

# Why is Taiwan so exposed to earthquakes and so well prepared to withstand them?

April 4 2024, by Simina Mistreanu

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A man looks at the cordoned off site of a leaning building in the aftermath of an earthquake in Hualien, eastern Taiwan on Wednesday, April 3, 2024. Taiwan's strongest earthquake in a quarter century rocked the island during the morning rush hour Wednesday, damaging buildings and highways Credit: AP Photo/Chiang Ying-ying

Taiwan was struck Wednesday by its [most powerful earthquake in a](#)

[quarter of a century](#). At least nine people were killed and hundreds injured, buildings and highways damaged and dozens of workers at quarries stranded.

Taiwan is no stranger to powerful earthquakes yet their toll on the high-tech island's 23 million residents has been relatively contained thanks to its excellent earthquake preparedness, experts say.

Here is a closer look at Taiwan's history of earthquakes:

## **WHY SO MANY TEMBLORS?**

Taiwan lies along the Pacific "Ring of Fire," the line of seismic faults encircling the Pacific Ocean where most of the world's earthquakes occur.

The area is particularly vulnerable to temblors due to the tension accumulated from the interactions of two [tectonic plates](#), the Philippine Sea Plate and the Eurasian Plate, which may lead to sudden releases in the form of earthquakes.

The region's mountainous landscape can magnify the ground shaking, leading to landslides. Several such landslides occurred on Taiwan's eastern coast near the epicenter of Wednesday's quake near eastern Hualien County, when falling debris hit tunnels and highways, crushing vehicles and causing several deaths.

## **HOW WELL-EQUIPPED IS TAIWAN TO HANDLE QUAKES?**

Wednesday's earthquake measured 7.2, according to Taiwan's earthquake monitoring agency, while the U.S. Geological Survey put it at

7.4. It damaged several buildings in Hualien but caused only minor losses in the capital Taipei despite being strongly felt there.



A rescue worker stands near the cordoned off site of a leaning building in the aftermath of an earthquake in Hualien, eastern Taiwan on Wednesday, April 3, 2024. Taiwan's strongest earthquake in a quarter century rocked the island during the morning rush hour Wednesday, damaging buildings and highways. Credit: AP Photo/Johnson Lai

The earthquake hit in the middle of the morning rush hour yet only slightly derailed the regular commute. Just minutes later, parents were again walking their children to school and workers driving to offices.

"Taiwan's earthquake preparedness is among the most advanced in the world," said Stephen Gao, a seismologist and professor at Missouri University of Science and Technology. "The island has implemented strict building codes, a world-class seismological network, and widespread public education campaigns on earthquake safety."

The government continually revises the level of quake resistance required of new and existing buildings—which may increase [construction costs](#)—and offers subsidies to residents willing to check their buildings' quake resistance.

Following a 2016 quake in Tainan, on the island's southwestern coast, five people involved in the construction of a 17-story high-rise apartment building that was the only major structure to have collapsed, killing dozens, were found guilty of negligence and given prison sentences.



People evacuated from their homes sit outside the shelter after the main earthquake in Hualien City, eastern Taiwan, Thursday earlier morning, April 4, 2024. The strongest earthquake in a quarter-century has rocked Taiwan during the morning rush hour. Credit: AP Photo/Chiang Ying-ying

Taiwan also is pushing quake drills at schools and workplaces while public media and cellphones regularly carry notices about earthquakes and safety.

"These measures have significantly enhanced Taiwan's resilience to earthquakes, helping to mitigate the potential for catastrophic damage and loss of life," Gao said.

## THE 1999 QUAKE WAS A WAKE-UP CALL

Taiwan and its surrounding waters have registered about 2,000 earthquakes with a magnitude of 4.0 or greater since 1980, and more than 100 earthquakes with a magnitude above 5.5, according to the USGS.

The island's worst quake in recent years struck on Sept. 21, 1999, with a magnitude of 7.7. It caused 2,400 deaths, injured around 100,000 and destroyed thousands of buildings.

It was also a major wake-up call that led to key administrative reforms to improve [emergency response](#) and disaster reduction, according to Daniel Aldrich, professor of political science and public policy at Northeastern University.

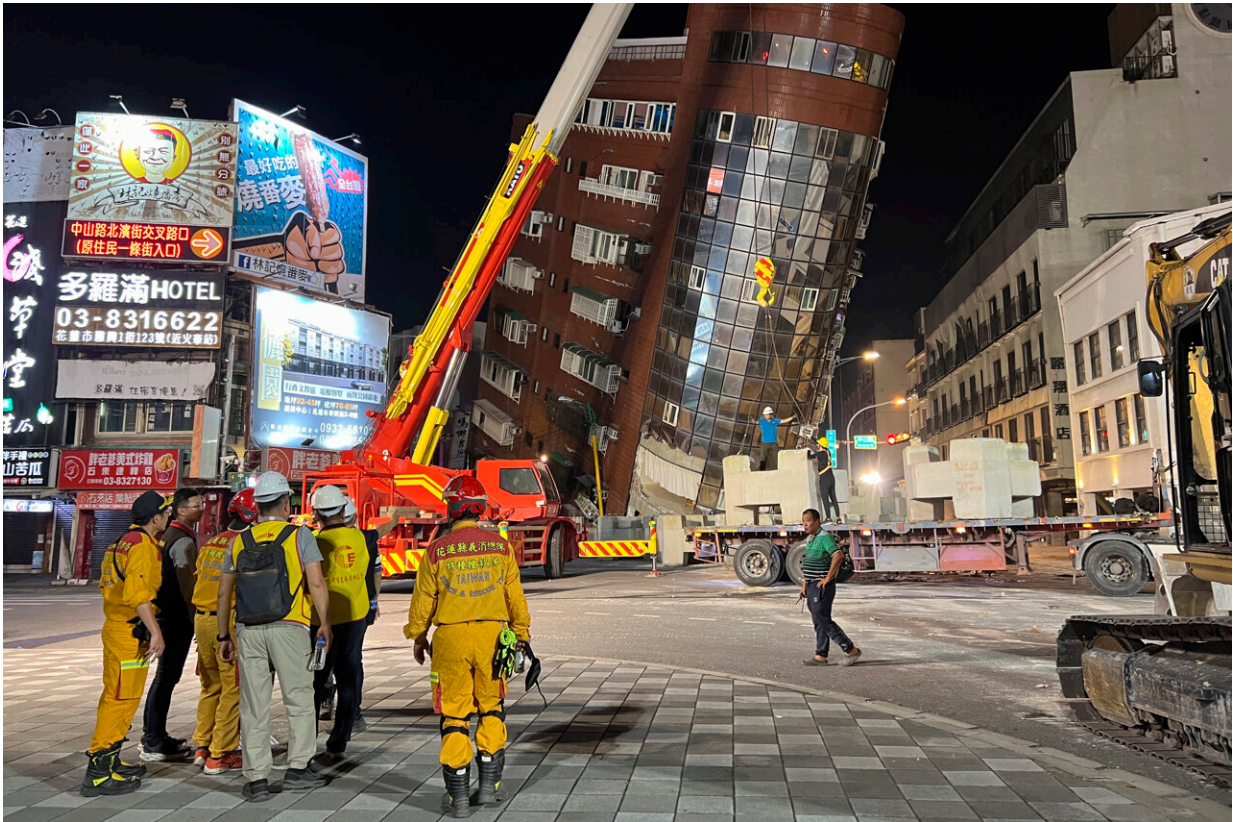


People evacuated from their homes are accommodated in the tent area of the shelter after the main earthquake in Hualien City, eastern Taiwan, Thursday earlier morning, April 4, 2024. The strongest earthquake in a quarter-century has rocked Taiwan during the morning rush hour. Credit: AP Photo/Chiang Ying-ying



Firefighters complete their mission and evacuate from the collapsed building during a rescue operation following an earthquake in Hualien City, eastern Taiwan, Wednesday, April 3, 2024. The strongest earthquake in a quarter-century has rocked Taiwan during the morning rush hour. Credit: AP Photo/Chiang Ying-ying





Rescue workers stand near the site of a leaning building in the aftermath of an earthquake in Hualien, Taiwan, on Wednesday, April 3, 2024. Taiwan's strongest earthquake in a quarter century rocked the island during the morning rush hour Wednesday. Credit: AP Photo/Johnson Lai



Rescue workers stand near the site of a leaning building in the aftermath of an earthquake in Hualien, eastern Taiwan on Wednesday, April 3, 2024. Taiwan's strongest earthquake in a quarter century rocked the island during the morning rush hour Wednesday, damaging buildings and highways Credit: AP Photo/Johnson Lai



In this photo released by the Taiwan Presidential Office, Taiwan's President Elect and Vice President Lai Ching-te, center left in red, visits the site of a building partially collapsed after an earthquake in Hualien in eastern Taiwan on Wednesday, April 3, 2024. Taiwan's strongest earthquake in a quarter century rocked the island during the morning rush hour Wednesday, damaging buildings and highways. Credit: Taiwan Presidential Office via AP



In this photo released by the Taiwan Air Force Command, members of a search and rescue team prepare to deploy on a Taiwan Air Force C-130 from southern Taiwan's Pingtung military air base en route for Hualien on Wednesday, April 3, 2024. Taiwan's strongest earthquake in a quarter century rocked the island during the morning rush hour Wednesday, damaging buildings and highways. Credit: Taiwan Air Force Command via AP



In this photo released by the National Fire Agency, members of a search and rescue team prepare outside a leaning building in the aftermath of an earthquake in Hualien, eastern Taiwan on Wednesday, April 3, 2024. Taiwan's strongest earthquake in a quarter century rocked the island during the morning rush Wednesday, damaging buildings and creating a tsunami that washed ashore on southern Japanese islands. Credit: National Fire Agency via AP



In this image taken from a video footage run by TVBS, residents rescue a child from a partially collapsed building in Hualien, eastern Taiwan on Wednesday, April 3, 2024. A powerful earthquake rocked the entire island of Taiwan early Wednesday, collapsing buildings in a southern city and creating a tsunami that washed ashore on southern Japanese islands. Credit: TVBS via AP

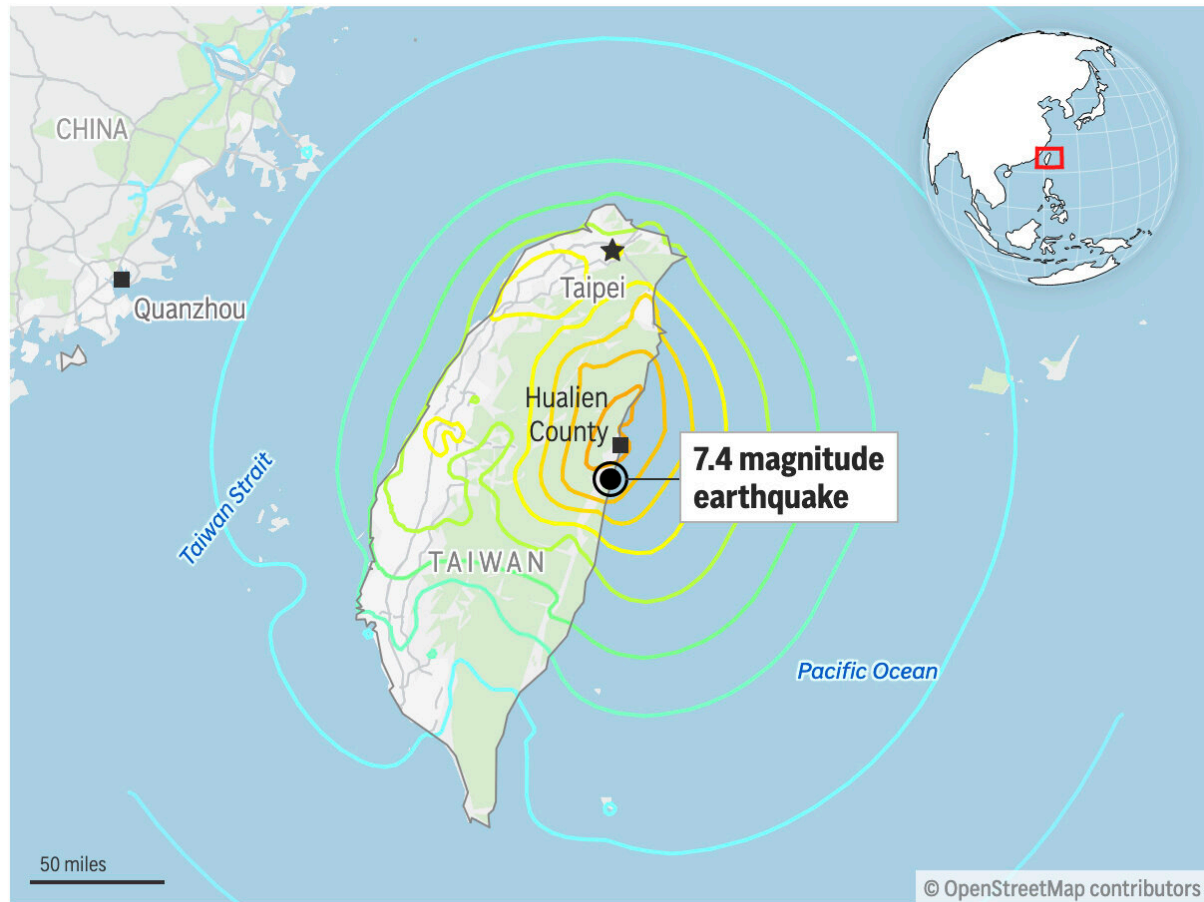


People evacuate to higher ground after a tsunami warning following a powerful earthquake in Naha, Okinawa prefecture, Japan, Wednesday, April 3, 2024. A powerful earthquake rocked the entire island of Taiwan early Wednesday, collapsing buildings in a southern city and creating a tsunami that washed ashore on southern Japanese islands. Credit: Kyodo News via AP

## Intense earthquake strikes Taiwan

Taiwan's strongest earthquake in a quarter century rocked the island just before 8 a.m. on Wednesday.

### Shake intensity



Source: USGS

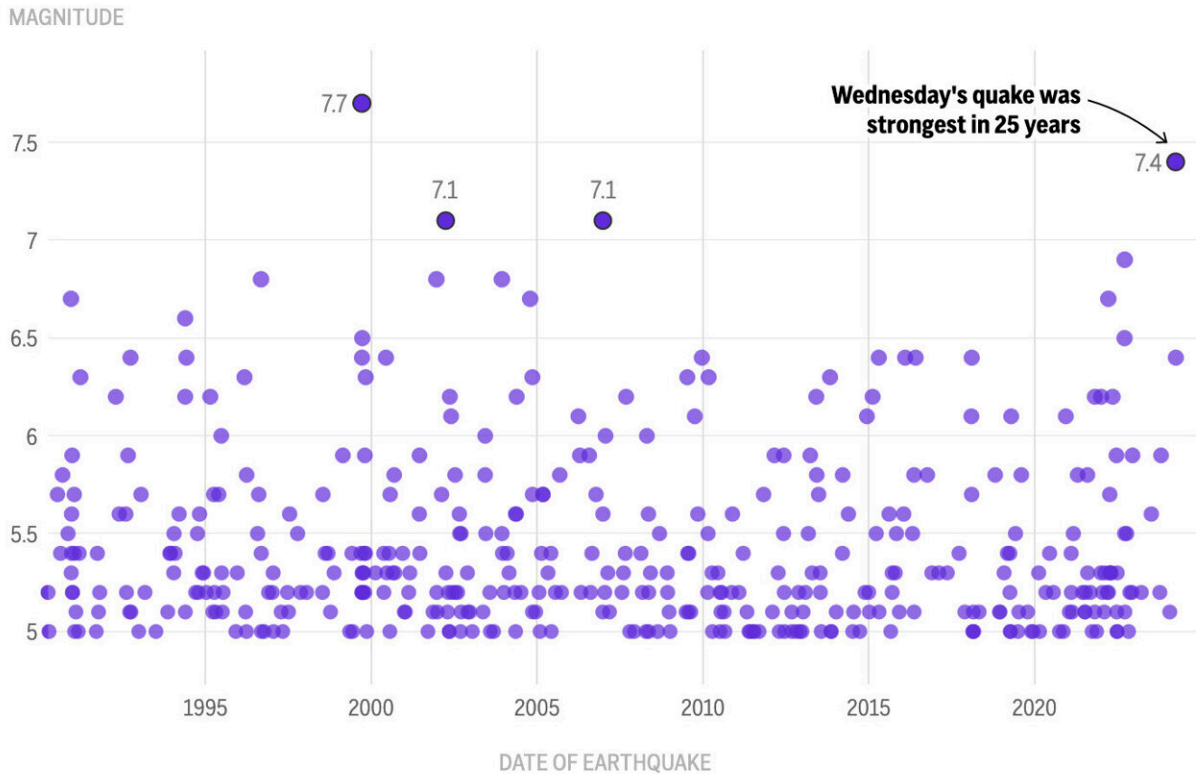


The map above locates the 7.4-magnitude earthquake that struck Taiwan on Wednesday, April 3 and plots its shake intensity. Credit: AP Digital Embed



## Taiwan has a history of strong quake activity

The strongest quake recorded each day of at least a 5.0 magnitude since April 1990.



Source: USGS / Graphic: Phil Holm & Mary Katherine Wildeman



The chart above plots the strongest earthquakes each day that occurred in Taiwan since 1990. Credit: AP Digital Embed



In this image taken from a video footage run by TVBS, a man checks a partially collapsed building in Hualien, eastern Taiwan on Wednesday, April 3, 2024. A powerful earthquake rocked the entire island of Taiwan early Wednesday, collapsing buildings in a southern city and creating a tsunami that washed ashore on southern Japanese islands. Credit: TVBS via AP

"Observers strongly criticized Taiwan's response to the 21 September 1999 earthquake, arguing that it took hours for emergency medical response teams to arrive, that rescuers lacked training, and that the operations between government agencies were not well coordinated," he wrote in an email. As a result, the government passed the Disaster Prevention and Protection Act and set up two national centers to handle coordination and training for earthquakes.

"I think we're seeing the results in this most recent shock," he said.

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