

Not My Fault: What we can learn from Japan's Disaster Prevention Day

Lori Dengler/For the Times-Standard
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Saturday September 1 was Disaster Prevention Day (防災の日 bousai no hi) in Japan, a day for the country to take stock of its hazards and conduct drills and awareness campaigns to build nation-wide resilience.

Like most annual preparedness efforts, Disaster Prevention Day grew out of a catastrophe. Ninety-Five years ago, Japan suffered its worst historic natural disaster, the September 1, 1923 Great Kanto Earthquake. The magnitude 8.1 earthquake was centered beneath the greater Tokyo area and the combination of shaking, tsunami and fire is estimated to have taken over 140,000 lives.

The Great Kanto earthquake was centered only nine miles beneath the Kanto plain, 19 miles east of Yokohama and about 30 miles SE of Tokyo's Imperial Palace. The earthquake ruptured a 60 by 60 mile interface related to the subducting boundary between the Pacific and Eurasian plates, thrusting the overlying plate about six feet up and 15 feet to the east, deforming the sea floor and producing a tsunami that reached 40 feet high along the coast south of Tokyo. Over 2000 of the casualties are attributed to the tsunami.

It is not known how many buildings succumbed to the shaking. There was no systematic post earthquake assessment in place back in 1923 and fires leveled much of the area in the hours and days afterwards. From the accounts of survivors, we know that several large structures collapsed, including the three-story Grand Hotel in Yokohama. Liquefaction, the phenomenon of saturated sediments behaving like a liquid, exacerbated the damage particularly in the port areas of Yokohama.

The strong shaking also caused many of the traditional homes and buildings to collapse. Although built out of wood and resilient to strong shaking, they were roofed with heavy tiles. The tiles, a traditional method of combatting high winds caused by typhoons, create a top-heavy load in earthquake shaking and led to many collapses.

Time of day can have important consequences in earthquakes. The 1923 earthquake struck shortly before noon on a Saturday, when many people were preparing lunch over small charcoal-burning hibachis. The shaking upended the stoves, triggering fires throughout the area. To make matters worse, the earthquake coincided with a typhoon that fanned the fires, turning a number into infernos. Like the 1906 San Francisco earthquake, shaking disrupted water supplies and the ability of fire fighters to reach fires. It took at least two days to contain the infernos. Most assessments attribute the greatest loss of life and structures to the fires.

There was one notable survivor of the 1923 earthquake, Frank Lloyd Wright's New Imperial Hotel. There were no earthquake building codes in place when Wright proposed his designs for the building, but recognized both shaking resilience and the fire threat. His autobiography recounts a debate with hotel directors in 1921 about the importance of the pool, "I told him via interpreters that it was the last resource against the quake. In a disaster, the city water would be cut off, and the window frames being wood in the 500-foot building front along the side street where wooden buildings stood, fire could gut the structure even though it withstood the quake."

Wright's Hotel was not the only survivor. A Tokyo Building Inspection Department study estimates about 40% of the buildings in Tokyo had as little or even less damage than the Imperial. But many of the principles that Wright employed in the design have become part of building codes in earthquake country today – broad footings to resist liquefaction, tapered walls with added strength on lower floors and a copper roof with no heavy tiles.

Roll forward to 2018. Japan has the most stringent earthquake resistant construction codes of any country in the world and continues to upgrade requirements. In 1960, tougher regulations were put in place post 1995 Kobe earthquake, a decision that reduced shaking damage from the 2011 Great East Japan earthquake. This year, the country staged an emergency exercise along the Nankai trough, a subduction zone along the south-central Honshu coast where the next great quake could be centered. There were local evacuation drills in some areas but according to several of my Japanese colleagues, not a great outpouring of activities this year.

Why doesn't the US have a Preparedness Day? Turns out, we have more than a day. The Federal Emergency Management Agency designates all of September as National Preparedness Month

<https://www.ready.gov/september>. The website suggests a number of activities this month that will help you prepare for all disasters. It isn't widely publicized, but you are hearing about it now. The problem with preparedness in both the US and Japan is that it's not a high priority before hand and afterwards it is too late.

Read more about the 1923 earthquake at <https://www.smithsonianmag.com/history/the-great-japan-earthquake-of-1923-1764539/#77Ep6slooYX3ud5b.99>, <https://www.theatlantic.com/technology/archive/2011/04/how-tokyos-imperial-hotel-survived-a-1923-earthquake/73306/>

Preparedness tip for this week: This week's recommendation from ready.gov for National Preparedness month is develop a plan. The first step is to talk about what a plan is and what to include. It's Step #2 in our Living on Shaky Ground magazine and the ready.gov site above has additional information.

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