



From  
the People of Japan

# Tsunami Evacuation during COVID-19:

## A Guide for School Administrators



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# **Tsunami Evacuation during COVID-19:**

## **A Guide for School Administrators**



# Introduction

In December 2015, the United Nations General Assembly designated November 5th as World Tsunami Awareness Day to promote a global culture of tsunami preparedness and awareness to build resilience across generations. World Tsunami Awareness Day was the brainchild of Japan, which due to its repeated, bitter experiences with tsunamis, has over the years built up major expertise in areas such as tsunami early warning, public action and building back better after a disaster to reduce future impacts. In the last five years, substantial efforts have been made to enhance capacities, raise awareness and develop knowledge and systems to strengthen tsunami response.

The United Nations Office for Disaster Risk Reduction (UNDRR) and the United Nations Development Programme (UNDP) in Asia-Pacific are committed to supporting tsunami awareness and preparedness. With support from the Government of Japan, UNDRR annually organises visibility events to raise awareness and UNDP is implementing a tsunami preparedness programme in schools in 23 Asia Pacific countries. Under the UNDP project, over 300 schools in 23 countries have reviewed and updated their tsunami preparedness plans.

The COVID-19 pandemic has brought new challenges to disaster preparedness and response. In planning safe evacuation from disaster events, physical distancing and hygiene practices need to be observed. As a result, disaster and tsunami preparedness plans need to be reviewed and updated to address the challenges brought about by the current pandemic. In view of this, UNDRR and UNDP have developed this Guide for School Administrators, based on best practice from Japan and elsewhere.

# About the guide

This Guide complements the 2019 Regional Guide for Schools to Prepare for Tsunamis. The Guide proposes additional measures that School Administrators<sup>1</sup> need to implement in tsunami evacuation centres. These evacuation centres may be either of the following:

- Designated safe evacuation centres close to a tsunami prone school where school children and staff are meant to evacuate to, or
- Designated safe evacuation area within a school's premise (such as a top floor) that may be safe from being inundated.

While the evacuation centres in both cases are primarily meant for school children and staff, parents and community members may also be accommodated depending on the designated evacuation centre. In many countries, schools are often used as evacuation centres as they can accommodate a large number of people. This Guide will also propose measures that must be taken to ensure adequate screening is undertaken for non-school members and that safety and security of school children are ensured.

The Guide provides step by step instructions for School Administrators to take prior to an emergency, during the evacuation and within the evacuation centre, with the view to prevent the spread of infectious diseases during a tsunami event. The Guide is divided into three main sections:

1. Updated facts from recent Tsunami and disaster events
2. Challenges associated with COVID-19 and additional evacuation measures
3. Checklist for school evacuation centres in view of COVID-19.

The Guide provides generic measures based on best available information at the time. National, local and school authorities should use the Guide to improve their own multi-hazard preparedness based on local needs and the changing trends of the pandemic.

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<sup>1</sup> The 2019 Regional Guide describes the composition of a School Emergency and Disaster Preparedness Committee and Task Teams for Tsunami Preparedness and Response. This Guide is meant for such Management/Committees/Teams.

# Updated facts about tsunamis: Did you know?

- Most tsunamis are caused by earthquakes. However, some tsunamis originate from slope failure, submarine landslides, volcanic eruptions in the sea and extremely rarely, meteorite impact.
- Currently, only tsunamis triggered by earthquakes can be predicted. Tsunami warning systems in most countries are based on the analyses of real-time data from seismic data networks. The size and speed of an approaching tsunami is estimated by comparing detected seismic activity to past earthquake records and simulations.
- Tsunamis caused by earthquakes also usually have natural warning signs such as strong ground shaking or an extended period of ground shaking. However, since tsunamis can also be generated in other ways, locals must evacuate immediately if they recognise other natural warning signs (e.g. large approaching waves) without waiting for official warnings and evacuation orders.
- A local tsunami (either from earthquake or non-earthquake sources) can arrive in minutes; whereas, a tsunami from distant sources can arrive in a matter of an hour to a day.
- A tsunami flow depth of 0.5 metres is enough to result in injuries and casualties, 1 metre is enough to move a car and 2 metres is enough to destroy houses.

At **2 metres**  
destruction of  
wooden houses

At **1 metre**  
vehicles float  
and drift away

At **0.5 metres**  
loss of human  
stability



## Difficult to Predict: 2018 Sulawesi and Sunda Strait tsunamis in Indonesia

The 2018 Sulawesi tsunami was a result of a large lateral movement of the earthquake fault, which is unusual for the generation of tsunami waves. The earthquake resulted in a vertical movement of the seafloor and triggered coastal and submarine landslides, which subsequently generated tsunami waves. Complex tsunami generation mechanisms such as these are difficult to predict and are not accounted for in any tsunami warning system.

The 2018 Sunda Strait tsunami was caused by the collapse of a volcano flank. Due to the non-seismic origins of the tsunami, there was no natural warning sign (e.g. ground shaking). Such tsunamis are hard to predict with traditional warning systems and their waves can arrive onshore in a matter of minutes before a warning can be issued. Recently, a tsunami sensor was installed near Mount Anak Krakatau in Indonesia to improve tsunami warning in the region.

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Pakoksung, K., Suppasri, A., Imamura, F., Athanasius, C., Omang, A. and Muhari, A. (2019) Simulation of the Submarine Landslide Tsunami on 28 September 2018 in Palu Bay, Sulawesi Island, Indonesia, Using a Two-Layer Model, *Pure and Applied Geophysics*, 176 (8), 3323-3350.



- In the case of giant tsunamis, such as the 2004 Indian Ocean Tsunami and the 2011 Great East Japan Earthquake and Tsunami, waves can reach up to 30 metres to 40 metres in elevation.
- The first tsunami warning is generally issued 3 to 5 minutes after the generation of an earthquake. In the case of local tsunamis, the lead-time is short and hence, **evacuation should take place immediately and it takes priority over a COVID-19 stay-at-home order.**



- Official warnings can be disseminated in a variety of ways – traditional media, public announcement, and mobile messages. Tsunami prone communities should be made aware of local warning systems.
- However, there are inherent limitations to early warning systems. For example, warning systems which are reliant on technology may fail in the event of power outage or a telecommunication breakdown, hence self-evacuation must be carried out.



- Tsunamis from distant sources and typhoon-related storm surges have enough lead-time that an evacuation can be carried out in stages. Priority should be given to evacuate the most vulnerable first including the elderly, small children, pregnant women and persons with disabilities.
- Evacuation centres should be evaluated for their structural resistance against earthquake ground shaking and tsunami waves.

## Tsunami preparedness saves lives: Learning from Kamaishi

Kamaishi City of Iwate Prefecture, Japan, was heavily damaged by the 2011 Great East Japan Earthquake. Approximately 30 per cent of the households were damaged and the city lost 1,000 lives (of a total population of 40,000). Despite this, Kamaishi City was able to save more than 3,000 lives from the devastating tsunami that followed the earthquake. When the magnitude 9.0 earthquake occurred, students and staff from the East Junior High School followed procedures learnt through the school's tsunami disaster prevention education. As they ran to higher ground, their quick response prompted children and teachers of the neighbouring Unosumai Elementary School to follow, and consequently drew in many local residents. Older students supported the younger school children, and together they reached a safe location while behind them the mega-tsunami swallowed their schools and the town. Kamaishi has sought to share this practice with school children across the world, in what has come to be known as the "good practice of Kamaishi".

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### SOURCE

Public Relations Office, Government of Japan <https://mnj.gov-online.go.jp/kamaishi.html>

# Proposed measures for school administrators to plan and implement a safe evacuation during COVID-19 or similar pandemic

## PLANNING A TSUNAMI EVACUATION DURING COVID 19

### 01 UNDERSTAND that immediate life-safety is the most urgent priority

As mentioned above, in the case of local tsunamis, the lead-time is short and hence, evacuation should take place immediately and it takes priority over a COVID-19 stay-at-home order. School Administrators must follow official and/or natural warning signs so that school children and staff (and communities where applicable) are evacuated safely whilst following prescribed COVID-19 guidelines.

### 02 UPDATE tsunami/ disaster preparedness evacuation plans

All schools are encouraged to update their tsunami/ disaster preparedness plans to incorporate guidance for COVID-19. Where possible, schools should conduct physical drills to test and improve these plans.

### 03 CLARIFY roles and responsibilities of the School Emergency and Disaster Preparedness Committee and Task Teams<sup>2</sup>

Each school must review the roles and responsibilities of the School Committee and Task Teams. As part of the awareness raising efforts, the team should include COVID-19 awareness and preparedness that incorporate the latest international guidance and official government measures as applicable in the country. The school may consider setting up a special COVID-19 Task Force that would be responsible for taking measures to ensure that safe hygiene and medical care are available at evacuation centres. If required, the school should have an understanding with a local hospital to have trained medical staff at the evacuation centres to support health screening and isolation of possible COVID-19 cases.

<sup>2</sup> As referred to in the 2019 Regional Guide for Schools to Prepare for Tsunamis, page 22. It is also encouraged to involve women and persons with disabilities to make safe environments for them.

#### 04 REVIEW and ADJUST evacuation routes

Physical distancing during an evacuation process may require that school administrators identify multiple evacuation routes to reach the designated evacuation centre/s. If this is not possible, priority should be given to evacuate the most vulnerable groups first.

#### 05 REASSESS evacuation centre size and designate multiple centres if needed

Evacuation centres are likely to become crowded, increasing the risk of physical contact and disease spread. Ideally, the same amount of physical distancing should be observed as in the classrooms. Additional evacuation centres should be selected so that all school children and staff can be evacuated safely whilst maintaining a safe distance. If the evacuation is carried out alongside the community, it is even more important to have multiple safe evacuation centres. A hazard map of the area can help to identify safe open spaces and/or buildings which could be designated

as safe evacuation centres. These could include public and commercial buildings, parks, hotels, sports facilities etc. School administrators should collaborate with local administration to designate these safe evacuation centres particularly during the pandemic. All designated evacuation centres should have clean water and hygienic sanitation facilities.

#### 06 ENSURE a sufficient supply of hygiene supplies

The evacuation centres must be equipped with hygiene kits that include enough masks, soap, hand sanitizers and wipes for each evacuee. In addition, each member of the School Disaster Management Team or Evacuation Team should wear Personal Protective Equipment (PPE) as they are likely to interact with outsiders. All evacuation centres must also have disinfectant supplies. Non-school community members should be encouraged to prepare 'go-bags' with basic essentials including hygiene kits, drinking cup, bowl, spoon, etc.

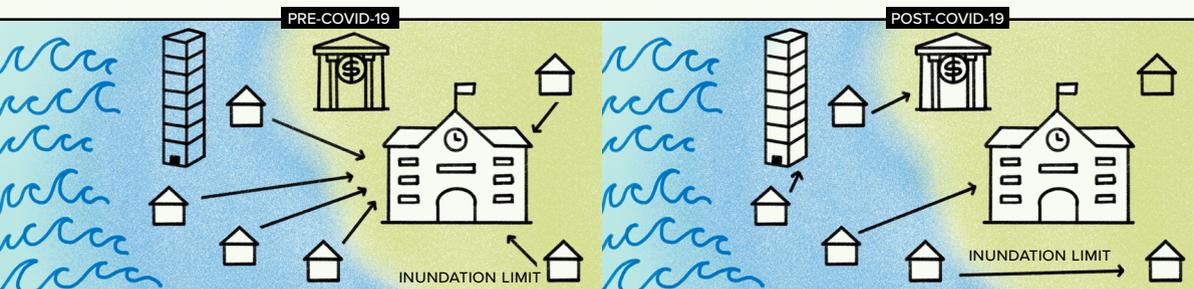


FIG. 2 ADDITIONAL EVACUATION CENTRES DURING COVID-19

## DURING EVACUATION

### 01 CHECK health condition of evacuees

In principle, evacuation centres are required to accommodate all designated persons irrespective of their health condition. It is also assumed that temperature checks are conducted for all school staff and students on a daily basis. Therefore, in cases of evacuation centres that accommodate people from outside the school, such as parents and community members, there should be a separate registration process for them. The registration process should include the use of contactless temperature screening and those with a fever or symptoms of any illness should be isolated in a separate area within the evacuation centre. During registration, care should also be taken to identify people requiring special assistance such as the elderly, persons with disabilities and women who are pregnant or nursing.

### 02 PREVENT the spread of infection

A designated task team should be assigned to monitor the evacuees. Strict rules should be followed such as the wearing of masks at all times, physical distancing and frequent handwashing or sanitizing, in line with international guidance and government measures. Depending on the length of the evacuation time, regular temperature checks of all evacuees should be conducted.

### 03 ISOLATE the infected

Any evacuee who shows any signs of illness should be isolated immediately in a designated area within the evacuation centre. All personnel in the isolation area must be full PPE gear. The School Committee should inform the local administration or the health department at the earliest possible chance of any patients suspected of COVID-19 or any other illness so that they can be taken for treatment. The School Committee should have patients complete a form listing all persons they may have been in contact with recently and areas they may have visited.

## AFTER EVACUATION

### **SHARE evacuation experiences and lessons learned to improve plans**

In the event of a real evacuation or an evacuation drill, evacuation plans may need to be revised to suit the unique needs of the local community and the changing trends of the pandemic. Where physical drills are possible, they should be assessed by a designated team so that lessons can be incorporated to improve and strengthen school preparedness for tsunamis during COVID-19 and similar pandemic events.

## Lessons from Cyclone Amphan

On May 20, 2020, Tropical Cyclone Amphan struck India and Bangladesh. Ahead of its arrival, authorities evacuated millions of people in both countries. In Bangladesh, more than 12,000 shelters and public facilities, such as schools, were prepared for evacuees, which was three times as many than for normal cyclones to minimize COVID-19 risk. These shelters were equipped with masks, sanitizers, and handwashing facilities with soap, and health clinics were prepped in advance to isolate any evacuees exhibiting symptoms.

Some early lessons have emerged that are relevant to planning for tsunami evacuations amid COVID-19, notably:

1- Need to revise evacuation Standard Operating Procedures (SOP): When applying distancing measures, the capacity of shelters is reduced to 40 per cent. This calls for a re-examination of how people can be moved to avoid the risk of cross-infection and the provision of enough PPE and sanitation facilities.

2- Repurpose existing capacities, resources and tools: When the capacity of shelters is reduced authorities should need alternative shelters that are still disaster resilient. The identification of such resilient assets should become part of risk assessments undertaken in coastal areas.

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<https://blogs.worldbank.org/climatechange/managing-tropical-storms-during-covid-19-early-lessons-learned-and-reflections-india>

## Potential for AI to support evacuation management during a pandemic

In August 2020, an experiment using Artificial Intelligence (AI) was conducted in Kawasaki City to prevent congestion in shelters and reduce the risk of COVID-19 infections in the event of a disaster. The experiment was conducted by Kawasaki City and Fujitsu, which is developing the AI, and included about 80 participants who simulated an evacuation from a large typhoon. Three separate evacuation centres were temporarily set up in elementary school buildings and gymnasiums, and AI analysed the images taken by the cameras at each entrance to determine the number, age, and gender of people evacuating. Based on this information, the response headquarters was able to grasp the degree of congestion in each evacuation centre in real-time, and instructed the staff at the site to allocate evacuees accordingly. In addition, the drill assumed that there are a certain number of evacuees were infected with the coronavirus, and thus, the AI guarded against possible infections by accounting for the degree of congestion. When there was a risk of contact, an alarm sounded at the evacuation centre and city officials called on people to distance from each other. The success of the drill highlights the benefits of tapping into advanced technologies to support evacuation management during the COVID-19 pandemic.

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### SOURCE

NHK news [https://www3.nhk.or.jp/news/html/20200831/k10012593181000.html?utm\\_int=news-new\\_contents\\_latest\\_002](https://www3.nhk.or.jp/news/html/20200831/k10012593181000.html?utm_int=news-new_contents_latest_002)

# Checklist for school administrators detailing tasks before, during and after a tsunami evacuation or drill during COVID-19 or a similar pandemic scenario

## PLANNING TSUNAMI EVACUATION DURING COVID 19

### 01 Review and update the existing School Evacuation Plan

- ❑ Organise a physical or virtual workshop to review the current school plan in cooperation with the local administration, health department, community members, private entities and development agencies.
- ❑ Assign additional tasks to an existing team or create a new team responsible for implementing COVID-19 measures during an evacuation.
- ❑ In consultation with the local administration, develop necessary registration forms beforehand.
- ❑ Use a hazard map to identify new evacuation routes and evacuation centres.
- ❑ Undertake physical checks of new evacuation routes and evacuation centres.
- ❑ Update the plan to reflect the changes including appropriate lists of contacts, supplies needed, additional tasks, hazard and area maps, etc.

### 02 Conduct awareness raising of COVID-19 measures according to international standards and government measures

- ❑ Organise a physical or virtual orientation for school and community members to raise awareness of COVID-19 measures, preferably involving the local administration and health department personnel.
- ❑ Design easy to understand posters with visuals to promote good hand and respiratory hygiene practice (development agencies may have ready-to-print posters).
- ❑ Design signages to indicate physical distancing, directions of traffic flow, etc. for schools, evacuation routes and evacuation centres.

### **03 Review and clarify roles for existing or new teams to ensure a COVID safe evacuation**

- Additional tasks should include registering all non-school evacuees, supporting the isolation areas, monitoring adherence to rules, ensuring safe disposal of waste, etc.
- If possible, have at least one trained medical staff at each evacuation centre.

### **04 Where possible, designate multiple routes to the evacuation centres**

- Mark all routes with appropriate signages.
- Assign routes according to classrooms/ households/ persons with special needs and inform evacuees of their designated routes.
- Ensure all routes are have a one-way traffic flow.

### **05 Where possible, designate multiple evacuation centres**

- Undertake physical checks of each evacuation centre with special attention to the facilities for drinking water, sanitation, waste disposal, ventilation, and the availability of separate areas for isolation, etc.
- Place easy to understand posters with visuals in all evacuation centres.
- Place signages to indicate physical distancing, directions of traffic flow in all evacuation centres to prevent congestion.
- Pre-assign school children and staff, and where possible non-school community members, and inform evacuees of their designated evacuation centre.

### **06 Prepare hygiene kits for all school staff and students**

- Hygiene kits should include masks, soap, hand sanitizer and wipes.
- The supplies should be stored safely either in the school or evacuation centres.
- Extra kits should be available for non-school community members.

## 07 Procure PPE for critical personnel<sup>3</sup>

- ❑ The updated plan should identify all critical personnel.
- ❑ PPEs should be procured for all critical personnel.
- ❑ PPEs should be kept safely in the school and personnel should wear them as soon as an emergency call for evacuation is sounded.

## 08 Advise non-school community members to prepare their own 'go-bags'

- ❑ Go-bags should include hygiene kits for the household, cutlery, cups, bowls, medication, ID cards, etc.
- ❑ They should be placed within easy access for household members to grab as soon as they evacuate.

## 09 Designate areas in evacuation centres for evacuees who (i) are infected, (ii) show symptoms of infection and (iii) have special needs

- ❑ Ensure that the evacuation centres are disinfected regularly.
- ❑ Ensure that the width of pathways between these spaces are at least 2 metres apart and traffic flow is one-way.
- ❑ Ensure that these areas hold only critical staff and designated evacuees and do not allow any other persons to enter.

<sup>3</sup> Schools should consider checking latest guidelines on Personal Protective Equipment (PPE) available at:  
<https://www.cdc.gov/coronavirus/2019-ncov/hcp/using-ppe.html>;  
<https://www.nejm.org/doi/full/10.1056/NEJMvcm2014809>;  
[https://www.who.int/medical\\_devices/priority/COVID\\_19\\_PPE/en/](https://www.who.int/medical_devices/priority/COVID_19_PPE/en/)

## DURING EVACUATION

### 10 Maintain physical distance during evacuation

- Follow international standards and government guidelines on physical distancing and wearing of masks.
- Provide additional assistance to small children and persons with special needs.
- School and non-school evacuees should follow separate evacuation routes.

### 11 Separate school and non-school evacuees

- Designate separate areas for school and non-school community evacuees.
- Ensure evacuation groups are small in size and clustered as classroom sections and households.
- Take school evacuees directly to designated areas in the evacuation centre and undertake temperature checks.
- Immediately transfer any student/ staff with a fever or sign of illness to the isolation area for registration and isolation.

### 12 Screen health of all non-school evacuees on arrival and registration

- Assign critical personnel to conduct contactless temperature checks on arrival of non-school community evacuees at the centre.
- Encourage evacuees to download and register themselves on COVID-19 tracking apps, if available.
- Require all evacuees to wear masks and sanitise their hands before entering the evacuation centre.
- Immediately isolate anyone with a fever or any sign of illness.
- Register contact details on relevant forms and inform head of School Team of situation.

### 13 Regularly monitor adherence to COVID 19 measures

- ❑ Ensure that all evacuees wear masks at all times except during mealtimes.
- ❑ Encourage regular handwashing/ sanitizing.
- ❑ Minimize movement and monitor physical distancing.
- ❑ Conduct temperature checks frequently.
- ❑ On suspicion of any illness, isolate the person including any critical personnel/ staff immediately.
- ❑ Inform the local government or health department of possible COVID-19 patients at the earliest.

### 14 Provide meals/ snacks to groups in their designated areas

- ❑ Only assigned critical personnel in full PPE gear should distribute meals.
- ❑ All meals should be provided where the groups are holding to reduce the need for movement.
- ❑ Critical personnel should dispose of waste safely.

### 15 Regulate air ventilation in the evacuation centres

- ❑ Let natural air into the holding areas regularly (opening doors and windows at least a few times a day).
- ❑ Check for signs of heatstroke amongst evacuees in the summer.

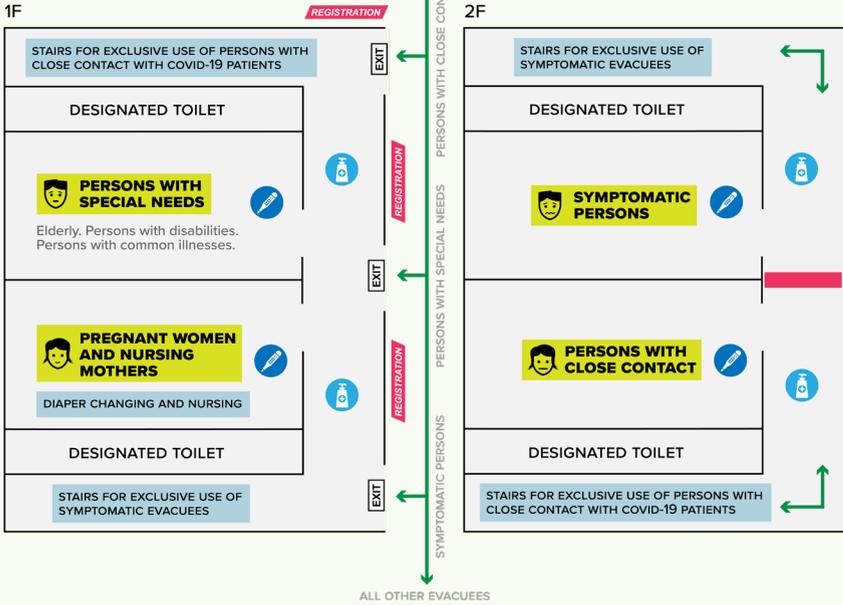


**REGISTRATION CHECKLIST**

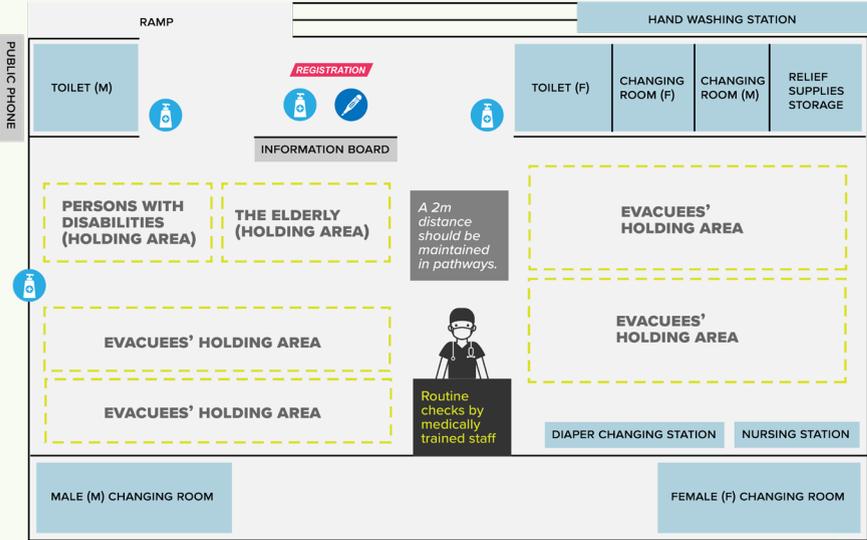
- Registration of names and personal details
- Health screening (temperature and symptoms check)
- Registration for people with special needs

**LIST OF ITEMS TO BRING ALONG**

- Thermometer
- Alcohol hand spray
- Hand soap
- Gloves
- Wipes etc.



**HOLDING AREA FOR SPECIAL CASES**



**GENERAL ASSEMBLY SPACE / MAIN HOLDING AREA**

**FIG. 3 LAYOUT EXAMPLE OF THE EVACUATION CENTRE**

SOURCE: Page 3 of Cabinet Office of Japan (2020a)

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