ONG Inclusiva and the Chilean-Japanese bi-national tsunami & earthquake drill

Valparaiso, Chile 2016

Chile and Japan are the most seismic countries in the world and both countries have had suffered great tsunamis. Coastline large cities, villages and towns in the world can face tsunamis too. People with disabilities and elderlies are the most at risk when dealing with this kind of phenomena. Inclusiva learned valuable lessons that can save lives.

Image: first picture correspond to Valparaiso city satellite view, second picture of Hososhima port: source google earth and Ministry of Land, Infrastructure, Transport and Tourism website

Earthquakes and tsunamis can affect many coastal line communities. The impact of them would vary from place to place depending from many variables. We can work to reduce vulnerabilities produced by environmental barriers such as urban, technological, communicational and cultural ones. Those barriers increase vulnerabilities to people with disabilities and elderlies.

The Chile-Japan bi-national tsunami and earthquake drill was held simultaneously in Valparaiso city and Hososhima city.

The goals of the Chile-Japan bi-national tsunami and earthquake drill were to:

- Achieve high participation of the target population
- Generate the instance for institutions to test regional / provincial / municipal and / or sector related to emergency plans and evacuation process
- Evaluate time, the security and the process of evacuation of the community
- Promote awareness of the public about preventive behaviors, self-care preparation to face the threat of earthquake of greater intensity and tsunami
Inclusion of people with disabilities in a joint Chile-Japan bi-national tsunami and earthquake drill

Inclusiva works with the National Emergency Office ONEMI. The mission of Inclusiva was to observe the drill and evaluate inclusion of people with disabilities. To fulfill its mission, Inclusiva followed a very strict protocol:

1) **Step 1:** Inclusiva team was trained as official evaluators by ONEMI. The evaluation process focuses specifically on the stages of preparation and emergency response plan against a higher intensity earthquake and tsunami.

The aspects to be evaluated are:

1. Behavior and community organization during the drill.
2. Evacuation time to security zones.
3. Safety conditions.
4. Implementation of emergency.
5. Preparation of Inclusive Actions

Pictures: Inclusiva being trained by ONEMI as official evaluators. Pictures by Esteban Iriarte

It is important to say that Inclusiva worked to help ONEMI to create the Preparation of Inclusive Actions form.

Official evaluators had to use measure instruments designed by ONEMI to evaluate a) strategic points, b) educational centers or rehabilitation centers, c) evacuation route, d) encounter point (safe zones)

Official evaluators, after making their evaluations, filled in the evaluation forms in the ONEMI website posting all their evaluations. ONEMI will process all the data
2) **Step 2:** Inclusiva created and validated its own measurement tools. The measurement tools were diverse in nature and propose, but all of them aimed to measure disabilities in the drill process. The instruments

1. Interview to key actors to know their perceptions about the whole process of the drill
2. Physical therapist evaluations form
3. Matrix of Inclusion index calculation  (an instrument designed to measure how inclusive is a given process)
4. SATI METRICS an app designed to have geo-localized data in real time, which also emits alerts. To be widely used, Inclusiva Asked GNDR members in the region to download and use it during the drill.
3) **Step 3**: Inclusiva studied the selected places beforehand to know all vital details about the topography, architectonic barriers, distances, road conditions. Inclusiva collected data from:

- ONEMI emergency maps
- ONEMI evacuation route maps
- Google maps from the streets
- Information gathered via on site visits

Image: map of the location of the Teletón Rehabilitation Center and a picture of the Teletón rehabilitation center for kids with disabilities
What Inclusiva found prior to the drill

Inclusive visited the places that correspond to a) rehabilitation center. Inclusiva worked with Teletón Valparaiso Children Center, they rehabilitated 3,000 kids with disabilities per year, b) evacuation route and c) meeting points (safe zones). Inclusiva made interviews to key local actors and that is what Inclusiva found

Accessibility and topography

Valparaiso city is a port, it has a mountainous landscape. Valparaiso has the nickname of “the pearl of the Pacific” because at night from the sea it resembles a necklace of shining pearls. The main problem is that the buildings and facilities located in the flat areas can be destroyed by tsunamis, and the safe zones are difficult to reach by people with disabilities and elderlies due to geography and lack of accessibility

Due to the above mentioned factors of both accessibility and topography, Inclusiva team went checking accessibilities issues in the evacuation routes for the Teletón Children rehabilitation center in Valparaiso city. Initially, Inclusiva would work with public schools that have integration program for people with disabilities and especial schools, but public sector is on strike now due to disagreements with Government over the new public salaries act, so all these public schools were closed.
Logic would recommend to use the streets and not just the sidewalks, to evacuate from a tsunami. However, people we interviewed from the Teletón Children Rehabilitation center told Inclusiva that in a real tsunami alarm evacuation, people driving cars did not respect them (people with disabilities groups) and drove their cars via the streets forcing people with disabilities to use the sidewalks, and the sidewalks are not accessible, present stairs and steps.

Pictures: Inclusiva team checking accessibility issues in the evacuation routes in Valparaiso city. Picture by Loreto Brossard

Pictures of one the meeting points (safe zone) in its route has stairs, the zone is narrow and dangerous because of cars
Inclusiva check all the points with an altimeter to be sure if the 30 meters altitude criteria has been met.

Inclusiva made the experiment to measure the time that takes for a person in wheelchair helped by a personal assistant to get from the rehabilitation center located in the flat zone of Valparaiso City to the nearest meeting point (safe zone) compared to the tame that takes for a person that can walk to reach the same place.

![Chronometer](image1.png)

Picture of the chronometer used for this experiment, credit of the picture Esteban Iriarte

The evacuation route of the Teletón Children Rehabilitation Center started from Francia Avenue and ended in Baquedano street. It took eighteen minutes, fifty two seconds for a person using a wheelchair helped by a personal assistant to get from danger zone to safe zone. For a person that can walk it took nine minutes to follow the same path. That could empirically demonstrate the validity of the Japanese estimation that a person with disabilities get twice the possibility to die in that kind of event.

![Altimeter](image2.png)

Picture: altimeter used to measure the standard of 30 meters of elevation
The need to prepare people with Down syndrome beforehand

When preparing all the details for its participation in the bi national earthquake and tsunami drill, Inclusiva contacted Down 21 president Mrs. Irma Zuazola. Down 21 is an institution that works for the human rights of people with Down syndrome.

“People with Down syndrome who attend to schools need to be prepared beforehand, they need to understand that a drill is a drill, that what people are doing is to mimic a situation to be prepare, that it is not a game. If not, they would be confused and start to get confused and start to believe that the drill is real” she said. “Many of them got terrified, which is why many of us will not participate in this drill, because there were no previous work with them” she said.

The need to include deaf people in the whole process

Deaf people organizations pointed that they need that police officers, fire department and other people involved must know sign language to help them in a real tsunami. They also said that information about drills must have also sign language interpreter, 80% of them in Chile cannot read.

During the tsunami and earthquake drill

In Chile, More than 100,000 people were mobilized in the evacuation of the regional coastal border to safe areas. The exercise, which emulated an earthquake with a tsunami of 8.8 Richter, was developed in commemoration of the International Tsunami Awareness Day at the same time in the Japanese city of Hososhima. It started at 10:30 Hrs.
At the time, the sirens of the regional coastal border were activated and announced that those who were in areas of tsunami threats should move to safe areas. The authorities and members of the Regional Committee of Emergency Operations carried out the evacuation and later, they met in the Maipo regiment (from the Chilean Army) to carry out an Emergency Operations Committee of evaluation of the activity.

Meanwhile Inclusiva was in the Teletón Children Rehabilitation Center. When the drill started all the people there followed instructions from the institution person in charge.

Three Teams of 3 people (one in front, the second in the middle and the third at the back) using reflective vests and flags stopped the cars and signaled the evacuation route for all the Teletón users
Inclusiva team were measuring and observing the drill, using all the measurement tools, the ONEMI and the Inclusiva ones.
Results of Inclusiva measurements

Inclusiva and Aconcagua Solutions used SATI Metrics to measure data in real time. People who downloaded the app follow four paths from danger zone to Meeting Points. The only group that ranked Red (in danger) were the group of people with disabilities from the Teletón Rehabilitation Center.

This group changed their Meeting Point from Francia Avenue-Baquedano street to Francia Avenue-Tres Street. It was a good decision that shortened evacuation time in almost four minutes, their total time to evacuate from a danger zone was ten minutes. People without disabilities took 6 minutes to evacuate in the same route, that show us evidence that support Japanese estimation that people with disabilities would have twice possibilities of dying in a tsunami.

![Results of SATI NETRICS](image)

**Evaluation from ONEMI forms**

Inclusiva is a certified evaluator trained by ONEMI to use their Evaluation Form. Here the general observations and conclusions:

1) Streets and sidewalks in the flat zone (danger zone) are in good general conditions, but with some problems regarding with accessibility in their ramps. There were no accessibility for blind people.

2) Streets and sidewalks in elevated zones and in the Meeting Points (safe points) presented several accessibility issues, with several barriers and were not safe at all for people with disabilities.
The Inclusive Index Calculation Matrix is a methodology designed to measure how inclusive is a given place, methodology, procedure or technology.

The Inclusive Index Calculation Matrix uses four variables and a five point scale that is compatible with the ICF of the World Health Organization. Here are the variables:

**Autonomy:** the ability to perform an action or activity without the need of intervention by third parties (strengthens independent living).

**Dignity:** protecting the respect due to each person and their self-image avoiding Exposure to situations that may violate them.

**Safety:** presence of protective factors (physical and/or social) that prevent or reduce the risk of accidents and/or loss of functionality.

**Diligence:** reasonable time (optimally the same time is required by any User) of execution and/or use of a space, service, attention or technology.

**The scale:**

**Level 0 or optimum level of inclusion:** Facilitates inclusion at an optimal level, does not exist Barriers or restrictions to the inclusion of users with disabilities in any type or degree.

**Level 1 or efficient level of inclusion:** Facilitates inclusion at an effective level, there are very few Barriers to the inclusion of users with disabilities in any type or grade. Users can use with little difficulty or requiring little or no help from external assistance.

**Level 2 or regular level of inclusion:** Facilitates inclusion at a medium level, there are barriers, Cause moderate restrictions on the autonomy of users. Users can make use with difficulty or requiring outside help or assistance.

**Level 3 or Deficient Level of Inclusion:** It hardly facilitates inclusion at a level of understanding, there are many barriers, cause severe restrictions on the inclusion of users. The users require a lot of help or external assistance.

**Level 4 or exclusion level of:** It prevents inclusion, there are many barriers, it causes total restrictions and exclusion of the users. Users can not use or participate.
Results of the Inclusive Calculation Matrix applied in emergencies

1. What level of these variables does the Drill Alert System has?

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Inclusion Index

2. How inclusive is the evacuation of People with disabilities in the drill?

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Inclusion Index

3. How inclusive are the safe zones for people with disabilities?

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Inclusion Index

4. How inclusive was the ending stage of the drill for people with disabilities?

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Inclusion Index
Conclusions:

1. Environmental barriers such as architectonical barriers combined with geographical factors such as mountainous landscapes in the coastline (Japanese and Chilean landscapes) reduces at least twice the survival possibilities of people with disabilities and their assistants/ family or co-workers.
2. Critical infrastructure such as schools, hospitals and rehabilitations centers cannot be placed in dangerous zones.
3. Resilient cities need to be intelligent cities with systems, services and technologies that have dialogues among them reducing vulnerabilities. The data collected must be used to design better, with inputs from the community, people with disabilities must be key actors in urban planning. Communication technologies are needed.
4. Urban planning needs to follow universal design.
5. Urban planning should contemplate better conditions in safe zones that would house temporally people that are escaping from tsunami.
6. The planning of the drills must take into account the needs of people with psychiatric disabilities, Down syndrome, autism, deaf people among others, it has to be planned beforehand, if not the drill itself can cause harm to people with disabilities (this is said from people with disabilities organizations in Chile, it is not paternalism because the solution is participation).
7. Local governments must work with local people with disabilities, the emergency authorities and ministries involved in building regulations alongside private sector to improve design and regulations.
8. Drivers need to not use their cars, but due to the danger that cars represent to pedestrians with disabilities, sidewalks must follow Universal Design applied to Emergencies Standards (UDES) with no barriers and of a proper width.
9. People with disabilities and its organizations must work at local and national levels with authorities involved in risk reduction, and must work as observers and technical evaluators.
10. Communities such as the people that inhabit a building, blocks, office workers, rehabilitation center users and professional teams need to be trained as inclusive risk reduction teams with procedure and protocols.
11. International cooperation should have specific projects on inclusive risk reduction.