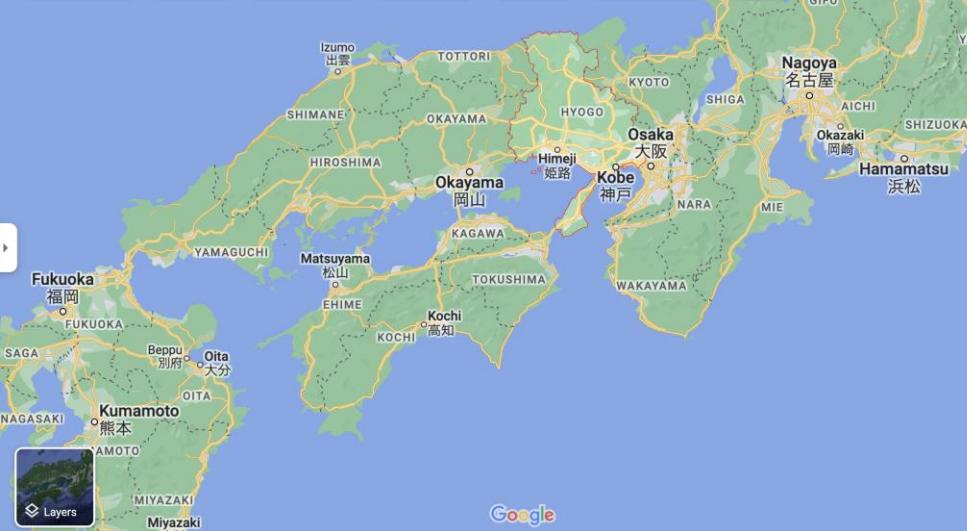


High DRR Literacy

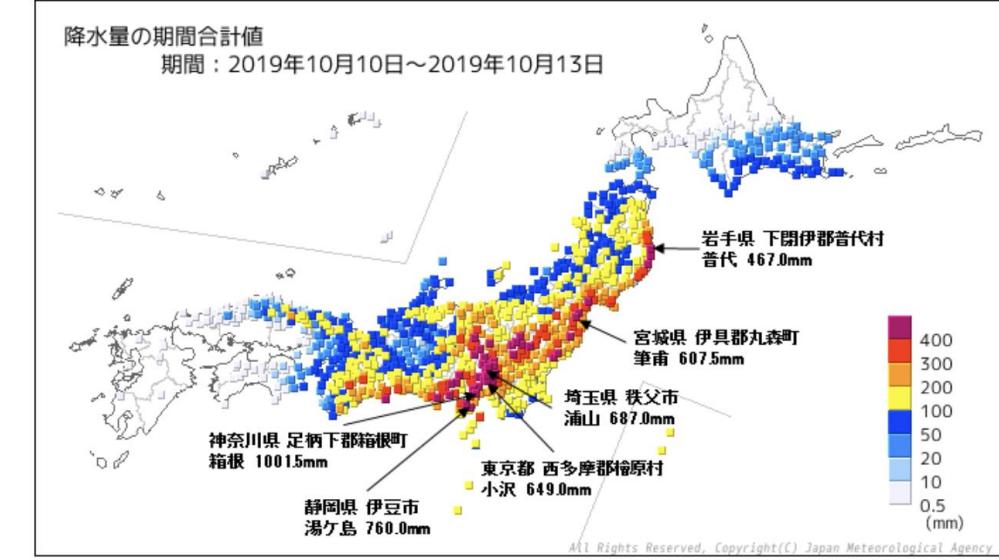
- Understanding of Hazards & Vulnerability
- Awareness of Self-help, Community help & Public Help
- Confidence in Immediate Action

Damage Impact Estimation in Future Disasters

Kawami, F., Hayashi, H., & Tatsuki, S. (2016). A Study of Nonlinear Interaction Effects of Disaster Risk Reduction Literacy with Seismic Hazard Risk, Physical and Human Damages Perception on Risk Avoidance Behavior: Report of 2015 Hyogo Prefecture Survey on Preparedness. *Journal of Social Safety Science*, 29, 135-142.



The 2015 Hyogo Prefecture Survey on Preparedness
(N=1,103)

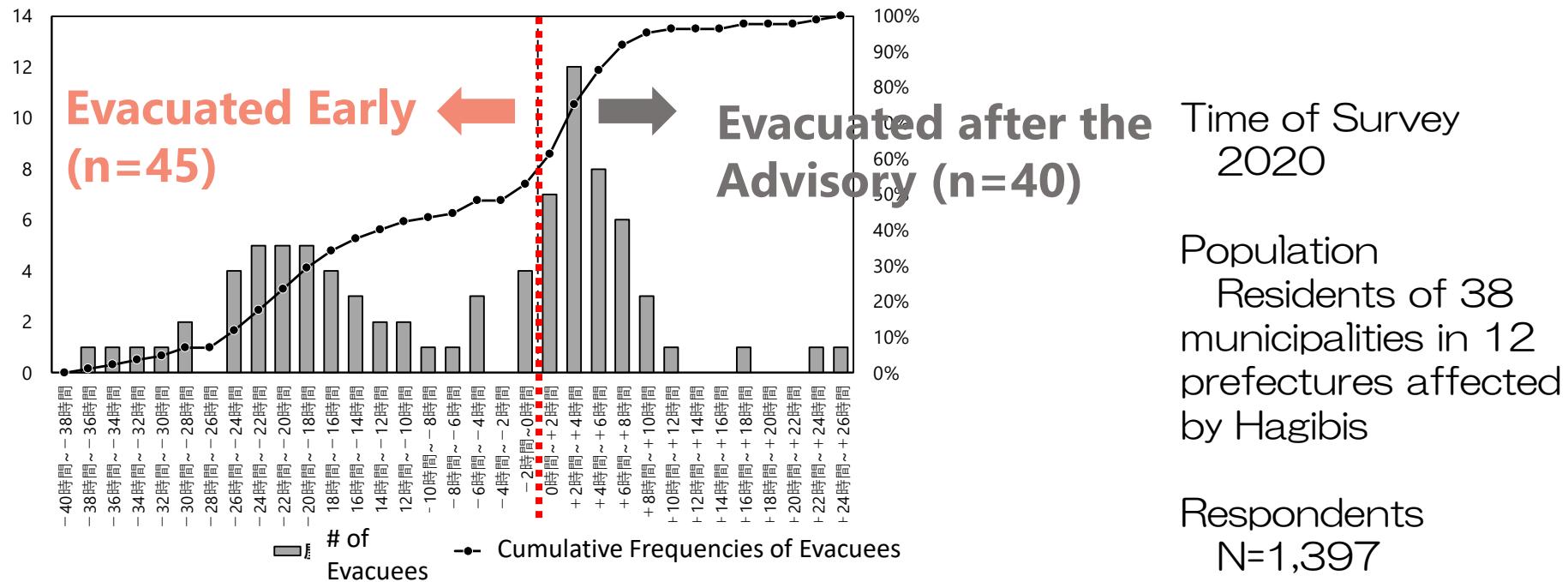


The 2019 Typhoon Hagibis (#19) Survey
(40 municipalities in affected 12 prefectures)

Empirical Evidence #2

The 2019 Typhoon Hagibis (#19) Survey

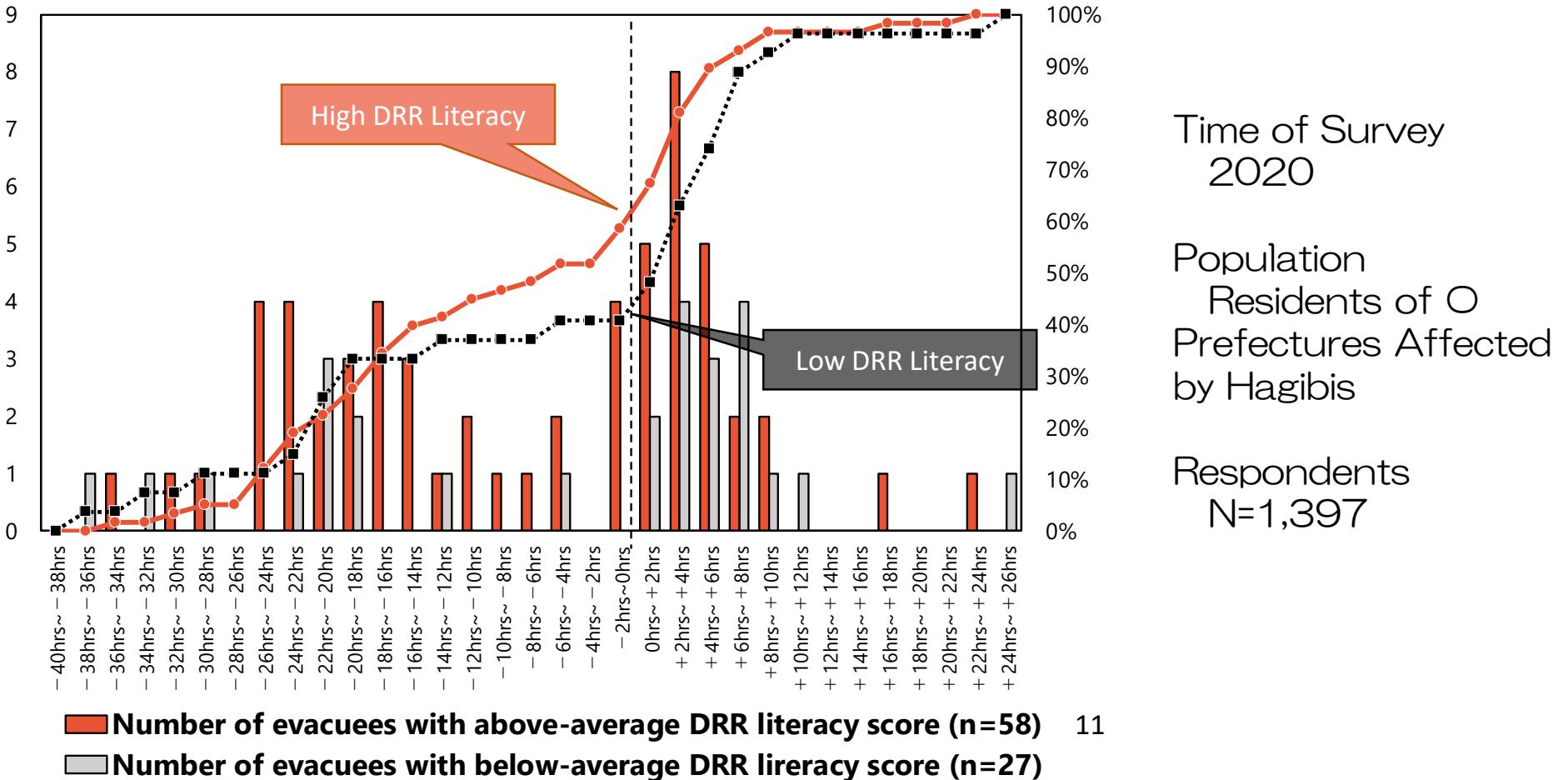
Two Groups of Evacuees: Those who evacuated BEFORE and AFTER the advisory



内閣府「令和元年台風19号災害被災40市町村民対象Web社会調査」2020年1月11日～13日実施、回答のあった3,078名中住宅であった1,397名対象。

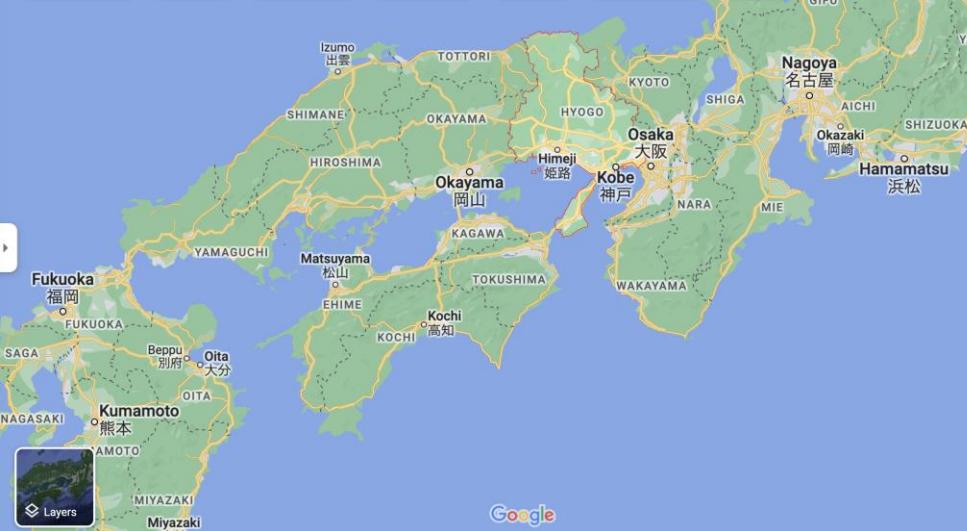
Shinya Fujimoto, Fuminori Kawami, and Shigeo Tatsuki, External and Internal Validation of the Disaster Schema-Initiated Evacuation Decision-Making Model, A poster/video presentation, 45th Annual Natural Hazards Research and Applications Workshop, July 12, 2020.

Most of Early Evacuees Were with a High Level of Bosai literacy

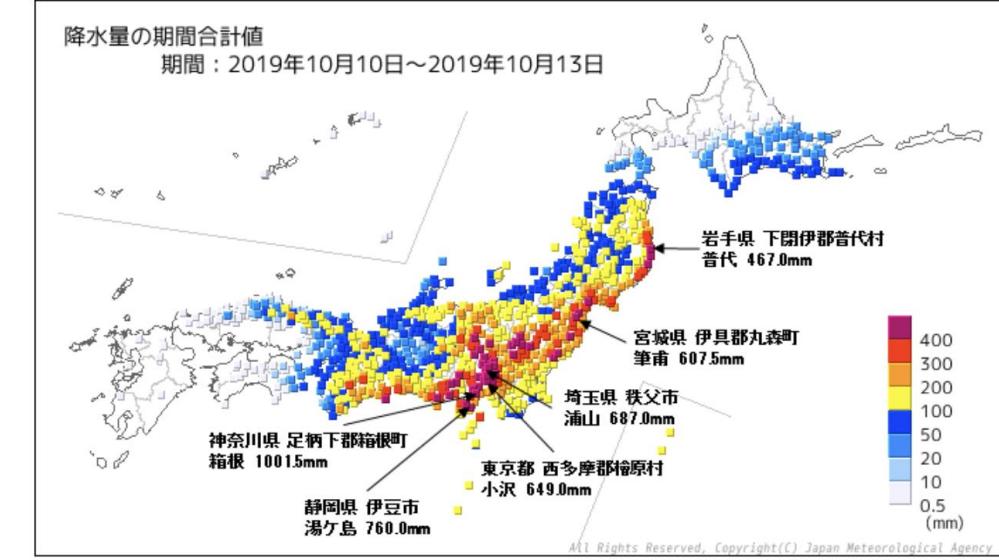


内閣府「令和元年台風19号災害被災40市町村住民対象Web社会調査」2020年1月11日～13日実施、回答のあった3,078名中住んでいた1,397名対象。

Shinya Fujimoto, Fuminori Kawami, and Shigeo Tatsuki, External and Internal Validation of the Disaster Schema-Initiated Evacuation Decision-Making Model, A poster/video presentation, 45th Annual Natural Hazards Research and Applications Workshop, July 12, 2020.



The 2015 Hyogo Prefecture Survey on Preparedness
(N=1,103)



The 2019 Typhoon Hagibis (#19) Survey
(40 municipalities in affected 12 prefectures)

Empirical Evidence #3

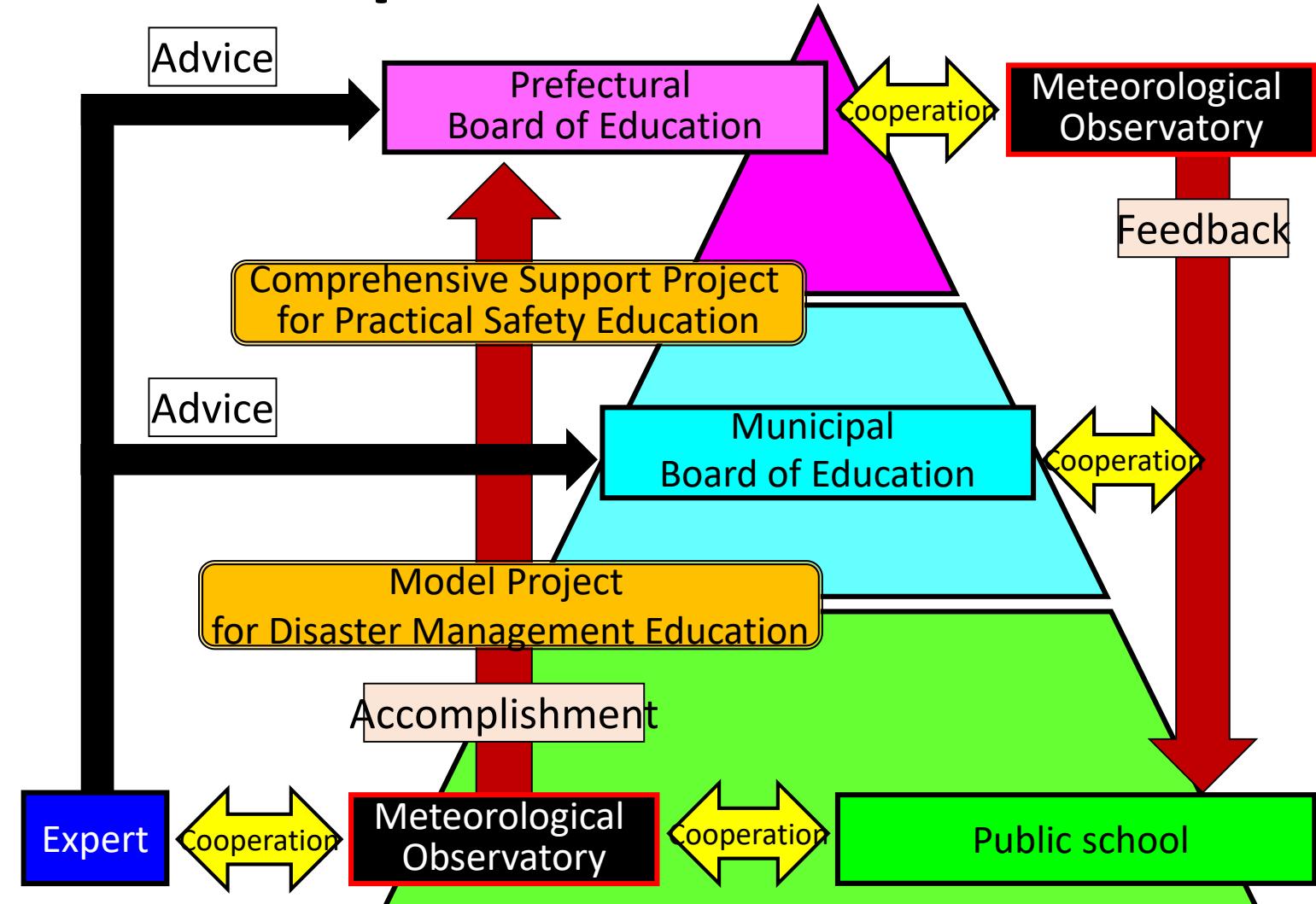
Formal Disaster Risk Reduction Education

Collaboration of Public Elementary School Teachers, a Local Meteorological Observatory Scientist & a Social Psychologist

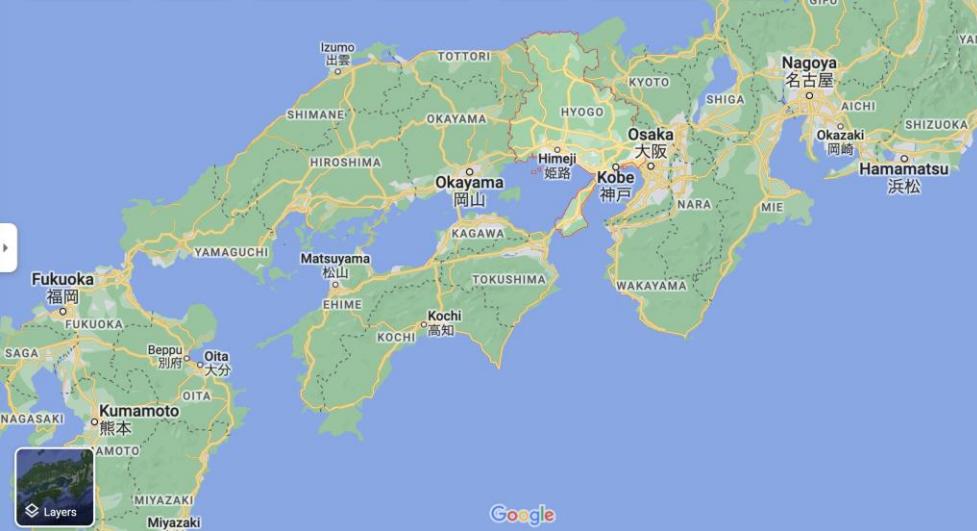
Menuma Elementary School, Kumagaya City, Saitama Prefecture



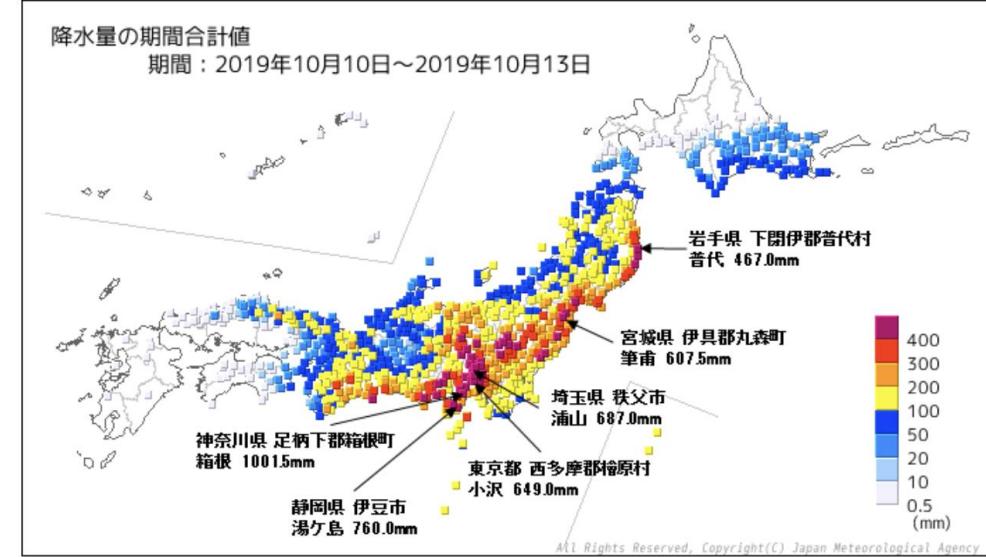
School, Meteorological Observatory & DRR Expert Collaboration



Nagata, T. & Kimura, R. (2017). Proposing A Multi-Hazard Approach to Disaster Management Education to Enhance Children's "Zest for Life": Development of Disaster Management Education Programs to Be Practiced by Teachers. *Journal of Disaster Research*, 12(1), 17-41.



The 2015 Hyogo Prefecture Survey on Preparedness
(N=1,103)



The 2019 Typhoon Hagibis (#19) Survey
(40 municipalities in affected 12 prefectures)

Empirical Evidence #4

Formal Disaster Risk Reduction Education

Collaboration of Public Elementary School Teachers, a Local Meteorological Observatory Scientist & a Social Psychologist

Nagata, T. & Kimura, R. (2017). Proposing A Multi-Hazard Approach to Disaster Management Education to Enhance Children's "Zest for Life": Development of Disaster Management Education Programs to Be Practiced by Teachers. *Journal of Disaster Research*, 12(1), 17-41.



Community-based Disaster Risk Reduction Camp

July 30-31, 2016

August 6-7, 2016

November 10-12, 2016

August 5-6, 2017

Aoyama Elementary School, Otsu

Kido Elementary School, Otsu

Sakuradani Elementary School, Hino

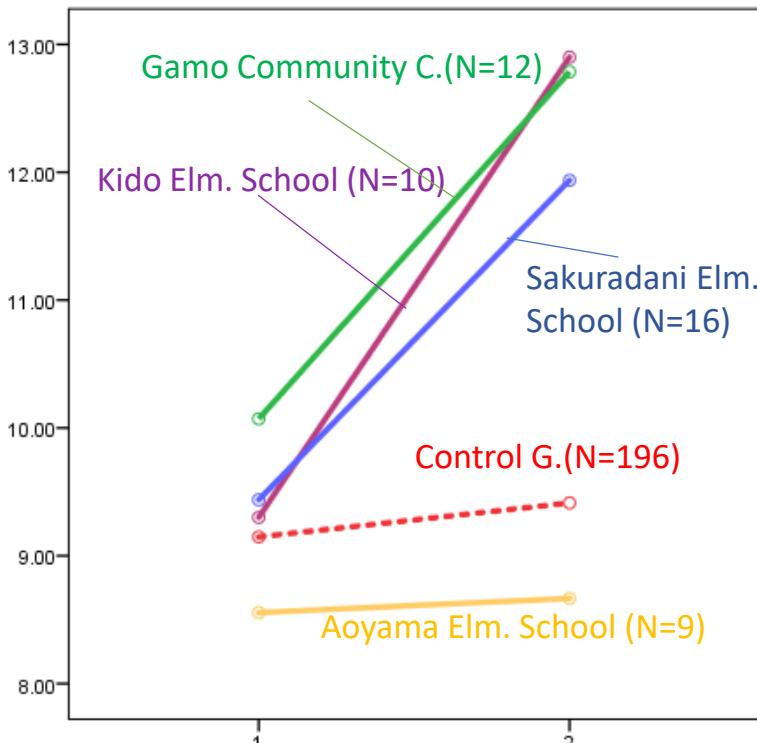
Gamo Community Center, Higashi-Omi



Kawami, F., Okumura, T., Yu, I., & Tatsuki, S. (2018). How to Enhance DRR Literacy that Protects Our Own Lives. Presentation at DRR Science Café, Shiga Prefecture Emergency Operation Center, February 16, 2018.

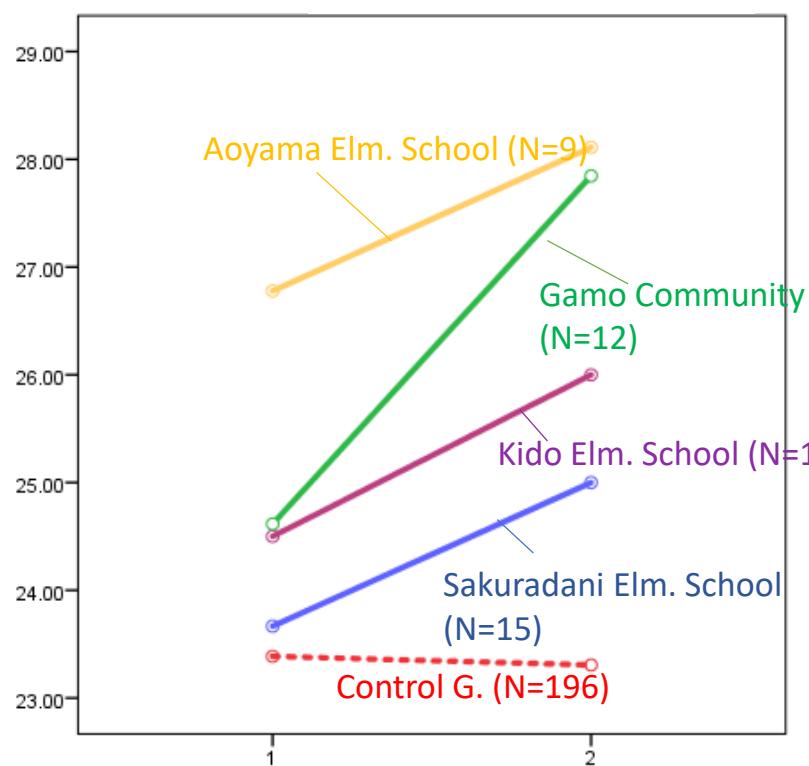


Understanding of Hazards & Vulnerability



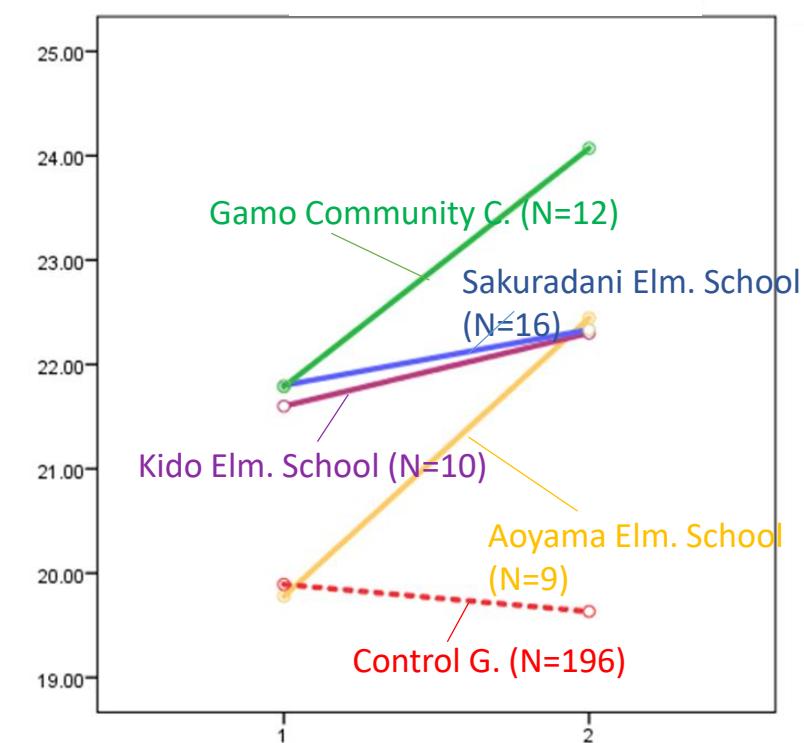
EQ Motion Simulation

Awareness of Self-help, Community help & Public Help



Shelter Operation
Simulation Game

Confidence in Immediate Action



Moving-the-Injured Drill



DRR Literacy Tools for i-BOSAI Implementation

Hazard Maps

BOSAI Security Notebook

BOSAI Time-Lines

Use of Hazard Maps

Hazard Map Portal Site



<https://disaportal.gsi.go.jp/>

Your Town's Earthquake Risk



<https://nied-weblabo.bosai.go.jp/amcj/>

Warning/Alert

Understanding
of Hazards &
Vulnerability

Confidence
in
Immediate
Action

Awareness
of Self-
help,
Community
help &
Public Help

Protective
Action

Hazard Map Portal Site

ハザードマップポータルサイト
～身のまわりの災害リスクを調べる～

使い方 利用規約 よくある質問 関連情報

重ねるハザードマップ
～災害リスク情報を地図に重ねて表示～

洪水・土砂災害・高潮・津波のリスク情報、道路防災情報、土地の特徴・成り立ちなどを地図や写真に自由に重ねて表示できます。

地図を見る

場所を入力
例：茨城県つくば市北郷1／国土地理院

表示する情報を選ぶ

- 洪水(想定最大規模)
- 土砂災害
- 高潮(想定最大規模)
- 津波(想定最大規模)
- 道路防災情報
- 地形分類

過去の代表的な災害事例を見る

わがまちハザードマップ
～地域のハザードマップを入手する～

各市町村が作成したハザードマップへリンクします。地域ごとの様々な種類のハザードマップを開覗できます。

地図で選ぶ

まちを選ぶ
都道府県 市区町村



Your Town's Earthquake Risk

あなたのまちの直下型地震

地震の震源地や規模、地震の発生する季節や時間帯を設定して想定される震度や被害状況、ライフラインの復旧状況などをシミュレーションします。

1.震源地や地盤の規模を設定。または想定される最大地震を選択して震度に関する情報を設定します。

2.地図上をクリックして震源の位置を決めます。

3.地盤の規模と震源の深さを設定します。

震源の規模（マグニチュード）

震源の深さ（km）

※過去の地震から地盤の焼損と震源の深さを設定する場合は以下から選択します。
1943年 烏取地震 1948年 三河地震 1995年 兵庫県南部地震
2004年 新潟県中越地震

4.地震発生時の季節と時刻を選択します。

5.ライフライン復旧想定を選擇します。

©防災科学技術研究所 鈴木進吾研究員

esri Japan, Esri, HERE, Garmin, INCREMENT P, USGS

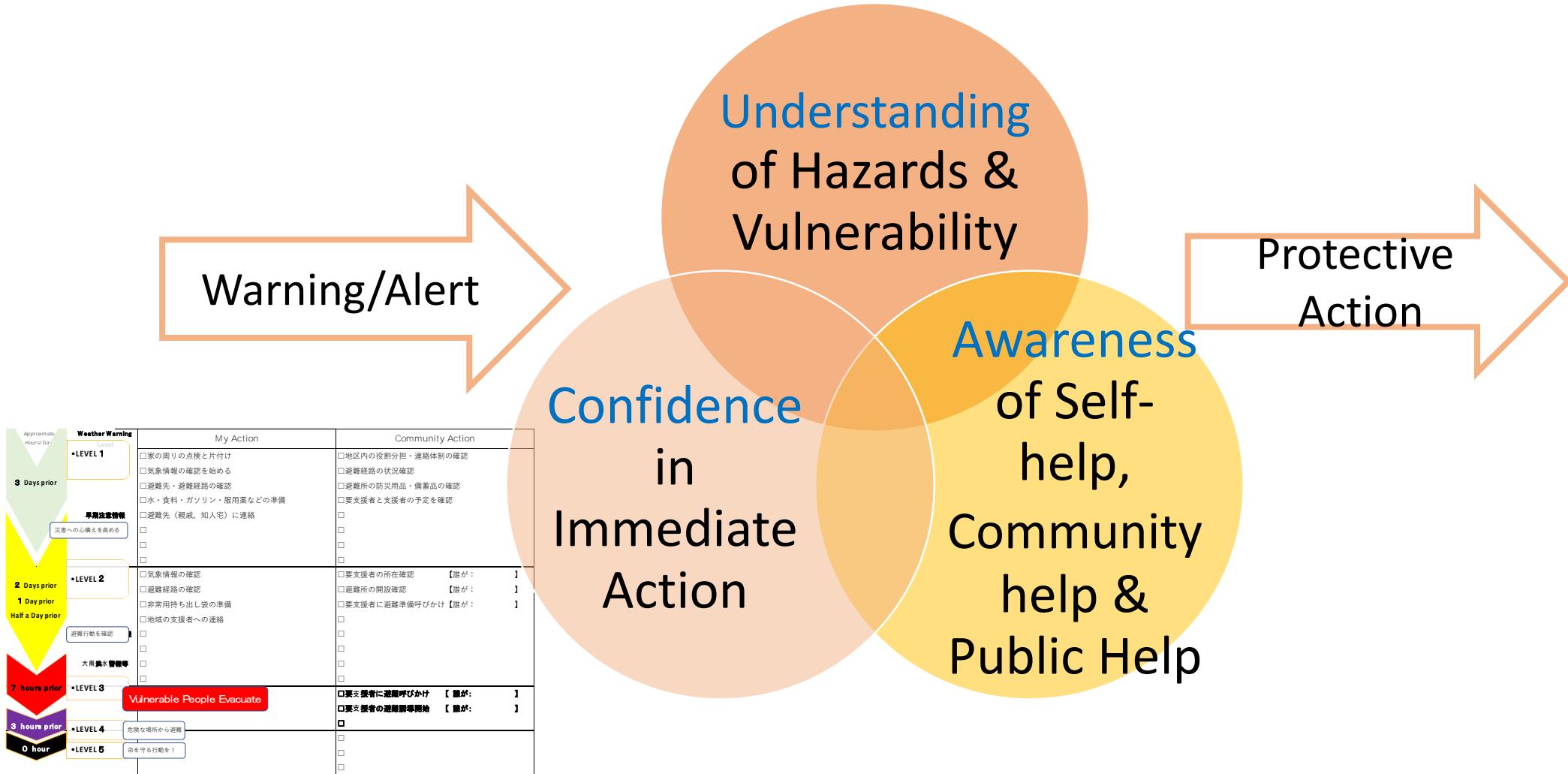
<https://disaportal.gsi.go.jp/>

<https://nied-weblabo.bosai.go.jp/amcj/>

BOSAI Security Notebook



BOSAI Time-Lines



Approximate Hours/Day	Weather Warning Level	My Action	Community Action
3 Days prior	•LEVEL 1 早期注意情報 災害への心構えを高める	<input type="checkbox"/> 家の周りの点検と片付け <input type="checkbox"/> 気象情報の確認を始める <input type="checkbox"/> 避難先・避難経路の確認 <input type="checkbox"/> 水・食料・ガソリン・服用薬などの準備 <input type="checkbox"/> 避難先（親戚、知人宅）に連絡 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> 地区内の役割分担・連絡体制の確認 <input type="checkbox"/> 避難経路の状況確認 <input type="checkbox"/> 避難所の防災用品・備蓄品の確認 <input type="checkbox"/> 要支援者と支援者の予定を確認
2 Days prior	•LEVEL 2	<input type="checkbox"/> 気象情報の確認 <input type="checkbox"/> 避難経路の確認 <input type="checkbox"/> 非常用持ち出し袋の準備 <input type="checkbox"/> 地域の支援者への連絡 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> 要支援者の所在確認 【誰が：】 <input type="checkbox"/> 避難所の開設確認 【誰が：】 <input type="checkbox"/> 要支援者に避難準備呼びかけ 【誰が：】 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
1 Day prior Half a Day prior	大雨洪水警報等 避難行動を確認	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
7 hours prior	•LEVEL 3 Vulnerable People Evacuate		<input type="checkbox"/> 要支援者に避難呼びかけ 【誰が：】 <input type="checkbox"/> 要支援者の避難誘導開始 【誰が：】 <input type="checkbox"/>
3 hours prior	•LEVEL 4 危険な場所から避難		<input type="checkbox"/> <input type="checkbox"/>
0 hour	•LEVEL 5 命を守る行動を！		<input type="checkbox"/> <input type="checkbox"/>