

Tsunamis, earthquakes, nuclear meltdowns, pandemic: What Japan has learned from centuries of disaster

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A decade on from [3/11](#)—the devastating earthquake, tsunami and nuclear catastrophe that hit Japan—the country is again amid a crisis

caused by COVID-19.

Japan's already [long experience](#) with hazards and disasters was expanded when it faced the catastrophic triple disaster of 3/11. Yet it does not seem like the potential lessons from how to respond to unforeseen disasters of unprecedented size and scale have been applied when it comes to COVID.

When flexibility and fast decision making was needed, Japan's government has been [slow to act](#) against the pandemic. The response [lacked urgency](#) and was [extremely cautious](#). With vaccinations getting underway in June 2021, Japan is finally coming closer to getting the pandemic under control, but it lags far behind other G7 countries.

The slow response—similar to a paralyzed [lack of action](#) during the nuclear disaster in 2011—shows that even extensive experience and expertise in hazard mitigation and disaster management do not automatically translate into good pandemic management. It is clear that there are serious weaknesses in Japan's bureaucratic disaster governance.

'Unprecedented' disaster #1

On March 11, 2011, the largest earthquake ever [recorded in Japan](#) (and [fourth in the world](#)) struck off the coast of the country. It caused a tsunami that killed more than [20,000 people](#), devastated communities along 500km of coastline and led to a nuclear meltdown at the Fukushima Daiichi Nuclear Power Plant.

Japan has an extensive history and experience facing and responding to earthquakes and tsunamis and because of this it is one of the most earthquake-prepared countries in the world. Few buildings constructed after Japan's 1981 seismic building code were damaged, [even by this mega-quake](#). But, [exceeding all predictions](#), the tsunami destroyed places

believed to be safe, causing tragic loss of life even among people who had escaped to [evacuation centers](#), and overwhelmed disaster response [capacity](#).

At 2:46pm on Friday, March 11, the shaking started. In Japan, earthquakes are measured and reported by not only their magnitude, but also on a scale that measures their shaking intensity from 1 to 7. This is called the [shindo](#) scale. For example, at shindo 6, people are thrown to the ground. On March 11, the earthquake hit [shindo 7](#) in some areas.

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'A black wave'

The shaking itself was scary, lasting six minutes that seemed like an eternity, but that was nothing compared to what was coming. In some places, the first tsunami wave arrived within 30 minutes. A tsunami is more like a moving wall of water than a wave in the ocean. Once the tsunami overtops levees or sea walls, water rises quickly in the streets and travels faster than a car. As it moves, it picks up oil, debris—all the parts of the cities it is destroying.

People described the tsunami as a black wave, a wall of water, a cloud of dust, a terrifying sound. On YouTube, you can see many [videos](#) from that day, filmed by survivors who managed to reach higher places. They show the sea level rising in harbors and then waters rushing into towns.

Tsunamis are not one, but multiple waves that come in and recede again and again; breaking and pulling houses, buildings, cars—everything—out to sea. In many of these videos, you can hear people yelling "tsunami" or "this is the end", or yelling to people below to run away. In much of this

region, which has experienced multiple tsunamis in the past, many people evacuated to the designated places on higher ground.

But some made decisions [which turned out to be fatal](#): to go back to get supplies or blankets to keep warm, or to go to check on family first before evacuating. Some people tried to evacuate by car and were overcome by the tsunami. Others were washed out to sea. Around [18,000](#) people lost their lives in the tsunami directly—a figure that jumps to more than [20,000](#) when including related deaths that took place later.

It was still cold in March, and it snowed that night. People who spent it outside stranded on rooftops, speak of the clear sky, of being cold and wet. With blackouts, there was no electricity and as phone systems were also not working, there was no way to share or get information about the safety of people in other places.

Some areas remained cut off for days, as people stayed in evacuation centers, sleeping on the floor of school gymnasiums, or with extended family and neighbors in houses above the devastation. More than [400,000 houses](#) were damaged, some with only the concrete foundations remaining. Homes and other buildings were reduced to huge piles of debris strewn across the landscape.

But even as rescue workers and relief supplies were arriving for tsunami evacuees, inside the Fukushima Daiichi Nuclear Power Plant, things were going from bad to worse. The plant had lost power and it was losing the ability to cool its reactors. At that time, it was not clear what was happening—but it was later confirmed that nuclear meltdowns happened in three reactors.

After several explosions, evacuation orders were issued and then upgraded for the surrounding communities. Without clear coordination

or an organized plan ([then or even now](#)), initial evacuation orders were issued for areas depending on their distance from the nuclear power plant. It turned out that this did not match the heavier areas of contamination caused by the wind patterns on that day.

Evacuation from the nuclear disaster area was chaotic. Some people evacuated on their own, some towns tried to evacuate together. Evacuation was especially difficult for residents of nursing or care facilities, many of whom [lost their lives](#). It was hard to find available areas, especially since many evacuation centers were already at capacity with tsunami evacuees. Nuclear evacuees often moved multiple times in their evacuation.

Even ten years later, there are still some areas where people are [not allowed](#) to return because of radioactive contamination. Many other people do not want to return even with assurances of safety, especially those with young families.

Building back

Although 3/11 was unprecedented, the Japanese government drew from past disasters and existing legal frameworks to develop a standardized menu of [funded programs](#) to rebuild destroyed communities. In the name of building back safer, massive [infrastructure](#) has drastically altered the landscape. Sea walls have been built, land raised and mountains cut into to relocate houses and communities out of reach of future tsunamis.

But questions remain over the long-term effects of these recovery projects and the changes inflicted on tsunami-stricken communities. For those affected by the nuclear disaster, programs that focus on "hometown recovery" (rebuilding housing and community infrastructure within former municipalities) struggle to address issues of radioactive

contamination, indefinite displacement and [un-inhabitability](#) in towns where residents cannot, or choose not to, return.

One strength of Japan's disaster response and reconstruction is standardization—emphasising "equal" support to all. Decisions made at the top are implemented through an efficient, if slow, bureaucratic process. Japan has detailed legal frameworks and [standardized disaster management policies](#), and [community disaster management plans](#) are promoted across the country. For housing recovery after 3/11, policies were based on standardized compensation for damaged homes and support for new housing across the region.

During COVID-19, the [highly-ridiculed](#) policy to send two (very small) masks to each household in the county (regardless of the household size or local pandemic conditions) is a perfect example of a policy that was fair and the same for all, yet [slow](#) and not responsive to actual needs.

The flip side of this precision and standardization is a lack of flexibility or incentive for developing creative solutions. This system is incapable of moving quickly, decisive action, or course corrections. Detailed manuals with rote responses that can be practiced could be effective for a reoccurring event such as heavy rains, typhoons, blackouts, or even small earthquakes—but they are useless in an unpredicted crisis.

It is difficult for this system to address massive and complex problems such as those created by the nuclear disaster. The slow moving governmental bureaucracy has proved itself even less capable of responding decisively to control the spread of an unknown pandemic virus, which does not fall under Japan's well established laws and policies governing disaster management.

'Unknowable' hazards

Both the nuclear accident and the pandemic were unpredicted and "unknowable" disasters, especially in the early days of each crisis. We grew to understand more over time.

In the days after the tsunami, the world wondered what was happening inside the Fukushima nuclear power plant—efforts to cover up the fact it was actually a nuclear [meltdown](#) were only officially admitted [five years later](#). While the path of radioactive particles was known, this data was [not shared](#) with the public, or used to direct evacuation—in some cases people unknowingly remained in, or were evacuated to areas, with higher contamination.

Like radiation, COVID-19 is an invisible risk. While both radiation and virus exposure can be silently carried in our bodies without our knowledge, the window when potential health impacts become known is much shorter with COVID-19. In both cases, though, unsure about what risks they were exposed to and lacking proactive government actions, people made their own judgements about risk and safety.

With an official COVID-19 death toll of just over [14,000](#), and daily deaths rarely much over 100, in Japan the pandemic has not reached the tragic levels seen elsewhere. The health care system has been stretched in some places, but never collapsed. This means that people in Japan are fortunate compared to those in many other countries, yet many of those lives may have been saved with more effective pandemic management.

In the face of uncertain risks and unknowable hazards, the Japanese government's approach to COVID-19 and the nuclear disaster show some similarities, with official narratives shaped through the use of selective information.

For example, COVID-19 case numbers and data have been released daily—but they [don't include all tests](#). Policies that focus on [contact](#)

[tracing](#) while [avoiding widespread testing](#) were intended to reduce the number of people going to hospitals. So—as explained by global health expert [Kenji Shibuya](#)—rather than a public health approach, Japan was focused on preserving the functions of the health care system. While this may have been a valid goal, it could not effectively control the virus after widespread community infection.

The Japanese government has continuously [downplayed the risk of COVID-19](#) (as it did with the [nuclear disaster](#)) prioritizing economic activity while promoting an image of "[COVID-safe](#)" Japan, both inside and outside of the country. Without real lockdowns or stay-at-home orders, Japan's [COVID-19 states of emergency](#) limit business hours for bars and restaurants and large gatherings. People are asked to practice "self-restraint" and avoid crowded and congested places.

Existing cultural factors such as widespread mask-wearing, keeping physically distanced, high levels of sanitation and rule-following may have contributed to slowing the spread of COVID-19 in Japan. Some experts and officials fell back on [culturalist](#) and even [racial superiority](#) reasons for this perceived Japanese exceptionalism. However, by the end of 2020 it was clear that Japan's strategies [were not working](#).

With the number of seriously ill COVID patients [peaking in May 2021](#) and vaccinations for the elderly only just getting started in June, [cases](#) continuing to rise and the [state of emergency extended](#) for much of the country, it is becoming harder to see Japan's pandemic management as something to emulate.

Despite this, the [national government](#) has been vowing to get [COVID under control](#) and promising the world that Tokyo will still hold the Olympics from July 2021.

Olympic redemption?

The shadow of the 2020 Tokyo Olympics was already present after the nuclear accident, when in 2013 the prime minister assured the world that [Japan was safe](#) while securing Tokyo's bid to host the games. Only days later it was revealed that massive amounts of radioactive groundwater had been [leaking into the sea](#).

Downplaying risks to create an image of safety both in Japan and globally was a core government strategy. This message became inextricably linked to hosting the Tokyo Olympics (an economic opportunity as well as an ultimate chance to present Japan in a positive way to the world). Initially, the "[Recovery Olympics](#)" were framed to show successful recovery after 3/11 (an idea that many found to be [offensive](#) to disaster survivors still facing many challenges).

Then in 2020, with the Olympics finally around the corner, the pandemic struck. Japan made every effort to [avoid the eventual postponement](#) of the Tokyo Games to 2021. Now, they have been reframed as a way to show the world Japan's triumph over the pandemic.

With Tokyo under an extended state of emergency into June, [questions](#) lingered as to whether the postponed games would go on as scheduled from July 2021 and if teams will come. There has even been speculation that the Olympics could result in a [new virus mutation](#)

With a few notable exceptions, the places that were able to act quickly to effectively control the spread of COVID-19 were those with experience handling the SARS pandemic, such as [Hong Kong](#) and [Taiwan](#).

While Japan has expert knowledge and a national infectious disease research center, without a national government agency such as the [CDC](#) in the United States, the COVID-19 response was ad-hoc. Several expert committees were set up to advise the government; the national response was led by the minister of economics. This is a telling factor of Japan's

response, although Japan is no way unique among countries of the world that struggled to balance the control of disease with impact on their economy.

In Japan, natural hazards are precisely predicted and calculated, with hazard maps of local areas mailed to residents. From a young age, children learn what to do in the case of an earthquake, and there is high awareness of [disasters](#) in the general public as well as private and public sectors. The *shinkansen* (bullet train) automatically stops seconds after an earthquake is detected, and cell phones automatically issue a warning for anyone in the area. With standardized policies in place, risk events are confirmed and conveyed, warnings are disseminated, and pre-existing plans are activated to set up evacuation facilities and give out relief supplies.

Yet, Japan shows us that disaster management experience does not automatically translate to effective pandemic management, at least not on a national level. Japanese disaster management and response is technologically proficient, with expertise and precise calculations and efficient systems to calculate and issue warnings and implement safety measures.

But [disaster management](#) that is based on planning for specific expected events is not flexible. Effective response to natural or technical hazards—or pandemic diseases—requires competent national leadership as well as suitable localized responses. Most importantly, as [natural hazards continue to grow](#) and become even more unpredictable with climate change, the [next global pandemic](#) or disaster may be here soon. The ability to respond quickly and with flexibility may be the most important factor to avoid repeating the failures of COVID-19 and a potentially even greater loss of life.

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