Why parts of North India felt big tremors of a 6.5-magnitude earthquake in Afghanistan

The epicentre of the earthquake was near Jurm in northeastern Afghanistan, about 300 km north of Kabul, quite close to Afghanistan's borders with Tajikistan. Tremors were felt in several parts of north India, including Delhi.

By: **Explained Desk**
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People gather after a building tilts following an earthquake, at Shakarpur area in New Delhi, Tuesday, March 21, 2023. (PTI Photo)

Tremors lasting several seconds were felt in Delhi and other parts of North India as a strong **6.5-magnitude earthquake struck Afghanistan** on Tuesday night, the US Geological Survey (USGS) said.

The earthquake was deep, with its origin 187.6 km below the earth's surface, the USGS said. Deep earthquakes tend to be felt over large distances, which is why tremors were experienced in Punjab, Rajasthan's Jaipur, and Jammu and Kashmir.

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The epicentre of the earthquake was near Jurm in northeastern Afghanistan, about 300 km north of Kabul, quite close to Afghanistan's borders with Tajikistan, according to the USGS. This is an earthquake-prone region where six-plus earthquakes are not rare. A similar 6.1 magnitude earthquake had occurred very

close to this place in 2018 as well, which again was felt through most of northern India.

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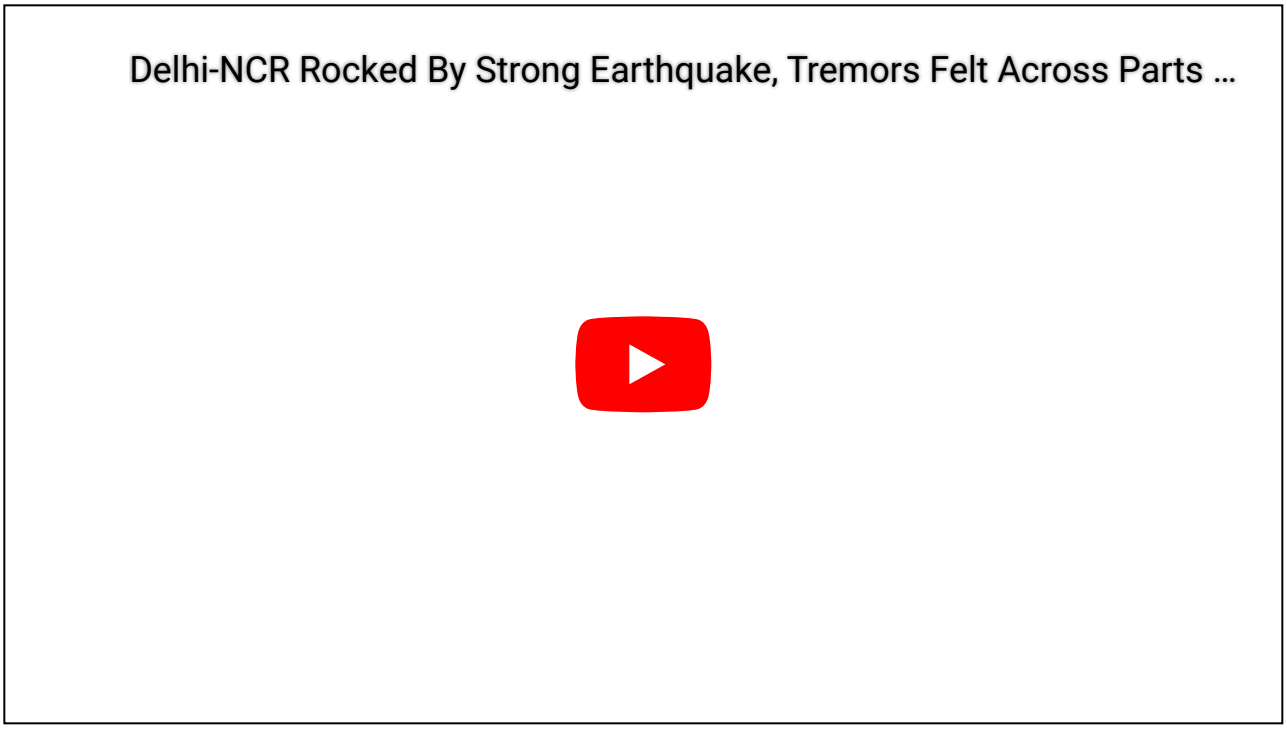
A 6.1 magnitude earthquake in eastern Afghanistan killed over 1,000 people last year.

How big is the earthquake?

How much damage an earthquake will cause depends on its depth and magnitude.

Shallow earthquakes are generally more devastating because they carry greater energy when they emerge on the surface. Deeper earthquakes lose much of their energy by the time they come to the surface. The deeper quakes spread farther — the seismic waves move radially upwards to the surface — even as they lose energy while travelling greater distances, and hence cause less damage. Thus, the current tremors are unlikely to cause much damage in India.

This earthqauke was of 6.5-magnitude. Magnitude is a measure of how big the waves are, while the strength refers to the energy it carries. Magnitude is measured on a logarithmic scale, which means the seismic waves produced by a magnitude 6 earthquake have 10 times higher amplitude than the ones produced by a magnitude 5 earthquake. The energy differential is even higher, 32 times for every change of 1 in magnitude.



Western Himalayas risky zone

Western Himalayas continues to be the one of the most dangerous seismic zones in the world. Scientists say the Himalayan region, the 2500-km stretch from the Hindu Kush mountains to the end of Arunachal Pradesh, is due for a big earthquake, of a magnitude over 8 on Richter scale, anytime. This is because of the huge amount of energy stored along the faultlines due to the continuous interaction of different techtonic plates. The energy can be released only in the form of massive earthquakes.

Earthquakes remain unpredictable

Earthquakes continue to remain the most **common natural hazard that cannot be predicted**. As such, no early warning systems can be developed.

Theoretically, it is possible to offer a lead time of a few seconds between the time of the origin of the earthquake and the time it reaches the Earth's surface. Seismic waves travel significantly slower than the speed of light — between 5 and 13 km per second. So if the earthquake is detected as soon as it is triggered, information about it can be related a few seconds ahead of it reaching the ground.

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Such systems are already in use in some locations to issue alerts about earthquakes. However, these are not predictions. The alerts are issued post-event.

Attempts to find reliable predictors to earthquakes have not been fruitful so far. Scientists have been able to map the areas that are earthquake prone, and are likely to generate earthquakes in future, but there is no way to predict when.

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