As Hurricane Sandy bore down on the East Coast in late October, we in southern New England had a week's worth of warning, including three days of increasingly accurate forecasts by the U.S. Weather Service. Now, imagine stripping away all that advance notice. Instead, it was Monday afternoon, Oct. 22, and you were going about your business as usual when, all of a sudden, your life was threatened and put on hold.

This was the situation for most people during New England's legendary 1938 hurricane. Though ancient mariners knew that a big blow was coming, the region was otherwise caught by surprise. Tragedy struck with much greater fury for lack of notice.

That same scenario of no prediction took place in the town of L'Aquila in central Italy on April 6, 2009. An unexpectedly violent earthquake struck without warning, killing 309, injuring more than 1,000 and leaving more than 65,000 people homeless.

A tragedy? Absolutely. Would prediction have made a difference? Absolutely. Was the absence of a prediction someone's fault? Absolutely, according to the judge who passed a sentence of six years in prison on seven members of Italy's National Commission for the Forecast and Prevention of Major Risks. They were recently convicted of manslaughter for not predicting the event.

This is absurd. It's equivalent to convicting our best hurricane forecasters for not being able to predict a year ago when, where and how strong Hurricane Sandy was going to be. The science simply isn't there yet, and may never be -- neither for a one-year hurricane prediction nor a several-day earthquake prediction.

In the 1980s, there was great hope for deterministic earthquake prediction. By deterministic, I mean doing what hurricane forecasters do within their 10-day time frame: feed real numbers about real physical entities (temperature, pressure, wind-speed, moisture content, etc.) into numerical simulation models and use the output to predict what will happen.

Instead, earthquake managers are becoming more probabilistic. Rather than emphasizing the seismic predictions of epicenters, timings and magnitudes based on the physics of stress and strain, they're emphasizing predictions for the same based on histories, starting with the basic idea: "If it happened once, it can happen again."

At the next level, they sort through the record of past earthquakes seeking patterns that can be projected into the future. For L'Aquila, the city was rebuilt in the 15th and 18th centuries after damaging earthquakes. This should have told the residents something.

Avoidance is not the answer. New York City can no more move to the Catskills to avoid hurricane damage than L'Aquila can move out of the sediment-filled basin that amplifies its earthquake damage. Preparedness is the answer. New York City took a hit because it was not prepared. L'Aquila took a hit because it was not prepared.

Preparedness begins with not rebuilding unnecessary infrastructure or private homes in harm's way, which to my mind is anything within at least 10 feet of high tide. Next comes adding resilience to infrastructure near that line, primarily by upgrading construction codes. Next comes the people part: emergency response protocols, public education and cultural awareness.
For detected hurricanes, we can now count on several days worth of warning, owing to deterministic models. This saves lives, but does little to save real estate and public infrastructure. For detected earthquakes, we'll soon be able to count on deterministic warnings in the 5-to-60-second range, based on seismic velocities in different kinds of rock. Automatic text-messaging makes this short time period long enough to save lives. Surgeons can hold the knife, drivers can pull to a stop, gas valves can be shut and children can dive under desks.

Had L'Aquila been better prepared and its people better educated, public anger at the destruction would have been mitigated, and well-meaning public servants would not be in jail. Let's hope New York City never takes this route.