



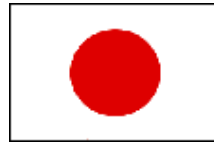
# Identifying Resilience of Localities Through Operational Continuity of Hospitals as indicators

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# Identifying Resilience of Localities through Operational Continuity of Hospitals as Indicators

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NAGOYA UNIVERSITY

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# July 2018 Torrential Rains in West Japan

Photo by Mihara City



Record breaking rainfall in Okayama, Hiroshima and Ehime prefectures brought wide-area inundation.



# An Aluminum Refinery Blasted by Inundation



Floodwaters flew into melted aluminum and triggered a blast.

Debris of the blast flew 200-300 meters across the road and broke the roofs and windows of houses.

The injured was hospitalized, But !



# The Next Day, the Hospital was inundated and lost electricity and water



The hospital in the neighboring city Kurashiki-Mabi, was the emergency hospital in this area. It had emergency generators but it was placed on the ground floor. Emergency generator automatically started but within one hour stopped due to inundation.

# Damage and Malfunctioning of Hospitals

## Recent Examples

### Japan

- 2018 Torrential Rains in West Japan and Inundation
- 2018 Hokkaido Iburi-Tobu Earthquake and Hokkaido Blackout
- 2019 Typhoon Faxai (No.15) and Prolonged Chiba Blackout
- 2020 Typhoon Hagibis (No.19) and Inundation in Eastern Japan
- 2020 Torrential Rains in Kumamoto and Inundation

### U.S.A.

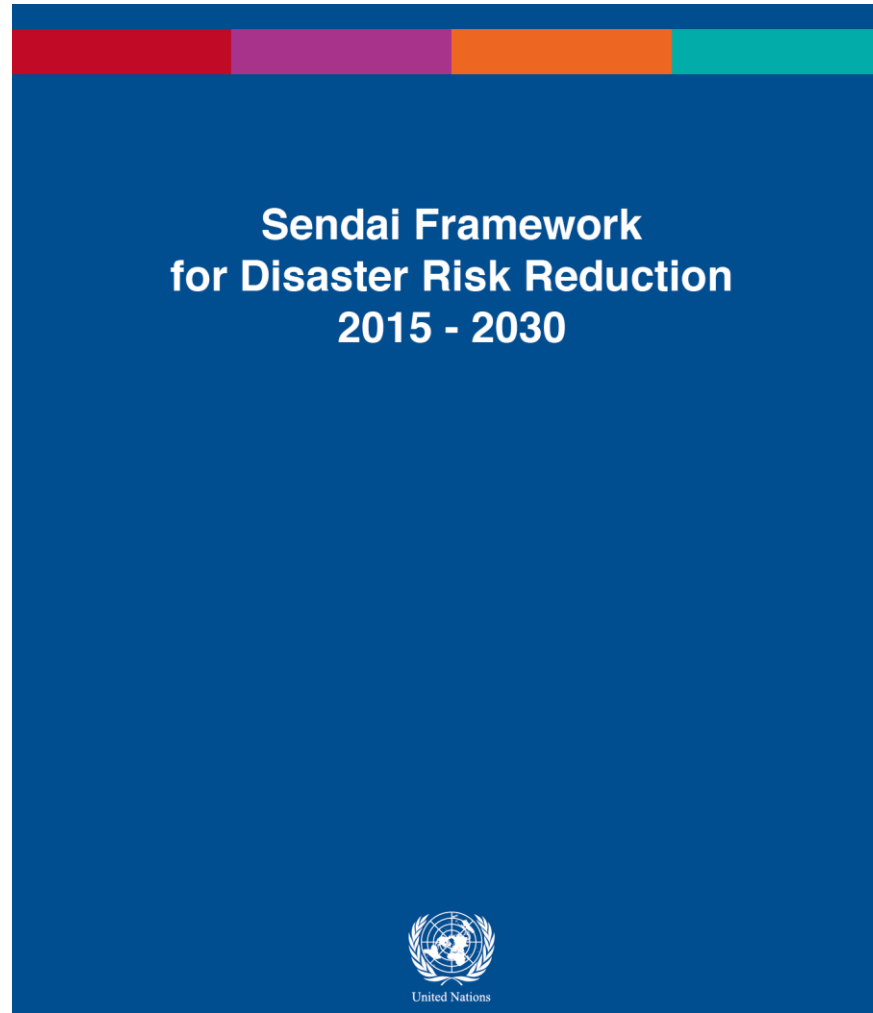
- 2019 Tornado in South Dakota
- 2020 Hurricane Laura in Louisiana
- 2020 Hurricane Michael in Florida
- 2021 Winter Storm Uri in Texas
- 2021 Marshall Fire in Colorado



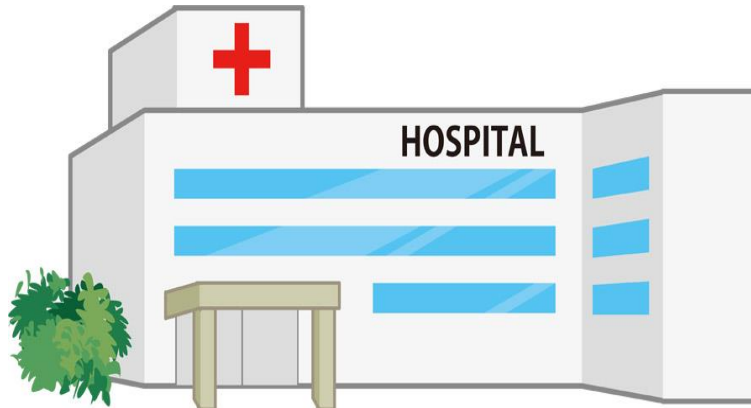
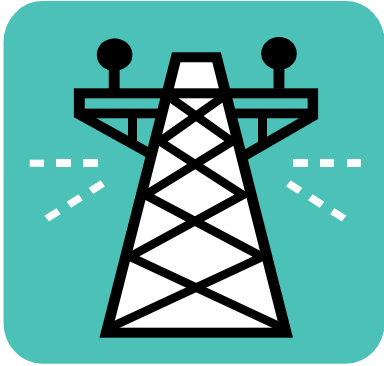
# Sendai Framework for Disaster Risk Reduction

IV. In SFDRR Priority 3 para30 (c)

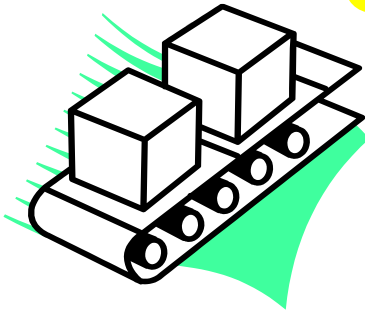
To strengthen, as appropriate, disaster-resilient public and private investments, particularly through [structural, non-structural and functional disaster risk prevention and reduction measures](#) in critical facilities, in particular schools and [hospitals](#).



# Elements to Ensure Hospital Operations 1

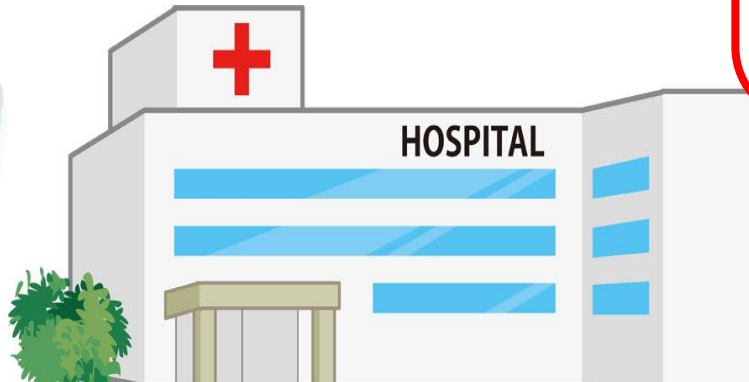
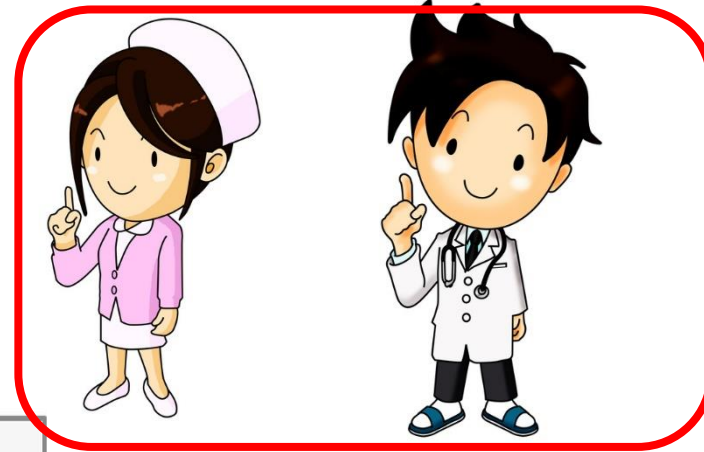
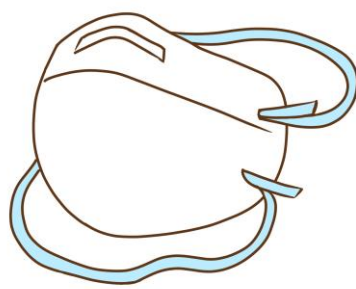


Many utilities are necessary to ensure the operational continuity of hospitals, it is not only water & electricity.

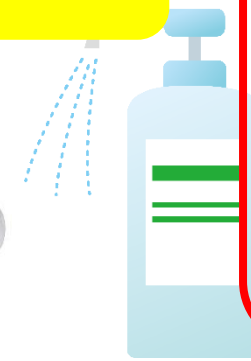
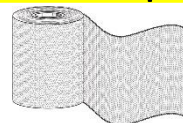




# Elements to Ensure Hospital Operations 2



Various professionals and numerous supplies are necessary to ensure operational continuity of hospitals.



# For Hospitals to operate the surrounding areas must be safe and be capable to support



# Policies by MHLW in Japan to Secure Operational Continuity of Hospitals in Disasters since 2012 based on the Bitter Experiences in March 2011 Great East Japan Earthquake and Tsunami

- Series of Questionnaires and Notices to Emergency Hospitals
- Focus on Electricity, Water supply, Safety of buildings and facilities, Emergency food stockpiles, Satellite communications
- Since 2017, all Disaster Base Hospitals are obliged to make their operational continuity plan to qualify as such.



All 740 Disaster Base Hospitals have operational continuity plan as of 2019  
60.5% of Disaster Base Hospitals have drilled wells for emergency water supply as of 2019

This is only the start line. Necessity to consider capability of the surrounding areas to support the operational continuity of hospitals.

# Interdependence

## Local Community & Hospital



### Necessity to address

- Enabling environment for professionals to work without worries
- Ensuring supply of medicines and medical supplies
- External services and resources needed for operational continuity
- Hospital site condition, access redundancy, hazard risks
- Willingness of the local community to support hospitals



# Our Team in Japan

## Principal Researcher

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## Co-Researchers

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# Exit Silos & Avoid Jargons to Address New Challenges

