

Avalanches, a mountain menace

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Avalanches such as the one that smashed into a hotel in central Italy on Wednesday are complex phenomena triggered by a combination of local factors.

An avalanche occurs when abundant snowfall fails to adhere to snow already on the ground—a process in which winds, topography, ground conditions and recent temperature change can each play a role.

And the incline of the spot where an avalanche begins is a key factor in determining its size.

Avalanches can consist of light, powdery snow, sometimes called "loose-snow" avalanches, or of dense wind-packed snow which breaks off to become a "slab" avalanche.

They can rumble or roar downhill at speeds of 10 to 400 kilometres (six to 250 miles) per hour.

Loose-snow avalanches often occur during or shortly after heavy snowfalls at [low temperatures](#).

The incline of the slope where they start often accounts for their overall size, as it determines how much snow provides the initial "punch" for the slide.

At [extremely low temperatures](#), even a relatively light snowfall can set off an avalanche up to a metre (three feet) deep.

In other cases, high winds create snowdrifts in sheltered areas, and the resulting slab can wrench free because of a steep gradient.

Finally, when the snowpack becomes wetter and heavier in the spring, slabs can break off from the slippery, still-frozen underlying layers, depending on how fast the surface [snow](#) melts.

Forecasting [avalanches](#) is difficult, but areas known to be frequent corridors and which threaten villages or ski areas are regularly purged with explosives to limit the risk.

The avalanche that buried the Hotel Rigopiano near Farindola occurred after the nearby town of Amatrice was rocked by moderate earthquakes with magnitudes of 5.2 to 5.7, according to the European-Mediterranean Seismological Centre (EMSC). Quake experts said the tremors almost certainly triggered the snowslide.

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