

Earthquakes in Japan: Risks, Resilience, and Advocacy for Safer Futures

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Introduction

Japan, positioned along the Pacific “Ring of Fire,” is one of the most earthquake-prone nations in the world. The country experiences approximately 1,500 earthquakes each year, and around 20% of all earthquakes of magnitude 6.0 or higher globally occur in or around Japan. These tremors range from minor, barely perceptible shakes to catastrophic events such as the 2011 Great East Japan Earthquake, which measured magnitude 9.0, making it the strongest earthquake ever recorded in Japan. Despite advanced early-warning systems, strict building regulations, and extensive disaster preparedness measures, earthquakes continue to pose serious and ongoing risks to Japan’s population. These realities highlight the urgent need for continuous awareness, advocacy, and community-based resilience strategies.

Risks Faced by People in Japan

Earthquakes in Japan present severe physical risks to life and infrastructure. During the 2011 Great East Japan Earthquake, over 19,700 people lost their lives, more than 2,500 were reported missing, and over 6,000 were injured. In addition, approximately 122,000 buildings were completely destroyed, while another 283,000 structures were severely damaged. Although modern construction standards have significantly reduced collapse rates, older buildings built before updated seismic codes remain highly vulnerable, especially in rural and coastal areas.

Critical infrastructure is also at risk. Major earthquakes have damaged roads, bridges, railways, and power networks, cutting off transport and emergency supplies at the time they are most needed. In recent years, earthquake swarms have highlighted this vulnerability, with some regions experiencing hundreds of earthquakes within a matter of weeks, placing constant strain on communities and emergency services.

Secondary hazards further increase the danger. Underwater earthquakes can trigger tsunamis capable of reaching coastal settlements within minutes. In 2011, tsunami waves exceeding 10 metres in height inundated large areas of northeastern Japan. Earthquakes also frequently cause fires due to ruptured gas lines, while mountainous regions face landslides that can bury homes, roads, and farmland.

Beyond physical harm, the social and economic impacts are immense. At the peak of the 2011 disaster, more than 470,000 people were displaced, many of whom lived for extended periods in temporary shelters. The total economic cost of the disaster is estimated to have exceeded US \$200 billion, making it one of the most expensive natural disasters in history. Industrial shutdowns disrupted domestic livelihoods and global supply chains, particularly in the automotive and electronics sectors. Survivors also experienced long-term psychological effects, including increased rates of anxiety, stress, and trauma that persisted long after reconstruction began.

Advocacy Project: “SafeSteps Japan”

To address these ongoing risks, an independent advocacy initiative called SafeSteps Japan could be launched to raise awareness and empower communities with practical safety strategies. The project would prioritise vulnerable groups, including children, the elderly, and residents of high-risk coastal and rural regions.

The initiative would begin with a nationwide awareness campaign titled “One Minute to Safety,” focusing on the first 60 seconds following the onset of an earthquake — a critical period that can significantly influence survival outcomes. Illustrated guides, animated videos, and public service announcements would teach citizens protective actions such as “Drop, Cover, and Hold On.” Schools, television stations, and public spaces would be used to ensure widespread reach.

In addition, monthly community preparedness workshops would provide hands-on training in first aid, evacuation procedures, and tsunami response. These sessions would include realistic emergency simulations to improve confidence and reaction speed during real events.

SafeSteps Japan would also advocate for safer housing by supporting stricter enforcement of seismic construction codes and promoting low-cost retrofitting programs for older homes. Community cooperatives and local governments would be encouraged to collaborate, making safety upgrades more affordable and accessible.

Children would be actively involved through a program called “QuakeSmart Kids.” Through games, role-plays, and the distribution of small emergency kits containing items such as whistles, flashlights, and emergency contact cards, the program would help instil preparedness habits from an early age.

Finally, technology would support preparedness through a mobile application offering real-time earthquake alerts, nearby shelter locations, and personalised emergency checklists to help users respond effectively during crises.

Conclusion

Japan cannot prevent earthquakes, but it can significantly reduce their impact. With the potential for future mega-earthquakes that could cause hundreds of thousands of deaths and trillions of dollars in economic damage, preparedness is not optional. By combining education, community training, resilient infrastructure, and digital innovation, advocacy initiatives such as SafeSteps Japan can help save lives and strengthen national resilience. Earthquakes may be natural, but the scale of their consequences depends on how well societies prepare for them.

Statistical Information

General Earthquake Activity

- ~1,500 earthquakes per year occur in Japan
- ~20% of global magnitude 6.0+ earthquakes occur in Japan

Source: Economic Times

2011 Great East Japan Earthquake

- Magnitude 9.0 (largest in Japan’s history)
- 19,729 deaths, 2,559 missing, 6,233 injured
- 122,000 buildings destroyed, 283,000 severely damaged
- 470,000+ people displaced
- Economic loss: US \$200–235 billion

Source: Japan Reconstruction Agency

Recent Earthquake Activity

- 900+ earthquakes in two weeks in the Tokara Islands region (2025)

Source: The Guardian

Building Vulnerability

- Over 50% of buildings in some affected regions built before modern seismic codes

Source: Government and disaster assessments (Noto Earthquake context)

Future Megaquake Projections (Nankai Trough)

- Up to 298,000 potential deaths
- Up to US \$1.8 trillion in economic damage
- Over 1.2 million people displaced

Source: Reuters (Japanese government estimates)

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